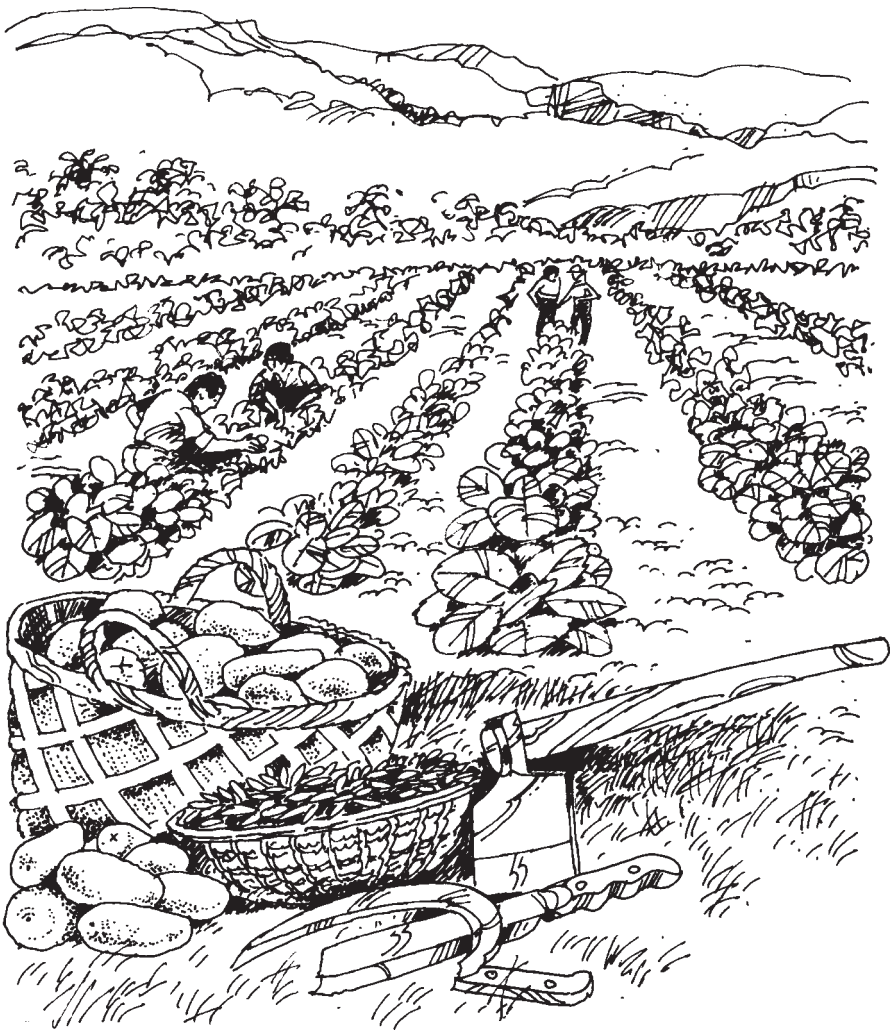
What is Organic Farming?



HDRA
the organic organisation

produced by

HDRA - the organic organisation

What is organic farming?

Organic farming works in harmony with nature rather than against it. This involves using techniques to achieve good crop yields without harming the natural environment or the people who live and work in it. The methods and materials that organic farmers use are summarised as follows:

To keep and build good soil structure and fertility:

- recycled and composted crop wastes and animal manures
- the right soil cultivation at the right time
- crop rotation
- green manures and legumes
- mulching on the soil surface

To control pests, diseases and weeds:

- careful planning and crop choice
- the use of resistant crops
- good cultivation practice
- crop rotation
- encouraging useful predators that eat pests
- increasing genetic diversity
- using natural pesticides

Organic farming also involves:

- careful use of water resources
- good animal husbandry

A modern approach to farming

Organic farming does not mean going 'back' to traditional methods. Many of the farming methods used in the past are still useful today. Organic farming takes the best of these and combines them with modern scientific knowledge.

Organic farmers do not leave their farms to be taken over by nature; they use all the knowledge, techniques and materials available to work with nature. In this way the farmer creates a healthy balance between nature and farming, where crops and animals can grow and thrive.

To be a successful organic farmer, the farmer must not see every insect as a pest, every plant out of place as a weed and the solution to every problem in an artificial chemical spray. The aim is not to eradicate all pests and weeds, but to keep them down to an acceptable level and make the most of the benefits that they may provide.

Combined techniques

On an organic farm, each technique would not normally be used on its own. The farmer would use a range of organic methods at the same time to allow them to work together for the maximum benefit. For example the use of green manures and careful cultivation, together provide better control of weeds than if the techniques were used on their own.

Why farm organically?

Organic farming provides long-term benefits to people and the environment.

Organic farming aims to:

- increase long-term soil fertility.
- control pests and diseases without harming the environment.
- ensure that water stays clean and safe.
- use resources which the farmer already has, so the farmer needs less money to buy farm inputs.
- produce nutritious food, feed for animals and high quality crops to sell at a good price.

Modern, intensive agriculture causes many problems, including the following:

- Artificial fertilisers and herbicides are easily washed from the soil and pollute rivers, lakes and water courses.
- The prolonged use of artificial fertilisers results in soils with a low organic matter content which is easily eroded by wind and rain.
- Dependency on fertilisers. Greater amounts are needed every year to produce the same yields of crops.
- Artificial pesticides can stay in the soil for a long time and enter the food chain where they build up in the bodies of animals and humans, causing health problems.
- Artificial chemicals destroy soil micro-organisms resulting in poor soil structure and aeration and decreasing nutrient availability.
- Pests and diseases become more difficult to control as they become resistant to artificial pesticides. The numbers of natural enemies decrease because of pesticide use and habitat loss.

Crop nutrition

To produce a healthy crop an organic farmer needs to manage the soil well. This involves considering soil life, soil nutrients and soil structure.

Artificial fertilisers provide only short term nutrient supply to crops. They encourage plants to grow quickly but with soft growth which is less able to withstand drought, pests and disease. Artificial fertilisers do not feed soil life and do not add organic matter to the soil. This means that they do not help to build good soil structure, improve the soils water holding capacity or drainage.

The soil is a living system. As well as the particles that make up the soil, it contains millions of different creatures. These creatures are very important for recycling nutrients.

Feeding the soil with manure or compost feeds the whole variety of life in the soil which then turns this material into food for plant growth. This also adds nutrients and organic matter to the soil. Green manures also provide nutrients and organic matter. These are plants with high nitrogen content that are sown as part of a rotation and are dug into the soil when young.

It is important to remember, however, that using too much animal manure or nutrient rich organic matter, or using it at the wrong time, could be as harmful as using man-made, artificial fertilisers.

The organic farmer must cultivate the soil at the right time and in the right ways to provide the best living conditions for the soil life and plant roots.

Choice of crops

Each crop and crop variety has its own specific needs. In some places it will grow well and others it will not. Crops are affected by;

- soil type
- rainfall
- altitude
- temperature
- the type and amount of nutrients required
- the amount of water needed

These factors affect how a crop grows and yields. If a crop is grown in a climate to which it is not suited, it is likely to produce low yields and be more susceptible to pest and diseases. This then creates the need to use agrochemicals to fertilise the crop and control pest and diseases.

The successful organic farmer learns to grow the crops and varieties which are suited to the local conditions. He should grow crops which are suited to his geography and climate. He should choose varieties which are suited to the local conditions such as local varieties.

Rotations

Growing the same crops in the same site year after year reduces soil fertility and can encourage a build up of pests, diseases and weeds in the soil. Crops should be moved to a different area of land each year, and not returned to the original site for several years. For vegetables a 3 to 4 year rotation is usually recommended as a minimum.

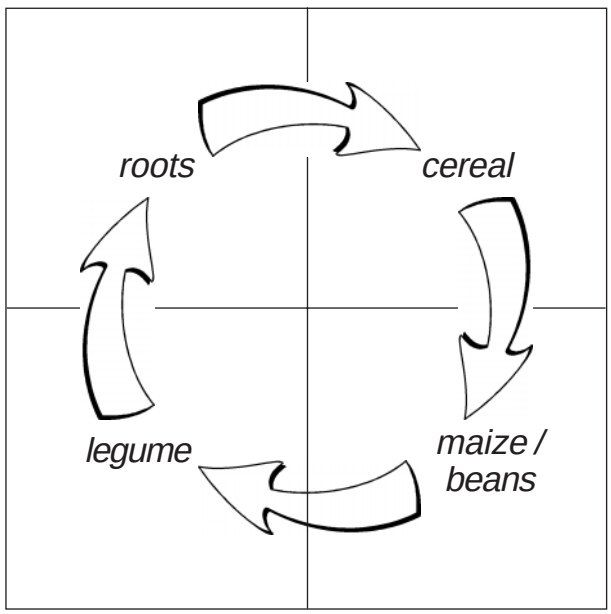
Crop rotation means having times where the fertility of the soil is being built up and times where crops are grown which remove nutrients.

Crop rotation also helps a variety of natural predators to survive on the farm by providing diverse habitats and sources of food for them.

A typical 4 year rotation would include a cycle with maize and beans, a root crop and cereals with either of the following;

1. Grass or bush fallow (a fallow period where no crops are grown).

2. A legume crop where a green manure, which is a plant grown mainly for the benefit of the soil, is grown (more information about green manures can be obtained from HDRA).

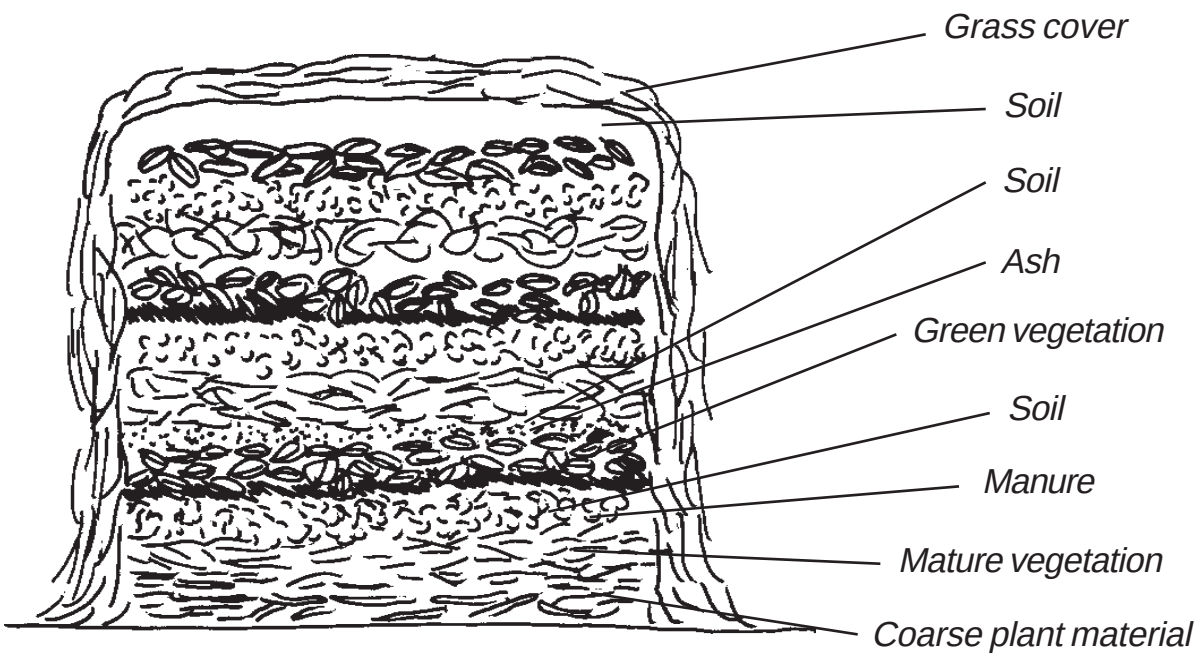


A simple rotation that includes a legume

Composting

Compost is organic matter (plant and animal residues) which has been rotted down by the action of bacteria and other organisms, over a period of time. Materials such as leaves, fruit skins and animal manures can be used to make compost. Compost is cheap, easy to make and is a very effective material that can be added to the soil, to improve soil and crop quality.

- Compost improves the structure of the soil. This allows more air into the soil, improves drainage and reduces erosion.
- Compost improves soil fertility by adding nutrients and by making it easier for plants to take up the nutrients already in the soil. This produces better yields.
- Compost improves the soil's ability to hold water. This stops the soil from drying out in times of drought.
- Compost can reduce pests and diseases in the soil and on the crop.

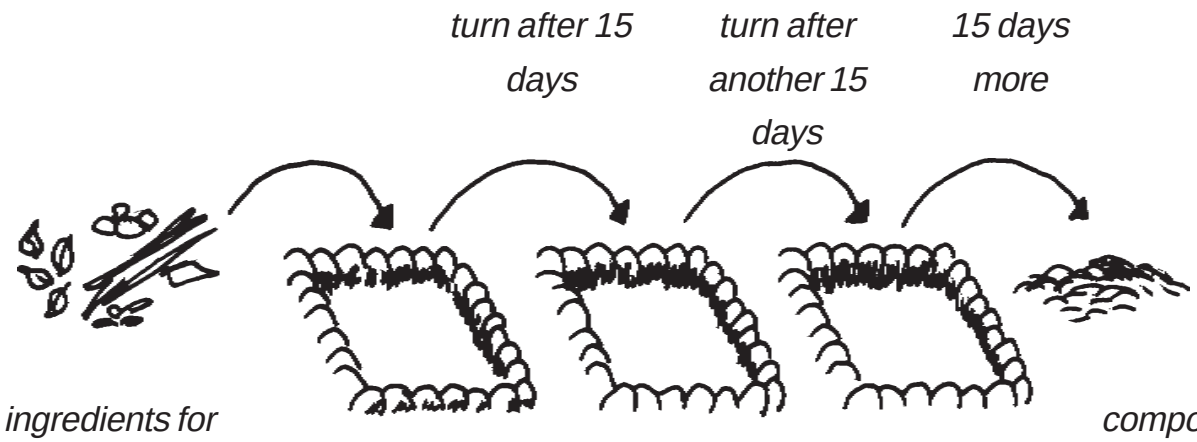


The layers of a compost heap

Compost has many advantages over chemical fertilisers. These provide nutrients for plants but do not improve soil structure. They usually only improve yields in the season in which they are applied. Because compost feeds soil life and improves soil structure, the beneficial effects are long lasting.

There are many ways to make compost depending on available materials and climate, for example:

- Indore method
- Bangalore method
- Heating process/Block method
- Chinese high temperature stack
- Pit composting
- Trench composting
- Basket composting
- Boma composting



Pit composting

Mulching

Mulching means covering the ground with a layer of loose material such as compost, manure, straw, dry grass, leaves or crop residues. Green vegetation is not normally used as it can take a long time to decompose and can attract pests and fungal diseases.

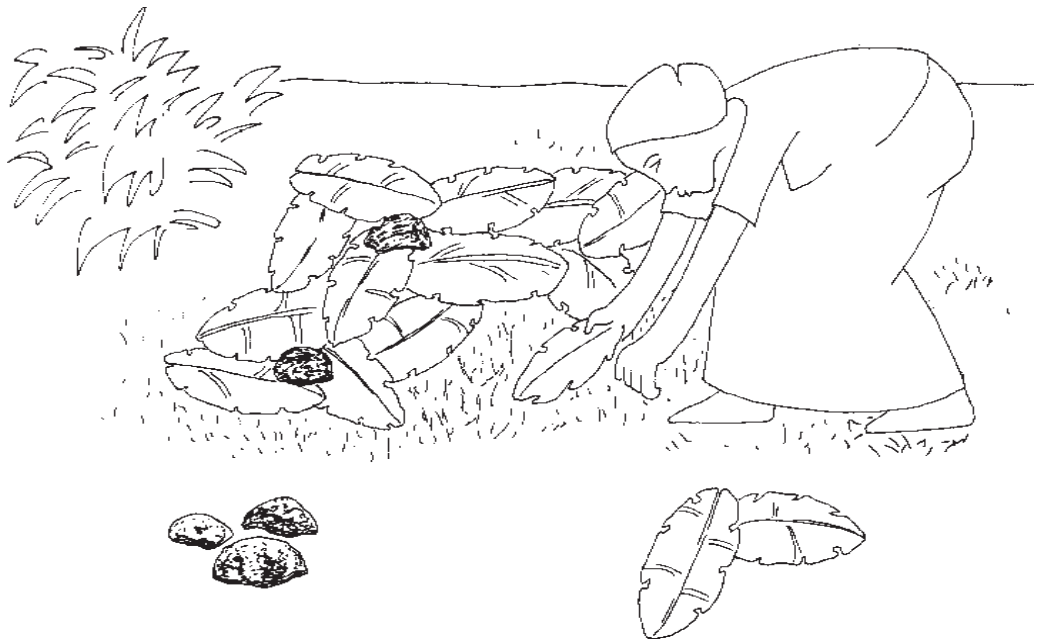
Mulches have several effects on the soil which help to improve plant growth:

- Decreasing water loss due to evaporation
- Reducing weed growth by reducing the amount of light reaching the soil
- Preventing soil erosion
- Increasing the number of micro-organisms in the top soil
- Adding nutrients to the soil and improving soil structure
- Adding organic matter to the soil

Alternative mulching materials include black plastic sheeting or cardboard. However these materials do not add nutrients to the soil or improve its structure.

How to use mulches

- Always apply mulches to a warm, wet soil. Mulch applied to a dry soil will keep the soil dry.
- Care should be taken as to the thickness of the mulch applied. Too much mulch will prevent air flow and encourage pests.
- To allow the germination of planted seeds through the mulch, a layer of less than 10cm should be used.
- To clear an area of land of persistent weeds a layer of 10cm or more can be used.



Mulching with large leaves

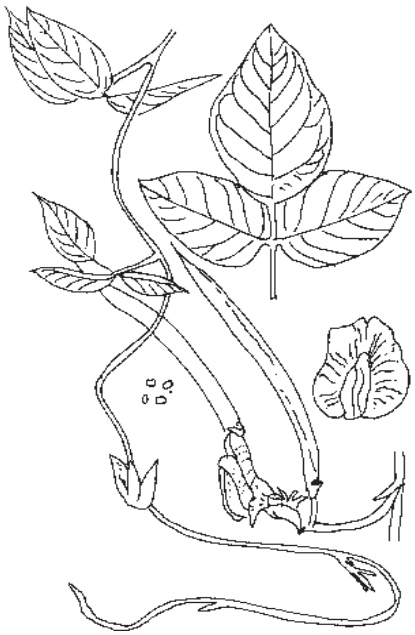
Green manures

Green manures, often known as cover crops, are plants which are grown to improve the structure, organic matter content and nutrient content of the soil. They are a cheap alternative to artificial fertilisers and can be used to complement animal manures.

Growing a green manure is not the same as simply growing a legume crop, such as beans, in a rotation. Green manures are usually dug into the soil when the plants are still young, before they produce any crop and often before they flower. They are grown for their green leafy material which is high in nutrients and provides soil cover. They can be grown together with crops or alone.

Green manures:

- Increase and recycle plant nutrients and organic matter
- Improve soil fertility
- Improve soil structure
- Improve the ability of the soil to hold water
- Control soil erosion
- Prevent weed growth
- Stop nutrients being washed out of the soil, for example, when the ground is not used between main crops.



Centro (Centrosema pubescens), *a useful green manure*

Weed control

In organic farming systems, the aim is not necessarily the elimination of weeds but their control. Weed control means reducing the effects of weeds on crop growth and yield.

Organic farming avoids the use of herbicides which, like pesticides, leave harmful residues in the environment. Beneficial plant life such as host plants for useful insects may also be destroyed by herbicides.

On an organic farm, weeds are controlled using a number of methods:

- Crop rotation
- Hoeing
- Mulches, which cover the soil and stop weed seeds from germinating
- Hand-weeding or the use of mechanical weeders
- Planting crops close together within each bed, to prevent space for weeds to emerge
- Green manures or cover crops to outcompete weeds
- Soil cultivation carried out at repeated intervals and at the appropriate time, when the soil is moist. Care should be taken that cultivation does not cause soil erosion.
- Animals as weeders to graze on weeds

Weeds do have some useful purposes. They can provide protection from erosion, food for animals and beneficial insects and food for human use.

Natural pest and disease control

Pests and diseases are part of nature. In the ideal system there is a natural balance between predators and pests. If the system is imbalanced then one population can become dominant because it is not being preyed upon by another. The aim of natural control is to restore a natural balance between pest and predator and to keep pests and diseases down to an acceptable level. The aim is not to eradicate them altogether.

Chemical control

Pesticides do not solve the pest problem. In the past 50 years, insecticide use has increased tenfold, while crop losses from pest damage have doubled. Here are three important reasons why natural control is preferable to pesticide use.

Safety for people

Artificial pesticides can quickly find their way into food chains and water courses. This can create health hazards for humans.

Human health can also be harmed by people eating foods (especially fruit and vegetables) which still contain residues of pesticides that were sprayed on the crop.

There is also much concern for those people using chemical pesticides. The products may be misused because the instructions are not written in the language spoken by the person using them. This has led to many accidents such as reports of people suffering from severe skin rashes and headaches as a result of using chemical pesticides. There are an estimated one million cases of poisoning by pesticides each year around the world. Up to 20,000 of these result in death. Most of the deaths occur in tropical countries where chemical pesticides which are banned in Europe or the USA are still available.

Cost

Using natural pest and disease control is often cheaper than applying chemical pesticides because natural methods do not involve buying materials from the outside. Products and materials which are already in the home and around the farm are most often used.

Safety for the environment

There are a number of harmful effects that chemical pesticides can have on the environment:

- Chemical pesticides can kill useful insects which eat pests. Just one spray can upset the balance between pests and the useful predators which eat them.
- Artificial chemicals can stay in the environment and in the bodies of animals causing problems for many years.
- Insect pests can very quickly, over a few breeding cycles, become resistant to artificial products and are no longer controlled. This means that increased amounts or stronger chemicals are then needed creating further economic, health and environmental problems.

Natural control

There are many ways in which the organic farmer can control pests and diseases.

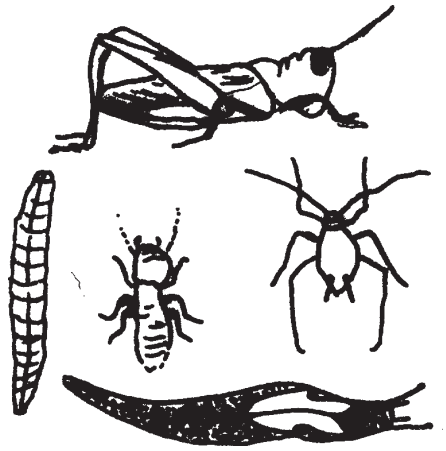
- Growing healthy crops that suffer less damage from pests and diseases.
- Choosing crops with a natural resistance to specific pests and diseases. Local varieties are better at resisting local pest and diseases than introduced varieties.
- Timely planting of crops to avoid the period when a pest does most damage.
- Companion planting with other crops that pests will avoid, such as onion or garlic.

Companion planting

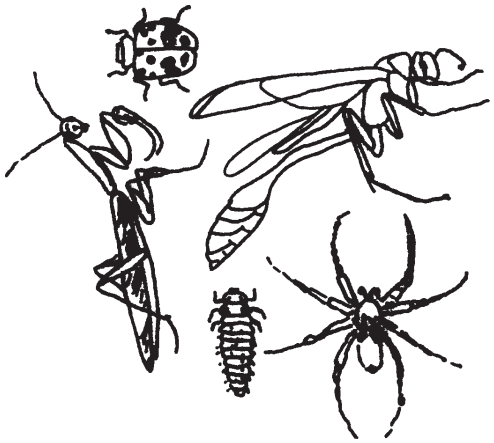
- Trapping or picking pests from the crop.
- Identifying pest and diseases correctly. This will prevent the farmer from wasting time or accidentally eliminating beneficial insects. It is therefore useful to know life cycles, breeding habits, preferred host plants and predators of pests.

- Using crop rotations to help break pest cycles and prevent a carry over of pests to the next season.

- Providing natural habitats to encourage natural predators that control pests. To do this, the farmer should learn to recognise insects and other animals that eat and control pests.



Grasshoppers, slugs, termites, aphids and types of caterpillars are pests



Ladybirds, spiders, ground beetles, parasitic wasps and praying mantis are predators

Through careful planning and using all the other techniques available it should be possible to avoid the need for any crop spraying. If pests are still a problem natural products can be used to manage pests, including sprays made from chillies, onions, garlic or neem. Further information can be obtained from HDRA.

Even with these natural pesticides, their use should be limited as much as possible and only the safest ones used. It is wise to check with national and international organic standards to see which ones are allowed or recommended.

Genetic diversity

Within a single crop there can be many differences between plants. They may vary in height or ability to resist diseases, for example. These differences are genetic.

Traditional crops grown by farmers contain greater genetic diversity than modern bred crops. Traditional varieties have been selected over many centuries to meet the requirements of farmers. Although many are being replaced by modern varieties, seeds are often still saved locally.

Crops which have been bred by modern breeding methods tend to be very similar and if one plant is prone to disease, all the other plants are as well. Although some modern varieties may be very resistant to specific pests and diseases they are often less suited to local conditions than traditional varieties. It can therefore be dangerous to rely too much on any one of them.

In organic systems, some variation or 'genetic diversity' between the plants within a crop is beneficial. Growing a number of different crops rather than relying on one is also very important. This helps to protect against pests and diseases and acts as insurance against crop failure in unusual weather such as drought or flood. It is important to remember this when choosing which crops to grow.

An organic farmer should try to:

- grow a mixture of crops in the same field (mixed cropping, intercropping, strip cropping)
- grow different varieties of the same crop
- use as many local crop varieties as possible
- save the seed of local and improved crop varieties rather than relying on buying seed from outside the farm every year. Exchange of seed with other farmers can also help to increase diversity, and ensure the survival of the many traditional crop varieties which are being lost as they are replaced by a few modern varieties.

Strip cropping onions and tomatoes to prevent pest and disease attack

Careful use of water

In arid lands the careful use of water is as much a part of organic growing as is any other technique.

As with other resources, organic farmers should try to use water which is available locally, avoiding using water faster than it is replaced naturally.

There are many ways to use water carefully, including:

- The use of terracing, rain water basins or catchments and careful irrigation
- The addition of organic matter to the soil to improve its ability to hold water
- The use of mulches to hold water in the soil by stopping the soil surface from drying out or becoming too hot

Animal husbandry

In an organic system, the welfare of the animals is considered very important.

- Animals should not be kept in confined spaces where they cannot carry out their natural behaviour such as standing and moving around in an inadequate amount of space. However, care should be taken that animals do not damage crops.
- Food for animals should be grown organically.
- Breeds should be chosen to suit local needs and local conditions and resources

These factors help to ensure that livestock are more healthy, better able to resist diseases and to provide good yields for the farmer.

International standards

The International Federation of Organic Agriculture Movements (IFOAM) has produced a set of international organic standards, laid down by people from many countries. These give guidelines about what organic farming is and how it should be practised on the farm.

International standards are also used to help countries set their own standards, which take into account different farming systems. Many countries have an organic standards authority which lays down national standards and awards a symbol to farms which have followed the standards. This symbol then allows farmers to market certified organic produce. This is important, as it ensures that people know that the food which they buy is organic.

The main principles of organic farming were laid down by IFOAM in 1992.

- To produce food of high nutritional quality in sufficient quantity.
- To interact in a constructive and life enhancing way with all natural systems and cycles.
- To encourage and enhance biological cycles within the farming system, involving micro-organisms, soil flora and fauna, plants and animals.
- To maintain and increase long term fertility of soils.
- To use, as far as possible, renewable resources in locally organised agricultural systems.
- To work, as far as possible, within a closed system with regard to organic matter and nutrient elements. This aims to reduce external inputs.
- To work, as far as possible, with materials and substances which can be re-used or recycled, either on the farm or elsewhere.

- To give all livestock living conditions which will allow them to perform the basic aspects of their innate behaviour.
- To minimise all forms of pollution that may result from agricultural practices.
- To maintain the genetic diversity of the agricultural system and its surroundings, including the protection of plant and wildlife habitats.
- To allow agricultural producers a living according to the UN human rights; to cover their basic needs and obtain an adequate return and satisfaction from their work, including a safe working environment.
- To consider the wider social and ecological impact of the farming system.

Organic food is becoming popular in Europe and America. However for food to be sold as organic it must bear a symbol that proves that it is truly organic. This is obtained through a certification organisation. This is quite a complex procedure and is potentially expensive if there are not certification organisations in your country.

Please contact HDRA for further information about how to become a certified organic producer.

Further reading

Field Notes on Organic Farming (1994) JW Njoroge. Kenya Institute of Organic Farming, PO Box 34972, Nairobi, Kenya

Natural Crop Protection Based on Local Farm Resources in the Tropics and Subtropics (1986) G Stoll. Intermediate Technology Publications, 103-105 Southampton Row, London WC1B 4HH, UK

Natural Pest and Disease Control (date unknown) H Elwell and A Mass. Natural Farming Network, PO Box CY 301, Causeway, Harare, Zimbabwe

Sustainable Agriculture Practices and Technologies: Guidelines for farmers (1997). Africa 2000 Network, UNDP, PO Box 7184, Kampala, Uganda

Regenerative Agricultural Technologies - Trainors Kit (1990). International Institute of Rural Reconstruction, Rm 38 Elena Apts, 512 Romero Salas St., Ermita, Manila, Philippines

Further information on organic farming can be obtained from HDRA. Other publications include booklets covering composting, green manures, weed control and the neem tree, as well as single information sheets about crop pests and diseases and their control, natural pesticides and green manures. Please write to:

HDRA - the organic organisation
Ryton Organic Gardens
COVENTRY CV8 3LG
United Kingdom
Tel: +44 (0) 24 7630 3517 Fax: +44 (0) 24 7663 9229
Email: ove-enquiry@hdra.org.uk
Website: www.hdra.org.uk

The aims of HDRA - the organic organisation are to carry out scientific research into, collate and disseminate information about, and promote interest in organic gardening, farming and food in the UK and overseas. For more than a decade, HDRA's international programme has been involved in the support and extension of sustainable farming practices; supporting research on aspects of tropical organic agriculture, providing advice and literature on appropriate organic techniques and providing tree seeds and technical information to organisations involved in tree planting and research.

We gratefully acknowledge the generous support of the Charlton Community Development Trust in the production of this booklet.

HDRA
the organic organisation

Gatsby Occasional Paper

The Quiet Revolution:
Push–Pull Technology and the African Farmer

Cover photographs: *The multiple aspects and benefits of the habitat management technology. Farmers who adopt 'push–pull' (top right) not only reap three harvests: maize (top left), Napier grass (bottom left) and desmodium forage and seed (bottom right); they also significantly reduce yield losses caused by stemborers and striga weed.*

Gatsby Occasional Paper

The Quiet Revolution:

Push–Pull Technology and the African Farmer

April 2005

Acknowledgements

The Gatsby Charitable Foundation gratefully acknowledges the support of the numerous individuals who contributed time and materials to this publication. From the International Centre of Insect Physiology and Ecology (ICIPE): Dr Zeyaur Khan, Professor Ahmed Hassanali, Dr Annalee Mengech, Mr George Genga, Mr Dickens Nyagol, Mr Naphtali Dibogo, Mr Philip Akelo and Ms Esther Njuguna. From the Kenya Agricultural Research Institute (KARI): Dr Romano Kiome, Mr Charles Nkonge, Dr Francis Muyekho, Mr Charles Lusweti and Mr Japheth Wanyama. From Western Seed Company Ltd: Mr Saleem Esmail. From Rothamsted Research: Professors John Pickett and Lester Wadhams. In addition, our thanks go to Dr Hans Herren and Professor Richard Flavell who pursued the basic concept with enthusiasm.

Susan Parrott of Green Ink conducted the field research and literature review, wrote the text, supplied the photographs and, together with other members of the Green Ink team, completed the edit, layout and proofreading. The publication was printed in India by Pragati Offset Pvt. Ltd.

Last, but not least, we thank all the farmers who cheerfully related their 'push–pull' experiences.

Dedication

This paper is dedicated to the late Professor Thomas Odhiambo, founder Director of ICIPE. His vision of science in Africa has been an inspiration to many and he is responsible for the initial idea that led to the development of the habitat management technology.

Contents

Foreword

The Trustees of the Gatsby Charitable Foundation have been supporting agricultural research and development in Africa for the past 20 years. Gatsby's mission is to increase the physical yields of small farms and the nutritional and market value of subsistence crops in ways that are both valuable to low-income households and environmentally sustainable. Gatsby aims to achieve this by supporting projects along a spectrum, from applied research at institute level, through the dissemination of improved varieties and cropping systems, to adaptive on-farm activities and multiplication of improved planting material[1]. Gatsby also helps small-scale enterprise through provision of micro-finance and business development support[2].

The habitat management or 'push–pull' project illustrates how action across the spectrum can lead to the development of a technology that markedly improves the lives of subsistence farmers. This project's success owes much to the very high quality of research and the vision, tenacity and determination of the principal scientists. The close working relationship that evolved between the various partners was another contributing factor.

Push–pull is just the kind of technology needed to support a 'uniquely African green revolution', as called for at the meeting of African Heads of State in July 2004. The participants agreed that efforts to increase agricultural productivity in Africa must be based on technologies that are more environmentally friendly and people-centred than those that fuelled the original Asian green revolution. Habitat management fits well with this concept and is worthy of support by all who wish to see Africa's declining yields and rising poverty levels reversed.

We believe the experiences gained during this project will be of interest to others involved in agricultural development in Africa and we hope the lessons learned will encourage further innovations in this challenging field.

Michael Pattison CBE
Director
The Gatsby Charitable Foundation
London, April 2005

[1] A review of all Gatsby-funded projects in Africa can be found in the Gatsby Occasional Paper: *Raising Yields, Creating Partnerships: Gatsby's On-Farm Work in Africa*.

[2] See *Building from the Base: The Work of the African Gatsby Trusts* for more.

Both publications are available on the Gatsby website (www.gatsby.org.uk).

1. Push and pull: plants versus pests

The Obinga family are subsistence farmers who eke out a living on the Kenyan shore of Lake Victoria. It is not an easy life; their farm is small and rainfall is often unreliable. Yet the Obingas are better off than many of their neighbours: fields of tall, strong maize plants promise ample food for the next six months; three crossbred dairy cows enjoy a plentiful supply of fodder brought to their stalls; the children drink milk every day; and sales of milk, maize and fodder grass bring in vital cash to spend on daily necessities and to invest in farm and household improvements.

Only two years ago, the scene was dramatically different. Years of cereal cropping without inputs had reduced soil fertility and the maize plants were being attacked by insect pests and parasitic weeds. The family's thin zebu cows produced little milk, and herding them along the roadside to find forage was a full-time job for the children. Meanwhile, Mrs Obinga was constantly engaged in the backbreaking, seemingly fruitless task of weeding the fields. The granary was empty, the family frequently went hungry, and there was no maize left over to sell. That meant no money to invest in fertilizer or other inputs to improve the situation. The family seemed trapped in a downward spiral of declining yields and deepening poverty and hunger.

Obinga inspects his healthy maize crop. Inset: two years ago all his fields looked like this: the maize was devastated by dual enemies - the stemborer Chilo partellus *and the parasitic weed* Striga hermonthica.

How were the family's fortunes turned around in such a short time? The answer lies in a novel approach to crop management that exploits the natural relationships between plants and insects. When scientists investigated the ecology of a widespread cereal pest, they discovered that introducing a carefully selected mix of forage plants into maize fields had a dramatic effect on cereal yields and total farm output. The so-called 'push–pull' technology that emerged from their research (see box on next page) makes use of natural plant chemicals that drive insect pests away from the crop and attract them to other host plants, which withstand attack better than maize. Along the way, the scientists discovered intriguing new properties in the forage legume, desmodium. Besides being nutritious for dairy cows, it repels insect pests of maize and substantially reduces damage from striga, a destructive parasitic weed. In short, the push–pull system can improve food security and farm income in an environmentally friendly way, making it an ideal ingredient in the long-term struggle to reduce hunger and poverty in Africa.

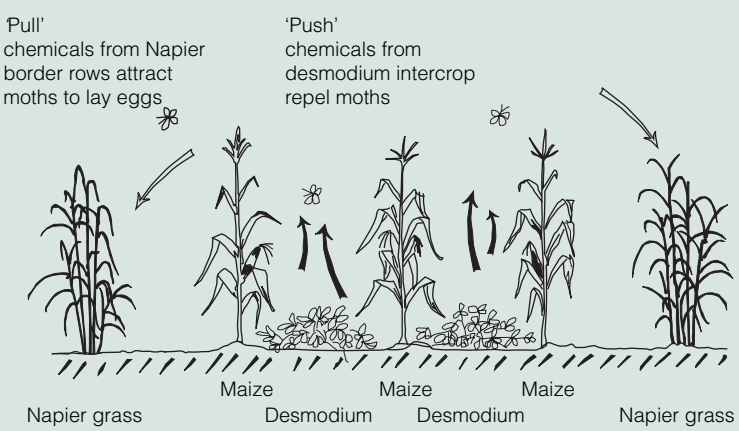
Maize field with border rows of Napier grass and an intercrop of Desmodium uncinatum.

What is push–pull?

The technique known today as 'push–pull' (or stimulo-deterrent diversion) was first documented as a potential pest control strategy in 1987 in cotton and 1990 in onion. However, neither of these studies exploited natural enemies, using instead an added chemical deterrent or toxin to repel or kill the pest. In contrast, the push–pull system described here uses no manufactured deterrents or toxins. Instead, it exploits natural insect–plant and insect–insect relationships.

"Push–pull is not something scientists have invented," says Ahmed Hassanali, Head of the Behavioural and Chemical Ecology Department at the International Centre of Insect Physiology and Ecology (ICIPE). "We have discovered several cases of integrated use of the forces of attraction and avoidance by different arthropods in their search for suitable hosts, feeding areas or egg-laying sites."

Insect behaviourists and chemical ecologists tend to agree that promising integrated pest management (IPM) tactics based on plant chemicals frequently fail because they are too narrowly based. They often target a single chemical and a single phase in the life cycle of a single pest species. The ICIPE–Rothamsted approach makes use of a wider range of behaviour-affecting chemicals produced by both plants and insects. It introduces nature's built-in checks and balances into a man-made environment – such as a maize field – by manipulating the habitat, relying on a carefully selected combination of companion crops planted around and among the maize plants.



Farmers using push–pull for pest control not only reap three harvests (maize, Napier grass and desmodium); when they plant a desmodium intercrop they also dramatically reduce the devastating effects of the parasitic weed *Striga hermonthica.* (See www.push-pull.net)

This publication describes the development of the push–pull technology and its dissemination to farmers in eastern Africa[1]. We illustrate – through the eyes of some of the participating farmers – the benefits the project has brought, together with the obstacles that impede more widespread impact and the strategies that could help overcome these hurdles. Finally, we examine why the project has been successful.

Starting with stemborers

The story begins in 1994, when the Gatsby Charitable Foundation funded researchers at the Kenya-based International Centre of Insect Physiology and Ecology (ICIPE) and Rothamsted Research in the UK to investigate the ecology of stemborers. These are the larval stages of various species of moth and the major insect pest of maize and sorghum in eastern and southern Africa.

[1] The full title of the project is 'Habitat management strategies for control of stemborers and striga weed in cereal-based farming systems in eastern Africa'. Project funding to date amounts to US$5.98 million, 65% of which was funded by the Gatsby Charitable Foundation.

Stemborers naturally feed on wild grasses, but when maize and sorghum became cultivated crops across vast areas of Africa, the insects began to feed on them as well. Lack of defence mechanisms in maize and sorghum allowed insect populations to flourish and become a problem of economic importance. In maize – Africa's most important food crop – losses to stemborers average 20–40% but can reach 80%. As a control method, pesticides are expensive and harm the environment. Since they cannot reach insects inside the maize stem, they are often ineffective. Moreover, they kill the stemborer's natural enemies. Preventing crop losses from stemborers could increase maize harvests by enough to feed an additional 27 million people in the region.

"It used to be thought that native grasses caused the stemborer problem and that getting rid of them would remove the stemborers too," says Zeyaur Khan, entomologist at ICIPE and leader of the project. But, in fact, the reverse is the case; the borers simply transfer to the maize. No one had studied the relationship between the grasses and the borers in depth, so, prompted by Professor Thomas Odhiambo, then Director of ICIPE, Khan launched a survey.

Multiple interactions

The initial objective was to study the multiple interactions among cultivated crops, wild host plants, different stemborer species and their natural enemies. This information would then be used to develop an integrated pest management (IPM) approach to controlling the insects. The scientists studied 400 wild grasses and grouped them according to their efficacy in attracting female moths to lay eggs and their ability to support larval development. "We already knew that some wild grasses act as 'trap plants', enticing egg-laying females but depriving the larvae of a suitable environment," says Khan. This is often because the grasses also attract the borers' natural enemies. Other grasses simply act as reservoirs for the pests and increase their populations. The survey results indicated that around 30 grass species were suitable hosts for stemborers, but only a few of them attracted both moths and their enemies. "These grasses were the ones with potential to be exploited as trap crops to draw the borers away from the maize and reduce their populations," adds Khan.

The large stems of maize plants provide an ideal habitat for stemborers. Species of greatest economic importance include Busseola fusca *(native to Africa and inhabiting higher altitudes) and* Chilo partellus *(introduced from Asia in the 1930s and found at low and mid-altitudes).*

The findings were encouraging, but the team knew that farmers with small amounts of land would be unlikely to plant a wild grass simply to attract pests. So farmers were consulted to find out which grasses were most useful as cattle fodder. Researchers at the Kenya Agricultural Research Institute (KARI) helped identify suitable farmers to consult.

The pull...

Two trap crop grasses appeared particularly promising: Napier grass (*Pennisetum purpureum*) and Sudan grass (*Sorghum sudanense*). Grasses planted among the maize plants provide too much competition, but researchers found that when they were planted in border rows around a maize field, the stemborers were enticed to lay their eggs on the grass rather than the maize. The grasses were providing a 'pull'. These grasses also have effective defence mechanisms to protect themselves against stemborer attack. Sudan grass is an attractive habitat for the parasitic wasp *Cotesia sesamiae*; these tiny insects inject their eggs into the stemborer larvae and, when the eggs hatch, the wasp larvae eat the stemborers. Napier grass has a particularly ingenious way of defending itself: when the larvae bore into the stem, the grass secretes a sticky gum, physically trapping the borer and preventing most larvae from completing their life cycle. Both grasses attract additional stemborer predators such as ants, earwigs, spiders and cockroaches, which are found in significantly larger numbers in push–pull plots than in control plots.

In 1997, the scientists began on-farm trials to evaluate the benefits of Napier grass, which has the added value of being a perennial and is already grown widely for livestock fodder. Researchers and farmers worked together to identify which varieties provide both a good habitat for the stemborer and good forage. 'Bana' was an obvious choice, since it has smooth, broad leaves (an improvement on some local varieties that have rough leaves and sometimes make cows cough) and is highly attractive to stemborers. Besides increasing their maize yields, the farmers planting Napier border rows benefited from a ready supply of grass to feed their livestock or sell to other farmers.

...and the push

Khan describes how he came across the repellent effects of another fodder crop, molasses grass (*Melinis minutiflora*), while visiting KARI's Kitale research station. This discovery was to become the 'push' component of the system. "Molasses grass has a very strong, sweet smell, which caught my attention. Quite by chance the KARI researchers had planted a plot of molasses grass next to one of maize. There was little stemborer damage on the maize closest to the molasses grass, but the other side of the plot was heavily infested."

Khan decided to investigate further. Trials confirmed that, indeed, molasses grass has a strong repellent effect on stemborer moths, even when only one row is planted in every ten of maize. Even more intriguing was the discovery that, like Sudan grass, molasses grass attracts the parasitic wasp, *Cotesia sesamiae*. This puzzled the scientists, who could not initially understand why the parasite would be drawn to a location where it was unlikely to find its host.

Obinga is multiplying his stocks of Napier grass by taking cuttings from the rhizomes. He keeps a 'bulking plot' especially for this purpose.

Molasses grass planted around a zero grazing unit. Farmers like Lillian Wang'ombe have discovered that the grass not only repels stemborers, but also reduces the number of ticks attacking their cattle.

Meanwhile, at Rothamsted Research, John Pickett (Head of the Biological Chemistry Division) and his team were helping to piece the puzzle together by investigating the nature of the plant chemicals (known as semiochemicals) that attract or repel stemborer moths. The most relevant compounds have been identified by a combination of insect electrophysiology and mass spectrometry and tested on the insects using bioassays. "We have discovered six host plant volatiles that attract female stemborer moths to lay their eggs," says Pickett.

The next step was to investigate the volatiles produced by the intercrop plants – the 'push' chemicals – and to find out why molasses grass repels stemborers but attracts their natural enemies.

A nonatriene compound emerged as a key stimulus. "The nonatriene is what we call a 'feeding stress' chemical," explains Pickett. "It is normally produced by molasses grass, but maize plants produce it when they come under attack from the stemborer."

It appears that, at low concentrations of the chemical, additional pests arrive, attracted to a plant that is already weakened by pest attack; but at high concentrations the pests are repelled, taking it as a sign that the plant is already fully exploited. At high or low concentrations, parasitoids are attracted to find their prey. "Molasses grass has evolved an ingenious defence strategy, since its release of volatile chemicals mimics that of damaged plants," adds Pickett. The use of chemicals by plants to protect themselves from attack in this way was an important discovery and was reported in the leading international journal *Nature* (14 August 1997). This work, which has led the scientists to develop a general hypothesis regarding the role of plant semiochemicals in determining insect recognition of host plants, could lead to a major new line of defence in IPM strategies in many different cropping systems.

Discovering desmodium

Molasses grass is accepted by farmers as a 'push' intercrop since it provides fodder for cattle. But Khan and his colleagues were keen to find alternatives that might add a further dimension to the habitat management system. The team focused their attention on legumes, since these not only provide nutritious food and forage but also improve soil fertility because they 'fix' part of their nitrogen requirements from the atmosphere. Cowpea (*Vigna unguiculata*) and silverleaf desmodium (*Desmodium uncinatum*) looked promising candidates. Cowpea had long been grown for grain and fodder in parts of West Africa, while desmodium originated in South America and had been introduced into Kenya in the early 1950s.

During this phase of the work, the Suba District Agricultural Officer visited the ICIPE team at their Mbita Point research station on the shores of Lake Victoria. Deeply concerned about the devastating effects of the parasitic 'witchweed' *Striga hermonthica* on local maize harvests (see box), he asked whether there was anything ICIPE researchers could do. Since the team were primarily entomologists and fully occupied by their stemborer research, they declined his request, without knowing they were on the verge of an important discovery that would address his concerns.

Khan and his colleagues tested desmodium as a 'push' intercrop with maize on-station at Mbita Point. "All our experimental plots are infested with striga," he says. "So imagine our amazement when we found that maize plots with a desmodium intercrop not only had little stemborer damage but

A sleeping enemy

Western Kenya is the 'maize basket' of the country. In some locations, two maize crops can be grown in a year. But in many areas, as the Obinga family discovered, the parasitic weed *Striga hermonthica* is taking over. The seeds are so tiny that Obinga could have unwittingly brought them into his field and sowed them along with the maize. Stimulated by chemicals released by the roots of the crop plants, the seeds germinate, but instead of growing roots and drawing nourishment from the soil, they parasitise the maize, weakening or even killing it.

Each mature plant produces around 50 000 seeds, which remain viable in the soil for up to 20 years, awaiting a suitable host. Recommended control methods for this 'sleeping enemy' include heavy application of nitrogen fertilizer, crop rotation, chemical germination stimulants, herbicide application, hoeing and hand-pulling, and the use of resistant or tolerant crop varieties. These have met with scant enthusiasm from farmers who have little cash or time to spare. Increased cropping frequency and deteriorating soil fertility favour the growth of striga and the survival of its seeds. Yield losses range from 30 to 100% and, in some cases, infestation has reached such a high level that farmers have no choice but to abandon the land.

The parasitic witchweed
Striga hermonthica

After just two seasons, Joseph Litunya's maize field is free of striga and he has plenty of desmodium forage to feed to his crossbred dairy cow.

also became virtually free of striga after only two seasons." In fact, eliminating the striga had an even greater effect on increasing maize yields than controlling the stemborers. This indeed brought a new dimension to the push–pull technology and posed the question 'how?' (see box).

The effects of desmodium on striga, combined with the potential of push–pull to increase yields of food and fodder, were hugely exciting, but the team was justifiably cautious. Although farmers were already familiar with intercrops, the idea of using them to affect insect behaviour was new and the farmers would need to grasp the idea and understand how it worked. This understanding would allow them to adapt the approach to their own needs and to changing conditions in the future. In short, the dissemination strategy should be based on knowledge and education.

How does desmodium suppress striga?

Most legumes act as false hosts of striga in that they stimulate germination but do not support growth of the weed. However, field trials showed that when legumes were intercropped with maize, far less striga was seen with desmodium than with other legumes such as cowpea, soybean and sun hemp. In addition, desmodium progressively reduced the number of striga seeds in the soil. Experiments revealed that the desmodium roots were releasing chemicals that undermined the growth of the weed, a so-called allelopathic effect.

Work to identify the chemicals responsible has been funded by Gatsby, the Rockefeller Foundation and the Biotechnology and Biological Sciences Research Council (BBSRC) of the UK. The research team have discovered three new isoflavanone compounds (uncinanone A, B and C) and a previously known isoflavanone (genistein). They now know that desmodium not only stimulates germination of striga seeds but also inhibits post-germination growth of the parasite's radicle – the part that attaches to the host plant. This is known as 'suicidal germination' and explains why desmodium can actually reduce the number of striga seeds in the soil.

The research work is time consuming. Hassanali at ICIPE reckons it will take another five or six years to isolate and characterise all the compounds produced by desmodium roots and to understand their roles in post-germination inhibition of striga. Nevertheless, the range of potential applications is broad and encouraging. Witchweeds threaten the staple food of more than 100 million Africans. Of the 23 species prevalent in Africa, *Striga hermonthica* is the most significant, parasitising a range of crops including maize, sorghum, millet, rice and sugarcane.

Investigating the effect of desmodium on striga. Plants on the right have little striga infestation since they have been exposed to root exudate from desmodium, but those on the left (controls supplied with water only) are heavily parasitised.

2. Uptake and impact: knowledge is the key

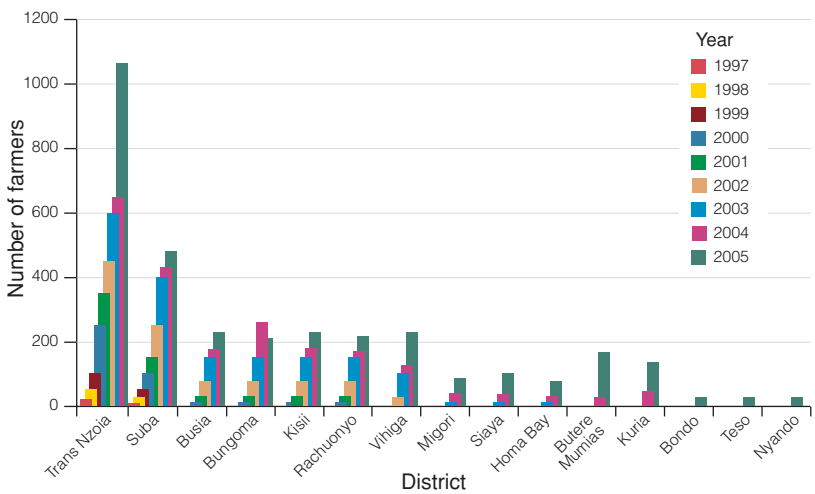
In early 1997, Khan and his colleagues began disseminating the push–pull or habitat management technology to farmers, aiming to transfer both the technology and the knowledge of how it worked. Training in scientific methods encouraged farmers to experiment further, gain ownership of the technology and pass on their new knowledge to others. By training a network of farmer–teachers, the team have established a mechanism for rapid adoption, which is the key to widespread impact. Over 3000 farmers have now adopted the technology (see graph) and most of them can relate stories of major upturns in their fortunes and living standards.

The push–pull garden at ICIPE's Thomas Odhiambo Campus at Mbita Point, Kenya.

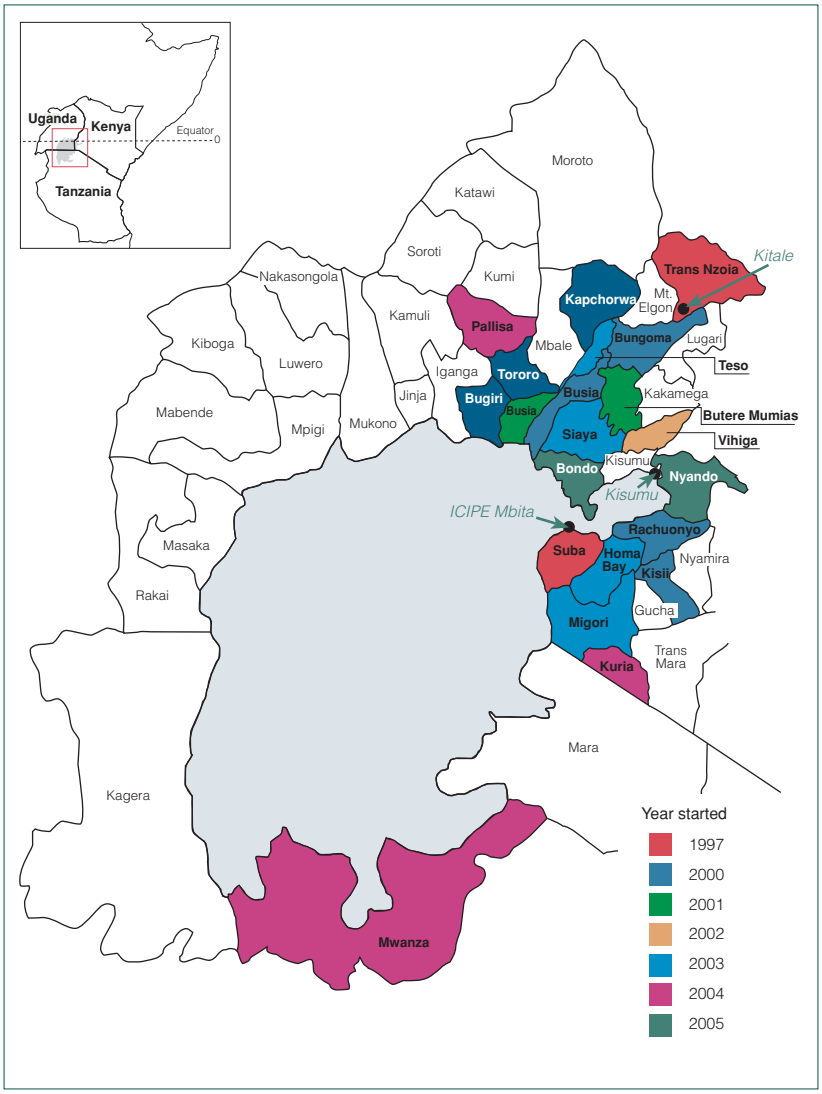
Seeing is believing

Although the researchers could explain the technology with confidence, they soon discovered that farmers remained highly sceptical unless they could see a push–pull plot for themselves. The first step, then, was to establish a push–pull garden at Mbita Point, which farmers and others could visit. Next, the researchers began to establish trial and demonstration plots on selected farmers' fields.

Researchers from KARI and government extension staff helped identify suitable areas for on-farm trials. The team chose two districts for the initial trials: Suba, on the eastern shores of Lake Victoria, and Trans Nzoia, further north. In both areas, there is a high reliance on maize and a lack of food security. Livestock ownership is also widespread but good quality fodder is in short supply.



Rates of adoption of the push–pull technology in Kenya, 1997–2005.



A map of East Africa showing districts where farmers have adopted push–pull. On-farm work commenced in Trans Nzoia and Suba Districts.

Trans Nzoia: wet and cool agro-ecology, altitude > 2000 m. Over 70% of the arable land is under maize. One crop per year. District suffers from low soil fertility (deficient in nitrogen) and high levels of stemborer attack (*B. fusca*). Initial trials here focused on a single aspect, i.e., planting border rows of Napier grass around a maize plot.

Suba: warm, semi-arid agro-ecology, altitude approx. 1200 m. Two maize harvests are possible, but the October short rains can be very unpredictable. Striga and stemborer (*C. partellus*) constrain yields. Initial trials focused on the use of border rows of Napier grass around the maize with an intercrop of desmodium.

The success of the dissemination tactics employed in the first two districts led the team to replicate the system elsewhere. In each new location the researchers begin by inviting local farmers to a *baraza* (public meeting), publicised through local chiefs, district agricultural officers and church leaders. The researchers listen to farmers' problems and explain the benefits of the push–pull technology. Based on criteria such as willingness to experiment, having enough land and cattle, availability of Napier grass and extent of the stemborer and/or striga problem, farmers are asked to nominate their own representatives, normally 10 per district. These 'guinea pig farmers' test the technology in their own fields. In exchange, they receive free desmodium or molasses grass seed. In some areas they are also given stocks of the Napier grass variety 'Bana', although many farmers already grow Napier and can multiply their own stocks.

After the first season, most trial farmers are keen to expand their push–pull plots, while field days and informal contacts attract additional local interest. If farmers can show a degree of commitment to the project by planting border rows of Napier, the project will supply desmodium seed for the intercrop. In all areas, ICIPE and KARI technicians and Ministry of Agriculture staff are available to advise and help with keeping records.

The demonstration plots proved to be a powerful advertisement for the technology and word spread quickly. Despite recruiting additional technicians, the researchers realised they needed to provide more extensive help and support if new project farmers were to acquire sufficient

knowledge to apply the technology correctly. The solution was to recruit some of the more experienced farmers as teachers to help their colleagues (see box). An internal review of the farmer–teacher system suggests it is working well, but needs close supervision from ICIPE or KARI technicians to ensure the teachers visit their students regularly and give good advice. Some farmer–teachers already have long waiting lists of prospective students. Indeed, Musa Aluchio in Butere Mumias District has 87 farmers queuing up for his services.

Information and awareness

Every Thursday and Sunday evening, more than five million Kenyan farmers listen to '*Tembea na majira*' ('Follow the path'), a rural 'soap' broadcast on national radio. Like the original concept for the UK radio programme 'The Archers', the storyline introduces new ideas and technologies for improving agriculture. Habitat management or push–pull features regularly and many farmers who have adopted the system heard about it here. The use of drama to convey educational messages is popular in western Kenya and can be highly effective. Some of the younger community members in Vihiga and Butere Mumias Districts have written a push–pull play, which they perform for their peers, entertaining and educating at the same time. Researchers hope to spread the idea to other districts.

Analysis by KARI of the flow of information about push–pull indicates that multiple communication channels are involved in spreading awareness of the technology. In addition to ICIPE and KARI field technicians (and in the absence of a fully functioning government extension service), these channels include unofficial ones such as non-government organisations (NGOs), community-based

Farmer–teachers spread the word

Peter Koinange is a respected elder in his village of Wamuini, 10 km southeast of Kitale in Trans Nzoia. Although there is no striga here, stemborers cause considerable damage and the soils are poor and lack nitrogen. Koinange was one of the first farmers to host on-farm trials in 1997, when he planted Napier grass around his maize plot. "It was incredible," he remembers. "Before, I had to spend a lot of money on insecticide and fertilizer. Adding the grass meant I could use fewer inputs and still get a better yield." He later added a desmodium intercrop and established a seed multiplication plot.

Koinange is one of a rapidly growing group of farmer–teachers who are spreading the word about push–pull. When he had successfully managed his push–pull plot for three years, he was given a bicycle, a notebook and a small allowance of KSh750 (about US$5) per month. He visits five farmers every two weeks to give advice and guidance. Visits and progress are recorded by both teacher and students and regularly reported to ICIPE technicians.

Training in scientific methods has encouraged farmer–teachers to experiment further, equipping them with new skills so they can expand the range of options they offer to other farmers. For example, Koinange has experimented with molasses grass, discovering that it not only repels stemborers from maize but also keeps ticks off his cattle. He has since planted a border of molasses grass around his zero grazing unit and some of his neighbours have copied the idea.

Peter Koinange shows off his desmodium crop.

Cecilia Ogony (22) is the youngest farmer–teacher (pictured with two of her trainees). She has almost quadrupled her maize yields using push–pull and is saving the money she earns from sales of maize and fodder grass to buy a dairy cow.

Some of the educational leaflets produced by ICIPE and KARI.

organisations, traders and fertilizer or seed sellers, particularly in the more remote areas. To ensure consistent and correct messages, KARI and ICIPE have jointly produced a range of information leaflets in English and local languages. These are being widely distributed as part of the educational dissemination strategy.

A basket of options

A striking aspect of the habitat management technology is the wide range of benefits it provides farmers and its adaptability to individual needs. In addition to raising crop yields, it addresses issues of soil fertility, erosion and moisture conservation, and provides a reliable source of good-quality fodder. With push–pull, farmers struggling to make ends meet on as little as 0.25 ha of land can grow enough to eat, build a livelihood and start to accumulate assets.

Although dissemination efforts focus mainly on small-scale farmers, where the need for food security and income generation is greatest, the technology has been enthusiastically adopted – and adapted – by medium-scale farmers too (see box). Some farmers plant only border rows of Napier grass around their maize plot, utilising the 'pull' part of the technology. Those adopting both 'pull' and 'push' can choose to plant either desmodium or molasses grass between the rows of maize. The planting scheme can be varied too – desmodium

Meeting different needs

At first glance, the Gumo family farm in Kiminini (Trans Nzoia) has little in common with that of the Chapya family, who live in Ebukanga (Vihiga). The Gumos have 40 ha, keep ten crossbred dairy cows and earn money by selling milk. The Chapyas, with ten people to feed, have to survive on only 0.25 ha of land.

Both families, however, have adopted push–pull and have seen a dramatic increase in their farm output. Due to shortage of desmodium seed, Livingstone Chapya planted only a small plot (measuring 35 x 15 m) with the technology but was amazed at the result. "Before, the farm was purple with striga," he says. "But after planting push–pull, I harvested two sacks (180 kg) of maize. I was only getting a quarter of that from the same area before." He has since expanded the size of his push–pull plot and feeds the Napier grass and desmodium to his zebu heifer. He also sells forage when he has enough. He no longer has to buy maize or seek off-farm work; instead, he can invest time and resources in improving his farm and household assets.

Livingstone Chapya currently has a zebu heifer but will soon have sufficient forage to support a crossbred animal.

Josephine (a farmer–teacher) and Charles Gumo grow desmodium as a sole crop, harvesting fodder and seeds.

Josephine Gumo is relieved she no longer needs to apply expensive fertilizer and pesticide to get an adequate maize yield. "With push–pull, I get a bigger harvest – even without using inputs – and the stemborers have all gone." She plants border rows of Napier and one row of desmodium to every five of maize, to allow for mechanised ploughing. Despite having a relatively large farm, she used to struggle to feed the cows in the dry season. Now that she has solved her fodder problem, she keeps new heifer calves and has noticed an increased milk yield – from 8 litres per cow per day to 12. Within five years she hopes to have 20 cows and will need to employ six full-time staff to manage the workload.

The contrasting stories of these two families show that the push–pull technology is widely applicable across a range of farm sizes and socio-economic circumstances.

can be planted either in alternate rows (the most effective way to deal with striga) or, if there is no striga, in one row for every three or five of maize, to allow for easier ploughing by ox or tractor. Molasses grass can be planted at a range of densities and provides an effective 'push' even at only one row in ten of maize.

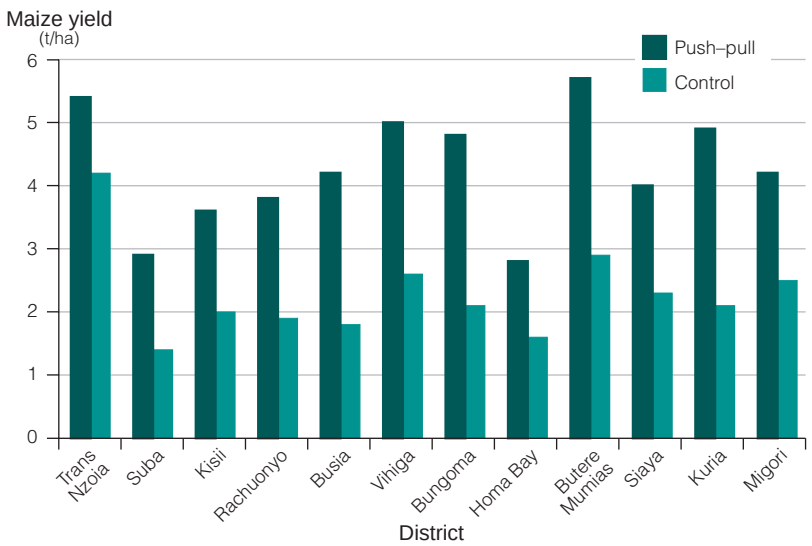
The robustness and flexibility of the system is demonstrated by successful adoption in different agro-ecologies. The system is used, for example, in the lakeshore region, where two rainy seasons allow two crops of maize and where striga is the main threat to food security. It is also highly effective in the highlands of Trans Nzoia, where there is no striga but farmers experience serious stemborer and soil fertility problems. Plans for the system's adaptation to more arid conditions, where sorghum is the main cereal and striga is rampant, are discussed in Chapter 4.

Food to eat, money to spend

Farmers adopting the habitat management technology have increased their maize yields by an average of 30% in areas affected by stemborers, and by over 100% where both stemborers and striga occur (see graph). The Obinga family now harvest two bags of maize (180 kg) from a push–pull plot of only 20 x 30 m, while the same area before would have given them only half a bag (45 kg). Cecilia Ogony, a farmer–teacher in Siaya, reports a similar yield improvement. Many families, even on quite small farms, are now self-sufficient in maize and some may even be able to sell part of their harvest. Yield gains are due not only to the control of pests; the desmodium intercrop also improves soil fertility (see 'Safeguarding the environment'). Furthermore, the Napier border rows help protect the maize from lodging (falling over) in strong winds.

Market forces play a large part in the adoption of any new agricultural technology. Although farmers recognise the value of the push–pull approach in controlling stemborers and striga to boost maize production, many cite the additional income-generating opportunities offered by growing forage as their main incentive to switch to the new system. Sales of Napier grass and desmodium to neighbours with stall-fed cattle provide a new source of income and, since the forage can be harvested regularly, this brings in money when there are no other crops to sell. Home-grown forage also obviates the need to spend many hours each day either gathering forage for stall-fed cattle or herding the animals as they graze.

Some farmers have made enough profit from the sale of forage to buy a dairy cow; others now have sufficient fodder to upgrade their cows by crossing their native zebus with exotic breeds (such as Ayrshires and Friesians), thereby increasing milk yields. A regular supply of milk not only raises farm income, it also improves the nutritional status of the farming family, especially the children (see box on next page).



Average maize yields in push–pull fields in 12 districts of western Kenya in 2004.

All areas are affected by stemborers and striga except for Trans Nzoia, where there are stemborers but no striga.

Milk to spare

Lillian Wang'ombe farms 1 ha in Wamuini, near Kitale in Trans Nzoia with her husband John. As her maize crop used to be infested with stemborer, there was barely enough to feed the family and none left over to sell. She heard about push–pull from her mother and was impressed by the way the technology got rid of the stemborers without using insecticide. After planting Napier grass and desmodium, Wang'ombe found she had enough maize to feed her five children for the whole year and still had a surplus for market. Within one season she had enough Napier grass to give some to her mother, in return for milk. Before long, it was obvious that there was enough fodder to keep a cow and, after selling the surplus maize, she was able to buy her first crossbred cow and pay a deposit on a second. Wang'ombe now has three cows, two of which are due to calve. When they do, there will be enough milk for the household and to sell. The children eat well and the family has been able to buy schoolbooks, medicines and furniture. "Some people laughed at us when we first planted Napier grass without cows on such a small farm, but now they come to us for advice!" she says.

Lillian Wang'ombe feeds her crossbred dairy cows with home-grown Napier grass.

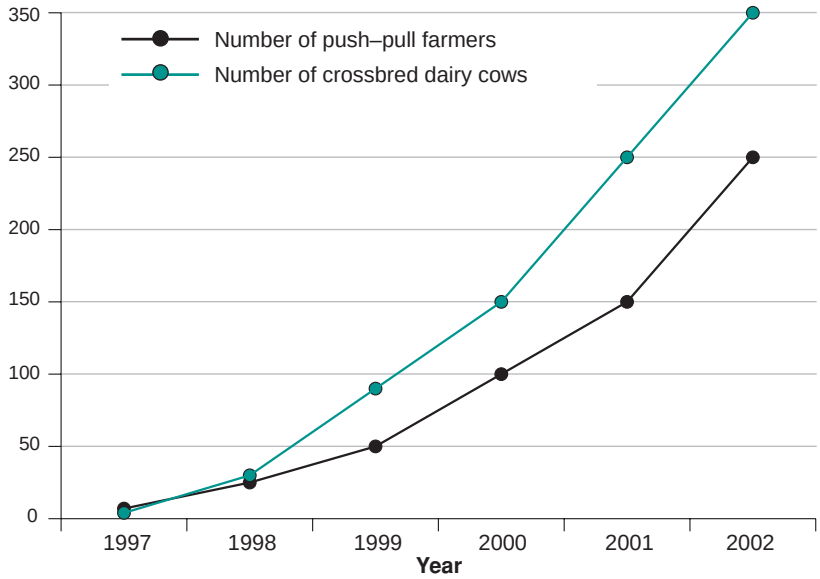
In Suba District, farmers currently produce 7 million litres of milk per year, far short of the estimated annual demand of 13 million litres. Most cattle are the indigenous zebu type and a major constraint to keeping crossbred dairy cattle is the seasonal shortage and generally poor quality of available feed. The push–pull technology, adopted by over 400 farmers in this district, is having a big impact. The number of crossbred dairy cattle in Suba rose from only four in 1997 to 350 in 2002 (see graph), putting the district well on the way to self-sufficiency in milk production. Obinga is one of the Suba farmers who upgraded his cattle. He used to keep zebus and obtained a meagre 300 ml of milk per cow per day. With crossbred cows he now gets five times as much.

Sale of desmodium seed is another income-generating opportunity. This came to light when the speed of adoption of the push–pull technology led to a serious seed shortage. In 2003, with Gatsby funding, ICIPE launched a seed multiplication project, and this has now developed into a commercial enterprise (see Chapter 3).

Napier grass being sold by traders (KSh50 per bundle) on the roadside in Luanda, western Kenya.

Asset acquisition

Making the difficult transition from subsistence farming to earning a cash income allows farmers to start acquiring assets and so to increase the income-generating potential of their farms still further. Accumulating assets also gives farmers some insurance against hard times or for when family needs arise. For example, Samuel Ndele, who lives on a 1.2 ha farm in Ebukanga, Vihiga, was experiencing diminishing maize yields due to the combined effects of stemborers, striga and declining soil fertility. When he heard about push–pull on *Tambea na majira* he thought it might help him. He tried it and was delighted when he harvested twice as much maize from his first plot than he had previously. With the money he earned from selling Napier grass and maize, he bought a sow and fed her on maize and desmodium forage. When she farrowed, he sold all six piglets and bought a zebu heifer and a new roof. Now that he



Increase in numbers of crossbred dairy cows in Suba District (1997–2002).

Since 2002, diseases carried by biting flies have killed many crossbred dairy cattle in Suba and the total number in 2004 had declined to 150. This and other constraints are discussed in Chapter 3.

has plenty of forage, he can return more of his crop residues (and the manure from the pig's stall) to the soil, improving the fertility of his farm. This year he hopes to build a bigger house and next year he will buy a crossbred cow. "Now every year gets better instead of worse," he says.

Safeguarding the environment

Many farmers comment on the beneficial effects of the habitat management technology on soil fertility, soil erosion and soil moisture. In addition, the improved availability of forage allows them to return crop residues to the soil instead of feeding them to livestock. Zero grazing units are an excellent source of farmyard manure that farmers can use to enrich the soil either by applying it directly or using it to make compost. Many apply farmyard manure to their Napier grass, which grows faster allowing more frequent harvesting. Improving soil fertility is especially important in Trans Nzoia, where non-push–pull farmers have to use inorganic fertilizer and pesticides if they are to obtain a reasonable maize yield. Farmers like the Wang'ombes and the Gumos have discovered that with push–pull they can get sizeable yields without adding chemicals.

Sale of piglets and, eventually, milk will allow Samuel Ndele to continue to invest in his farm and improve his income over the longer term.

Monocropping and the use of chemical inputs are strongly correlated with the loss of biodiversity. By introducing a mixture of crop species into the farm environment and reducing the need to use pesticides, this project reverses that trend. In addition to increased numbers of natural enemies of stemborers, researchers found significantly more beneficial soil organisms in maize–desmodium fields than in maize crops alone. Reducing the use of pesticides and inorganic fertilizers has important benefits for human and environmental health and, of course, releases farmers' cash for other purposes. Another benefit with far-reaching implications is the ability of the system to improve livelihoods on even very small farms. This has the potential to reduce human pressure on the land, thereby slowing human migration to the cities and to marginal or protected areas.

Bilia Wekesa shows researchers how she makes compost in her zero grazing unit. Farmyard manure, household waste and crop residues are piled up and covered with maize stover and will make good compost after about three months.

Extending the benefits

With Gatsby's help, the ICIPE team is linking with national scientists to introduce the technology in Tanzania[1] and Uganda. Dissemination efforts in Uganda began in 2001 and, after some initial difficulties with trial design, made good progress. Ugandan researchers selected study sites, visited farmers, identified their problems and exchanged visits with ICIPE staff. They also conducted laboratory-based studies to determine which fodder grasses the local stemborer moths find most attractive. Nevertheless, adoption was disappointingly slow until the ICIPE team had the idea of taking the Ugandan farmers to Kenya to visit demonstration plots. Since then, the pace has quickened and 159 farmers in five districts are now testing the technology. Field days held on-farm in Uganda, managed by National Agricultural Research Organisation (NARO) staff and government extension officers, have increased the farmers' knowledge of striga and stemborer biology and have given them more confidence to adopt the technology and explain it to other farmers.

A similar initiative involving farmer exchange visits helped establish trial and demonstration plots in Tanzania in 2003. The technology is being tested by 20 farmers in the lakeshore region and 30 more in the coastal region of eastern Tanzania. Both areas are characterised by low-input maize-based crop–livestock farming and maize yields are adversely affected by striga, stemborers and declining soil fertility.

New zones, different crops

Although developed initially for maize, the habitat management technology can also benefit sorghum- and millet-based farming systems. These cereals are more tolerant of drought than maize and are grown in areas where rainfall is scant and unreliable. Striga and stemborers can also be severe constraints in such areas. Researchers have found that, when these cereals are intercropped with the drought-tolerant greenleaf desmodium (*Desmodium intortum*) and bordered by rows of Napier grass, the effects of striga and stemborer can be greatly reduced. "This adaptation of the technology will be particularly applicable for arid and semi-arid regions throughout Africa," says Khan.

A good return?

Although the long-term benefits are clear, the early stages of establishing a push–pull plot place heavy demands for labour on participating farmers. (This and other constraints are discussed in Chapter 3.) So, does the technology offer farmers a good return on their investment?

A formal cost–benefit analysis, performed by the project's socio-economist, Esther Njuguna, has helped to answer this question. Njuguna collected data from 25 farmers in Suba and 45 in Trans Nzoia, measuring their income, expenditure, use of inputs and labour. Overall, the technology has a benefit-to-cost ratio in excess of 2.5 when evaluated over several years. "This indicates that it is efficient and consistently gives farmers a good return on their investments," she says. "Economic gains are greatest in areas where both striga and stemborers pose a constraint to growing maize. Returns are good even for farmers who have small plots and little money to invest – and these, after all, are the ones who need help the most."

[1] The work in Tanzania is funded by the Maendeleo Agricultural Technology Fund.

Project Leader, Zeyaur Khan, illustrates the beneficial effects of push–pull on sorghum crops in a trial at Mbita Point. Good results have also been achieved on-farm in Suba District.

It is important to emphasise that the high labour inputs for establishing the Napier border rows and desmodium intercrop are a one-off, while the benefits continue for many years. Hence, the benefit-to-cost ratio is likely to increase as time goes on.

A collaborative project between ICIPE, the International Maize and Wheat Improvement Center (CIMMYT) and the Tropical Soil Biology and Fertility (TSBF) Programme[2] has revealed that the gross margins of push–pull can be greater than those of other striga control strategies. The scientists studied combinations of desmodium, soybean or sun hemp and local maize or imazapyr herbicide resistant (IR) maize, developed by CIMMYT. IR maize has a low dose (30 g/ha) of imazapyr herbicide added as a seed coat to herbicide-resistant maize. The herbicide attacks the striga seedling before or at the time of attachment to the maize root and any imazapyr not absorbed by the maize seedling diffuses into the soil, killing non-germinated striga seeds. The various options were tested with or without fertilizer.

Christian Were (pictured with Dickens Nyagol from ICIPE), is testing various crop rotations together with IR maize and the push–pull technology on her farm in Siaya District.

The results showed that push–pull with local maize and no fertilizer gave the best return. Adding fertilizer is inappropriate in dry areas since drought frequently affects crop growth and the investment cannot be recovered. The high gross margins of push–pull are related to the low input costs, since Napier and desmodium are perennial crops and, once planted, provide income for several years.

Christian Were is one of the farmers comparing these options. Although she found that a combination of push–pull with IR maize and fertilizer provides the best control of striga, her preferred option is to grow local maize in a push–pull plot. "With this system I don't have to buy fertilizer or seed," she explains. "And I get more maize when I plant a desmodium intercrop than I do with the other legumes."

[2] TSBF is a programme coordinated by the International Center for Tropical Agriculture (CIAT). This work was not funded by Gatsby.

3. Challenges and constraints: from seeds to policy

As they start to be adopted, new technologies often encounter obstacles, some of which may have been unforeseen at the outset of the project. Hurried dissemination, without first addressing these obstacles, may lead to failure. For example, desmodium is labour-intensive to establish since the plot requires frequent and thorough weeding if the emerging seedlings are not to be overcome by weeds. Until farmers have seen desmodium seedlings growing, they cannot tell the weeds from the crop. This is where visits to Mbita Point and help from farmer–teachers prove invaluable. The high incidence of HIV/AIDS in some areas is another factor contributing to shortage of labour. Here too, farmer–teachers or farmer groups may be able to help by mobilising support within the local community.

The need for seed

As word spread about desmodium's ability to suppress striga, farmers throughout the trial districts began clamouring for seed, creating a serious shortage. Although the Kenya Seed Company was importing seed from Australia, the price was high and availability limited. Gatsby responded by providing additional funds for a seed multiplication project. Initially, this was implemented by informal groups of farmers, who planted desmodium bulking plots primarily for the seed harvest. The activity proved lucrative, with seeds fetching a high price in the market – between US$15 and 20 per kg.

The quantities produced, however, were rather small and in 2003 Khan sought help from the private sector. He approached the Kitale-based Western Seed Company to undertake commercial seed production through contracts with local farmers and community groups. The initiative began with 300 farmers in Bungoma and Trans Nzoia, who were trained in seed production and preparation and given 250 g of seed each to multiply (see box overleaf).

Harvested desmodium seed before (left) and after on-farm processing.

Turning a tidy profit

A worsening stemborer problem and the high cost of fertilizer and insecticide meant that Bilia Wekesa could no longer rely on maize as the main source of income from the 1.6 ha she farms near Kitale in Trans Nzoia. She heard about push–pull on the radio and thought it sounded 'too good to be true'. But after attending a *baraza* she decided to try the system.

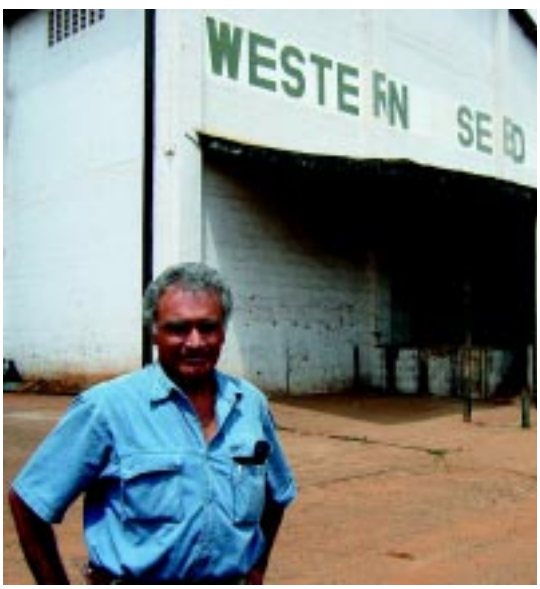
Wekesa collected enough seed from her initial desmodium intercrop to plant her own bulking plot and is now a contract producer for Western Seed. She harvests weekly and prepares the seeds by placing them on a large stone and threshing them with a piece of rubber. "Establishing the plot and collecting and cleaning the seed are hard work and take a lot of time, but the profit is good, so it's worth it," she says. "I make more money from selling desmodium seed than from maize or Napier grass, from a much smaller area of land. And the money is available all year round."

Bilia Wekesa harvesting desmodium seed. Her homemade overall prevents the hairy seed pods sticking to her clothing.

Western Seed undertakes to buy the harvest from all its contract farmers. It then cleans the seed, checks germination and viability, and packs and stores the seed. In 2004 the number of contract farmers increased to 450 and, by the end of 2005, there should be over 700 farmers involved. While the company currently sells most of its packaged seed to ICIPE (for distribution to new project farmers), after 2005 it hopes to sell seed on the open market. In conjunction with ICIPE, the company has started a promotional scheme, whereby a 100 g pack of desmodium seed is given away with every purchase of a bag of hybrid maize seed. This scheme could reach up to 3000 new farmers each year, considerably expanding the market for desmodium seed. Sufficient information to enable farmers to adopt the technology and make contact with Western Seed and/or ICIPE will be included in the package, together with suggestions for contacting local farmer–teachers.

Although busy with his own maize development programme, Saleem Esmail, Chief Executive of Western Seed, was keen to assist because he was convinced of the benefits of the habitat management approach. But did it make good business sense to become involved? "Yes, probably there will be long-term benefits," he replies cautiously. "There is an element of risk." In fact, profitability is not the immediate reason for his involvement. "There is a need to address the whole sustainability of farming in Africa," he continues. "We cannot sell to farmers who have no cash – first we have to help put money in their pockets." Esmail believes that, by raising farmers out of poverty, his company can lead them into the cash economy so that they become tomorrow's seed buyers.

Linking a commercial seed company with numerous small-scale farmers can cause logistical problems, which is why the scheme is restricted to only two districts at the moment. ICIPE is currently covering the cost of seed inspection and certification, which are required by law and conducted by the Kenya Plant Health Inspectorate Service (KEPHIS). Once seed production is on a purely commercial basis, it will benefit farmers to



Saleem Esmail, Chief Executive of Western Seed Company.

form groups so that they can reduce inspection costs, ease the work of seed preparation (possibly by using simple hand-driven threshing machinery) and get a better price from the seed company. If additional private seed companies become involved (one in Maseno has expressed interest), competition will help keep seeds affordable.

Credit and cows

The second major constraint preventing farmers from capitalising fully on the push–pull technology is the lack of cash or credit to buy crossbred dairy cattle. Although some (like the Wang'ombes) have saved money from sales of forage, this is not possible for all farmers, particularly those with large families and small farms. Development schemes and programmes are available, but have no formal links to ICIPE or its partners. For example, the Kenya Ministry of Agriculture and Livestock Development previously gave farmers an in-calf heifer if they had a zero grazing unit and year-round supply of quality forage. The farmer then undertook to pass on an in-calf heifer to the next farmer in the scheme. Although this programme has ceased, there is hope that the success of push–pull may encourage ministers to reinstate it. Meanwhile, farmers can apply to similar NGO-run schemes such as the Rural Outreach Programme (ROP) and Heifer International (see box). The role of the project in this respect is restricted to the provision of information, but once farmers are aware, they can take advantage of such opportunities. Furthermore, the technology helps them meet the most essential entry criterion, namely a reliable source of high-quality forage.

When adapting push–pull to sorghum- and millet-based farming systems in the drier areas, an obstacle that has yet to be overcome is the need to protect the intercrop and border rows from herds of cattle, which traditionally graze freely on crop residues after the grain has been harvested. Here, farmers will incur additional input costs (for fencing and/or labour) to protect their forage crops. Cost–benefit studies may be needed to determine whether this issue is likely to deter adoption. In current project areas involving maize cropping systems, most cattle are stall-fed, tethered or herded and free-grazing cattle are uncommon.

The gift of hope

A cow named Zawadi (meaning 'gift') represents Joseph Litunya's aspirations for the future of the farm he shares with his parents and five brothers. Since adopting the push–pull technology, his family have not only doubled their maize yield but also satisfied the criteria for the local Rural Outreach Programme (ROP), which helps farmers without cash or access to credit to acquire a crossbred dairy cow. Zawadi is 75% Ayrshire, and when she calves, Litunya hopes she will give over 6 litres of milk per day, which will provide the family with much-needed income. As a farmer who would otherwise have had no opportunity to obtain a crossbred cow, Litunya is only too glad to help someone else in his situation by offering them his first in-calf heifer and sharing his knowledge of dairying with them.

Thanks to a plentiful supply of forage grass and a home-built zero grazing unit, Joseph Litunya has met the criteria for a livestock scheme that provides crossbred dairy cows to farmers who lack the required cash or credit.

Litunya has also helped found the Busia Farmers' Group, which is helping all its members to acquire crossbred dairy cows. Registered with the Ministry of Social Services, this formal group has better access to credit and development funds than individuals, and the members may have better status with schemes such as ROP. In time, the members also hope to win a contract for commercial production of desmodium seed.

Adopting push–pull has doubled the Wekesas' maize harvest, but pests and diseases mean that much of the harvest is lost while stored in the granary.

Storing the surplus

Overcoming the major constraints to growing maize is certainly a good starting point, but it is frustrating for farmers when they cannot store the surplus grain. Post-harvest losses caused by pests and diseases are extremely high in maize. Together with acute cash shortages, the risk of such losses often forces farmers to sell their crop immediately after harvest. Improved storage conditions would not only increase the amount of maize available to eat but also enable farmers to sell their surplus later, when prices are higher. While research institutes such as CIMMYT are investigating this problem generally, the ICIPE–Rothamsted project is hoping to secure additional funding for research into potential solutions that would be particularly appropriate for push–pull farmers.

Pest defence strategies

Because it increases crop diversity on the farm, the habitat management approach might be expected to minimise the risk of pest and disease attack. However, the success of both desmodium and Napier grass as cash crops means that many farmers are planting them as sole crops, where there is a risk of pest and disease outbreaks. Indeed, project staff in Bungoma and Busia Districts have already noted an insect-borne disease of Napier grass that causes the plants to become yellow and stunted. Interestingly, a local variety appears to be resistant. KARI plant breeders are therefore working to incorporate this source of resistance into the popular 'Bana' variety. Potential insect pests on desmodium include the pollen beetle (*Mylabris* spp.) and the pod borer (*Maruca vitrata*). Scientists at ICIPE and Rothamsted are working on a defence strategy targeted on these insects, which involves traps baited with floral volatiles. The idea is that farmers could make their own traps with the appropriate flowers.

Another pest that threatens the success of the project is the tsetse fly, which transmits *nagana* disease (trypanosomosis) to cattle. Crossbred animals are particularly susceptible and several project farmers in Suba have lost their newly acquired crossbred animals to the disease. Control programmes are in operation (funded by the Kenyan Government and the European Union), but have met with difficulties. A large-scale eradication programme has yet to gather significant momentum and is unlikely to provide a long-term solution, while local control approaches have not led to sustained area-wide suppression. Meanwhile, the lack of effective control may deter farmers from investing in crossbred dairy cattle.

*Pod borer (*Maruca vitrata*) found on a desmodium seed production plot at KARI, Kitale. The insect is not currently an economically significant problem. However, the project team needs to be proactive in investigating control measures to combat the threat of attack from this and other pests of desmodium and Napier grass.*

Entomologists at ICIPE believe that area-wide efforts managed by local communities offer the best hope for successful control. Establishing such initiatives is not easy; a community-based suppression programme using baited traps in the Lambwe Valley collapsed after a few years because farmers lost interest following low catches of flies and reduced incidence of disease. But there is potential for educating and empowering communities to implement their own control measures. ICIPE scientists have helped establish several successful community-based programmes, in Kenya in the 1980s and more recently in Ethiopia.

Promoting policy change

In Butere Mumias, project activities are in their second season. The team expects to see a rapid increase in adoption here, since the local member of parliament, the Honourable Julius Arunga, is a devotee of the technology. The advantages of having a politician involved include greater chances of raising funds, such as money from the Constituency Development Fund, which is allocated by local MPs and could be used to establish additional demonstration plots. Interested politicians like Arunga may also be able to tackle long-standing policy constraints, such as regulations concerning seed supply and certification.

Seed supply regulations have placed several obstacles in the project's path, but the team made a major breakthrough when they influenced a change of policy regarding the distribution of seed that was the product of KARI research. Until 2000, such seed could only be distributed through the Kenya Seed Company. The problem was that this public sector organisation did not perceive a demand for desmodium and was unwilling to distribute the seed. Since the change of policy, the private sector (Western Seed) has been allowed to distribute seed originating from KARI and the project team have begun to address the desmodium seed supply problem.

Harvesting desmodium seed is time-consuming, but the profit is good.

ICIPE technician, George Genga, advises farmer–teacher Musa Aluchio when to harvest his desmodium seed. At present, the harvest from an intercrop can only be sold through unofficial channels.

The team has had less success with seed certification regulations. Seed must receive KEPHIS certification if it is to be sold commercially. Current rules state that all certified seed must be grown as a sole crop. This precludes seed from desmodium intercrops from being sold through approved channels. Although seed yields from sole crops are often better than from intercrops, there is greater risk of pests and diseases. Farmers do harvest intercropped desmodium for seed – for their own use and to distribute informally. But if they could sell certified seed, their profit would be greater and this would represent another significant benefit for the push–pull system. The project team and the Director of Western Seed are working to change the regulations but it is proving to be a slow process.

4. Across the spectrum: learning from experience

The story so far is one of success. Thousands of Kenyan farmers have adopted push–pull and most have experienced impressive gains in their food security and incomes. The research team and the farmers they have worked with have learned much about plant and insect chemistry and the principles that underlie environmentally friendly pest control. Constraints to adoption have been identified and strategies for addressing them have been devised. The key question now is how widely can the technology be applied elsewhere in Africa? Experience shows that out-scaling of projects in African agriculture is difficult and requires considerable investment of time, money and other resources. Local adaptation is also essential if new technologies are to reach their full potential in different areas.

The push–pull technology is flexible and can be successfully adapted and introduced to new cropping systems and agro-ecologies. Habitat management options can be developed and fine-tuned for a range of cereal crops, while introducing the genes that code for stemborer-repellent and striga-inhibiting chemicals into food legumes could extend the reach of the technology still further, to areas where striga affects food security but where few people keep livestock. Perhaps most importantly, the technology points the way to a much broader approach to IPM than previously attempted – an approach that sets pest and disease management in the context of the health of the whole agro-ecosystem.

From science to impact

When Gatsby began supporting agricultural research in Africa 20 years ago, the prime objective was to alleviate hunger by raising the yields of key crops through the transfer of existing technology to farmers' fields. However, action across the whole research and development spectrum is still needed if real improvements in rural livelihoods are to be achieved. This action ranges from strategic research (building knowledge), through applied research (developing new technologies), to adaptive on-farm research (fine-tuning technologies to local conditions) and to scaling up and out (involving intensive programmes to educate farmers).

The push–pull project provides a good illustration of the need to base new agricultural technologies on sound science. Detailed knowledge of the chemical mechanisms responsible for the push–pull effect helps to ensure the continuing efficacy of the system and allows it to be adapted to new situations. As Pickett says: "Science-based solutions are more robust. Understanding the underlying mechanisms means that if the technology ceases to work, we will be able to find out why and take appropriate action." Knowledge also gives researchers and farmers confidence to experiment further with the technology.

Linking the science with the results is a deliberate feature of many Gatsby-funded projects, and one that other donors find attractive. Indeed, the habitat management project has secured significant funding from sources other than Gatsby, including the UK's Department for International Development, the Rockefeller Foundation and the Global Environment Facility of the United Nations Environment Programme, among others.

A flexible agenda

In 1994, when Gatsby began supporting research on maize stemborers, push–pull was little more than a promising idea in the minds of an informal global network of chemical ecologists. That it has now become mainstream thinking in several national research systems is due in large part to the freedom enjoyed by the scientists involved to pursue new research directions as these arose – and in particular the links between the environmental

William Abonyo Seko, a farmer–teacher, passes on his knowledge of striga control to other farmers.

aspects of the technology and its implications for poverty eradication. When Professor Odhiambo and his colleagues at ICIPE decided to focus on developing a strategy to attract stemborers away from maize, they never anticipated that one of the 'push' plants would also suppress the parasitic weed striga and that a major benefit of the technology would be improved livestock production. The flexibility of the project's funding mechanisms was a key factor in maintaining the open-ended nature of the work.

Investing in farmers

Although a knowledge-intensive technology is expensive to disseminate, the project's focus on farmer participation and training has sown the seeds of widespread and self-sustaining impact. Participating farmers have a sense of ownership and feel pride in what they have achieved, which encourages them to learn more and pass on their knowledge to others. They also have increased confidence and this is demonstrated when they form farmer groups, which have a louder 'voice' and can attract more resources than individuals. Teaching farmers to experiment and innovate makes them inherently more adaptable and resilient in the face of changing conditions – whether these are economic forces, such as from globalisation, or ecological, as a result of climate change.

The team has high hopes that farmer–teachers will eventually accept much of the responsibility for passing on knowledge. Currently there is still a need for technical backstopping from trained ICIPE or KARI scientists. Indeed, Pickett believes the project will need careful stewardship for some time to come. "Push–pull is a highly self-reliant technology and it is really up to the farmers to make it work for their own situations," he says. "But because it is so flexible, it needs some kind of anchor point. For example, if farmers start planting field beans in the space between the maize and the Napier, someone has to remind them that this may interfere with the 'pull' of the Napier grass and upset the balance of the system. It is also important at this stage to spot new challenges quickly – for example the dangers of disease in Napier grass or insect pests on desmodium." The need for backstopping also extends to quality control, for

Training in scientific methods has helped Mary Rabilo (pictured with ICIPE technician George Genga) to develop her own forage ration for dairy cows, which contains ground maize and dagaa *(small fish from Lake Victoria) mixed with chopped desmodium leaf. She has evaluated different combinations of ingredients and developed a mix that costs less than bought concentrate feed, yet gives a higher milk yield.*

example the monitoring of desmodium seed produced by farmers to prevent a shift in its genetic make-up and/or loss of the active chemical stimuli.

Building partnerships and institutions

Adopting a partnership approach to R&D increases motivation and speeds up progress. It can also allow for a gradual exit of the initial funding and managing institutions, which can pass on responsibility to national organisations. The ICIPE–Rothamsted collaboration has worked well, due mainly to good communication. The lead scientists talk to each other weekly and will soon have a dedicated low-cost telephone line installed between their desks in Kenya and the UK. They do not compete for funds and neither organisation considers itself the leader, but each has a clearly defined role. The partnership is based on mutual benefit: while ICIPE researchers benefit from Rothamsted's advanced equipment, Rothamsted scientists rely on the ICIPE team's local knowledge and field experience. Both sides appreciate the exchange of experience and the challenging of existing ideas that the partnership entails. "Science today is highly interdisciplinary," says Hassanali. "We can no longer work in isolation. When people are asked to contribute intellectually they develop more enthusiasm and motivation." The two institutions have also fostered close links through exchange visits of research students.

The team have succeeded in involving a wide range of stakeholders. They have conducted workshops at Mbita Point for government extension officers, farmers, teachers and community opinion leaders such as chiefs and church ministers. The project experience highlights the need to recognise the interdependent but separate roles of scientists, extension workers and farmers. Although farmers can and should be active partners in research, they will often need continued support from trained researchers.

Eventually, it is expected that KARI and the government extension service will take on responsibility for supporting technology dissemination in Kenya. For this transition to be successful, ICIPE must continue working closely with KARI, helping to build capacity through training and collaborative research. The process was given a boost at the 2004 KARI conference (see box).

Push–pull proves to be a winner

In November 2004, the KARI team involved with the project were awarded the KARI Best Scientific Programme award. This is presented at KARI's biennial scientific conference and generates intense competition among the 26 regional centres.

Each centre may submit up to three projects, which are judged on scientific merit, benefits to rural communities, impact on the ground, sharing of information, participation of stakeholders, sustainability and other criteria. "The idea is to encourage competitiveness and focus on research that works towards the mission, vision and objectives of KARI, while creating local impact and improving research management," says Charles Nkonge, Director of the Kitale research centre, where the project team is based. "The push–pull project was a clear winner and met all the judges' criteria."

Winning the award has raised national awareness of the technology and attracted the attention of government ministers who attended the conference. There is now more hope that policy constraints will be addressed, for example by making the rules governing small-scale seed production more flexible. The award has also attracted additional donors: for instance, Oxfam have pledged funds to support technology dissemination in Kenya's Central region.

Charles Nkonge, Director of KARI's Kitale research centre, and his team congratulate each other on winning the Best Scientific Programme trophy.

Environmentally friendly and people-centred technologies like push–pull are the key to Africa's 'unique green revolution'.

The big picture

The experience of the push–pull project confirms that science can successfully support the interests of small-scale farmers and promote food security and sustainable livelihoods. With the essential ingredients of commitment, drive and enthusiasm, much can be achieved on a local scale. Thanks to push–pull, more and more families like the Obingas are finding a means to escape from the trap of diminishing yields and deepening poverty and hunger.

That is not to say that the technology will continue to spread unchecked. Issues such as a continuing under-investment in national agricultural research and development, the lack of agricultural credit for small-scale farmers and the frailty of public sector seed supply systems could well frustrate widespread impact if they are not dealt with soon. In addition, poor market access and inadequate post-harvest processing are likely to cause problems in the future when districts become self-sufficient in commodities such as maize. All too often in the past, these factors have led swiftly to the collapse of prices once surpluses have been achieved in a given area.

If these problems can be tackled, the habitat management technology will make a substantial contribution to the 'uniquely African green revolution' called for by Kofi Annan, United Nations Secretary-General, at a meeting of African Heads of State in July, 2004[1]. The technology also fulfils several of the agriculture-related recommendations of the United Nations Millennium Project's Task Force on Hunger[2]. Global opinion is now united in the belief that efforts to improve Africa's agricultural productivity must be based on technologies that are highly environmentally friendly and people-centred, in comparison to those that fuelled the Asian green revolution. Push–pull is one of these technologies: it is a new and much healthier approach to pest management; it teaches farmers how to become food-secure and build a livelihood on just a small piece of land, without demanding inputs of cash or labour that are beyond their resources; in providing forage for livestock it contributes directly to poverty eradication, since it enables farmers to meet Africa's rapidly rising demand for milk and meat; and in protecting and enhancing soil fertility it tackles what is perhaps the most fundamental constraint of all to the development of African agriculture.

If push–pull continues to spread and achieve a positive, long-term impact, it will play a vital part in helping African countries reverse their backward slide and set themselves on the path towards achieving the Millennium Development Goal of halving poverty and hunger by 2015.

[1] www.un.org/apps/sg/sgstats.asp?nid=1010
[2] www.unmillenniumproject.org

Websites

Green Ink Publishing Services Ltd.	www.greenink.co.uk
International Centre of Insect Physiology and Ecology (ICIPE)	www.icipe.org
Kenya Agricultural Research Institute (KARI)	www.kari.org
Rothamsted Research	www.rothamsted.bbsrc.ac.uk

THE GATSBY CHARITABLE FOUNDATION
Allington House (First Floor)
150 Victoria Street
London SW1E 5AE
Tel: 020 7410 0330
www.gatsby.org.uk

ISBN 1 901351 53 X

The Organic Farmer

The newspaper for sustainable agriculture in Kenya Nr. 6 Sept./Oct. 2005

Dairy goats are becoming popular with many farmers, page 4,5

Fighting the potato disease

New approaches are being used to control bacterial wilt and to increase production of clean potato seed.

The Organic Farmer

In the May and June issues of *The Organic Farmer*, we gave you tips on how to control the devastating potato bacterial wilt. Following the story, many farmers have written to us requesting for copies of the two issues. But all the copies were sent out to farmers. That's why we decided to give farmers once again the most important tips they can apply to control the disease. (See page 12).

Apart from the disease we mentioned that the country faces an acute shortage of clean potato seed for sale to farmers.

Positive selection

To address this problem, the government with assistance from the International Potato Centre (CIP) and the German Technical Cooperation (GTZ) is using two approaches. One of these is to use selected farmers across the country to produce clean seed for sale to other potato growers. The other is to train the potato farmers on positive selection of healthy potatoes in their farms, which they are encouraged to use as seed the following season. The method has been found to increase the overall yield by about 50 per cent. The two approaches could greatly reduce the spread of the disease while increasing potato yield for farmers.

BIOVISION

In this issue

Dear farmers,

As you can see we have additional pages in this issue of our newspaper. We have made a double issue for September and October. We are taking a break for one month in order to reflect on what we have already done. This period will give us a good opportunity to go out and meet as many farmers as possible and hear their views. It will enable us provide better service to you. We also will use this break to streamline the distribution of the paper and ensure it reaches farmers in every corner of the country. The aim is to empower them with the relevant information on agriculture and organic crop and animal production in particular.

We are so disappointed that some of the people we have entrusted with the responsibility of passing on the copies of The Organic Farmer to fellow farmers have not done so. Instead we have at times found the copies stacked in an office. This is sad taking into consideration the number of farmers who are calling us daily, requesting for copies of the newspaper. One cannot understand why these people would not like farmers to benefit from this useful information. Are they not happy when farmers are enlightened? Farmers, if you have not received a copy, approach the chairman of your group and ask him why your copy for the month is missing!

Going by the response we are getting daily from the farmers, demand for the newspaper is higher than we are able to meet. We will have achieved our objectives in information dissemination if every farmer who gets a copy of the paper is willing to share it with a neighbour, discuss the content, may it be an important tip on how to control a particular pest, where one could get seeds for a particular fodder crop or even how to prepare farm yard manure in the right way.

As we have mentioned many times, the responsibility of improving agricultural productivity in the country falls squarely on the farmers themselves. We will do our best to provide you with the relevant information to help you improve organic agricultural production.

The Editors

MY OPINION

By John Kariuki

Are we Kenyan farmers serious with farming? I doubt it! If you want to find out yourself, just walk to the small garden behind your house. Chances are that your bean or vegetable garden is overgrown with weeds. It sounds very good to blame the government and urge it to support agriculture. Or to blame the extension officers and the Non-governmental organisations staff for sitting only in their offices instead of visiting you. Do not rely on them, depend on yourself! It is up to us farmers to work hard. In this way you and your families will move forward.

John Kariuki is farmer in Nakuru

The Organic Farmer

Nr. 6, September/October 2005

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly and distributed free to farmers.

The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch BIOVISION

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Secretariat
Lucy W. Macharia
Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com

The powder that kills pests

Diatomite is an effective powder for pest control, it's deadly to insects and completely harmless to animals.

The Organic farmer

Diatomite is a powder made up of fossilized microscopic plants called diatoms. The plants once lived in the oceans and lakes, which covered much of the world in prehistoric times. Today they remain as deposits of soft porous white rock. In Kenya the African Diatomite Industries Company mines diatomite at Kariandusi near Gilgil and Soysambu.

This porous white rock is pounded to extremely fine powder, consisting of millions of small particles which have very sharp edges. If you would see diatomite under a microscope, its particles resemble broken glass. How does diatomite work against insects, and why is it deadly to them? This is easy to explain. Most insects have a waxy outer shell covering their bodies. When diatomite's sharp edges come into contact with an insect or a parasite, the protective coating is pierced, causing the insect to dehydrate and die. This makes diatomite an excellent and totally natural pest control, with no risk of chemical damage to animal tissue. By rubbing the dust into an animal's coat, it can be used as a control for fleas, lice and other external pests.

When used correctly, diatomite is effective against ants, aphids, bollworm, salt marsh caterpillar, cockroaches, maize worms, earwigs, houseflies, fruit flies, leaf perforators, leaf hoppers, lygus bugs, mites, pink boll weevils, red spider mites, slugs, snails, termites, Japanese beetle (grub stage) and many other insects.

Useful for stored maize

Australian and American farmers have for decades relied on diatomite to control pests in both cattle and plants. The very strict US health laws do not require products containing the substance to carry a warning, but one should avoid breathing in diatomite dust.

Diatomite, a naturally occurring siliceous sedimentary mineral compound, is relatively unknown in Africa. Not even in South Africa do the farmers know about Diatomite, even though the country boasts some top quality diatomaceous earth, all of which is mined in the Northern Cape. Diatomite can also be used as a natural preservative for protecting stored grains. You apply 3 kilos of the substance to each ton of maize, barley, buckwheat, wheat, oats, rice, rye, sorghum or mixtures of these grains directly after harvesting. Coating the grain's outside surface can be done when the grain is being moved into storage.

Diatomite is ground and graded for various uses, which include filtration in beer industry. It is also used for the same purpose in sugar syrup making, water, fruit juices, swimming pools and lubricating oils among others. And you can find it in toothpastes and plastics.

Following strict rules on use of chemicals in agricultural produce exported to European Union markets

in the last few years, Kenyan companies growing flowers for export to this market are increasingly turning to diatomite for pest control. According to Rogers Oluchiri, the sales and marketing manager at Diatomite Industries, one of the major customers for diatomite is Home Grown-Kenya, a flower company based at Naivasha which is now using diatomite for pest control.

Even Su Kahumbu who is answering the farmer's questions in *The Organic Farmer* is using diatomite. She is applying it on her animals and vegetables. Diatomite can be mixed with water and sprinkled over the vegetables.

Available and cheap

In Kenya diatomite is on the market under the name KensilF. Phillip Sudi, of the quality control section of Diatomite Industries, says the KensilF grade of diatomite is specifically suited for agricultural application. A Kilogramme of KensilF goes for Ksh 20. For trade enquiries farmers interested in buying diatomite should get in touch with the company:

African Diatomite Industries Compay. P.O. Box 32 Gilgil, Tel.050-4015209 or 050-4015209

"Sacco loan has improved our farm"

Co-operative societies are beneficial to farmers. In this issue we provide an example of the Mathira Co-operative Sacco.

By Eric Lumosi Asiligwa

Mzee Zacharia Kanyotu is a small scale farmer whose life has greatly improved thanks to loans he received from the Savings and Credit Co-operative Societies (Saccos). "If it was not for the loans we receive from the co-operative societies, we would not be able to send our children to school, developed our homes, pay for un-foreseen urgent needs or improve our farms", he says.

Mzee Kanyotu is one of thousands farmers in rural Kenya who has seen the benefits of Saccos. For farmers in the rural areas, hard cash is normally difficult to come by except through ventures like these. Saccos are a concrete process of fighting against poverty by developing the hidden and non-productive financial resources of the rural populations. Saccos provide financial self-help to its members who eventually learn to tap their potential.

90'000 members

For over 30 years, Nyeri Farmers Sacco has served the farmers in Nyeri District making a big difference in farming. As a result, Karatina is recognised for its agricultural achievements. The society which started in 1974 as a union banking section of Nyeri District Co-operative Union was transformed to a cooperative society in 1998. "This was done specifically to mobilise savings for its members", said the operations bank manager Karatina branch, Mr. George Githinji. The other nine co operative branches include: Nyeri, Mukurweini, Othaya, Ruringa, Mwiga, Naromoru, Nanyuki including Karatina town which is the main branch.

The Nyeri Farmers Savings Society boasts of hosting over 90, 000 members in all of its branches. A lot of water has passed under the bridge since its conception. Now it has a high capital base and a share value of over 50,000 members who pay Ksh 100 membership fee. "At the moment, the society is stable and has assets such as buildings and land which appreciate in value", Mr. Githinji said.

The Sacco serves coffee farmers, tea farmers, dairy farmers, businessmen and women, and other small co-operative societies. These include the Baricho Farmers Co-operative Society, Kiama Farmers Co-operative society, Mathira Farmers Co-operative Society among others. The co-operative societies specifically help in marketing farmers' produce. In addition to the produce which guarantees a certain amount of money regarded as shares, farmers may also choose to increase their shares by depositing them in the bank.

Credits

All Sacco members are entitled to loans. These may be given out to pay for school fees, improve farms, and repay debts, capital to start a business or to buy assets. In the Mathira Sacco branch alone, the total loan given out for 2005 amounted to Ksh 5.1 million. "We have been having cases of defaults where farmers defect to other Co-operative Sacco groups without re-paying our loans", complained Mr Githinji. He said this was a big hitch in the development of the bank. However, a debt collectors' group has been formed to follow up on those who default. Alternatively, those who guaranteed for the loans will be required to re-pay the loans themselves. According to Mr Wamae Wanjau, the Baricho Farmers Co-operative Society accountant, "the Co-operatives Law Act does not allow one to join two societies at the same time. This is a punishable offence with up to two years imprisonment or a fine of Ksh 50,000. When farmers default due to bad weather which results in poor harvest, the farmer will be given an indefinite time to re-pay the loan".

Management

The Saccos are managed by the farmers themselves. They hold an annual general meeting to discuss matters arising from the running of the societies. A team of 60 delegates are elected to spearhead the running of the societies. These then elect within themselves nine directors who run the Saccos. They arrange and organise several meetings through out the year and do not earn a salary for their work. Instead, they receive a seating allowance. "The elected delegates must meet certain criteria. This includes having shares amounting to Ksh 50,000 in value. Without proper management, the society may end up splitting and forming other societies. At one time we only had one Savings and Credit Society serving the big Mathira Division, but it was split into 13 different societies", said Mr Githinji. "Sacco has to work competitively to attract farmers", he adds.

Savings in the club are foresight's granary
and drop by drop, palm wine fills the canary.

Saccos to be regulated

In Kenya there are more than 4200 Saccos, controlling about Kshs110 billions in members savings and shares. There has been no adequate framework or legislation to safeguard member's savings and stop mismanagement. As a result the Ministry of Cooperative Development and Marketing is working on Sacco societies regulatory bill, which is currently at the drafting stage. The bill is intended to regulate Saccos and ensure they are well managed to serve members and protect their savings. It is expected that if regulatory mechanisms are put in place Saccos can move higher and provide long term financing. (TOF)

Goats improve income for rural women

The goats have helped improve nutritional levels and income for families of Nakuru women group

By Peter Kamau, Ngorika

Kunyotoka Group members at their goat demonstration shed. *(Photo TOF)*

Eight years ago, 42-year-old Margaret Wanjiru together with other women from Ngorika village in Nakuru District formed a women's group. The women who started off by raising money among themselves would each take turns to receive a lump sum of money to cater for their urgent needs such as paying school fees or buying household goods.

A local Non Governmental Organisation (NGO), Farming Systems-Kenya who heard of the group, advised the women to try zero grazing cattle. They took the advice and formed the Kunyotoka Zero Grazing Women's Group. "After paying Ksh 2,000 to the group, a member would receive a heifer whose offspring would be given to the next member who would also pay Ksh 2,000. But we soon realised that the size of land was too small to adequately cater for cattle rearing. Many of us then switched to dairy goat rearing instead", Wanjiru says.

Multiple births

Wanjiru was lucky. In 2000, when she heard about the benefits of dairy goats, she sold her only cow and bought a female goat. On first conception it produced triplets. On second conception, it produced quadruplets and all the kids survived. By the end of the year, she had seven goats after giving up one of the kids to another group member. By last year, this goat produced five kids which are all doing well.

Built a house

"Dairy goat keeping has brought a big change in my life", Wanjiru says. After selling some of the goats, she was able to pay school fees for her children, buy a water tank and build a new house. With the income, she is able to take care of her parents. Each goat produces an average of three liters of milk per day. Her family now has more milk than it need and the surplus is usually sold. Apart from milk production, the goats have provided her with good quality manure which has helped improve the quality of soils on her 3-acre-farm. As compared to keeping cows, Wanjiru says that goats require a small land area to graze. "Anybody can rear goats as they consume as little as 5 kilogrammes of feed per day," she says.

Grace Wacuka, 41, is the group's chairlady and a single mother of two. She says that most of the group members do not own land because most families have not yet sub-divided the land among their children. She says this is the reason why goat keeping is popular among the group members as it does not require a big piece of land.

"The goats have not only helped us improve our diet and nutrition, but have also become our major source of income. We are now able to supply goats to farmers in many parts of the Rift Valley Province who want to start rearing goats", she says.

A model for goat farmers

The Kunyotoka Women Group which now comprises of 25 members is one of the most successful dairy goats farming project in the country. The group provides training to many farmers in the province on the techniques of dairy goat keeping. For a day of training, a farmer pays Ksh50. Each year, the group takes part in the annual Agricultural Society of Kenya (ASK) shows where it competes with other breeders. The group has often taken trophies home with them.

Unlike cattle rearing, dairy goat keeping does not require much care but owners are advised to keep proper records to ensure cases of inbreeding are reduced. To start with, the women group had to qualify for membership of the Nakuru Sheep and Goats Association, a local body that helps maintain standards for all hybrid sheep and goats in the district. After being trained on how to care for the goats, the group received four female goats and a male. In 2001, the Kenya Agricultural Research Institute (KARI) recognized the group's effort and donated four more goats.

"When the goat produces a female kid it is given to another member who pays a deposit of Ksh1,000. As a result, all our members have within a short time managed to own and keep a number of goats", says Wacuka.

Good earnings

Like Wanjiru, most women in the group have made progress in their lives since joining the group. Many of them have bought plastic water tanks, iron sheets, TV sets, cooking gas and even purchased farm inputs with earnings from the goat sales. Most members sell up to three goats in a year. A female goat sells for 8,000. For each goat sold, five per cent is deposited to the group's account. In addition, the Breeders Association which regulates and helps maintain quality standards in the dairy goat project charges a levy of 10 per cent for every goat sold.

Interested in goat breeding?

If you need more information, contact:

Kenya Diary Goats Breeders Association, P. O. Box 2816, Nakuru, Tel: 051 22 111 77

There are two publications:
- Keeping goats in Kenya, by Ian Skea, published by Ministry of Livestock Development, copies are available at Agricultural Information Center, Waiyaki Way, P. O. Box 14733, 00800 Nairobi
- Training Manual for keeping and breeding goats, by Farming Systems Kenya, P. O. Box 2816, Nakuru, Tel 051 2111 77, e-mail: fsk@africaonline.co.ke

Dairy goat farming is easy

The dairy goats need good shelter and care. In addition, the farmer has to keep proper records.

The Organic Farmer

Except for pastoral communities in Northern Kenya many people in the country do not like goat milk. Farmers keep or buy goats for meat. But goat milk is nutritious and unlike cow milk, it contains fats and proteins in a more refined form that is easily digested by children and adults.

That is why it is recommended for infants, sick people and those recovering from illness. Indeed many children are often weaned on goat milk when they reject cow milk. Unlike cow milk, goat milk is said to be free from most of the disease causing pathogens which are responsible for tuberculosis.

Breed

The most common dairy goat breed in the country is the Swiss or British Toggenburg. The British type is bigger and can attain up to 70 kg with some males growing to 100 kg. The Swiss type is smaller, ranging between 50-70 kg. The goats are brown or grayish brown with white stripes on the face and legs. The Swiss type is longhaired. The Toggenburgs are intelligent and are easy to handle and train. However they must be well fed to produce milk. The other popular breed is the German Alpine.

Farmers wishing to buy these hybrid goats are advised to do so from breeders who are registered with the Kenya Stud Book (KSB). This is a secretariat of the Kenya Livestock Breeders Organisation (KLBO) that maintains records of farmers who own hybrid goats and other livestock. The goats are inspected regularly and farmers issued with certificates to show the animals meet set standards.

Benefits of a goat

Felistas Kibutha from Ruthimiti village in Wangige likes goat milk. Her extended family consumes much of the milk from her 3 goats. She sells the surplus at Ksh 50 a half litre. She prefers goats, since they are not heavy feeders and are easy to sell when she needs money.

(Photo by TOF)

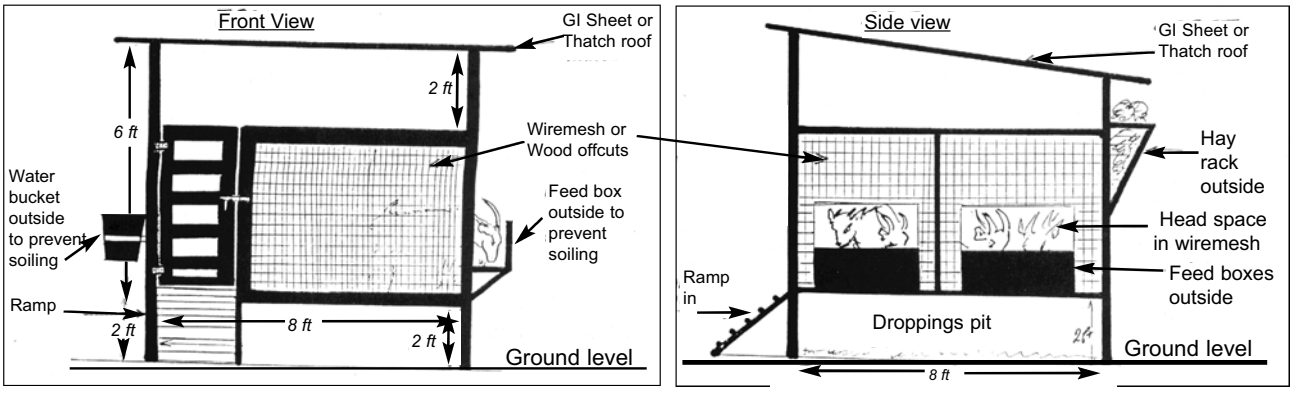
Housing

Farmers are advised to avoid keeping the goats on free range. They should be properly housed in well-ventilated sheds with slanted floor to allow flow of urine and other waste. The shed must be kept clean. Structures made of cedar posts or any strong material are recommended. The farmer should use corrugated iron sheets for the roof and timber offcuts for the walls.

Record Keeping

The farmer should ensure the goats are regularly de-wormed. They should also be de-horned and their hooves trimmed regularly with a sharp knife. Good husbandry practice involves the maintenance of records on each goat to help in their management. Details such as the name of goat, breed, date of birth, parent information, date of service in case of does, including milk records are important. The goats also need branding with tattoos, ear tags or notches. This depends on methods of identification recommended by the rules of the Kenya Stud Book.

How to build a goat shed



Why maize has black tassels

Nyuthe Nduati and fellow farmers in Ngorika area in Nakuru are concerned about a disease which is devastating their maize crop: "A black lump grows on the tassels and the maize ear or cob. All that remains is a black powder on the cob and the tassel. What can we do to control this disease or eradicate it altogether?"

The maize sample sent to me from the farmers in Nakuru was infected with Smuts. Smuts is a fungal infection which affects the cobs and tassels of the maize plant. The affected areas look like white swollen pouches which if left later turn black and burst releasing myriads of black spores into the environment. The maize plant becomes non productive and in fact a cause of contamination for the entire maize crop. The fungal spores may be carried by wind, water, humans animals etc creating havoc in their path and may stay in the soil for many years. The solution to this problem is to identify infected plants very early before the pouches burst and to destroy them by fire. Do not put this affected material into compost pits. There is no known cure or prevention other than vigilant crop husbandry, where soils are kept at optimum fertility through good crop rotation in order to prevent re-infection.

This fungus also affects Sorghum with similar symptoms thus neither of these crops should be grown in an affected area for a minimum of three years. Take note of neighbouring fields of crops as this disease can spread between shambas. It is important to note that Smut can originate from poor maize seed, thus it is advisable to buy seed from a reputable source. Do not plant your own seed if you have this problem.

A maize plant affected by smuts: the disease has caused huge losses to the farmers in Nakuru. (Foto TOF)

Su's answers

Stalk borer becoming a threat

Duncan Mwangi of Ngorika wants to know what methods he can use to control stalk borer which is devastating the maize crop. He has tried all pesticides but they are not working.

Stalk borer is a serious pest in all maize growing areas in Kenya. It is identified by perforation of the upper leaves caused by the larva of the borer which sit inside the funnel of the maize stalk, feeding off the new tender leaves. Early infestation will cause stunting of the maize plant and if left untreated will result in the larva progressing to infecting the newly formed cobs, drastically reducing yields and storage quality of the maize.

To effectively treat this pest, the larva must be eradicated at an early stage. It appears from the question posed by Duncan Mwangi of Ngorika that he has finally created a resistant borer that is not affected by conventional pesticides, caused by his continual use of the same. His solution now is to look at bio pesticides such as Neem cake, Pymac and diatomite all of which when sprinkled into the funnel of each maize plant, will control the problem. Sprinkling must be done at early symptom stage and carried out again when symptoms reappear.

Store at a dry place

It is very important to keep close vigilance on our crops as organic farmers knowing prevention and early intervention is crucial. Secondly, at maturity the crop must be harvested as soon as possible and all cob leaves must be removed. This is because the borer may still be present in the leaves covering the cobs. The cobs must then be sun dried and stored in a well ventilated maize storage area. At this stage, diatomite should be sprinkled on the cobs to prevent infestation of both the borer and weevils. Diatomite is locally available as Kensil. It is non toxic and therefore very safe to use. It does not need to be removed before cooking of the maize.

Control the weevils

John Kiragu of Molo would like to know the causes of weevil infestation of maize while still in the shamba. Is there a way we can control the weevil at this stage?

Firstly, weevils affect drying or dry maize. There is no way of controlling weevils in the field because they hide inside the cob leaves. Therefore to control weevils, the crop must be harvested at maturity and sun dried as quickly as possible with leaves stripped off the cobs. Then same treatment as above for storage applies for weevils - dusting with diatomite. Also putting leaves of Neem trees or Lantana in between layers of maize cobs will help, store in a well ventilated maze store protected from rodents, and your yield of maize will keep for a long time.

Storage of grains

All grains must be stored with a maximum moisture content of 13% to avoid the on set of moulds which ca n cause serious health consequences e.g

Continued on page 7

Take care of your chicken

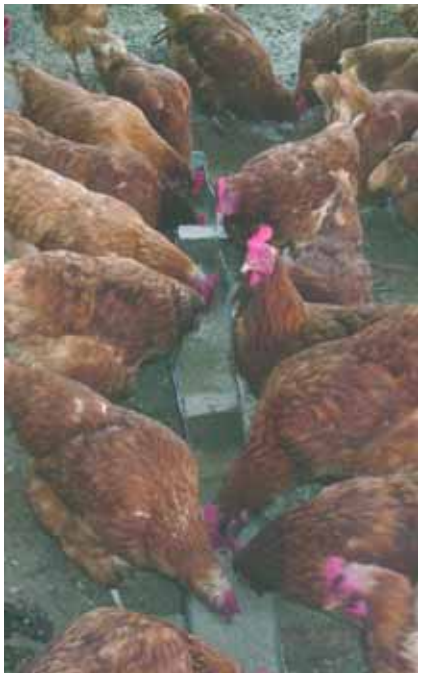
Ronald Mokaya Nyabuya, P.O Box 995, Kitale is asking for information about chicken (Hens) diseases affecting them, and medicine used.

Hens like plants must be given adequate nutrition and conditions for their survival. It is very important that the hen housing is dry as bacteria breeds in moist conditions. It is also important that the temperatures of the hen house are neither too warm nor too cold as this will affect the energy levels of the hens. Conditions that are too hot result in more water consumption than feed and constant heat stress of the hens. This applies to both, broilers that are grown for meet and layers grown for egg production.

Chickens that are kept in housing that is too cold will burn their energy trying to keep warm. The resulting effects will be stress and low egg production, weight gain and a reduced immunity to disease. As with plants we try to create strong immunity, so too with hens, in fact any and every livestock, in fact any living organism, life in general.

A happy hen must have access to clean drinking water, dry grains free of fungus, fresh organic greens, sunlight and an area to run and play. In the case of layers, a comfortable private slightly dark laying area is essential too.

Sick poultry can spread disease very quickly. Sick chickens must be quarantined from the rest of the flock as soon as illness is realised. Diseases



vary in degree of severity and a visit from a vet will help in identifying absolute problems. If medication is necessary ask your vet for natural alternatives if any.

We use EM

To ensure our chickens have strong immunity, we add EM to their drinking water and have done so from day 7 of their lives. This helps them with better feed conversion, vitality and strength. We also feed them loads of organic green materials from the farm. Sometimes we do have a chicken that succumbs to illness. More often than not, we remove this bird from the flock immediately. In quarantine if the bird does not show signs of recovery, we cull it, cook it and feed it to the dogs.

If you have a continuous problem with disease and chickens, it is advisable to get rid of the entire flock. Before starting a new flock, clean out and rest the chicken housing for at least 2 months. Or try something new. I have just read a story about a farmer in the States who rotates his livestock! Every 6 months he rotates his livestock into a different housing area. He moves his pigs to the chicken area, cows to pigs and chickens to cows. He believes the disease and bacteria that effect one group of animals cannot survive or cause damage to another. And it works ! We rotate our plant groups for exactly this reason!!

Be sure to let us know the action and results with your chickens!

Continued from page 6

Aflatoxins. Some simple guide lines can help us determine the correct moisture content.

1. If you can bite through already dried grain, it is not yet dry enough.
2. If you CANNOT bite through a grain kernel, chances are it is dry enough for storage and will not develop fungal growth.

These very simple details could be life saving. If you can eat an uncooked grain, so can a fungus.

Diseases in our crops become more common as we upset the natural balances of nature. We must strive to create healthy soils by the incorporation of nutritious organic matter as well as crop rotation so that at every level, starting with the soil, there is a balance. When this is achieved, ours will just be a matter of scouting and slight intervention as our crops will be healthy and able to resist most problems.

Earthworms and Termites

Joseph Gachie Kiragu from Nyeri will know more about earthworms and termites.

Termites require a high, possibly dry carbon content in their feeding material. They are not likely to be found in a very wet manure.

Termites are regarded as pests in situations where they destroy wooden structures, However, in the organic garden, they are very useful and necessary in speeding up the first stages of decomposition of organic matter with a high carbon content, e.g. straw and wood shavings. Where they are pests they can be controlled by sprinkling diatomite directly onto their bodies, or in an area they must pass (see: Diatomite, page 2).

Earthworms

Earthworms are a good sign. They do not eat roots, but rather digest decomposing organic matter and make it readily available for plant uptake. They also help to aerate the soils they inhabit. They are a sign of healthy soil, compost or manure. They will be found where conditions are right, soil acidity, temperature, humidity and availability of food. The conditions of the manure in which they were present, suggests optimum conditions were present. In

manure where they are absent, the opposite is true.

Prove it yourself: Sift 2 square feet of soil from your best farm area. Count the earthworms. Do the same with soil from your worst area. Count the earth worms. Earthworms = healthy soil = healthy crops = healthy YOU!

Su Kahumbu answers your questions

Write to:
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com

Farmers can control potato bacterial wilt

Crop rotation and careful potato seed selection are the best measures which farmers can take to control the disease.

The Organic Farmer

Many farmers across the country are still unable to control bacterial wilt in their farms. As a result the disease is still affecting production in many potato-growing areas. However, it is important for farmers to know that although the disease has no known cure, it can be easily controlled or even eradicated if only they can follow simple rules to manage it.

As we said in our May issue, potato growers should ensure that where the disease is identified, they should never replant the same field with potatoes or any other crop in the potato family. This includes tomatoes, bananas, eggplant, capsicums, pepper and groundnuts. Fields affected by the disease should never be planted with these crops for a period of up to four years. During this period, farmers can plant other crops that are not attacked by the disease. These include beans, maize, cabbages, sorghum, wheat, onions, carrots, sweet potatoes or grass.

Positive selection

Farmers should always ensure they get good seeds from established seed growers working with the Kenya Agricultural Research Institute's National Potato Research Centre (KARI-NPRC) at Tigoni. Where a farmer has no way of getting clean seeds, he can practise what is called positive selection. This involves marking healthy potato plants with pegs at flowering stage, after harvest these are stored as seed to be planted in the next season.

Selecting the best potato plants for seeds has been found to increase potato production by 50 per cent in areas affected by bacterial wilt. But farmers should know that this method only reduces the disease's prevalence and does not eradicate it.

Mode of infection

Farmers should ensure that infected plant material such as tubers, crop residues, contaminated surface run-off water or irrigation water spreads the disease. Infected soil on shoes and farming tools such as jembes, fork or even tractors can transmit the disease. Pests and insects in the soil also spread the disease.

Affected plants wilt may appear like those lacking water; farmers can confirm the disease's presence by cutting a tuber from the wilted plants and squeezing it. If a white creamy liquid (which contains the bacteria) comes out, this confirms the disease's presence.

Many weeds serve as alternative hosts for the bacteria. They must be removed to reduce its presence in the soil. Volunteer potatoes (potatoes from the previous harvest which grow on their own) should be removed.

In cool areas of the country with an altitude of 2,500 metres, the bacteria can hide itself in healthy plants only to re-emerge when potato seed from these areas is replanted in warmer lowlands. Buying certified seed and planting these on uninfected soil is perhaps the best way to avoid the disease.

Important tips for bacterial wilt control

How to identify the wilt

- In rapid disease development, the potatoes do not change colour.
- In the long term, the potato leaves turn yellow.
- The plant is stunted. Sections of the diseased plant may wilt completely and dry up, while the rest appear healthy.
- There is a dark brown colour in the inner section of the stem.
- Heavily infected tubers have soil stuck to the tuber eyes.

How to handle infected plants

- Remove all infected plants and tubers with surrounding soil and put them in a 2 feet deep pit and cover with clean soil or burn them.
- Do not put diseased plants in your compost heap.
- The plants next to the diseased plants should be harvested only for consumption, not for seed.

How to select good seed

- Use clean seed or tubers of tolerant varieties bought from reliable sources such as Kenya seed Company or recognized seed growers.
- Disinfect all tools with household bleach (Jik solution) before and after use.
- Avoid planting in low-lying and waterlogged areas.
- Plant only whole undamaged tubers.
- Weed regularly and cover the potato crop properly with soil.
- Taking care not to damage roots and stems.
- Ensure that farmyard manure and compost are fully decomposed to avoid spreading the disease.
- Check field regularly for wilt and other diseases.
- Do not put diseased plants tubers on your compost heap.
- Do not buy potatoe seed from neighbours.

Useful addresses

Farmers can buy clean potato seed from the following producers:

Central Province

1. Gathaithi Pioneers Group, Tel: 0721 341 655, Kiambu
2. Mr. Kelly Ndung'u, Tel: 0722834 725
3. Mr. David, Tel: 0720 376 478, Meru
4. Midland Ltd., P.O Box 20529, Nairobi, Tel: 045 40206, 41209

Central Rift

1. ADC Marindas Farm, Molo
2. Samwel Ketyenya, P.O Box 104, Keringet, Tel: 0722 898 805

South Rift

1. Sara Macharia, Tel: 0735 263 607, Trans-Mara
2. John Maleke, Tel: 0735 589 294, Trans-Mara

North Rift

1. Kerio Trade Winds, Mr. Moiywo, Tel: 0720 220 641
2. Philip Ruto, Tel: 0721 918 667
3. Mr. Powon, c/o KARI, P.O Box 450, Kitale, Tel: 0733 893 140

Letters to the editor

Change attitudes

I salute the editorial board of organic farmer magazine for the good job you are continuing doing in bringing to our attention about organic farming. It is now five months from the time the magazine was launched i.e. April 2005. Here in Nakuru and Nyandarua districts farmers, frontline extension officers, farm manager and other relevant learning institutions have been receiving all the five copies and are quite happy for the good formative information concerning organic production and opening other channels in organic value chain. The magazine has reached over 10,000 farmers, through farmer groups in our region.

The magazine has been an eye opener for all players in organic production. It is now high time farmers and other organic experts join hands and pull resources together for example in information sharing on production, value adding, marketing and other new Bio-products, also looking for appropriate techniques or measures to reduce the cost of production. Farmers require to be given the right and relevant information which is applicable and realistic.

May I extend my thanks to all other players who are promoting organic production to mention but a few, organic farmer magazine, KIOF, SACDEP, Baraka college, Manor house and others for their noble efforts. It is through participatory approach and serious training and campaign that will help in spreading and expanding of organic production in this country. It has come a time when farmers have to change attitudes toward farming and take farming as other business. Experts need to re-double their efforts and reach about 80% of the rural small and medium scale farmers who are still in the dark as regards modern farming.

If the above measures are consistently put in place the problem of unhealthy food in many regions shall be solved. The future seems brighter with organic farming.

Daniel Njoroge Kamau, 0721 350796

It takes two days to sort, package and send out The Organic Farmer newspaper to farmers throughout the country. Last time Swiss Journalist Rudolf Kueng passed by to do a story on the newspaper. Here he is seen talking to Eric Lumosi, one of our writers who is also helping in the distribution. In the foreground is our office secretary Lucy Macharia sorting out the newspapers for despatch. (Foto TOF)

Cooperation

Mwakamuki small farmers organization is a community-based organization (CBO). It draws its membership from small-scale farmers at Kakuzi division in Thika. It has a membership of 70 members (families). We are pleased to send you this letter to cooperate with you the way in which we can get more advise on organic farming and the way we can control the pest. Thank you in advance and looking forward to your positive response and also your cooperation.

Mrs. Margaret Waringa, P.O Box 48, Ithanga

Valuable

I write to request for *The Organic Farmer* monthly. I have read the last several issues with my friends and found it very valuable and impressive especially on how to make liquid manure and use it to top dress out plants in shamba. I am a catholic justice and peace commission Kabula parish chairman and a coordinator of Namawana Sub-location Self Help Group. We find that the organic farmer would be of much help to us. Thanks alot.

Cosmas Khaemba, P.O Box 13, 50124, Kabula Via Bungoma

Very realistic

Greetings from agriculture and rural development programme (ARDP) Catholic Diocese of Nakuru. I hope and trust you are fine. I would like to acknowledge with sincere thanks receipt of *The Organic Farmer* magazines that you have been sending to us on monthly basis. I thank you very much on behalf of the programme staff and the farmers we are working with.

The magazine is very realistic and applicable to the farmers. I want to assure you that we are trying our best to make sure that all the magazines reach the farmers. We will also in future try and contribute to the magazine. Kind regards.

Daisy Rono, ARDP Coordinator

More copies

I thank you for your organic farmer magazine and request you to be sending me at least 2 copies for the nearby groups and schools.

John Chege Mungai
P.O Box 136
Ithanga Via Thika

Visit us

I hereby kindly request you to visit our group. Our group holds its meetings on Wednesday every week, so we expect your visit. Thank you.

Alex Makau, P.O Box 1232, Kangundo, 0735565849

Form your own farmer group to get copies

I have the pleasure to say thanks for your July issue and this is my first time to receive your newspaper. And I am saying thanks for your services. I want to ask you some questions:

1) I want you to explain well about the organic farmer services?

2) In your letter, I saw you are dealing with the groups and my question is, would you like to organize my group here?

I hope you will answer my questions and thank you in advance. I am looking forward to the next issue of the newspaper.

Eustus Gakere, P.O Box 33, Kiganjo, 0721 588163

Dear Mr. Gakere,
We are encouraging farmers to form groups for the purposes of receiving the newspaper through one address- NOT officially registered groups. The reason we are doing this is to help cut the cost of sending the paper to each individual farmer. In this way we can be able to reach more farmers.

The wasps that save farmer's cabbage

ICIPE introduces farmer-friendly alternatives with biological control to protect the cabbage against the Diamondback Moth.

By Liz Nganga

Larva of Diamondback moth. . .

. . .and its enemy, the wasp

Cabbages and kales are the most important vegetables in the region, especially for lower income groups. The importance of these vegetables is probably greater in Kenya than other African countries. According to the Ministry of Agriculture, in Kenya they occupy over 18,000 hectares.

Eaten daily, either raw in salads, steamed, boiled or fried, cabbages and their cousin kale serve as important cash-generating crops in many households, and are used as fodder for animals. Grown in all of Kenya's eight provinces, with Rift Valley and Central province jointly making-up 82% of the total production, cabbages have the potential of being an economic enterprise, and could contribute to poverty reduction.

Low returns

So far, however, cabbage production has generated less than satisfactory income. The average yield of 13.8 tonnes per hectare per year is very low, and at an estimated Ksh10 per kg generates about Ksh 138,000 per hectare, working out to Ksh 2.61 billion per year for the entire production in Kenya.

Various factors have contributed to the low yield and returns, the most important being insect pest damage, which can lead to up to 100% loss if not controlled. One of the cabbage's major devastating pests is the Diamondback Moth (Plutella xylostella DBM), a small greyish-brown insect which gets it name from a diamond pattern on its back, seen when its wings are closed at rest.

Small insect, big damage

Despite its minute size - 8 mm in length with a wingspan of about 15 mm - the moth causes damage often sufficient to ruin cabbage heads to a level where they are no longer marketable and contaminates the heads with larvae or faecal waste. The moth's destruction to the cabbage, and other host plants such as cauliflower, broccoli, radish and turnip, is felt at all stages of its 15-17 day lifespan. Feeding by the larvae damages leaves, making them appear skeletonised.

Control of the moth has remained a tricky issue. This completely cosmopolitan pest, which tolerates the tropical, subtropical and temperate climates, extending as far north as the Arctic Circle in Europe, is notorious for developing pesticide resistance. In Kenya and the East Africa region, ICIPE, the International Centre for Insect Physiology and Ecology, is making great strides in the control of the moth as part of the Centre's research into the pests of staple food crops and horticultural crops. ICIPE is working with partners to develop Integrated Pest Management strategies that will provide farmers with affordable solutions to the moth problem.

Biological control

Intensive studies carried round the world found biological control - the use of a living organism to control pests, implemented through conservation, augmentation and important and importation of natural enemies - of the Diamondback Moth safe and sustainable.

Use of chemical pesticides for control often leads to serious environmental problems, besides affecting the health of users and consumers. In addition, chemical pesticides eliminate the natural enemies of the moth, thereby creating the need for more pesticides and causing the build-up of considerable residue levels in subsequent cabbage production. This in turn increases production cost and development of resistance. Ironically, in order to overcome resistance, farmers have resorted to applying higher doses of insecticide cocktails more frequently, making control more complicated.

In 2000, ICIPE started a project to introduce parasitoids (natural

Continued on page 11

Nothing left to harvest: Infested cabbage

Cabbage crop 2 years after releasing wasps (Photos courtesy of ICIPE)

Continued from page 10

enemies), which are a major feature of Integrated Pest Management. The project commenced with a survey in the major cabbage growing areas in Kenya, Uganda and Tanzania, which showed that existing enemies were not providing a big enough impact in control of the Diamondback Moth. ICIPE therefore imported an exotic parasitoid, a parasitic wasp (Diadegma semiclausum), already being used in a number of countries in South East Asia (Taiwan, Indonesia, Mainland China). The wasp stings the Diamondback Moth larvae, lays its eggs, which hatch into larvae, which feed on the internal organs of the moth causing death. The wasp's larva pupates in a cocoon inside the loosely

Releasing wasps in the field near Karatina

spun webbing of the moth larva and remains stuck to the leaves. The adult parasitic wasp then emerges after a few days.

Good results in Taita Hills

A number of trials were conducted at the Centre's laboratories before a permit was given for the release of the wasps in Kenya, which was initially done in July 2002 in Kisii, Taita Hills and Muguga. Sites were visited every fortnight and data collected to find out if the natural enemy was getting established. Results showed a reduction on the number of Diamondback Moths in the fields, and of the damage on crops. In Taita Hills the wasp destroyed the Diamondback Moth at a rate of 60 %, and in Tanzania areas visited after eight months were observed to have the natural enemy spread widely with an average 30% parasitism, though some recorded as high as 80%. In Uganda, the wasps were released in November 2003 and data collection will begin soon. Uganda was also the second country in Africa to have a second natural enemy released - the Cotesia plutellae, which is appropriate for semi-arid areas.

KARI takes over

Rearing, release and monitoring activities are now in the hands of the Kenya Agricultural Research Institute (KARI) Muguga Biological Control Station. Several districts in Kenya have benefited from the release of the wasps, mainly Meru, Nyeri, Embu, Maragua, Kiambu, Naivasha and parts of Nakuru and Nyandarua.

In most situations, the released parasitoid will completely control the pest without any additional activity required by the farmer. However, says ICIPE-Scientist Dr. Bernhard Loehr, "farmers should regularly scout their fields as there are other pests like aphids that might require treatment. Spraying against Diamondback Moth is only necessary when there is an average of more than two pests on the scouted plants in the dry season, and more than three in the wet season". There are a number of neem-based products available in Kenya which can be used in organic agriculture and give a satisfactory control of Diamondback Moths and aphids.

Climate change a threat for Africa

Climate change threatens to increase the number of the world's hungry by reducing the area of land available for farming in developing countries, a report of the UN-Agriculture Organizations says. "In some 40 poor, developing countries, with a combined population of two billion, including 450 million undernourished people, production losses due to climate change may drastically increase the number of undernourished people, severely hindering progress in combating poverty and food insecurity".

The severest impact was likely to be in sub-Saharan African countries, which are the least able to adapt to climate change or to compensate for it through increased food imports. In Africa are 1.1 billion hectares of land with growing period of less than 120 days. Climate change could, by 2080, result in an expansion of this area by 5 - 8 percent, or by about 50 - 90 million hectares, the UN-organization said. Sixty-five developing countries, home to more than half the developing world's total population in 1995, risk losing about 280 million tonnes of potential cereal production as a result of climate change. *(TOF)*

Managing pests, diseases and weeds

The biological pest control as explained on page 10 is important for organic farming. There are many ways to manage pests, diseases and weeds.

The Organic Farmer

The approach described here is to protect crops from damage caused by some pests, diseases and weeds by strategically placing other pests and weeds to serve as predators or deterrents. For commercial and conventional farming, a low incidence of all pests, diseases and weeds is considered necessary for maximum yields and product quality. Relatively large sums are spent on buying chemicals and on research to find new chemicals to sanitize fields. Many pests and disease have developed resistance to the chemicals used making more research and chemicals necessary. Other pests and diseases are able to develop because their natural enemies have been killed. This approach is short sighted and does not take natural systems into account.

For sustainable agriculture, the approach is to control stressed food webs, predators, life cycles and other aspects of the ecosystem. In the natural balance, each organism, including pests, diseases and weeds, serves one or more functions. If an organism appears not to be useful, it is usually because all its roles in the system have not been discovered or acknowledged. The terms 'pest' and 'weed' need to be redefined to include the positive roles these plants and organisms sometimes play in agriculture.

For example, weeds may serve as a resource for production because they can be used for composting or mulching. Their presence in a field is and indicator of healthy soil. A few pests on crops are needed to keep the predator population functioning in the process of biological control without causing a significant reduction in yield.

It is important to understand the cycles of pests, diseases and weeds to find out when dertain natural control methods are needed.

Source: Production without Destruction, Natural Farming Network Zimbabwe, 1995

Farmers can do a lot to control spider mites

In the August-issue of The Organic Farmer we wrote about pyrethrum. ICIPE-Scientist Dr. Markus Knapp gave us some more tips how to control spider mites.

By Markus Knapp

Spider mite web on a tomatoe plant. The red points on top are female adult mites waiting to be blown by the wind to the next plant for getting more food. (Photo courtesy of ICIPE)

In the last issue *The Organic Farmer* pointed out very clear, that early recognition is very important for controlling spider mites. The spider mites prefer the lower side of the leaves and only go to the upper site, stems and later even fruits of the lower leaf surfaces are over-crowded. The spider mites can be reddish brown, bright red, orange, greenish or yellowish. Spider mites are very small. What you can see without a magnifier are only the adult females. If you check with a magnifier you will see many smaller mites (these are their children) and eggs, which look like small white or yellowish balls.

Support tomatoes with sticks

Because the spider mites are on the lower side of the leaves it is very important that you cover these places when you spray. This is very difficult in tomatoes, which are not staked. Putting a stick and tying the plant to it lets the tomato grow more upright and makes spraying easier. Pruning (removing shoots that are not necessary) helps even more. Then turn the lance of your sprayer around and spray from below to reach the lower side of the leaves. It is also very important to have the right sprayer nozzle and make sure that it is working well. Replace the sprayer nozzle every year. Never use a piece of wire or any other thing to clean a clogged nozzle. It will not work properly afterwards.

For efficient spider mite control the plant must be covered completely with the spray solution, of whether you use a botanical or a synthetic pesticide. Scientists have shown that surviving mites can find small areas that were not covered during the spraying and feed and lay eggs there until the pesticide is not effective any more. In Zimbabwe it was found that yield and quality of staked and pruned tomatoes was much higher than of the one grown without a stick.

Terrible pest from Brazil

The two most important spider mite species (types) in Kenya are the tomato red spider mite and the two-spotted spider mite. The tomato red spider mite is not native to Africa. It was introduced accidentally. We do not know exactly where it comes from but we suspect that its home is South America. It was found for the first time in Kenya in 2001. This mite prefers tomatoes and its relatives like potatoes and eggplants but it can now also be found on beans.

Predatory mites are the most important natural enemies of spider mites. They are also small and usually whitish to yellowish in colour. They move much faster than spider mites because they have to hunt for their food while the spider mites just walk around slowly and prick the leaves. However, we have never seen predatory mites feeding on the tomato red spider mite. This is very common when pests are transferred from one area of the world to another. The native natural enemies do not attack it because they are not used to it.

ICIPE has therefore established contacts to research institutions in Brazil to search for natural enemies in South America. Early last year predatory mites were found on tomato plants infested with the spider mites. These predatory mites were further tested in the laboratory in Brazil and found to do very well. ICIPE has now obtained a permit from KEPHIS to import this mite and keep it in the quarantine laboratory at ICIPE for further testing. Before it can be released into the field another permit from KEPHIS is needed.

Take care with pyrethrum

The two-spotted spider mite has many more host plants. It can be a problem on beans, eggplants, cucumber, squash, pawpaw, okra, roses, carnation and other flowers, even maize and many other plants. There are predatory mites and other natural enemies (e.g. small ladybird beetles) feeding on the two-spotted spider mite in Kenya. However, these natural enemies are usually more susceptible to pesticides than the pest. You should therefore use pesticides (botanical or synthetic) only when it is really necessary. This is of special importance with pyrethrum because it kills all bugs, good ones and bad ones. If you want to use neem to control spider mites, look for a product that contains a high proportion of neem oil because it is more effective. However, it might also damage your plants. Therefore try it on one plant before you spray the whole field.

To reduce spider mite pressure on your farm remove and burn or compost all plant leftovers immediately after harvesting in terminated. Don't leave them in the field until you need it again to plant something else. These old plants are ideal breeding grounds for spider mites. When there is nothing to eat any more the mites will move to your new crops. Because they are small and cannot walk far, they use the wind for distribution. When the host plant is exhausted they move up the plants and wait to be blown away. That is the reason why you sometimes can find huge numbers of orange mites on the web on top of plants or even on the top of sticks used for staking tomatoes. From there they are blown into your new crops by the wind.

The Organic Farmer
in November

Why not plant Soya beans?

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 18 November 2006

It's harvesting time, farmers!

Delays in payment, exploitation by middlemen, storage problems – harvesting time is a real challenge to maize farmers.

Peter Kamau

It is once again that time of the year when farmers are harvesting their maize. They are doing this with great expectation that markets will be available and the prices favourable to them.

The harvesting time is a difficult period for farmers. Although the National Cereals and Produce Board has somewhat stabilised prices, delays in payment has often forced farmers to sell the produce to middlemen who buy it at throwaway prices and sell at a premium in maize deficit areas. At least the NCPB has already opened their depots which will enable farmers to deliver the produce on time.

Another problem among farmers is their tendency to wait for too long before they start harvesting. By this time, most of the maize cobs have opened, exposing the grain to weevils

and rotting. Storage structures in most farming areas today are made of timber off-cuts which provide a good haven for weevils. A store made of wire mesh is ideal as it gives adequate space for air circulation. The use of chemical pesticide dusts in Kenya is tricky. Many dusts are no longer effective against weevils and other dangerous pests such as the Larger Grain Borer (§). Experts now suspect the products are faked. Unless farmers use the available organic methods of pest control, preventive measures seem to be the only option available to them.

Harvest early and store properly. *See page 3*

Good response to our plant extracts special

We have received numerous letters, telephone calls and SMS messages from farmers commending us on our September / October 2006 issue that featured plant extracts. That is why we have decided to make a reprint in English. Farmers interested in getting copies of the reprint can get in touch with us through our usual address. We thank you all for your positive comments.

in this issue

Su's organic shop now open in Nairobi

Organic food consumers in Nairobi finally have a shop where they can get fresh supplies: Su Kahumbu, well known to readers of the *The Organic Farmer*, opened the Shop at Gigiri Shopping Center near the UNEP headquarters on September 2 this year. The shop is stocked with lots of certified organic products from farmers' groups trained through the TOF Support Programme. *See page 8*

Dear farmers,

There is a widespread view among farmers that farming has become a loss making venture. Many will sit back and remember the good old days when they could sell their agricultural produce at good prices which were regulated by the Government. But things have changed with the liberalisation of the market, together with competition from other producers of the same goods. Competition is stiff and only the best can meet the demands of the ever changing market.

How can farmers really survive in this environment? In this issue (see page 4) we have a story on farmers in Meru, who have, against all odds, managed to start a factory to process their farm produce. This is a major step in the right direction because the farmers will now earn more from their farm produce. For many years, Kenyan farmers like their counterparts in the rest of Africa, have been primary producers of agricultural goods which do not fetch good prices because they are not processed.

Sometimes when we visit farmers in the field, we are shocked to learn that they do not have even the most basic tools, yet the same people can spend large sums of money on ceremonies which do not promote their farming activities. It is often surprising to find a farmer who does not even possess a wheelbarrow for carrying fodder for their cattle or who does not have even milk cans to deliver their milk to KCC. Some of these items can even be bought on credit.

What we are saying is that farmers have to do more. They should be well organized and be able to plan ahead. Farming should be viewed as an investment that can bring good returns and help raise the standards of living for the majority of rural people. Some farmers have borrowed money from Savings and Credit Cooperatives (SACCOs) in their areas and used it wisely to develop their farms.

We keep our word. Some months ago, we promised you that we would increase the number of copies of The Organic Farmer following the great demand from farmers across the country. With the support of BioVision Switzerland we have now increased the number of copies from 12,000 to 14,000. Karibuni, wakulima!

MY OPINION

Every month I look forward to receiving a copy of *The Organic Farmer*. The reason for this is simple, TOF is not an ordinary newspaper. Every issue comes with something new for the farmer. It is so exciting to try new methods of farming which help increase production on my farm, at the same time cutting the cost of using expensive and harmful chemicals. Since most of the farmers in my locality do not receive a copy, I always share this information with them and also encourage them to try new ideas. I feel this is the only way information on organic farming can get to as many farmers as possible.

Robert Mukhwana, Bungoma

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

How to prevent water loss

There are many ways a farmer can conserve run off water for use in crop production, even during the dry season.

The Organic Farmer

With the increasing frequencies of drought and water scarcity in many parts of the country, farmers need to know and practise water conservation methods in order to make maximum use of the available water resources on their farms. Water conservation involves trapping as much water as possible and storing it on the surface or allowing it to sink into the soil in order to raise the water table and increase the soil moisture level. A protective vegetation cover on the soil surface helps to slow down the flow of running water before it settles on pits and dams. Contour ditches are then dug to help spread the water all over the farm.

As we mentioned in previous editions, keeping the soil covered prevents soil erosion and water loss, and in the process improves the overall productivity of the soil. One method of doing this is the use of mulch; this is the use of dry plant residue to cover the soil. Mulch keeps the soil underneath moist, which is not possible if the soil is left bare. It also suppresses weeds and promotes a healthy plant growth. Mulching also reduces soil erosion and provides plant nutrients as the material decomposes.

Water conservation methods

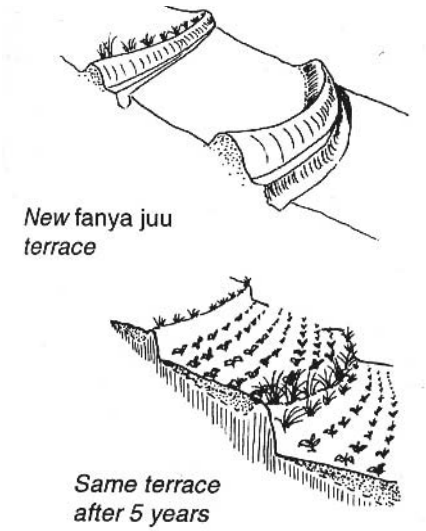
Contour ploughing: Contour farming involves ploughing, planting and weeding along the contour, which is across the slope rather than up and down. (see photo)

Tumbukiza method: In this method, a hole 60 cm and 60 cm wide is dug and filled with compost mixed with soil and planted with maize or Napier grass. Water from run off collects in the hole and seeps slowly into the plant. (Sketch)

A garden with terraces *Photo TOF*

Fanya juu method: Fanya juu terraces are made by digging a trench along the contour and throwing the soil uphill to form an embankment. Fodder grasses are then planted to stabilize the embankment. It later develops into bench terraces which harvest and conserve water (see sketch).

Bench terraces: Bench terraces are level steps constructed on the contour and separated by embankments. They can be formed by excavation or may develop over time from a grass strip or *fanya juu*.



Stone Terraces: Stone terraces are useful in areas with steep slopes. The terrace walls are made of stones collected from the land. However many farmers do not prefer them as they provide shelter to rats and other rodents which eat the crops.

Intercropping: Planting maize as an intercrop between the rows of the main crop such as beans, cabbages, sukuma wiki (Kales) or potatoes provides shade which helps reduce water loss and also protects from the wind.

Our series on water

In the August 2006 issue of *The Organic Farmer*, we introduced drip irrigation, which can help farmers grow crops using very little water. In this issue, we will provide you with cheap and easy methods of retaining water in the soil as long as possible. In December, we will share the experiences of farmers in Lare Division in Nakuru District who have learned various methods of water harvesting for agricultural production, livestock and domestic use.

Harvesting early cuts down losses

Every year, farmers lose a large portion of their harvest due to poor timing, pests and lack of proper storage facilities.

Peter Kamau

Once again farmers are harvesting their maize crop. It is the dream of every farmer to harvest much more than they did last year. But this may not be the case for many of them. Although the crop may look healthy while still in the shamba, much of the crop will be lost due to pest damage and the rains. Every year farmers either lose a huge portion of their harvest, not because they did not use the right inputs but because they did not harvest at the right time or take the necessary measures to reduce pest damage.

As we have said before in this newspaper, losses to farmers always begin in the field. The maize crop is the most affected, due to poor timing and poor storage methods and facilities used by farmers across the country. Many farmers tend to leave the crop too long in the field where rains and pests attack the crop even before it is harvested. Most of the maize varieties grown at the beginning of the rainy season in mid-March and April are ready for harvest by October and November. In areas where the crop has been knocked down by wind and has come into contact with the wet ground, decay and pest damage is always faster. Right now, weather forecasts indicate that rains will increase in November and December. This means that farmers who harvest late will lose a considerable portion of their crop.

Reducing post harvest losses

Farmers should take the following measures to reduce losses during harvest and storage:

Sorting: Before storage, the maize should be sorted out to remove the cobs that have already been damaged by insects and mildew (mould). Research shows that sorting can help reduce the damage by up to 36 %.

Drying: The maize should be dried for a few days before storage. Drying gets rid of excess moisture which is responsible for decay during storage.

Shelling: Shelling helps to check pest damage. Since most pests prefer maize which is still on the cob for easy movement. If a farmer has to apply pesticides, this should be done after the shelling. The maize should then be dried in the sun for a further 3 to 4 days after shelling. Direct sunlight kills weevils which have not entered the maize grain; the maize should be turned and stirred to ensure it dries evenly. Drying also helps bring down the moisture level to 13 %, which is ideal for long term storage of grain.

A large portion of maize harvested every year is lost to pests and rotting. *Photo TOF*

Construction of store: A good store should be well constructed. It should have adequate space for air circulation at the base and also on the upper part; pests prefer a warm environment and will keep away if the store is well ventilated. It is recommended that a store should have 40 to 50 % open space for the stored grain to dry properly. The store platform should be raised up to 60-90 cm above the ground to allow for air circulation.

Cleaning: Weevils reside in cracks in the wood of the store; they can remain there until the next harvest. Thorough cleaning is therefore necessary before fresh grain is stored to ensure infestation of the maize does not occur during storage. Cow dung and fresh eucalyptus leaves can be burned to keep away any pests before storage. Granary floors and walls can also be plastered with cow dung for the same purpose.

Natural pest control methods

Diatomite: Diatomite is one of the most effective of natural pest control compounds. It is a natural preservative that does not affect the quality of grain. It is made up of millions of fossilized microscopic plants, called diatoms, which have sharp edges which pierce insects, killing them. It is not poisonous to both animals and human beings. The Kensil F grade of diatomite is the most appropriate (it costs Ksh 350 for a 20 kg bag). The recommended application rates are 3 kg of diatomite to one tonne of maize, wheat, oats, rice or sorghum. It is applied directly to the grain and mixed with a shovel.Wash off the diatomite and dry the grain before consumption.

Various plants can also be used to control pests in stored grain. Research shows that neem oil can repel The Larger Grain Borer. When applied at the rate of 20ml/ kg of maize neem oil has been found to prevent reproduction of the LGB and to drastically reduce damage to stored maize. The effect of neem oil has been found to last for up to 6 months.

Pyrethrum dust (*Crysanthemum Cinerari*): Flowers can be picked during a hot day and dried in the shade. They are then crushed into powder and mixed with grain. Pyrethrum powder from plants in general are said to reduce pest damage to maize and other cereals. Wash the grain and dry before consumption**.** The ashes mixed with grain are known to give 4 to 6 months' protection.

Battle against rats

Apart from weevils, rats and mice are troublesome pests that bring huge losses to farmers because they eat large quantities of maize especially during storage. Rats can be controlled by use of traps and rat poison. Fixing of rat guards on raised stores can stop the rodents from access to the store. The rat guards look like a collar fitted around the pole (see photo). Farmers should take great care when using rat poison to ensure children, pets and livestock do not come into contact with the chemicals.

Value addition helps Meru farmers

This farmers group can now sell a wide range of farm products after processing them in their factory.

Jane Kigo, Meru

Products ready for the market (left), farmer S. Mukuru tends his arrow roots. Photos: TOF

Stanley Mukuru, a farmer from Chuka, Meru South, practised farming like any other farmer in his village- that was to provide food for his family and sell the surplus whenever he could get a buyer. It was very hard for him to depend on farming as a source of income. This was due to the fact that many people in the area were farmers and did not require farm produce. The market, too was overflowing with the same products, pushing the prices down.

But all this changed in the year 2003, when the Ministry of Agriculture introduced the National Agriculture and Livestock Extension Programme (NALEP1). Mukuru and 15 other farmers from his village formed the Mungoni Focal Area Organic Group. They were trained by the Kenya Institute of Organic Farming (KIOF) under the NALEP programme. The group members were trained on compost making, use of plant extracts for pest control, value addition through processing and how to practise farming as a business.

"It was not hard for many of us, because our farms are not contaminated and we only needed to apply some other requirements of organic farming," Mukuru says.

Arrowroot around homestead

The group (now renamed the Mungoni Organic Farmers' Group) is one of the most successful in Meru district. Following the training, they have transformed their farms into some of the most productive enterprises in the region. Mukuru's farm, located a few kilometres from the Nyayo Tea Zone farm, is a good example of the skills the farmers have acquired from the training. Contrary to the belief that arrowroot are planted near or next to a river for a constant supply of water, he has been able to turn a flower garden near his homestead into an arrowroot garden. From a shallow basin, he has dug several holes 1 metre deep and 2/3 metre wide. An inlay of perforated polythene sheeting is spread in the trenches where arrow roots are then planted. The polythene helps conserve water. Soil enriched with manure is put onto the polythene paper to cover 2fts of the trench. Through this method, arrow roots and other crops can be planted throughout the year bringing a steady income. The water supply to the garden is replenished from a tap in the homestead.

The other portion of Mukuru's land is covered by a healthy crop of maize, sweet potatoes, Irish potatoes and a small banana plantation. On the lower side next to the river is a plantation of Napier-grass, coffee trees and tea bushes.

Factory for value addition

Mukuru and his group members realized that their main difficulty was marketing of their produce. They therefore decided to go into value addition using the knowledge they acquired in the training.

They approached their Constituency Development Fund (CDF) committee for assistance to set up a food processing factory. After going through their intended plan of work, the Committee decided to offer assistance of Ksh 600,000 in two phases. The first phase of Ksh 400,000 has enabled them to build the factory and buy the necessary equipment.

The factory has been processing pawpaw fruit jam; fruit juice from passion, mangoes, avocado and pineapples; cassava and banana flour; and cakes from arrowroots and cassava. They also process crisps from bananas, arrowroots and Irish potatoes, and even a beverage from amaranth. The products are sold in Meru, Embu, Sagana and even supermarkets in Nairobi.

"The processing of these farm products has greatly improved income for our members and also created a market for other farmers in this region," says Mukuru.

The group is currently developing a marketing strategy to expand their reach. They have also incorporated other farmers' groups into their production and marketing chain. The products will in future sell under the brand name VACID. To retain the group identity however, each of the groups will also have a brand name under which they will market their products.

Invested in training and marketing

Although production has been going on for the last one year, the members plough back their profits into the factory for expansion and other purposes such as registration, licenses and purchase of production equipment. Following their success with the factory, they now want to set up a multi-million food processing complex to process more farm pro-ducts, much of which goes to waste during peak production period and which will now earn income for members and the community at large.

The group is now recruiting new members. The approved constitution allows a maximum number of 70 members; to date 50 members are registered. An agricultural officer is available to train them on weekly basis. They have been given a piece of land by Ndagani Secondary School which they use for demonstrations during training. Produce from the demonstrations land is given free of charge to the school.

The group plans to develop a large training institution to train other farmers in Meru district. With the results from the market survey conducted by the Group's sales representative, the entire range of their products have a lot of market potential. It takes a lot of hard work, but the group says it well in their motto "where there is a will there is a way''.

Methods to control termites naturally

Termites cause great damage to crops. ICIPE has developed an environmental friendly fungus to control them.

Nguya K. Maniania *

Termites or white ants are known to concentrate their feeding activities on dead plant material from wood to humus. By these activities they contribute to the soil profile, soil texture and redistribution of organic matter. Termites are therefore important for recycling matter. But in their quest for cellulose, termites may also cause significant damage to crops, trees and houses of poor subsistence farmers, particularly in developing countries. Data on economic losses caused by termites to crops is difficult to obtain; but in most African countries the losses appear to be sporadic and localized, and can be more widespread and catastrophic in many other countries.

Rain fed crops more vulnerable

In general, damage by termites is greater in rain-fed than irrigated crops, during dry periods or droughts than periods of regular rainfall, in lowland rather than highland areas, and in plants under stress, because of lack of moisture, disease or physical damage, rather than healthy and vigorous plants. In particular, exotic crops are more susceptible to termite attacks than indigenous crops.

Conventionally, damage to plants by subterranean termites has been prevented by persistent insecticidal barriers in the soil around the roots, thus, preventing termite access to the crops and trees. This has in the past relied almost exclusively on the use of insecticides (lindane, aldrin, dialdrin, chlordane and heptachlor). Following the ban imposed on the use of these insecticides, less persistent insecticide groups such as organophosphates (chlorpyrifos, iodofenphos), carbamates (carbosulfan, carbofuran), and pyrethroids (permethrin, decamethrin) have been used as alternatives to termite control; but their low persistence calls for repeated applications.

Healthy plants more resistant

Although healthy plants may be damaged by termites, unhealthy and stressed plants are generally more susceptible to termite attack. Therefore, cultural practices should aim at maintaining or enhancing plant health.

Termites (worker and soldier)

Termite mound

Damage to maize cobs (Photos courtesy Dr J. van den Berg)

The use of good quality seed, healthy seedlings, and appropriate transplanting procedure is more likely to produce healthy plants. In general, indigenous crops show more resistance or tolerance to termites. For instance, sorghum and millet are more resistant to termites than maize and groundnut, which are exotic crops. Deficiency or excess of water may stress plants and encourage termite attack. In general, attack on crops and trees is greater in drier areas and during dry periods. Overall annual rainfall is important but the even distribution of rainfall through the growing season may be more significant.

Control techniques

A number of techniques are used and include cultural methods, plant insecticides and biological control.

Cultural practices: Deep ploughing or hand tillage exposes termites to dehydration and to predators, thus reducing their number in the crops. Pre-planting tillage also destroys the tunnels caused by termites and minimizes their foraging activities and associated damage to crops. Removal of the queen and/or destruction of the nest have frequently been used by farmers as a traditional method for control of mound-building termites. Mounds are dug, flooded or burnt with straw to suffocate and kill the colony.

Intercropping is the most effective cultural practice used by small-scale farmers in sub-Saharan Africa to control insects that have specific host ranges. However, controversial results have been reported in case of termites. Intercropping in forestry has been suggested as a means of retaining termite diversity in the crop in order to prevent them from achieving pest status. Certain grasses are intercropped with different crops in West Africa to repel termites.

The removal of residues and other debris from the field may reduce potential termite food supplies and hence lead to a reduction in termite numbers and subsequent attack. On the other hand, leaving residues in the field or adding further organic matter could provide alternative food to which termites will be attracted, thereby reducing levels of attack on the main crop.

Plant extracts: Various parts of plants and extracts are known to be either toxic or repellent to pests of agriculture, and widely used in rural settings. Some of these extracts have been investigated in the laboratory and found effective against termites. Plant extracts such as those of neem and dried chilli have been used to control termites in the field and in storage.

Biological control: Many natural enemies (predators, parasites and pathogens) attack termites in nature. Biological control is the use of these natural enemies for their control. It constitutes a more environmentally acceptable alternative to traditional chemical control measures.

A new method: Control by fungi

Among the pathogens (bacteria, viruses and fungi), fungi offer a greater opportunity as termite control agents compared to other pathogens. Fungi infect their host through the cuticle and do not need to be ingested. They are environmentally safe. The ento-

continued on Page 7

** Dr. Nguya K. Maniania is Scientist at ICIPE*

Organically certified seeds are hard to get

M Abuoro (Tel. 0720 063 460) in Rongo wants to know if the use of certified seed is allowed in organic farming.

Certified seed implies the seed has been grown following strict standards, and the resulting seed has been tried and tested before being given the status of being certified. This ensures that there are no disease pathogens on the seed and the viability is good. It also ensures that the seed is pest free. 'Certified seed' is not the same thing as 'Organically certified seed'.

From an organic producers perspective nevertheless, certified seed is good to use as we are less at risk from diseases and pests from the start, and should get a good quality yield from production.

The international standards for organic production require that seed is undressed, or untreated and comes from an organically certified source. Conventional certified seed is often treated with Thiram or some other chemical. Untreated seed does not have any chemicals. It is however more prone to getting fungal disease and other infestations. In Kenya we do not have certified organic seeds available yet. As producers, we may therefore, if following international standards, apply for a derogation on seed. This requires getting letters from 3 local seed companies supporting our claim to the non-availability of their organic equivalents. Alternatively, we can opt to import them but must follow very strict phytosanitary regulations set by KEPHIS.

This starts with making application to KEPHIS and if successful, being granted a Q-license to import, with certain conditions. A Q-license is a quarantine license and comes with the following requirements: Documentation of the origin of the seed must be supplied to KEPHIS and on entering the country, the seed is immediately taken to and tested at the KEPHIS laboratories. If it is seen to be carrying pathogens foreign to our local pathogens, it will be destroyed. From there, germination tests are done and if all goes well, you will be given the seed on certain planting conditions. The entire planting area will be quarantined, which includes 6 foot plastic sheet fencing and foot and car/tractor baths at all entrance and exits. Transfer or sale of the seed is also prohibited. As you can see, as organic producers we are caught between a rock and a hard place. To import following the regulations is expensive, time consuming and risky. To grow our own seed can also be risky as we are subject to many variables. Our best option to minimize risk is to use certified seed and try to propagate our own when we feel confident enough to.

Farmers can propagate their own organic seeds

What about Nibecidine?

"Is Nibecidine organic?" asks Mary Wanja (Tel. 0721 673 830) in Molo.

Unfortunately I do not know what Nibecidine is. However, just as farmers/producers are expected to show integrity via organic certification, so too must be manufacturers of agricultural inputs and solutions. The best thing to do when in doubt is to ask them for documentation or symbol proving organic certification.

Growing tomatoes without chemicals is not easy

Sylvester (Tel. 0727 400 821) plans to start tomato growing between November and December this year. "Please advise me on care, disease control and other requirements," he asks.

Tomatoes are easily subject to insect and fungal diseases. They are particularly difficult to grow organically and require much vigilance throughout their growth period. To begin with, a good disease free source of seed must be used. If you are producing by using self grown seed, be sure to have selected your seed from your healthiest plants. If you are purchasing seed from a seed agent, ask for seed that generally does well in your particular area.

It is important that you plant the seed in a well prepared seed bed. Make sure there is good spacing between each seed to avoid overcrowding of emerging seedlings. Seed beds must be kept moist, but not too wet, especially for tomato seedlings. If there is evidence of damping off, noticed by collapse of seedlings, remove the affected seedlings immediately, and also a few good ones on each side of those affected. This is mainly caused by over watering.

Tomato seedlings are generally ready for transplanting at 6 weeks of age. Do not leave seedlings in bed for much longer than this as they will struggle for nutrients and become stunted, stressed and subject to disease.

When transplanting, make sure to allow ample spacing between plants, up to 3 feet. Most diseases affecting tomatoes spread from plant to plant and strive in damp humid conditions. By giving ample spacing this is avoided.

Tomatoes are heavy feeders and require soil with ample compost and very good drainage. Weekly feeds are recommended using plant teas, either fed to the plant at the root base, or as a foliar feed.

Any onset of disease must be quickly recognized and dealt with. Fungus and blight are common and can sometimes be contained using a spray of milk and water 1:10, neem or garlic. Blight is very difficult to control using organic solutions.

Insects are normally not too much of a bother apart from the spider mites. These can be controlled with pyrethrum extract; neem extract, Sodom apple extract etc. (*The Organic Farmer*, Sept./Oct. 2006 issue).

It is important to realize when pruning and harvesting tomatoes, that we act as carriers of insect and disease from plant to plant. Therefore we must keep a keen eye on these issues and avoid contamination.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Visit us in Matuga!

It was until the start of this month when I managed to come across your June issue of the newspaper. While visiting a farmers field school at Mau Narok, the facilitator of the same school produced a number of copies of *The Organic Farmer*, distributed them and started a topic on crop's nutrient deficiency symptoms. As she referred to each, the paper had the pictures where the participants could look and verify the colors. I saw a number nodding their heads signifying acknowledgements. Surely the technology on organic farming is unheard off in the coast more so Matuga division where am serving as a forest extension officer. While challenging you to consider poking your nose to this area, I kindly ask you to send me a few copies to distribute them to a number of organized groups within the Division some of which I am very closely working with. Please keep it up.

P. O Kibagendi,
Divisional Forest Extension Officer,
P.O Box 5, Kwale

TOF for East Pokot

I am interested in receiving your publication titled *The Organic Farmer*. I am a missionary living in Barpello, East Pokot and have seen a few issues of your newspaper which I found very helpful. Would you please put me on your mailing list.
My mailing address is:

Sr. Rebecca Janacek,
Barpello Catholic Mission,
P.O. Box 47, Marigat

natural termite control method...

continued from page 5

mopathogenic fungus, *Metarhizium anisopliae,* has recently been developed for control of termites in Kenya by the International Centre of Insect Physiology and Ecology (ICIPE) and Kenya Agricultural Research Institute (KARI). The spores of the fungus are injected in the nest and thus, resulting in the destruction of termite colonies. Successful control of termites has also been achieved in maize crops, tree nurseries and grass. The fungus is produced on rice as substrate and formulated as pure spores or granules and applied in the soil. - The fungus is still under development at ICIPE.

Ideal for adults

I congratulate you for continuing to inform farmers through your newspaper. By chance I have come across your publications thrice. I am a voluntary adult education teacher working at Njoro division, Ngata location. Together with my students, we are small-scale farmers, farming on a quarter acre farm. The materials you publish is ideal to my literacy class and my immediate community. Therefore, I request to be receiving 10 copies of the newspaper and also the publications of previous months would be of paramount importance to us if possible. Thank you.

Daniel Gikima,
C/o Ngano AIC,
P.O Box 110, Njoro

I want to know more

In good faith I am writing to thank you for your response to my request for backdated copies of July 2006 and before. From this, I am getting some knowledge, which I am beginning to implement practically on the farm with good results, very humbly please do me a favour by defining in very simple language the meaning of organic farming. I am looking forward to your more knowledgeable and educative copies magazine. Thanks.

Rev. Jacob Henry Adhinga,
P.O Box 37, Butere

Dear Rev. Adhinga,
We shall send you by post a copy of an article which tells you in simple words the meaning of organic farming.

Useful for students

Msingi Bora Club is one of the clubs in Magana Primary School. The club is engaged in activities that promote character building and better farming methods. On behalf of club members, I wish to request you to be sending us monthly copies of your esteemed and informative issues of *The Organic Farmer*. The magazines would be placed in our school library where they will be accessible to all pupils and nearby farmers. Kindly consider also sending us previous issues.

Stephen Waweru,

P.O Box 28, Thika

Carrots ready for market

We lack market

On behalf of my group we are much interested in receiving your monthly newspaper for us to learn more. We would request you to assist us in marketing our farm produce which we are growing organically. We have been hearing that there are markets within and outside the country. But our farmers lag behind because we are not aware of it. So assist us to know more by sending us these magazines.

Stephen Marindany, P.O Box, Moiben

Helping the poor

I am agricultural extension and education officer of SMART in West Pokot District, semi arid areas of Kenya. The organization promotes bio intensive / organic agriculture in the region. I am interested in your monthly magazine which gives the real gospel on organic agriculture. This will lead to improved productionin rural Kenya and the African continent. I request to be supplied with monthly copies of the newspaper so that the farmers in my region can get it.

Dismas Weminah Marango, Box 1395 Webuye, Kenya. Thanks.

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Shop in Nairobi offers organic products

Anja Bengelstorff

One of the biggest problems facing organic marketing in Kenya is lack of a system to authenticate organic products. Although most shops claim to be selling organic products, it is often difficult for them to prove to consumers that the products were really organic as they are not labelled. Su Kahumbu, a certified organic farmer herself, saw this problem and decided to do something. The result of her effort is the Organic Shop, which opened its doors to customers on September 2 this year.

Her consumers are mostly from the middle and upper class and foreigners working in Kenya, Su says. "They have been educated about the organic concept in their countries and appreciate to find those products here." The news of the shop opening spread fast, and Su enjoys a steady increase in customers and turnover. So far, the Organic Shop is supplied by two organic farmers groups from Gilgil and one group from Wangige who are already undergoing the certification process under *The Organic Farmer* Support Programme. Among products on sale are vegetables, frozen chicken, milk products, different kinds of jam, and Herbal products from brands such as Meru Herbs as well as coffee and tea, among others. All products are clearly labelled to show their organic status and origin, a departure from other organic food outlets in Nairobi

However, Su Kahumbu would like to offer her customers a wider variety of fresh vegetables, including tomatoes, onions, aubergines, different types of beans and okra. "The farmers cannot always deliver what they promise, and when they do it is not always in time to be sold fresh," Su explains. "But I am sure those are teething problems which we will be able to overcome with time." She nevertheless urges farmers who wish to provide the shop with their organic products to contact the shop first before they supply anything.

The Organic Shop is open from Monday to Saturday between 9 am and 5.30 pm. Home delivery is possible. For this service, customers can call Helen on Tel. 0722-874 172.

Thank you for the SODIS article

In the last issue of The Organic Farmer, we published on this page an article on a very cheap and easy method to clean drinking water. However, we forgot to mention the Website where readers can get more information on this method (www.sodis.ch). One of the scientists behind this water cleaning method saw the article and wrote us a letter which we reproduce below:

"I am pleased to see a nice short article on SODIS (Solar Water Disinfection) written by Felix Mbitu Murimi and published on page 8 in your journal *The Organic Farmer* Nr. 17, Sept/Oct 2006. We would like to thank you for your efforts and the well written note. On this occasion, we would like to inform you that our SODIS Lead Agency KWAHO (Kenya Water For Health Organisation) is implementing large scale SODIS projects in Kibera and Mukuru slums of Nairobi. Finally, I am pleased to inform you that Elgg, the village where I am living in Switzerland has made several donations for the *The Organic Farmer*. At the moment, several shops in Elgg sell products at a slightly higher price to collect money for your journal. Congratulation for the very practical information published in *The Organic Farmer.*"

Martin Wegelin,
Dept. of Water and Sanitation in Developing Countries (Sandec) Eawag,P.O.Box 611, CH-8600 Duebemdorf, Switzerland

Market Place

Goats for sale: Farming Systems of Kenya, a non-governmental organization working with farmers in Nakuru district has 20 female and 50 male goats for sale, Farmers interested should get in touch with the organization at the address given below:
Farming Systems Kenya, P.O. Box 2816, Nakuru, Tel. 051 2211177 or 0722 588 143 Ask for David Gicharu or Joseph Muraya.

Export: A German-based company would like to buy certified fruits from Kenyan farmers. They would like to buy mangoes, avocadoes, pawpaws and pineapples (Victoria baby varieties). Farmers groups or individuals should be able to supply a minimum of one tonne per week. They should also indicate the seasons when they can deliver supplies. Contact Wachira Waikwa, E-mail: nefshi@yahoo.com

Market for daisies: An organic farmer Limuru is looking for a market where he can sell flowers of the daisy variety. He would also like to sell his organically produced vegetables.
Interested: Alphaxard K. Njoroge P.O.Box 62 Nderu, Limuru.

Beekeeping: "I would be grateful if anyone would send me any information they may have on organic honey production. I am also interested in exploiting marketing opportunities for organic honey and beeswax. Kindly get in touch with me at the following address: Thomas Carrol, Director of Community Development, Baraka Agricultural College, P.O. Box 52, Molo, 20106, Tel. 051 721310 Fax: 051 721 310
E mail: tom@sustainableag.org

Photocopies: In the July issue of *The Organic Farmer*, we advised farmers in need of past issues of the newspaper that we were no longer able to send them these copies because we had run out of most of the issues. We repeat here that we can still assist those of you who need the copies by making photocopies of the same and sending them to you. But we cannot do this for free. Any farmer interested in getting the copies will have to buy stamps worth Ksh. 350 put them in an envelope and send it to us. We will then send the copies to you. We can make copies of all the issues. Give us your full address.

Contacts: I am producing organic fertilizer and would like to have a database of organic farmers located in Kiambu, Ruaka. I am farming 2 acres bananas and am an organic farmer. Please contact Silas Mwaura, 0722 300610.

The Organic Farmer

The newspaper for sustainable agriculture in Kenya Nr. 2 May 2005

Potato plant affected by Bacterial Wilt caused by Ralstonia solanacearum. (Courtesy: Dr. Z.M. Kinyua, KARI-NARL)

Potato production threatened

Kenya's potato production faces a bleak future unless steps are taken to control bacterial wilt.

By Peter Kamau

Our country is faced with bacterial wilt, a devastating disease that has spread to almost all potato growing areas and which has no cure. The disease, which contaminates the soil making it unsuitable for a range of crops in the potato family, is now found in more than 80 percent of the highland potato growing areas of the Kenya. So far the government has not taken any measures to control it.

Too few seeds

According to the director of the National Potato Research Centre in Tigoni Limuru Dr.Jackson Kabira, farmers can easily manage the disease through use of appropriate farming practices that include crop rotation.

The disease was controlled earlier through provision of healthy seed to farmers. Seed production would be done at the research center and later given to the Agricultural Development Corporation for multiplication and sale to farmers. But this is no longer possible because much of the land was grabbed. The Potato center itself had 250 acres for research and seed production; now only 50 acres are remaining after the institution's land was taken by private individuals.

"18 districts have requested us for seed in this planting season but we have no seed" says Dr. Kabira. "Before no farmer would come to us for seed because they would buy them from our multiplication centers in Molo, Meru and Njabini. This is no longer possible."

Important food crop

As a result of the disease potato production has gone down to 1.5 million metric tonnes from the country's potential of 9 million metric tonnes. Population increase in the potato growing areas has made it difficult for farmers to practise crop rotation, the most important method in bacteria wilt disease management as it allows the farmer to plant other crops which do not harbour the disease - causing bacteria thus limiting its spread.

Potato is an important food and cash crop in Kenya. It plays a major role in national food security and nutrition. The potato-production is set to expand as it extends to the traditional maize growing areas (see page 5)

In this edition:

Encouraging feedback

We are really surprised! The response from farmers across the country towards the launch of The Organic Farmer has been overwhelming.

By The Organic Farmer

We have got dozens of telephone calls, e-mails, text messages and a bulk of letters, some of which we may not be able to publish because of limited space. We would therefore like to thank all farmers for their response. We assure them that we are committed to providing accurate information on all pertinent areas in the agricultural sector.

But for these goals we need your cooperation. For example, after our last issue on pest control in stored maize, some farmers gave us additional advice for other methods. One of these is the use of Diatomite, a natural mineral compound mined at Gilgil area in Nakuru. Diatomite, which is readily available, is made up of small sharp edges. When insects come into contact with it their bodies are cut, dehydrating and and killing them. In one of our next editions we intend to carry a story detailing the uses of this important compound in pest control. This interesting piece of advice on the use of Diatomite shows that The Organic Farmer can become a market place for information-sharing. That's why we urge you to pass the copies to fellow farmers in your locality..

We are still streamlining our distribution-arrangements. Many of the addresses we used to send out our newspaper to farming groups may have been changed. So we would appreciate if all farming groups confirm receipt of the newspaper. We are printing 10'000 copies every month, and we think that in the near future we may increase the number according to the needs of the farmers. This is is a good sign of the growing importance of organic farming in Kenya.

MY OPINION

By Isaac Maina Munyari

Being a small scale farmer I know the challenge most of the farmers are facing in Kenya. One is the right information about good agriculture. Many of my colleagues use the wrong food production methods, which lead to poor yields and damage to the environment. One would wonder what the Kenya Governments priorities are if not in farming; 80 percent of the population of Kenya relies on agriculture.

Let me give two examples; The soil! Although many Kenyan farm-ers use the soil year in year out, they do not know how to enrich it to increase food production. It is well known that chemical fertilizers destroy the soil and are expensive. Farmers have a lot of fertilizer like, manure or kitchen waste.

Or let us look at the crops we grow! Of course we know that maize is one of Kenyas staple food. What farmers should also be going for is to grow other varieties which take less time, needs less imputs and fetch higher prices in the market. To achieve these changes, farmers need much more information!

Isaac Maina Munyari is an Organic Farmer in Subukia

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan organic farming community. It is published monthly and distributed free to farmers. The Paper is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA, Tel. (020) 861 680
e-mail: icipe@icipe.org
homepage: http://www.icipe.org
Editors
Peter Kamau, Peter Baumgartner
Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
Tel. 0721-793 759
organickenya@yahoo.com

A great supporter of farmers

Dr Hans Herren has made ICIPE a world renowned institution. He was a strong supporter of African farmers.

By Peter Baumgartner

To improve the food security, to strive for an agriculture which promotes the health of the people and does not harm the environment: this have been the most important goals Dr. Hans Herren has tried to achieve during his time as Director General of the renownd International Center of Insect Physiology and Ecology (ICIPE) in Nairobi. For more than a decade, from August 1994 until end of April 2005 Mr. Herren was in charge at the Institute.

The Millennium Institute in Washington (US) which he will now head has the vision of a sustainable

and more peaceful and equitable future for Earth by developing and providing advanced analytical tools for national and global development

Worldwide Respect

A Swiss national, Hans Heren has shaped ICIPE into an institution which became famous not only across the continent but far beyond; almost every farmer in Kenya knows ICIPE as The Organic Farmer could witness during the past few weeks when we met farmers across the country. Under the leadership of Herren ICIPE became famous worldwide; thanks to his many international contacts he found various sponsors for the research projects in favour of African farmers. Their well-being was his greatest concern. Who-ever has been talking with him about African farming, about the problem of poor soils, crop rotation, the fight against insect pests with biological methods found in Mr. Herren an exciting, intelligent and experienced partner. He is not living in an ivory tower but is familiar with the worries the millions of small farmers are faced with. These are the people his Institute has tried to help.

His legacy at ICIPE includes establishment of major research and development divisions in environmental and biodiversity conservation, commercial insects for rural enterprises, and horticultural crops development. He also formulated the 4Hs concept that integrates Research and Development in the areas of human, animal, plant and environmental health.

Dr. Herren's work in improving the livelihood of the poor in the tropics has earned him several awards, among which are the prestigious World Food Prize in 1995 for his elimination of the cassava-mealybug; this pest was a big threat to food security in Africa.

The African and especially the Kenyan farmers owe Hans Herren, the co-founder of The Organic Farmer, a lot. It is their hope that he will continue to play an important role in improving organic and sustainable farming methods worldwide.

Neem-pesticides now available

In our last issue we introduced to you the Neem-fertilizer made by BIOP Company in Nairobi. In the meantime the Pest Control Products Board has registered two other important BIOP-products: the Neem-Extractive, which is a broad spectrum insecticide, and the Neem Cake Powder, which can be used as a fertilizer or pesticide. Farmers can purchase the products directly from the company, whose address is given below, or through their established stockists.

BIOP Company Limited
P.O Box 65101, Nairobi, Kenya
Tel : 020 861 680, ext. 3127 // 0720 458 931
Fax : 020 860 110 or 020 803 360
E-mail: Biop@ icipe.org

A huge potential for export market

Kenya exports only 4 percent of its fruits and vegetables. 60 percent of these comes from small-scale farmers

By Eustace Kiarii Gachanja

Farmers can increase their income if they can find good markets. *(Photo P. Kamau)*

Paul Nganga is a trained organic farmer. He grows oranges, avocadoes, Sukumawiki, cabbage, bananas and maize. In his two-acre market garden in Ruiru area in Thika district. He also keeps dairy cows, a few goats and free-range chicken. He is tired of middlemen who buy his produce at throwaway prices. so he sells the produce at his roadside kiosk.

Increased demand

A huge market potential exists for organic products in Kenya and abroad. Farmers however lack proper information on how they could market their products. As a result, the producers have been left at the mercy of middlemen who continue to offer low prices and sell at a premium in Nairobi and other major towns in the country.

Market information especially on prices are very crucial in deciding what to grow and when. It is not uncommon to see farmers producing the same type of crop, flooding the market and in the process bringing down the prices. The result is reduced earnings and decreased interest in farming.

Markets for organic foods are growing worldwide, as more people get concerned about where the food they eat comes from and how it is produced. Exports require a costly infrastructure such as cold chains, technical expertise and quality assurance procedures that are costly to undertake. This is the reason why only large companies or individuals with adequate capital investments are involved in the export trade. Does this mean then that small-scale farmers cannot access European markets? What Kenyan farmers need to know is that 60 percent of the country's horticultural produce exported to European markets comes from small-scale farmers contracted by large-scale exporters of these products.

In this arrangement the exporter gets orders from say, supermarkets in Britain, Netherlands or Germany to supply a particular product. Sometimes he may not be in a position to produce the required quantity, so he contracts a number of growers to produce for him.

Out growers

The exporter will also provide the farmers with inputs such as seed. Farmers must repay the cost of these inputs when they receive the final payment for the crop.

For the last 40 years, export of horticultural products from the country has been the preserve of large-scale players. But in the last few years the government has taken a keen interest in the industry, which is likely to see the entrance of more players including small-scale producers into the export scene.

This is especially so with the restructuring of the Horticultural Crops Development Authority (HCDA) a state corporation under the ministry of agriculture whose main function include development, promotion, coordination and facilitation of the horticultural industry in the country.

The main function of HCDA is to link the farmers with the export markets. The corporation does this by carrying out market intelligence surveys and provides the information to farmers. "Kenya only exports 4 percent of its horticultural produce. We are educating small-scale farmers so that they can exploit the huge export potential which remains untapped. What we want is to make them understand that farming is business," says the authority's principal marketing manager Anne Gikonyo.

Fruits

She says the main fruit crops that could be grown for export by small-scale farmers are avocadoes, french beans, passion fruits, peas, baby corn and summer flowers. Most large-scale growers are involved in production of flowers and horticultural crops. Efforts are also being made to develop the local markets for small-scale farmers.

The corporation provides a number of services to farmers that include training on production of fruits and vegetables, field monitoring of the crop, handling of horticultural produce and even pre-cooling facilities and pack houses in all major growing areas. It also has refrigerated trucks to keep the produce fresh until it reaches the market.

***

For details on export markets farmers can get in touch with:

Horticultural Crops Development Authority,
P.O Box 42601-00100,GPO
Nairobi
Tel. 254-020-827260/1/2/7/8
E-mail: hcda@wananchi.com
Website: www.hcda.or.ke

Pioneer discovers organic farming

Su Kahumbu is one of the most successful organic farmers. She supplies supermarkets chains, restaurants and homes in Nairobi.

By Patrick Mwangi, Tigoni

Before her mother became seriously ill after inhaling Dimethoate chemical sprayed on her tomato at their family home in Karen, Su Kahumbu had never thought she would take organic farming as a source of livelihood. But when she discovered that the poisonous fumes were the cause of her mother's painful diarrhoea and vomiting, Su resolved she would never use chemicals to grow crops again.

That was in 1999. Today, she is one of the most successful organic farmers now supplying fresh salads to supermarkets chains, restaurants and homes in Nairobi. The rented 10-acre farm she set up in Tigoni area in Limuru, about 40 kilometres from Nairobi is today covered by healthy shades of green and teeming with assorted fruits and vegetables growing without the use of chemicals.

" When my mother got ill, I said, if this is what chemicals are doing to people when they breath the fumes, what about the food we eat?" Su quips. "Organic farming is much more than protecting our health and the environment than anything else"

More benefit ...

She sells the salads to Nakumatt, Uchumi, several airlines and restaurants, Farmers choice and at least 50 home customers weekly. The crops include tomatoes, broccoli, lettuce, comfrey, carrots, strawberries, peas, radish and even maize. Su markets her produce under the brand name Nature's Organics, owned by Green Dreams, a company she founded with a partner in 2000. To ensure her products stand out, they are washed and packed neatly.

However marketing is a rigorous exercise involving tough negotiations with the companies. They sell her products at a higher price than conventional farm foods. This is because organing farming requires more labour than conventional agriculture. "It needs much less time to apply a bag of chemical fertilizer on the garden than to produce compost,

Su Kahumbus vegetable garden in Tigoni is a model for all organic farmers in Kenya.
(Picture P. Baumgartner)

and to spread it on the crops", Su says. "But the customers know my foods are healthier, so they do not mind paying a few extra shillings".

Su is assisting three local farmers to market their organic produce through her brand name so they can make a better bargain for prices. She trains the farmers on how to maintain standards and supplies them with seeds and free advice. Even though Su practises internationally recognized organic farming standards, she has not tried to sell her salads outside Kenya. " I do not think it is proper for Kenyans to grow healthy foods and sell them abroad with the numerous health problems here, we should eat the healthy foods ourselves", Sue adds.

... earthworms ....

Although she has no formal training in agriculture, Su learned her organic farming through books and magazines, enquiries from friends with kitchen gardens and experimentation on the farm. Her knowledge of organic farming is so extensive that she now appears an expert in this field. On one part of the farm, she rears earthworms in a trough filled with compost from which she drains water to squeeze out nutrients made by the worms to apply on her organic crops. She explains that the worms are able to "digest" farm and kitchen waste to produce nutrients that are more readily available to plants.

On another section of the farm is the

comfrey herb whose root system goes deep into the ground and brings nutrients to the surface for other shallow rooted plants to thrive on. It also has properties that hasten decomposition of compost.

... and pest control

To deal with soil pests, the farmer is developing healthy soils in which they cannot survive. Crop rotation is practicised to keep pests off target crops. Stubborn pests such as termites are eradicated naturally by exposing them to diatomite, which lacerates their bodies, causing death through dehydration. Pymac, a pyrethrum extract is used in the soil as a fertilizer and pesticide.

As we leave the farm, one is left wondering what Su Kahumbu will have discovered in organic farming by the next time we pay her a visit.

How can farmers avoid bacterial wilt?

The disease can only be controlled through crop rotation and related measures that include careful seed selection.

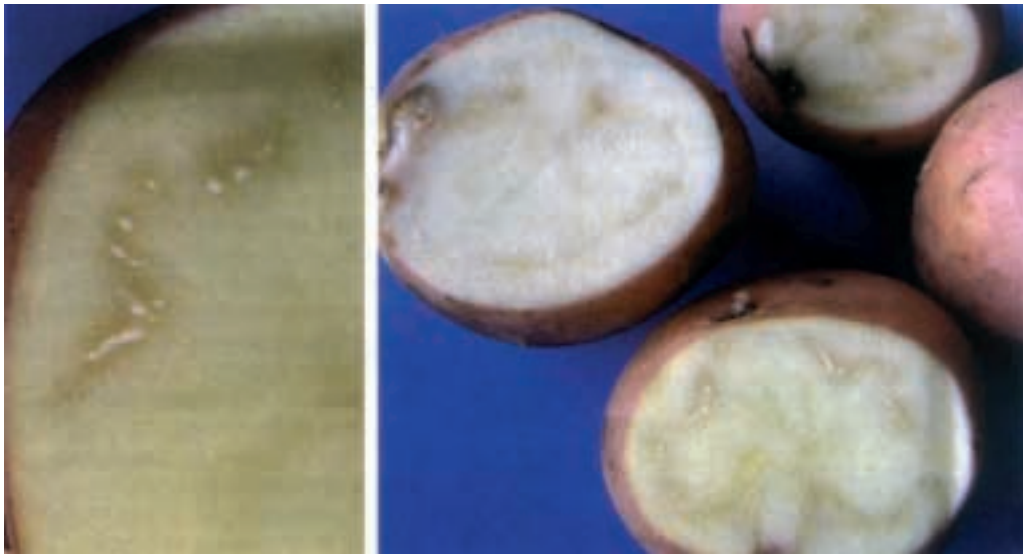
By Peter Kamau

Bacterial wilt (see page 1) is a devastating disease that afflicts potatoes when the soil becomes contaminated through constant cropping. The plants stems affected die while tubers rot. The disease has no known cure but control is possible if only farmers can follow simple rules to manage it.

Crop rotation

One way to do this is to ensure they use only certified seed either bought from established seed growers or multiplication centres working with National Potato Research Centre. Where the potato crop has been affected farmers should never replant the field with potatoes or any other crop within the potato family. This includes tomatoes, bananas, eggplant, pepper and groundnuts. Fields affected by the disease should never be planted with these crops for a period up to four years. During this period farmers can plant other crops that are not attacked by the disease. This include beans, maize, cabbages and peas, lettuce, cucumber, sorghum, wheat, onions, carrots, sweet potato or grass.

Farmers should avoid buying seed potatoes from neighbours. Farmers should always ensure they use healthy seed in clean soil.



Infected potatoes: The black ring and the white spots indicate the presence of the bacteria. (P. Kamau)

Mode of infection

Infected seed tubers, crop residues, contaminated surface run-off water or even water used for irrigation, spread the disease causing bacteria. Infected soil, which attaches itself on shoes and farming tools such as jembes, fork or even tractors can transmit the disease. Wounds made by the tools during cultivation, nematodes and insects in the soil may also facilitate entrance of the disease into the potato roots.

Wilted plants can confuse farmers who may think its caused by lack of water; they can confirm this by cutting a tuber from the wilted plants and squeezing it. If a white creamy liquid (which contains the bacteria) comes out, this confirms the disease's presence.

Many weeds serve as alternative hosts for bacteria wilt and these must be removed to reduce the presence of the bacteria in the soil. Volunteer potatoes (those potatoes from the previous harvest which grow on their own) should also be removed. One fact farmers should not forget though is that the bacteria can hide itself in healthy plants especially in cool areas at an altitude of above 2500 metres. It will re-emerge when potato seed from these cool areas are planted in warmer lowlands; this is the reason why farmers should only buy certified seed which is tested for the bacteria.

Tips from potato-specialists

How to identify the wilt

- In rapid disease development, the potatoes do not change colour.
- In the long term the leaves turn yellow.
- The growth of the plant is stunted. Sections of diseased plant may wilt completely and dry up, while the rest of the plant appears healthy.
- There is a dark brown colour in the inner section of the stem.
- Heavily infected tubers have soil stuck to the tuber eyes.

How to handle infected plants

- Remove all infected plants and tubers, with the surrounding soil, and put them in a 2- feet deep pit and cover with clean soil, or burn them.
- Do not put diseased plants and tubers on your compost heap.
- The plants next to the diseased plants should be harvested only for consumption, not for seed.

How to select good seed

- Use clean seed or tubers of tolerant varieties, bought from reliable sources such as Kenya Seed Company, stockists or farmer groups.
- Disinfect all tools with household bleach (Jik) before and after use.
- Avoid planting in low-lying or water-logged areas.
- Plant only whole, undamaged tubers.
- Weed regularly and cover the potato-crop proper with soil taking care not to damage roots and stems.
- Ensure that farmyard manure and compost are fully decomposed to avoid spreading disease.
- Check fields regularly for wilt and other diseases.
- Do not put diseased plants and tubers on your compost heap.

Enrich and feed the soil with compost

Experienced farmers maximize their yield with the use of compost manure. It is a long-term improvement of the soil.

By Eric Lumosi Asiligwa

Man eats to live. Some believe that he lives to eat. Whichever category you fall in, at any time men depend on food to energize their bodies for proper functioning. Without nutrients, they will emaciate to death.

Soil in itself has been one of the key factors to life. Plants grow healthy and of good quality yield if the soil is fertile. If land is repeatedly used for cropping, it tends to lose fertility. In this case, there is need to institute measures to improve soil fertility. In this issue of *The Organic Farmer* we will talk about vegetation compost. It is not the only way of deliberately producing organic matter; other methods are mulching, as we wrote in the past issue, green manure and planting of agroforestry trees will also contribute organic matter. In one of the next issues we shall write about this other methods including the correct use of manure and production of liquid fertilizer.

Local materials

The most effective way to improve soil is to recycle nutrients from local materials. Composting is one of the natural processes whereby organic matter is decomposed to humus. This provides an excellent source of nutrients for regenerating the soil. Composting offers a cheap means of ensuring soil fertility management without the need for expensive external inputs. Applied regularly over many years, it can improve the long-term productive capacity of the soil.

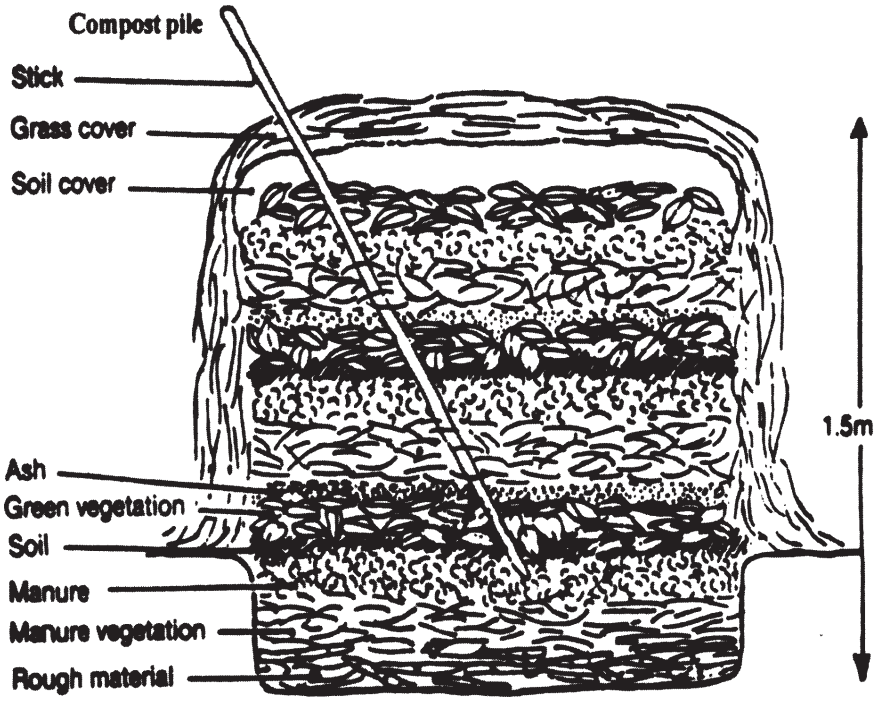
All waste plant and animal materials can be collected into a heap and allowed to rot down as compost. These include weeds, kitchen waste, feathers, urine, manure, stalks and so on. Materials such as glass, tins, plastic, broken crockery and other similar materials are inorganic and cannot be used. Material which is rich in nitrogen does not usually contribute to a good structure and thus does not allow air circulation if composted separately. Material which has good structure, usually has a low nitrogen content and does not offer enough nitrogen for the bacteria to feed on. Mixing different materials thus helps to achieve a balanced nutrient composition and structure.

Helpful activators

Moisture and air are essential in the first stages of decomposition after three days, and as a result, high temperatures are produced within the heap. This first stage of decay, induced by bacteria is followed by fungal decay as temperature falls. The heap has to be turned regularly to let air in for a further bacterial stage which also needs to be moist.

Well decomposed compost should be dug in as quickly as possible after spreading it onto the land. It should be mixed into the top 10cm of soil so that it is readily available to the roots of plants. Less decomposed compost should not be dug in but left as mulch with another grass mulch on top of it.

Farmers can also use a number of compost activators to speed up the decomposition. One of the cheapest method is to plant the comfrey-herb whose leafs are mixed with compost. Other activators are: EM-compositor (to make an order farmers can get in touch with Peter Chandi, Embu, tel 0733 546 491); another compositor is "bio-algeen quick compositor" (order at BESYP, P.O.Box 30105 Nairobi, Tel/Fax 020 572 476 //0722 700 190).



Construction of a compost heap

1. Choose a shady location and excavate a square portion of 150cm by 150cm. It must be possible to work on the compost without walking on it.

2. Loosen the ground where the compost pile will be made. It is best to make a shallow trench about 30 cm (1 foot) deep.

3. Set up the heap in layers beginning with rough materials such as maize stalks, leaves, branches and twigs, followed by soil

4. The second layer should be manure or old compost, it should be about 10 cm thick. Sprinkle some soil to cover the material generally.

5. The next layer should be made up of green vegetable (grass, hedge cuttings or kitchen waste), about 15 - 20 cm thick. If you have wood ash, sprinkle some of the green vegetation, if not, use soil.

Continuation see page 7

Construction of a compost heap

Continuation from page 6

6. Then water the whole pile well.

7. Repe3at the process, starting with rough vegetation, then manure or old compost, soil, green vegetation, ash or soil and water again. Build the pile to a height of one to one-and-a half metres (around five feet).

8. Cover the pile all over with 10 cm soil, this prevents gases from escaping the compost pile. Lastly, cover the whole pile with dry vegetation to prevent loss of moisture through evaporation.

9. Drive a long sharp stick into the pile at an angle. After two or three days, decomposition will have started in the pile. The stick, when removed, will be warm. The stick supports the aeration and also helps you to check the condition of the pile from time to time. It will show whether the pile is dry or wet. If the stick is white, this is caused by a fungus called "fire fang" which destroys the compost when the pile becomes dry inside.

10. The pile must be watered occasionally, about every third day depending on weather conditions. If it is raining, there is no need to water. If "fire-fang" develops it is best to add water and turn the pile.

11. When all goes well, the pile should be turned after three weeks. Make sure that while turning the bottom part of the pile becomes the top of the new pile. This is important: rotting at the bottom goes slower than at the top.

12. After three weeks the pile should be turned a second time. Be carefully: the pile should be moist, not wet. When the pile has been taken care of well, there is no need for further turning. The finished cooked compost should be a dark, crumbly, sweet smelling substance. You should not be able to identify any of the raw materials used, except some woody branches as they take a long time to rot.

13. Three weeks after the second turning (in total after two to three months, depending on the materials used, the time of year and the climatic zone) the compost should be ready for use. If the planting season is still far away, let the pile where it is. The pile should be kept covered well with dry material, and it should be moist - moist, not wet! Good luck!

Letters to the editor

The paper fills the gap

Many thanks for the copies of the first edition of 'The Organic Farmer'. It is excellent and we in Baraka fully support you in the undertaking. We are happy with the general thrust and tone of the publication and feel that it will fill a big lacuna in the organic farming sector. For further details on what we do in Baraka you can have a look at our website. One of our five programmes is an area based programme to Kamara and Tenges Divisions so we have regular direct contact with farmers in both divisions. If you can send us up to 100 copies per month we will ensure that they are well distributed among interested students and the small holder farming community. Again, congratulations and wishing you success with this venture.

Tony Dolan, Principal, Baraka Agricultural College, Molo

Send copies

I have read the April issue of organic farmer it has taught me a lot. I kindly request you to send me monthly copies. I will be grateful.

Manoah Agorah, Maragoli

A breakhrough

Thank you for appointing me your agent for the distribution of the farmers newspaper. It is a major breakthrough in promoting organic farming in Kenya. The attached is a copy of my introductory letter to all the new recipients of the newspaper. It is expected to instill a sense of responsibility to enhance constructive assessment of the newspaper content and any worthwhile suggestions for future improvement on coverage of matters affecting organic farmers. I request you to forward 10 more copies of April 2005 edition. For logistical purposes, let me know your other agents in Kirinyaga district.
Pass my best wishes to the publisher-ICIPE and the sponsors Biovision for their worthy contribution to Kenyan organic farmers.

J. T. Muriithi Simba, Sagana Organic Horticultural Growers (SOHGRO), Sagana

English or Kiswahili?

I have read through The Organic Farmer and I have found it to be a well thought out piece of work. Journalistically speaking, the design and the content corresponds to the objective. However, my only worry is that 75 per cent of the rural farmers may not benefit from the information published in the magazine due to high illiteracy. May I therefore suggest that you consider turning the magazine into a bilingual (English/Kiswahili). If you don't have anyone to do the translation, the I can volonteer to offer my services. I'm a veteran journalist, som if you find the idea good, let's meet and discuss.

Nicholas Okeya

Dear Mr. Okeya! You have mentioned a real problem. In December 2004 and January 2005 we travelled throughout Kenya and discussed the issue of the language with a lot of farmers. The majority of them adviced us to publish The Organic Farmer *in English. Of course we would like to write in both languages, but we lack funds for this. Dear farmers and readers! What do you think about the language? Let us know!*

A partner

On behalf of farmers, I would like to take this opportunity to thank you for sending me the magazines for the organic programme. I gave the newspapers to two farmers, one for our institution, one for myself and one for the primary school which is our neighbour. I will be grateful if you give me a chance to be one of your partners in this important venture. Please send us more.

Thanks, Rahab Nyangena

Dear Farmers!

Thank you all for your feedback! We got a lot of SMS's, e-mails, telephon calls and letters; we have published some on this page. We are very much delighted about your positive responses to *The Organic Farmer*. If you have comments or remarks, please write to us. If you have advice for your fellow farmers, send them to us. And if you have questions about organic farming, we will find experts who can give you the correct answers.

The Editors
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
e-mail : organickenya@yahoo.com

Buy certified seed to boost production

Farmers in Kenya are yet to produce their own organic seeds.

By Abisae Amugune, Kaplamai

Organic farmers in Kenya will have to keep pace with their counterparts in the rest of the world in the development of this fast growing agricultural sub sector. One of the areas that is undeveloped is the production of organic seeds. Before any farm product is certified as organic, it has to undergo all organic processes from seed production to the final processing for marketing.

Kenyan farmers cannot buy certified organic seeds from other countries because the law does not allow it. To import any seed products or plants, an importer has to undergo a rigorous process of certification by the Kenya Plant Health Inspectorate Service (KEPHIS) and the Kenya Bureau of standards (KEBS).

Due to the global loss of natural heritage brought about by modern methods of seed production, organic farmers worldwide are encouraged to produce their own seeds. Farmers in Kenya should follow this trend if their products are to be certified. It is only the third generation of seeds that can be passed as purely organic.

Seed banks

One of the ways in which farmers can produce seed is to set up their own community based seed banks- this is a community managed seed storage facility in form of pots, gourds or gardens. Farmers can select diverse seeds for storage to meet their needs in food production, for sale or exchange between themselves.

Not all maize can be used for seed. *(Picture P. Lüthi)*

Development of local seed reserves would increase seed stock at farm level and reduce the cost of buying seeds. It would also facilitate production of seeds suited to local conditions.

Maize seed

But for the production of maize seed, farmers in Kenya would require more expertise and adequate land. It is therefore advisable for them to buy certified seed to help increase maize yield and income for the time being.

Thousands of Kenyan farmers do not use certified seed because of the increasing prices. This is one of the reasons for the declining food production in the country. Unscrupulous traders often take advantage of the situation selling commercial maize packaged as genuine maize seed.

Apart from low yield, commercial maize peddled as seed maize is responsible for the transfer of diseases and pests such as leaf inflammation, stalk and the larger grain borer. Farmers should therefore be prepared to buy certified seed if they expect good returns from maize growing.

How to deal carefully with seeds

•Genuine seed stockists are provided with licences by the Kenya Plant Health Inpectorate Service (KEPHIS). Farmers should always request to see the licences or buy from reputable seed distributors to avoid buying fake seed from unscrupulous traders.

•All genuine maize seed must bear seed companies tags and KEPHIS inscribed labels.

•Cool and dry storage facilities are important and help keep the seed in good condition. Well stored maize seed can last upto seven years.

•Maize seed is treated with fungicides and insecticides. It should never be used for consumption.

•Farmers should be able to tell colour differences for seed maize from different companies.

•Although bean seed can be recycled for upto six times because they are self pollinated, farmers should buy Hybrid seed from seed companies to get better yield that are tolerant to diseases.

•Uncertified fruit seedlings especially from roadside traders are responsible for Black spot and Greening disease in oranges. Farmers should be careful on where to purchase seedlings.

The Organic Farmer in June:

• Drought resistant crops like sorghum are important for Kenya's food security.

• How can farmers make their own pesticides?

• What credit schemes are available to farmers in Kenya?

The Organic Farmer

Support Programme

April '06 Page I

An initiative of *The Organic Farmer* sponsored by BIOVISION

Dear Farmers,

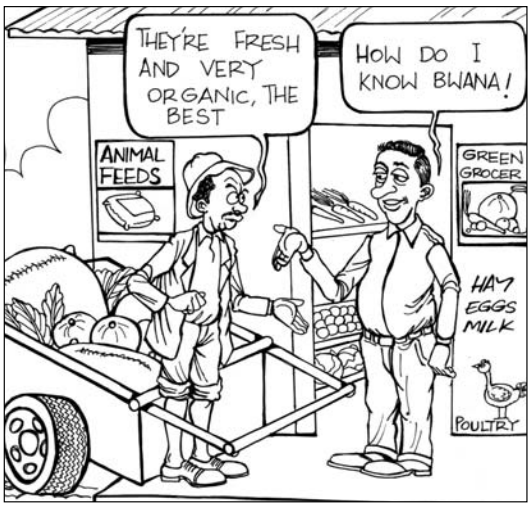
Every week, the editors of *The Organic Farmer* receive questions from farmers wanting to know if they can get markets for their organically grown farm products. The major complaint from most farmers is that they are forced to sell their produce like any other conventional produce. They feel that organic foods have health benefits, and therefore should fetch more in the market because they are of higher value to the consumer.

They are right. But the problem of marketing is a thorny issue for farmers across the country. This is due to the fact that organic production is a recently accepted mode of agricultural production in the country. Organic produce is currently available in small quantities and has thus not made an impact in mainstream supermarkets, green grocers, farmers markets etc. In addition, there are few consumers of organic produce, due to lack of awareness about the benefits of eating healthy foods, as well as the limited availability of the organic products.

On the other side, the traders and the customers too are in a difficult situation. Those who are more health conscious are often willing to pay higher prices for food that can be trusted to be natural and without any poisons or artificial chemicals added. The only problem so far is: How can they be sure that the products they are buying are organically produced? And how do farmers prove that their products are organic? Organic produce often looks like any other vegetable or fruits,, or milk or meat. It probably tastes a lot better, but consumers would not know this until they get home and put it on the table.

Proof is needed

To be able to sell their products as organic, farmers need to prove to the buyers that it is indeed organic. This is where the issue of certification comes in. Farmers wishing to sell their produce as organic have to undergo a process of inspection by an established certification company. They will then be issued with a certificate showing they have complied with all the requirements of organic production. To convert a farm into organic production may take up to 3 years. During this conversion period, the farmers can still sell their produce labelled as "In Conversion" as long as they can prove that they are under conversion and using only organic farming methods.



Most other countries have official standards for organic farming. The most famous systems are that of The Soil Association (in England) and the International Federation of Organic Agriculture Movements (IFOAM). The Kenya Bureau of Standards (KEBS) is a Government Department has recently printed the Kenya Standards for Organic Food, which farmers, who want to sell their produce as organic have to comply with.

In order to get fresh produce inspected in the field and to be able to label it "organic", as we also mentioned in the January issue, the company EnCert has been formed to work as an inspection and certification body to help farmers to prove to their customers that - yes indeed - this cabbage or those tomatoes for instance, have indeed been grown organically. EnCert has its own label which can be used by farmers once certification has been approved. Use of an EnCert label will prove to the customer that the labelled product is garanteed to be organic.

TOF initiative

The inspection process has its costs as you can read on the following page. And here, our one-year-old newspaper is launching "*The Organic Farmer* Support Programme". As part of its first anniversary gift to farmers, *The Organic Farmer* (TOF), together with the Swiss foundation BioVision, has arranged to support 10 farmer's groups in the country to help them get certification for their organic produce. This capacity building initiative will be a milestone for the organic movement in Kenya.

Not only will TOF help the 10 farmers' group start organic production according to the set standards, but it will also assist with price negotiations and finding good markets for their produce. To this end, our newspaper has had long negotiations with a number of market outlets in Nairobi who have expressed willingness to buy the produce. These include Nakumat, Fresh N'Juicy and Kengeles chain of restaurants. In future we plan to find more buyers of organic produce as the farmers show seriousness in the venture and increase their volumes

Farmers' commitment

Farmers' groups participating in this programme will be required to make their own transport arrangements for the delivery of their produce to the buyers. We expect the farmers' groups to exercise the utmost care to ensure that the products are of high quality and meet all the requirements of organic production. Farmers must show a high degree of honesty, trustworthiness and transparency. The integrity of the system established will ensure that the produce is acceptable to the buyers. Any farmer found to be cheating in the production process, for example by using chemicals, will cause their entire group to be disqualified from the project.

The newspaper will arrange a training programme for participating farmers' groups to ensure they are familiar with all the procedures of production and certification requirements

continued on page II

The conditions for group selection

As you have seen on the previous page, *The Organic Farmer* and BioVision, the Swiss Foundation, will partly sponsor the certification of 10 farmers' groups. Certification of organic produce will help farmers in three areas:

i) It will ensure that their production systems meet the set standards of organic production.
ii) It will give an assurance to both the traders and consumers that the produce is organic.
iii) The certification logo will help the consumers identify the organic produce on the shelf, and to pay for it a higher price, since it is of higher value. Certification hence increases the income for farmers.

Selection criteria

To qualify for this improvement initiative, the farmers' groups will have to meet certain conditions as set out by *The Organic Farmer* and its Advisory Board. Among these conditions is the willingness of the groups to take part in the process and adhere to the guidelines of organic production.

The groups will also have to meet the following conditions:

a) Establish a central unit responsible for ensuring members' compliance with the organic production guidelines.
b) Have a common marketing system for certified products; no member will be allowed to sell their products individually.
c) Follow the guidelines for the group's internal control as will be established and directed by EnCert from time-to-time.
d) Be able and willing to pay the requisite annual inspection fee as outlined on page I (the fee can also be paid in installments).

According to the local certification company EnCert, individual farmers have to pay more to be certified. However farmers' groups are given concessionary rates for the certification. It is therefore advisable that farmer' groups go for group certification. The following are the certification fees for a farmer group of 20 farmers (groups with more than 20 farmers will also qualify for assistance).

Initial Application fee	Ksh10, 000
Annual inspection fee	Ksh35, 000
Annual license fee	Ksh15, 000
Total	Ksh60, 000

As an anniversary gift to farmers *The Organic Farmer* and BioVision Switzerland will support each farmers' group in paying the application and the annual license fee, to a total 25'000/=. A group of 20 farmers, for example, is required to pay Ksh 35,000 per year. This means that every farmer in the group is expected to pay Ksh 1750 per year or Ksh 146 per month. This is not expensive when considering that it will guarantee the farmers a ready market for their produce while at the same time bring an investment for the future.

The Organic Farmer has undertaken to pay for the application and annual license fees for the 10 groups during the conversion period of 2 years and also for a third year. Later the farmers will have to pay all the annual fees once the marketing system is established. The certification company is also willing to pay the application and annual license fees for two extra groups during the conversion period. This means that a total of 12 groups will benefit from the programme.

Integrity and accountability

For the project to succeed, the groups will be expected to show a high degree of honesty, trustworthiness and transparency in their operations. This will ensure that members follow the laid down procedures and set standards of organic production. Many organizations have failed to meet their objectives due to lack of accountability of financial management on the part of those running the organizations. For example, the groups will rely on selected members of the groups to deliver the produce to the market and deposit the payments in the group's bank account. Those charged with such a responsibility will have to show a high degree of accountability and transparency to ensure the funds are not misused or diverted for individual gain. Any dishonest officials will lose their positions, including membership in the group. This will help protect the members' earnings and ensure the smooth running of the project. Groups that do not pay their inspection fees as agreed with *The Organic Farmer* may not qualify for assistance and will therefore be excluded from the programme.

Dear Farmers ...

continued from page I

before the farmers start selling their produce through *The Organic Farmer* network.

The selection board will consist of the editors of *The Organic Farmer* and a number of specialists on the environment, organic farming and staff from agricultural institutions in the country. Applications will be assessed on merit, but the first groups to apply may stand a better chance of being selected.

Requirements

Interested groups are required to write an application letter to the editors of *The Organic Farmer* giving the following details:

1) Name of the group, location, mailing address and other contatcs.
2) Date of registration of group (provide a photocopy of registration certificate).
3) Number of men and number of women in the group.
4) Name of the chairman, vice chairman, treasurer, secretary.
5) A list of members' names.
6) Estimated total area of the group members' farms.
7) Area already under organic management.
8) Types of commodities currently produced by the members

In Addition, the group should answer the following questions:

9) What are the main crops the members now grow for family use and for cash sale?
10) Are you adding value to the products? If yes, how and which products?
11) What kind of record keeping system do you practise?
12) What mode of irrigation is installed in members' farms (rain fed, furrow, and sprinkler)? Do you have a borehole or access to water source (river, reservoir, etc.)?
13) Which domestic animals are you keeping?
14) What transport arrangements do you have to ensure the products reach the market on time and in good condition?
15) Are you receiving any other form of assistance from other donors, NGOs churches or government, be it financial or material support?
16) Does the group operate a bank account? If so, where?

Know the standards of organic farming

The standards for organic production play an important role for the farmer as well as for the customer.

Organic farming implies friendly farming techniques that help to minimize pollution and damage to the environment. It is governed by the International Federation of Organic Agriculture Movements (IFOAM). In this mode of farming, emphasis is on natural ways of soil fertility management, such as the use of compost, manure, mulches and agroforestry techniques wherever possible. The man aim, first and foremost, is to encourage natural ways of soil fertility management and physical soil protection in order to ensure the products' quality and maintain a sustainable environment. Organic farming prohibits the use of synthetic products and has a limited list of permitted substances for control of pests and diseases.

The rules for organic farming are outlined in Organic Standards. In Kenya, we have the standards of EnCert, a Kenyan body that offers opportunities for products to be certified as organic. The EnCer standards define the requirements, and lay

down the practices and criteria that must be met and maintained when food or other products are described as organic (or in other terms, indicating that they have been produced according to EnCert requirements). At a minimum, these standards comply with the Guidelines for Organic Production, Processing and Labelling of Agricultural Products developed by the Kenya Bureau of Standards (KEBS). They are based on guidelines established by IFOAM, and also efforts have been made to make them compliant with the European Union (EU) Regulations.

As is the case with certification requirements the world over, farmers' groups undergoing the process of certification shall be inspected on a regular basis, but at least once a year. However, EnCert reserves the right to make unannounced inspection visits. Inspectors may take samples for the detection of substances not allowed in the standards. An inspection report will be drawn up after each visit and countersigned by the responsible person in the group.

Where farmers are found to have seriously violated the standards, EnCert will withdraw all the group's references and certification of organic production. It is not possible to publish the entire EnCert-standards in this issue of The Organic Farmer. We will, however, publish the key requirements of organic production. Each farmers' group being certified organic will get a copy of the standards with the entire list of allowed and forbidden fertilizers and chemicals and other means for pest and disease control.

What is allowed and forbidden in organic farming

Crop Production

- There shall be a period of organic management (conversion period), meeting all the requirements of the standards, before the resulting product may be considered as organic.
- Crop production and handling systems return nutrients, organic matter and other resources removed from the soil by recycling, regeneration and addition of organic nutrients.
- Organic seeds and planting materials of appropriate varieties and quality should be used - where available.
- A functional crop rotation for all annual crops should be established and followed.
- Weeds, insect and other pests and diseases should primarily be controlled by a combination of: an appropriate choice of crops and varieties, appropriate rotation programmes and proper attention to cleaning routines and hygiene.
- All relevant measures are taken to ensure that organic soil and food is protected from contamination.
- Effective steps are taken to protect organically grown crops from contamination during harvesting, storage, handling and transportation.

What is prohibited

- Genetic engineering is prohibited in organic production and processing.
- Use of chemical and hormone herbicides is prohibited in weed management.
- Use of Nicotine.
- Use of methyl bromide and formaldehyde for soil sterilization.
- Strychnine for killing moles.
- Steam sterilization or pasteurisation of soils for pest and disease control.
- Human sewage sludge as a fertilizer for use on crops for human consumption.

Animal Husbandry

- All livestock to be handled, housed and transported under conditions which reflect proper care and concern for their welfare at all times.
- All animals to have access to pasture or an open-air exercise area or run, whenever the physiological condition of the animal, the weather and the state of the ground permit.
- Livestock to have access to water at all times.
- Organic animals are fed with organic feedstuffs, preferably using organic feed from the unit or, when this is not possible, using feed from other organic units.
- All practical measures are taken to ensure the health and well-being of the animals through preventive animal husbandry practices.
- Accurate records of production activities should be maintained.

Restricted practices

- Castrations, dehorning, trimming of beaks, tail docking of lambs, ringing, cutting of teeth.

Prohibited practices

- Embryo transfer techniques and cloning
- Mutilations such as docking (removal of tails), trimming of ears.
- Hormones for promoting growth and weight gain

Changing conventional to organic farming

It takes up to two years to convert a farm from conventional to organic production.

The conversion from a conventionally managed farm to organic farming should not only improve the farm ecosystem, but also ensure the economic survival of the farm. Therefore, the adjustments which are required on the farms, and the related chances and risks, have to be analysed carefully.

Conversion to organic farming needs a new way of thinking, too. The first and probably most important conversion has to take place in the mind of the farmer. The decision for organic farming is also a decision for continuous learning. Before taking a decision on whether to convert the farm to organic management, farmers should get a clear understanding of what organic management would mean to their farm. Training courses, suitable printed materials and professional advice are possible sources of knowledge. That's why farmers' groups sponsored by *The Organic Farmer* will undergo a 3-day training workshop.

It is important that all persons involved in the farm (usually the farmer's family), are involved in the decision making process. Also, the situation of the farm should be analysed carefully, considering the requirements of organic farming, since new farming methods need to be introduced and applied. These include soil management, nutrient management, weed management, pest and disease control, animal husbandry, and fodder cultivation, among others. Thus, the necessary areas where change will be needed can be identified. Support from field advisors or experienced organic farmers can be of great help in this analysis.

To become familiar with the methods of organic farming and to see whether they would work in the prevailing conditions, some methods can be tested in a small area. Based on the results of the discussions, analysis and experience, farmers and their families will be in a better position to take a decision on whether to "go organic" or not. This is important in terms of the economic consequences. Some changes involve an increase on the work load or labour requirements. As the quantity of the production may decrease, at least in the first years of conversion, farmers need to find ways to overcome the constraints. The change to organic farming does not only mean a change from the use of chemicals, it entails the use of only those permitted materials and practices as defined in the Standards for Organic Farming (see previous page). A conversion or transitional period is mandatory before a product is declared organic.

Conversion procedure

Organic production takes place on clearly defined units of land, such that the production and storage areas are clearly separate from those of any other unit not being converted. Land contaminated by environmental pollution (for instance from factories, traffic, sewage sludge) or by pesticides residues may render the land ineligible for organic conversion or may require a longer period to convert. Farmers should have clear plans on how to go about the whole process. Such plans should include field histories and plans for progressive step-byy-step conversion.

Where the land was previously under intensive cropping, the conversion programme begins with a fertility-building phase. Once land has been converted to organic production, its conversion should not be switched back and forth between organic and non-organic management. Farmers whose land is in conversion should take reasonable measures to identify and avoid potential contamination.

Separation of conventional and organic

If the whole farm is not converted to organic management (split production), the converted part needs to be clearly defined, so as to have fixed demarcation and divisions from to the conventionally farmed parts. There also have to be separate production and storage areas, separate accounting and strict division of responsibility where more than one person or family manages the farm.

A conversion period enables the establishment of an organic management system and gives time to build soil fertility. The conversion period should be long enough to improve soil fertility significantly and to re-establish the balance of the ecosystem (this takes an average of two years).

EnCert may, however, with the approval of the competent regulatory authority, extend or reduce the conversion period with regard to the previous use of the land in question. In particular, EnCert may reduce the conversion period provided that:

a) the land was already in conversion or fully organic;
b) the degradation of the chemical or other prohibited product used does not result in a significant level of residues in the soil and, where a perennial crop is involved, the crop residues;
c) Products of the subsequent harvest are not sold as organic.

Produce from conversion period

The produce may be sold as "in-conversion" under the following conditions:

a) A production plan or conversion plan has been approved by EnCert .
b) The land and production has been inspected and registered as "in-conversion".
c) At least 12 months have elapsed from the start of conversion to harvest.

The start of the conversion period is often calculated from the date the application is approved by EnCert.

The Organic Farmer

The newspaper for sustainable agriculture in Kenya Nr. 1 April 2005

Welcome, Kenyan farmers!

We are pleased to introduce you to *The Organic Farmer*, a newspaper for the organic farming community in the country. There is a growing awareness of the importance of organic agriculture. This can be seen not only in the founding of the Kenya Organic Agriculture Network (KOAN), which introduces itself on page 8; the growing number of organic farmer groups is as well enough evidence of a desire by farmers to move away from the use of expensive chemical farm inputs to produce food.

Organic farming is a departure from the conventional methods of food production. At the same time it means a change in the use of farm inputs. BIOP, a small Nairobi-based company has developed many products arising from ICIPE research on the well known Neem tree (Muarubaini), for instance the Neem fertilizer which will be of great benefit for the farmers (see page 3).

The bulk of information on organic agriculture does not reach the small-scale farmers. *The Organic Farmer* seeks to fill this gap. We will inform you about what is going on in the agricultural sector. We intend to provide advice and farming tips in an easy, understandable version, as we have carried the story on maize storage (page 5) or mulching (page 7). Stories of this nature not only provide farmers with new ideas, but they also add to their traditional experience. The paper will come up with similar articles in its future issues to ensure farmers acquire adequate skills that will increase crop yields, raise their earnings and living standards.

The production of this newspaper is the result of a joint effort and cooperation between the International Centre of Insect Physiology and Ecology (ICIPE) in Nairobi and BioVision. This Swiss-based foundation for the promotion of a sustainable development is sponsoring *The Organic Farmer*. That is the reason why it is being distributed to you free of charge.

Dear farmers, we also need your help and cooperation. If you get this newspaper, share it with your colleagues.

Let us know your opinion, your ideas and wishes. And if you have advice or tips for fellow farmers, please write to us and tell us about them. Together let us make *The Organic Farmer* a strong voice for Kenyan Farmers.

The Editors

Good tilling and proper land preparation is very crucial in organic farming. (Photo P. Lüthi/BioVision)

In this edition:

Bridging the communication gap

Farmers around the world have progressed by their own research, through trial and error, and also through information exchange with neighbours close and far. Since the development of science,

By Hans Herren

trial and error approaches, or what will happen if I do this or that, have given way to experimental approaches, based on hypotheses. This means that if one has a problem such as a low soil fertility. The scientist would then try different levels and mixtures of fertilizers, chemical and/or organic and measures the relationship between the different application rates and fertilizer qualities. The best results are then adopted, promoted and become part of the production system, through an adaptive management system. This includes not only learning by doing but also the introduction of new technologies.

The crucial factor in increasing farm productivity is: How do farmers benefit from the research of scientists and of their peers? The farmers newspaper that is being launched with this first issue will bridge the gap between information creation and access. It is hoped that it will become a two way communication channel, on the one hand bringing relevant and usable information and knowledge to the farmers, and on the other carrying questions back for processing and answers to reach the farmers in subsequent issues.

The editorial board assures you that the information brought to the farmers is in line with sustainable, ecologically and economically accepted standards and welcomes the readers to this common venture.

Dr. Hans Herren is Director General of the International Centre for Insect Physiology and Ecology (ICIPE) in Nairobi

MY OPINION

By John W. Njoroge

It is great pleasure to learn that a magazine on organic farming has become available to the organic farmers in this region.

I want to congratulate the producer and all those who will be involved in informing and educating the organic farmers. Up till now there are many farmers who have been trained in organic farming, sustainable agriculture, bio-intensive farming and low external inputs agriculture. These farmers have so far had no local magazine, that clearly expresses the need and problems associated with these alternative farming methods.

We believe this magazine fills this void that has existed for many years. I therefore urge farmers in Kenya and elsewhere to embrace this magazine as their own, to read it , to contribute to its rich information and to share the knowledge learned with neighbours and friends.

This will give the publishers and editors of this magazine the incentive to get more information that is relevant to our unique situation as organic farmers who are dedicated to produce healthy food.

John W. Njoroge is Director of the Kenya Institute of Organic Farming

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan organic farming community. It is published monthly and distributed for free to farmers.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi/Kenya
Tel. (020) 861 680
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Writers
Ilona Eveleens, Njuguna wa Kamau, Eustace Kiarii

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
Tel. 0721-793 759
e-mail : organicfarmer@yahoo.com

The tree called the "Wonder tree"

The Neem tree is a multipurpose tree which yields income from al-most all its parts. It has medicinal and agricultural uses.

By Ilona Eveleens

In Kenya, especially along the Coast, the Neem tree is very well known, in Kiswahili as "Muarubaini". The tree, which grows up to 30 meters and reaches an age between 100 and 200 years, provides shade and timber. The seeds, leaves and bark can be used to produce medical, cosmetic and insecticide products. Because it is an evergreen and fast growing the Neem tree is a favorite for reforestation. The wood is useful as building timber because termites will not attack it.

A lot of medicines

The tree starts bearing fruits after 3 to 5 years and is fully productive after 10 years. Under favourable conditions a tree can produce up to 30 kg of seeds per year and 350 kg of leaves. Extracts from seeds and leaves can be turned into medicines against a number of ailments as well as insecticides for agricultural use. The oil especially, produced out of the seeds, is a much sought after ingredient for cosmetic products.

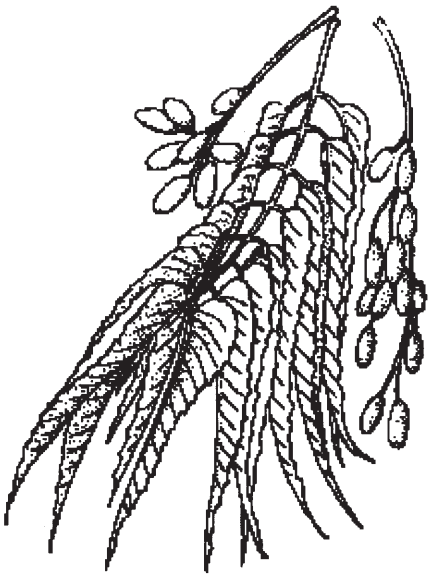
Found in Africa, Asia and South America, the Neem tree grows basically everywhere. It thrives at low as well at high altitudes on sandy, stony or loamy soil. It handles a humid climate with ease but also survives prolonged dry spells. When planted on slopes, the tree can help to combat erosion and landslides. The fallen leaves help to neutralize acidic soils.

Pesticide use

Termites avoid the Neem tree and that knowledge led to research into the pesticides effects of the tree by the International Centre of Insect Physiology and Ecology (ICIPE). Results show that extracts and smoke can be used as repellant.

Just place a few leaves on embers or on a hot plate such as a chapatti plate and the smoke will prevent insects from coming near. Insects do not die immediately after they come into contact with an extract of the Neem tree, instead they are blocked in their development process and die for sure after a few days.

The healing effect of the seeds, leaves, roots and bark seems to be almost endless. Already in ancient texts from the Asian continent the medicinal effect of the tree are mentioned. In India it has the nickname of "village pharmacy" and others call it the "wonder tree". And up to now scientists are still doing research into the effectiveness of the Neem tree. Most medicines are made out of the oil from the seeds and the leaves. The oil is produced by pounding the dried kernels while adding a bit of water to make it into a paste. After kneading for a while the oil begins to ooze out.



The leaves are being added to water and mostly drunk as a tea which has a bitter taste (see also page 6).

How to plant a Neem tree

The Neem tree is best propagated from its seeds which will only germinate if less than three months old. The seeds need to be sprinkled daily while laying on a newspaper which is placed on plastic in the shade. The newspaper has to be renewed every second day. After a week the seed will crack and sprout ready to be planted in compost made of half soil and half cow manure. To propagate from a cutting, a small twig has to be stripped of its leaves and stuck into moist soil.

More crop yields with Neem-fertilizer

The BIOP company in Nairobi produces a cheap and environmentally friendly fertilizer for farmers.

By Njuguna wa Kamau

The ambition of any farmer is to get the highest yield possible and a good return for their investment, not only for food self-sufficiency but for commercial purposes. Unfortunately for Kenyan farmers (as is the case with farmers in most sub-Saharan countries in Africa) the soils are poor. They lack essential nutrients to sustain agriculture. In order to feed the increasing population and raise their incomes many farmers rely heavily on chemical fertilizers and pesticides to increase crop yields.

Despite the use of these synthetic farm inputs to boost soil productivity, many farmers are today faced with a sad scenario; as they try to apply more chemical fertilizers to increase yields, the yields are instead decreasing by the year. What many of these farmers do not know is that continued application of modern fertilizers and pesticides increases soil acidity. The chemical pesticides themselves destroy essential organisms such as earthworms that maintain soil structure and fertility. These organisms are also important in controlling harmful pests that damage crops.

Neem fertilizer

"Our products are a way out of this dilemma", argues Daniel Mahinda Wahome. He is agricultural expert at

BIOP, a small company in Nairobi, which is producing biological fertilizer products from the Neem tree. The products are available under the Wonder Tree brand.

The fertilizer has a high nutritive value. It is a soil conditioner and should be applied after the land preparation by mixing thoroughly with the soil. The fertilizer can be used on crops such as cabbages, sukumawiki, tomatoes, bananas, potatoes, onions, soybeans and groundnuts. "Apart from increasing crop yield for the farmer the fertilizer does not leach or increase soil acidity as chemical fertilizers do", Mahinda says. BIOP will sell the fertilizer through a large network of distributors and stockists throughout the country.

There are other advantages of the new Neem-fertilizer. Most Kenyan farmers are already faced with increasing prices of fertilizer and related farm inputs. Higher fuel costs have also pushed up land preparation costs. The new Neem fertilizer produced by Biop is cheaper than chemical fertilizers. For example one kilogram of organic fertilizer retails at Ksh 25 but its chemical substitute costs Ksh 32/=. Moreover the organic Neem-fertilizer needs only one application per season, while the synthetic alternative will require three applications per season.

BIOP maintains close links with the well known International Centre of Insect Physiology and Ecology (ICIPE) in Nairobi, a research institution which is trying to apply its findings in assisting farmers to practise sustainable agriculture and food security. On the basis of many years of research by ICIPE, Biop has come up with a range of products that hold the future to organic farming in Kenya.

While Neem-fertilizer is already being sold, two other BIOP-products are still in the process of registration at the the Kenya Pest Control Product Board to ensure they meet International Pesticide standards. These two products are Neem-Extractive and Neem Cake Powder.

Other Neem-products

Neem extractive is a broad spectrum pesticide that controls nematodes and sucking and biting insects in vegetables, fruits and legumes. The Neem cake powder can be used as a fertilizer or pesticide. It controls pests in vegetables and fruits. The company hopes to get registration for the two products in the next few months before it releases them into the market.

For Kenyan farmers the change to organic farming is a big challenge; it needs a different way of practising agriculture. The use of organic inputs may not show immediate results but their effects are long lasting, environmentally friendly and safe. Another reason why organic farming will become the standard practice in future is the fact that many countries which import agricultural products have imposed tough conditions for imports of chemically produced foods.

A lot of information dissemination is needed so that farmers can understand the benefits of using organic farm inputs. BIOP is already working with farmers in selected parts of the country to provide training on the products. An aggressive marketing campaign using seminars, workshops and government sponsored field days is on going. "This is meant to ensure that farmers are given the correct information on their application and use", BIOP agriculturist Mahinda adds.

The use of natural fertilizers increases crop yields for farmers photo: P. Lüthi/Bio Vision)

Mary Wakonyo shows with pride her organically grown banana crop. *(Photo: P. Kamau)*

"Now I have enough to feed my family"

Mary Wakonyo is one of the thousands of Kenyan farmers who changed to organic farming

By Peter Kamau, Ithuri

For many years Mary Wakonyo had used chemical fertilizers and pesticides on her small shamba in Ithuri of Juja Division in Thika District. But she could not understand why the yields kept on decreasing. The answer to her problems came three years ago when extension officers from the Kenya Institute of Organic Farming (KIOF) visited and showed her how to make farm manure and compost, and how to use crop rotation and mulching procedures to conserve soil moisture and to use organic pesticides.

"They introduced me to simple ideas of using organic material to improve soil fertility and control pests. Now I am happy I listened to them", says the 56-year old mother of five, who does most of the work on her two-piece one acre of land with only occasional assistance from her children. .

Her farm has a healthy crop of sukumawiki, bananas, spinach, paw paws, avocado, guavas and passion fruit. The farm products are not only enough to feed her family; she also sells the surplus in her roadside kiosk. "Last year the rains were poor, but I was the only farmer in this village, who harvested some maize and beans, the rest did not harvest anything", she says with pride.

Her neighbours may not understand the secret behind her success but it lies in the simple procedure of conserving soil moisture through mulching and careful application of compost and manure. "I realised I had to feed the soil as it was no longer able to produce enough food for me and my family", she adds. Mary Wakonyo has come together with 15 other women from the Ngirigama Women Group. The group continues to gain from training and refresher courses offered by KIOF.

"Now I am able to plant twice a year whereas I could do it only once previously"

Natural pesticides

Since Mary Wakonyo changed to organic farming she has never used chemical fertilizer or pesticides. To control fungal diseases such as Early Blight in her tomato crop, she mixes milk with water, then adds bar soap foam to act as a sticker and applies it to the affected crop and it works. For pesticides, she applies chilies, Mexican Marigold leaves and onions to make a mixture that controls pests. Tobacco leaf extract protects her crops effectively against aphids.

Her two milking cows provide enough manure for the farm. In return, plant residue from the farm provides fodder for the animals. "Before I did not know the use of farm manure. Now it is my main source of fertilizer", she says. Due to her method Mary says she is now able to plant twice a year, whereas before she could plant only once in a year.

Lack of buyers

In the past Mary had go to the market to buy produce to sell in her roadside kiosk. Now she gets all from her shamba. But her main concern is marketing of her organic produce. Although aware that organic food products could fetch higher prices than chemically grown alternatives, she has not been able to identify outlets which could buy her vegetables and fruits. "As a result I am forced to sell these items like normal food", she says.

She would be happy if she was introduced to shops which specialise in organic foods. "If only I could find markets for my organic products, my earnings from these commodities would increase", she adds. "But anyway, I am lucky to have gone into organic farming".

What can be done against storage losses?

Every farmer is pleased to get a good yield.But pests can destroy the harvest during storage.

By Peter Kamau

Nearly all Kenyan farmers know about threat caused by pests in stored cereals such as maize. Pests do a lot of damage and reduce considerably farmers' profit margin. The ability to store maize longer gives the farmer benefits from market price changes which tend to increase with time.

According to reports post-harvest losses to farmers in Africa are high. The United Nations Food and Agriculture Organisation (FAO) findings show that African farmers lose between 15 and 50 percent of their harvest every year to pests.

Reduce contamination

Maize storage management is also important as it reduces chances of the harvest getting contaminated by poisonous moulds.

The Larger Grain Borer: shown here 10 times bigger than in reality. (Photo G. Goergen, IITA, Benin)

Infested grain is a big loss to farmers. (Photo G. Goergen, IITA, Benin)

Last year a large number of people died from aflatoxin poisoning when residents from parts of Ukambani District in Kenya consumed maize suspected to have been poorly stored and distributed by traders. The incident clearly shows the dangers in poor grain storage.

The most common pests in Kenya are weevils and rats which have been easy to control with chemical pesticide dusts and rat poison.

Biological pest control

The last few years however have witnessed the invasion of the more destructive Larger Grain Borer (LGB), nicknamed "Osama" for its devastating damage to farmstored maize. Introduced from Mexico and Central America into East Africa through relief food in 1990s, the borer has caused a lot of havoc.

For many years scientists in West Africa have carried out research to cope with these pests. They have identified a predator that preys on the borer. One of the scientists, who was worked for a long time with a team searching for means to control the Larger Grain Borer with an other insect, is Dr. Fritz Schulthess, who since 2003 has been at the International Centre of Insect Physiology and Ecology (ICIPE). "The problem is", says Dr. Schulthess, "the predator which targets the male borer can only survive in hot, dry semi-arid areas". Unfortunately for farmers, Kenya's maize growing areas are in the cool highlands where the borer is causing great devastation to smallscale farmers. And many of them can not afford the pesticides.

Research for the moment is focusing on selection of races of the predator, which can do well in cool and semi-arid regions. Some natural enemies have been identified in Mexico and will be introduced soon into the ICIPE laboratories for further research. In the meantime some farmers will have no other choice but to use chemical pestizides if there is a need. But, argues Dr. Schulthess, there are environmentally friendly methods for controlling the pests which may help the farmers to avoid losses *(see box)*.

Pest Control Tips

- ♦Storage facilities should be properly cleaned. Remove undesired grains, cobwebs and other residues which may harbour pests.
- ♦Storage facilities should be fumigated to kill pests before storing maize.
- ♦Maize should be harvested immediately it matures. Longer stays in the field lead to husks opening and exposing the grain to pests.
- ♦Maize should be placed in plastic containers if possible to prevent pest infestations.
- ♦Shelling the maize will reduce pest damages since most pests prefer maize while still on the cob; even if a farmer has to use pesticides, shelling gives better results. Maize should be sorted before storage to remove infested cobs.
- ♦The harvest should be properly dried after shelling to prevent mould growth, which leads to aflatoxin poisoning.
- ♦Shelled maize should be dried in the sun for 3 - 4 days to bring the moisture content to 14 percent or below which is safe for longterm storage.
- ♦Wood ash, cypress and eucalyptus leaves help repel most pests but the effect is not long lasting. When there is no true biological control method for the Larger Grain Borer and other pests, farmers should continue using the available recommended pesticides for control.

High standard for the export of vegetables

Consumers in Europe are becoming more concerned about the quality, safety and reliability of the products they buy.

The OrganicFarmer

Since the beginning of 2005 the European Union (EU) has set standards for import requirements under the Euro Retailer Produce Working Group Guidelines for Good Agricultural Practice (EUREPGAP) standard. The standard, drawn by supermarket chains in Europe is aimed at producing fresh fruits and vegetables that are safe, socially acceptable and of high quality.

Registration

All suppliers and exporters of fresh fruits and vegetables to the European supermarkets, whether from the EU countries or outside have to comply with this standard. The producers and exporters who do not meet these requirements will not be allowed access to the European market. The EU is the single largest consumer of fresh fruits and vegetables exported from Kenya.

Among the requirements for small scale farmers to access the EU markets is that they should form legally registered groups with the Ministry of Gender, Sports, Culture and Social Services or the Attorney Generals Chambers. Alternatively, they can form a cooperative under the Ministry of Cooperative Development. They must also maintain proper records of all group members, farm records, registration certificates, and proper sanitary and crop handling procedures.

The produce must meet traceability and residue level requirements. This allows EUREPGAP products to be traced back to the farm or group of registered farms where they were produced. The standard allows only a certain specified residue level in all food imports.

Farmers must use certified seeds. To avoid pollution, the pesticides and chemical fertilizers must be carefully handled. Operators must wear protective gear while handling pesticides. Farm chemicals must be properly stored to avoid leakage and pollution of the environment.

Storage containers must be disposed in a responsible manner by burning or burying them in deep soil. They should not come into contact with water sources.

Customers in Europe prefer organically produced fresh vegetabes and fruits. (Photo P. Lüthi/BioVision)

Working conditions

For proper disposal of human waste, clean toilets must be built for the workers on the farm. Their working conditions including wages, and safety must be addressed. Child labour is discouraged.

Dear Readers!

In future we will reserve this page for the letters to the editor. We would like to hear your opinion on our newspaper *The Organic Farmer.* If you have comments or remarks, please write to us.

We are interested in getting a feedback to enable us to improve the content and meet the needs of the farming community.

If you have advice for your fellow farmers, send them to us. And if you have questions about organic farming, we will find experts who can give you the correct answer.s.

Address your letters to:

The Editors
The Organic Farmer
P.O. Box 14352, 00800 Nairobi
e-mail: organickenya@yahoo.com

Some products made from Neem

BIOP Nairobi offers a wide range of health products made from Neem.

Neem Herbal Tea
The tea is 100% pure Neem product made from dried Neem leaves. It contains no additives. It is best used as preventive-curative in treatment of sore throat, colds, fever, food poisoning, low in cholesterol, malaria, hypertension, respiratory problems, diabetes, hepatitis and kidney ailments. Taken regularly, helps to eliminate fatigue. Neem is regarded as one of the best blood purifying herbs.

Neem Seed Oil
This product is a refinedNeem oil from the neem seeds. It has been blended with lemon grass to create an exellent therapuetic oil and skin cleanser. Seed oil can be applied directly to the infected areas of skin and scalp. It is a fantastic natural treatment for rashes, burns, cuts, bruises, fungal infections, acne, pimples and other skin blemishes. Neem seed oil has been found to be effective against inea pedia, the fungus that causes athletes foot. Fungal infections of this type affect eight out of ten people in Kenya at some time or another.

Neem Soap
This is a herbal soap made from pure Neem oil. It has natural skin moisturising oil that makes the skin soft and supple. It assists in preventing as well as healing many skin and scalp ailments, inflamation, fungal infections, burns, cuts and bruises. Neem soap alleviates the intense itching and scarring,which is the main problems associated with chickenpox. Take cool baths to reduce itching.

Neem Leaf Capsules
Made from sun dried grown Neem leaves, they are used for the same purpose as Neem tea. Neem is one of the most potent immuno-stimulant available herbs.

Mulching protects the soil

Responsible farmers take care of the soil. They use the age old mulching method.

Have you ever seen farmers sitting in the sun, when they are having a chat about issues affecting them? No! They are looking for the shade to protect themselves against the hot sun. Why do we not do the same with the soil?

In agriculture we have a special word for this protection of the soil: mulching. It means: spreading organic matter on the soil surface and covering it. Mulching will reduce the evaporation of moisture from the soil surface. Mulching reduces excessive heating of the soil.

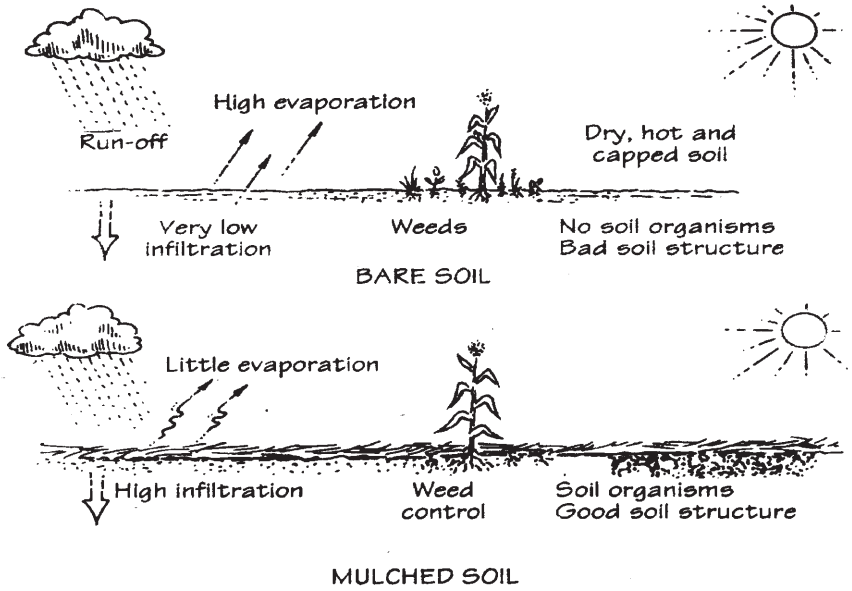
The soil is the most important resource for producing food, it must be protected at all times from erosion and general degradation.

That makes better conditions for the decomposition and mineralisation of organic matter under the layer of mulch. Mulching helps to reduce the possibility and effects of soil erosion in cases of strong and heavy rains. The cheapest and easiest method of mulching is to use crop residues and tree cuttings. Since many different kinds of materials can be used, one should identify useful materials locally.

Mulching with straw or dry gras provides a clean surface that protects the fruit of various crops such as tomatoes. Mulching with compost will improve the nutrient level of the soil as the compost is drawn into the soil by earthworms.

Mulching needs to be monitored carefully to avoid problems and achieve full benefits. Green vegetative matter, for instance, should not be used as it may encourage pests and diseases.

Many problems can be avoided by using mulch during the dry season and applying mulch two weeks after planting to allow the seedlings to develop. But one has to look carefully at mulch brought from another area, as it may contain weed seeds and pests. *(TOF)*



The positive effects of mulching

- Evaporation is reduced. This, along with increased infiltration, allows maximum utilisation of rainfall.
- The impact of raindrops is cushioned, thus reducing surface sealing.
- Water run-off is reduced, thus minimising soil erosion and improving infiltration of water into the soil.
- Seedlings are shaded and protected.
- Temperature extremes are moderated, thus seedlings are protected from extreme heat or cold.
- Crustling and compaction are reduced resulting in better seed emergence.
- Weeds are better controlled by mulching.

News-Corner

• Beneficial Pests

Any farmer detests pests because of the damage they cause to crops. But what many farmers do not know ist that some insects and other pests are infact useful inhabitants of agricultural areas. Take the mole for example. It feeds on a wide range of insects. Its burrows aerate the soil while the tunnels help to drain excess water. To reduce their damage to crops, a farmer should place green castor oil beans in the tunnels; this encourages the moles to move away to areas where they can not cause much havoc.

• Insect traps

Many insects are attracted to different colours. To reduce damage to crops in the field, insects such as wasps and aphids can be controlled by making a shalow yellow painted owl filled with soapy water. Any insect drawn to the bowl will drown in if. If collected, these pests can provide food for fish or chicken. A farmer can also experiment with various colours to find which ones excite particular pests.

• Useful birds

Duck and geese rearing may not seem an important occupation to most farmers. However these birds are cheap to feed as they live on grass and weeds. Geese are militant and can serve as guards since they become aggressive when strangers appear in their territory. Ducks eat insects such as slugs and snails in mulched gardens; they do not scratch the soil as chicken do. Their manure is rich in nitrogen and phosphorus. There must be water in their enclosure so they can dip their heads, as these are water birds.

• Try garlic

Garlic and onions have the effect of managing a variety of pests and diseases in the garden. Their strong smell repels aphids, beetles and even rats. To make a mixture, crush one garlic bulb in one litre of water and spray on the crop; alternatively crush 3 bulbs and mix in paraffin, let it stay for three days, then add 10 litres of soapy water and spray. This will eliminate most pests and disease-causing organanisms.

• Protect your nursery

Nurseries and seedbeds need to be disease- and pest-free. Farmers should use clean, fertile soil. If plants are being produced for sale, the soil needs to be sterilized. Th easiest way to do this is to pour boiling water into the layers of soil no deeper than 2 inches. The boiling water will kill off most pests and bacteria.

Advocating for the Organic Movement

*Many stumbling blocks hinder the development of organic agriculture. **KOAN** seeks to promote the organic movement.*

By Eustace Kiarii Gacanja

The Kenya Organic Agriculture Network (KOAN) is the National Coordinating Body for organic agriculture activities in Kenya. It came into being as a result of a consultative process that culminated in a seminar and workshop dubbed, "Grow for the Future" held late March 2004.

During the seminar and workshop, participants mapped out the future of organic agriculture in Kenya and formed an all-inclusive National Co-ordinating Body, KOAN,

KOAN

for the purposes of addressing challenges facing the organic subsector.

KOAN's mandate is to coordinate, facilitate and provide leadership and professional services to all members and stakeholders in the areas of production, training, marketing, certification, lobbying and advocacy. It seeks to promote the organic movement in Kenya, to evolve and become a highly beneficial and integral industry with direct impacts on the environment and socio-economic status of farmers.

It is organized into five sub-committees, namely: Production,Training, Certification and Standards Setting, Marketing , Lobbying, Advocacy and Networking. KOAN has a steering commmittee/board of 14 members.

Broad-based survey

This year, in 2005, KOAN will establish the detailed and true picture of the organic sector in Kenya by carrying out a baseline organic agriculture status survey.

The survey will establish who is doing what and where. It will also collect figures in terms of certified and non-certified producers, organic market outlets, products, number of people directly employed by the sector and its contribution to the GDP (Gross Domestic Product). It will also determine the various opportunities available and stumbling blocks that hinder development of the organic subsector.

For any development initiative to take place, it has to operate within a policy framework. This is currently lacking as regards organic agriculture in Kenya. Information gathered from the survey will form the basis of developing an organic agriculture policy which KOAN will lobby for implementation.

Though thousands of smallscale farmers grow organically, they have not been certified because of the associated costs and as such they cannot sell their products as organic. KOAN will work to develop a simplified, credible and affordable certification system for smallscale farmers for the local markets. To ensure that farmers have access to markets, KOAN will act as a linkage between producers and buyers and provide timely market information to both. For the local markets, we shall work with farmers, members and other partners to establish local organic market outlets.

KOAN is a membership organisation, open to any organisation or individual willing to join. KOAN will work towards increasing membership and developing other aspects of organic agriculture. If you are interested in joining KOAN or participating in its activities, please contact:

Eustace Kiarii Gacanja
KOAN Secretariat
P.O Box 72461, 00200 Nairobi
Tel: +254 (20) 576114/576154
Fax: +254 (20) 576115
Email: koansecretariat@elci.org
Website: www.koan.org

Unjust dealings with farmers

There are no fair rules in the world agricultural trade.

The current agricultural policy of the European Union and of the USA makes not only the world's poor nations suffer, but also the majority of European farmers, who are short-changed by the system now in place. According to a report of the development-organisation Oxfam, seven big landowners in Spain received a total of over 19 million dollars (KSH 1.4 billion) in EU subsidies in 2003. This is roughly the same amount that was shared among 12,700 smaller Spanish farms that same year, and is equivalent to the combined annual income of 90,000 peasants in Mozambique.

In most of the other EU countries, the situation is similar, or even worse. In France one quarter of the country's farmers receive no assistance at all, while 15 percent are given six out of every 10 Euros in subsidies. Every farmer in Germany receives a subsidy equivalent to more than four times the average salary of a German factory worker.

The United States does not differ greatly from the EU in this regard. While 60 percent of farmers do not benefit at all from the 20 billion dollars (KSH.1.5 trillion) in agricultural subsidies doled out by the US-government, ten percent of the biggest and often most profitable producers received 72 percent of the total paid out between 1995 and 2003.

There are currently 2.7 billion people in the world, who live on less than two dollars a day, and 1.2 billion who scrape by on less than one dollar. The vast majority are in Africa, Asia and Latin America. *(TOF)*

The Organic Farmer in May:

- Organically produced vegetables and fruits are healthy. But how can farmers access European markets?
- Good seeds are vital. But do farmers get them?
- Manure and compost are the soil's best friends. How to make them?

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 12 April, 2006

It is difficult to replace top soil once swept away by run-off water. *(TOF)*

Prevent soil erosion now

Soil erosion takes away the topsoil which contains organic matter and other nutrients essential for plant growth.

The Organic Farmer

"A nation that destroys its soil destroys itself". This statement from former US President Franklin D. Roosevelt in 1937 is still relevant to Kenyan farmers today. Every year millions of tonnes of highly productive soils are washed away by rains and even wind. Poor soil management by farmers can lead to poor crop yields. Research shows that erosion on a slope can carry away up to 10 tonnes of soil per acre of slope in a year. Right now, many farmers have already ploughed their land in readiness for planting, but one area they may not have paid attention to is prevention of soil erosion. Erosion takes away the topsoil; this is the most fertile soil that is suitable for agriculture because it contains organic matter and the essential nutrients that help to promote plant growth. When the topsoil is washed away, the land becomes less productive and the ability of the remaining soil to retain water is also reduced.

Take conservation measures

Most farmers do not use any soil conservation measures in their farms.

The Organic Farmer launches an initiative to assist farmers' groups in certification and marketing.
see insert

This is one of the factors that has contributed to the declining productivity of land in many parts of the country. Soil erosion is the most serious threat to soil fertility in all farming areas. Soil erosion actually starts during the dry season. This is a time when most of the land is left bare after the vegetation dries out. Strong winds then take away much of the topsoil. Farmers should therefore ensure that the land is always covered after harvesting to stop soil loss through wind erosion. After ploughing the land also, the top soil is loose, which makes it vulnerable to erosion (see page 4).

in this issue

Dear farmers,

One year ago, in April 2005, we started The Organic Farmer *newspaper. When we consider the feedback from the farmers, mainly through letters, SMS, e-mails, and field visits, we can confidently say that the newspaper is playing an important role in the Kenyan agricultural sector and in organic production in particular.*

The production of a newspaper of this nature is a demanding task. However we are happy to note that the interest of the thousands of farmers who rely on the newspaper for information is what motivates us to apply ourselves and work even harder in its production. It also gives us the inspiration to research for more relevant information that addresses the problems facing Kenyan farmers. In other words, we can say that the newspaper is "farmerdriven". In our May issue, we are going to give you an insight into the achievements of the newspaper and the way farmers want it to appear in future. This will be done after going through the questionnaires which most of you have already sent back to us.

Like any other serious publication, The Organic Farmer *has the responsibility of addressing the problems that face its readers and finding ways to solve them. From the time we started the newspaper, farmers have complained that they are not able to sell their organic produce. After research, we discovered that what the farmers lack is certification to show that their produce meets all the conditions that are required to qualify as "organic". With support from BioVision, the Swiss Foundation, that supports this newspaper, we have decided as a kind of birthday gift, to help farmers in this important area: we will assist selected groups to become certified as organic producers in order to help them market their organic produce.*

Moreover, the newspaper has found a number of reliable buyers of your organic products. In the inside pages of this issue, you will find the details of The Organic Farmer Support Programme.

We thank all our readers for their trust in the newspaper and are looking forward to the success of the new initiative to help Kenya's organic farmers.

MY OPINION

By Richard Koech

Many of us are preparing to plant now. A bit of planning can help save us a lot of time and money. A clever farmer should by now have decided the best crop to grow for the season considering the size of his land, weather conditions and the market. He also keeps proper farming records showing how much he spent to buy inputs last year and what he got in return. Apart from meeting our food requirements, what we grow should also earn us some additional income to meet our other financial commitments. If it does not, we should be able to look for other crops that meet these needs.

Richard Koech, farmer in Nakuru

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

The best banana planting method

Farmers should ensure they use disease-free planting material such as tissue culture varieties.

The Organic Farmer

Banana is an important horticultural crop, providing food and income to Kenya's small- scale farmers. It does well in most of the agricultural areas in Kenya with a rainfall of at least 1000 mm per year and temperatures of 28° c the plants require sunlight. Shaded areas should be avoided. Banana plants should be planted on sites that are sheltered from the wind because heavy banana bunches are easily knocked down by the wind. The plants require deep, fertile and well-drained soils. The soil should contain organic matter as well as nitrogen, potassium and magnesium.

Planting site

Land that has been left fallow for at least a year is ideal. The ground should have a gentle slope. Steep slopes, rocky areas and waterlogged sites should be avoided. In windy areas, agro-forestry and fruit trees should be used as windbreaks to reduce plant breakage.

Land preparation

The bush should be cleared and debris removed from the field and composted. Compost is a source of organic manure for banana plants. Since the banana roots are soft, soil depth should be approximately 60 cm (2 ft). The preparation should be done during the dry season.

Hole preparation

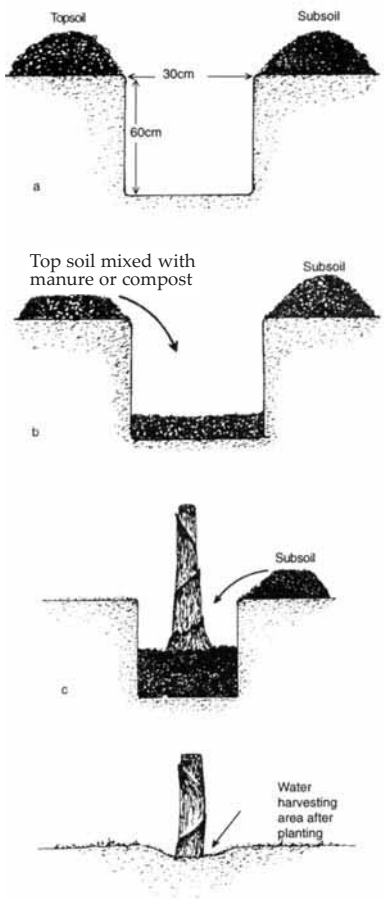
The spacing between plants and rows depends on the type of bananas being planted. For medium size bananas, spacing of 3 by 3 metres is recommended. Short varieties such as the dwarf Cavendish require 3 by 2 metre spacing. In level fields, planting holes should be dug in rows along straight lines while on sloppy land; holes can be dug along the contour lines.

Planting holes should be 2 feet long and 2 feet wide, with a depth of 2 feet. The topsoil should be heaped on one side of the hole and subsoil on other side. Mix the topsoil with 2 debes of well-decomposed organic manure. The manure should be thoroughly mixed with the topsoil. Plant the banana plant in the topsoil-manure mixture around the roots. The subsoil, which is not as nutritious, should be spread as the top layer to make a basin around the plant.

Use good suckers

Banana plants should be planted at the beginning or during the long rains. In the prepared hole, dig a central hole about 2 feet deep. Firm the soil around the plant by pressing with the feet. The young plants have to be watered regularly as bananas need plenty of water for proper growth.

Farmers are advised to use tissue culture bananas obtained from established nurseries (see next page). However, sword suckers from existing plantations that are disease-free can still be used. The suckers should be 1 to 1.5 meters tall. The leaves and roots should be cut off, especially in dry weather. A thin layer of the corm (lower stem) can be peeled off to get rid of weevils or nematodes. Farmers can split the banana lower stem and plant the slices. These should be covered with loose soil.



Preparation of banan planting holes and planting

Source: A guide to planting bananas in the East African Highlands, by ICIPE

Tissue culture bananas are productive

This method has produced disease resistant varieties which are high yielding and take a shorter period to mature.

The Organic Farmer

Banana production in the country has been declining in the past two decades following the spread of fungal and bacterial diseases in most parts of the country. The two most common diseases responsible for the decline are the Fusarium wilt or the "Panama disease", and the black and yellow sigatoka leaf spot disease. Sharing of planting material between farmers is responsible for the rapid spread of these diseases.

To counter this problem, researchers at the Kenya Agricultural Research Institute (KARI) have now developed superior varieties which are more productive and are resistant to diseases using the tissue culture method. The method involves selection of healthy shoot tips from the existing banana varieties which are then cleaned and split into small pieces.

Tissue culture bananas give better yields than conventional varieties. (Photo TOF)

These are then grown in special jars in a disease-free laboratory environment. Hormones and nutrients required for plant growth are then fed to the young plants to make them reproduce. The plants are then split further, and put in more jars for large scale multiplication of planting material. One plant can produce up to 1000 seedlings using this propagation method.

Tolerant to diseases

Susan Muli, a researcher at theKARI station in Thika, says that any variety can be propagated and multiplied within a short period. The transfer of diseases is not possible because any contamination of planting material is destroyed in the laboratory propagation process. Some of the new varieties that have been introduced recently are tolerant to the Fusarium wilt. Tissue culture bananas give better yields than conventional bananas. One bunch can produce up to 13 hands weighing between 35 to 40 kg. Conventional banana bunches weigh between 15 to 20 kg. Tissue culture bananas have also a shorter growing period of 9 months while the conventional varieties take 18 months or so to mature.

Varieties of tissue culture bananas

The common varieties being produced under the tissue culture method are the Giant Cavendish, Chinese Cavendish, Dwarf Cavendish, Williams, Kampala, Valery, Grand Nain and Apple, which are ideal for desserts. Other varieties include the Uganda green, Ngombe and Grade which are good for cooking purposes.

Climate and soil requirements

Bananas prefer a warm climate with an optimum temperature of 27 degrees centigrade. Rainfall should be at least 1000 mm and evenly distributed throughout the year. They require deep, well drained loam soils with high fertility and organic matter content (see page 2).

Farmer now grows new banana variety

Many farmers who have started tissue culture banana production have reaped great benefits from this new technology. Charles Kimani, a farmer from Kibichiku sub-location in Lower Kabete in Nairobi is one of them. Two years ago, he and 42 other members of the Murimi Mugunda Self-Help Group were concerned with the declining production on their small-scale farms. They approached a number of agricultural institutions to train their members on modern production methods. One of the NGOs they approached is Africa-Harvest's Chura Tissue Culture Banana Project, which is trying to promote commercial production of tissue culture bananas among small-scale farmers in the country.

"They immediately set up a demonstration plot in one of our member's farms and taught us how to dig holes, plant and manage tissue culture bananas. The training made a big difference to the way we used to tend our bananas. I removed Napier grass from a portion of my land and put it under tissue culture bananas."

Today Charles Kimani is one of the most successful tissue culture banana farmers in his village. He owns a beautiful orchard with more than 150 healthy banana mats. At his first harvest in January this year, he got 35 bunches weighing a total of 850 kg which he sold at the price of Ksh 15 per kg, earning him a total of Ksh 12,750. He was voted the best farmer for getting the highest yield while using purely organic production methods, during the first harvest cerebrations organized by the Africa Harvest project early this year.

To help farmers get good prices for their bananas, the NGO has helped farmers set up a marketing company called the Teecee Bell Company Ltd., which has brought together 200 farmer's groups in Kiambu and outlying districts in Central Province. The company was able to sell more 2.5 tonnes of bananas during the harvest season last January. They attend field days and agricultural shows where they sensitise farmers on banana production.

Farmers interested in buying tissue culture bananas can write to the following address:

Africa Harvest, P.O.Box 642 -00621, Village Market, Nairobi, Tel.020-7124083/1/6/5/2

Identify and prevent soil erosion

Farmers should try to avoid soil erosion since heavy rains can take away their valuable soil.

The Organic Farmer

A farmer should be able to know when they are losing their top soil on their land through soil erosion. At first, erosion appears in the form of small channels or lines made by running water when it rains on freshly ploughed land. The accumulation of fine soil material in trenches and depressions is another clear evidence of soil erosion. The brown colour of run-off water or small streams during and after the rains is a good indicator that soil erosion is taking place. Sometimes tree roots are exposed, indicating that a considerable amount of topsoil has already been washed away. It is not only the steep slopes that are affected by erosion - even the level plain fields can be severely affected.

Prevent erosion before it happens

A farmer should stop soil erosion before it takes away the valuable soil. Farmers can do this by employing soil conservation measures. One way is to ensure that the soil is always covered with vegetation or by mulching. This improves the infiltration (sinking in) of rain water into the soil.

The other measure is to ensure that the speed of rain water flowing down the slope is reduced through the construction of bunds or other barriers such as gabions.

Planting Napier grass across the slope prevents soil erosion. *(Photo TOF)*

Any plant which covers the soil and helps build soil fertility is called a "cover crop". Examples of good cover crops include the Crotalaria species, Mucuna, Desmodium, purple vetch, velvet bean or jack bean.

Conserve soil by what you plant

Planting of different types of crops should be designed in such a way that the soil is permanently covered with plants. Careful timing of sowing and planting can help avoid uncovered soil being washed away during the rainy season. After the main crops are harvested, a green manure crop may be planted. When planting, crops should always be grown in lines across not up and down, the slope.

Controlling soil erosion

Cultivated slopes are extremely prone to soil erosion. In order to reduce the speed of water flowing down during the rains, construction of barriers along the contour lines are useful. Contours are imaginative horizontal lines across a slope. The construction along contour lines is aimed at reducing the slope and speed of the surface water. The lines help catch and hold the soil eroded above the slope. The constructions made along contour lines to prevent soil erosion include wooden barriers, stone walls, terraces, trenches and living barriers like Napier grass and trees.

Wooden barriers or stone walls

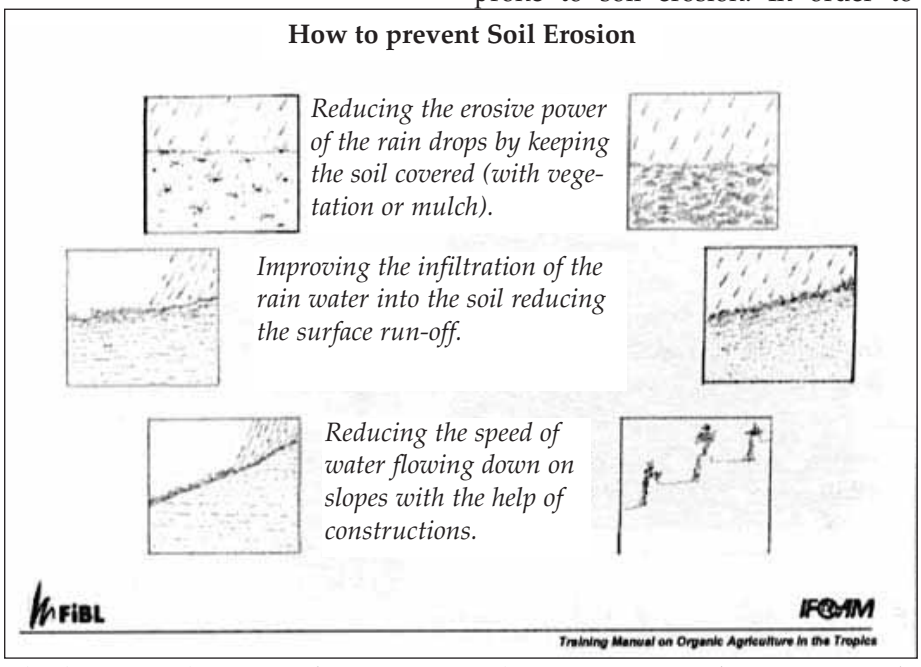
These are simple barriers constructed using tree trunks and branches. They accumulate eroded soil behind them, preventing it from being washed away. Construction of stone walls need more time but lasts longer and needs less maintenance. Apart from barriers, a farmer can just leave a strip of unploughed land across the slope.

Bunds and trenches

Bunds are earth or mud barriers made along contour lines to stop erosion. They are easy to build but need more work to maintain. When digging a trench, the soil should be deposited on the upper side of the slope (fanya juu method). A farmer can add fodder grass, hedges, pineapples or even fruit trees. They hold back eroded soil, reinforce the walls and help increase water infiltration.

Bench terraces

Bench terraces are efficient in erosion control and help build up soil fertility. When digging terraces it is important that the fertile topsoil is kept aside and later spread on the finished terrace. Various plants can then be planted to hold the soil.



The three general strategies for preventing soil erosion *(Source: IFOAM)*

Natural fertilizers are rich in nutrients

Natural fertilizers not only feed the plants. They also help make the soil healthy for farming.

Su Kahumbu

Without resorting to the use of harmful chemical fertilizers, there are a number of ways an organic farmer can use to provide the nutrients that are needed for plants to grow through the natural recycling process. The use of plant and animal materials not only feeds the plants, but also makes the soil healthy. The following are some of the methods that can make farming more sustainable by adding nutrients to the soils:

Green manures

Green manures are plants grown to improve the soil. These plants may fix nitrogen, protect soil from drying, improve soil structure via roots, and suppress weeds by fast growth. They control pests by harbouring predators. They may be ploughed back into the ground, or cut and left to use as a top mulch, or they may be cut and used in the compost pile.

Examples of plants for green manure include amaranthus and beans or any other weeds that farmers often throw away. These weeds take nutrients from the soil; by ploughing them back the farmer will be replenishing the soil with these essential nutrients. Excess green manure can also feed animals.

Animal manures

These manures must be well rotted or composted before use. They are best mixed with the bedding of the animals (e.g. straw, grass), as this will also contain most of the nitrogen that is in the animal urine. The bedding will also provide bulk which will improve the soil structure. If the bedding is wood shavings, a longer composting time is required, especially with higher nitrogen manure like chicken manure. Both nitrogen (N) and potassium (P) are easily washed away by rain, so manures should be covered. Animal manures are best used after composting, for vegetables however, they are not suitable for root crops such as carrots.

Compost

All garden vegetative waste can be composted. Make sure to add fibre into the compost too, so that the resulting mixture is crumbly and sweet smelling, not sludgy and smelly. Animal bedding, cereal straw, maize stalks and other crop residues are all good. Comfrey leaves and Tithonia added to compost act as a compost activator as well as adding micronutrients. EM (Effective Microorganisms) can also help speed up your composting time by adding a ready source of microorganisms for the composting/decomposition process.

Compost must be turned to aerate and mix the materials at least three times over a period of 6 weeks. High temperatures in your compost heap will help to kill pathogens (disease organisms) and weed seeds. After the third week, your compost will progressively cool down over time until it is completely cool and ready to use.

Earthworm compost

Worms cannot process large quantities of organic material at a time, therefore they are ideal for composting kitchen and vegetable waste in limited quantities. They will not compost rotten, smelly waste, which may in fact kill them. Both the worm compost and a worm compost tea can be used from these friendly decomposers. Be careful not to kill them in the process of removing the compost.

Leaf mould

Throwing leaves into the rubbish or setting them alight is a waste of a very valuable resource. Collect leaves in an empty sack or container, moisten and leave to decompose. You may add EM or earthworms, although you will find they will make their way into the leaf mould without invitation. Leaf mould may take up to 5 months or more to fully decompose, therefore as with compost, try to have a few containers going at the same time. The final dark, rich soil - like leaf mould can be used in seed beds, potted plants or as mulch for delicate seedlings.

All of the above soil improvers may be used as "teas" after they are ready, simply by putting them into a sack and soaking in water for a few hours. On removal, the resulting "tea" can be diluted 1:4 and poured onto your soil as a top dressing.

Permitted organic fertilizers

Organic fertilizers are products of plant, animal or mineral origin that generally release nutrients slowly over time. Some are compound mixtures, such as mixtures of bone meal, seaweed meal and fish meal, supplying a range of plant nutrients. As they are natural, they often contain some trace elements too.

Bone meal: Contains phosphorus (P), promotes strong root growth. Used as a base dressing before planting shrubs, fruit trees and other perennials.

Fish meal: Contains nitrogen (N) and phosphorus (P). Promotes root and leaf growth. Used as a general fertilizer.

Rock phosphate: Used to correct phosphate deficiency. Best incorporated into the compost pile. Available in Kenya from Mijingu.

Seaweed meal: Nitrogen (N) and potassium (K) helps build up humus levels in soil. Good for fruiting plants.

Dolomitic limestone: Calcium magnesium carbonate. Use to increase the spoil pH, making it less acidic.

Gypsum: Contains calcium sulphate. Supplies calcium without altering soil pH. Use a gypsum/dolomitic limestone mix (80:20) to help lighten heavy clay soils.

Potash: Contains potassium (K). Good for fruits and vegetables. Best incorporate it as wood ash (potash) into compost piles.

These organic fertilizers (available at agro-vet-shops) are normally used where there is a nutrient deficiency in your crop. One must therefore learn to identify the deficiencies and strive to correct the cause of the problem.

The right way to prepare plant extracts

Zacharia Mwarari from Kilgoris in Trans Mara district asks how long it takes for plant extracts to be effective once they areapplied to crops. In particular, he wants to know more about foliar feeds prepared from stinging nettles, comfrey and Tithonia. He asks: "How can we prepare them to be effective against pests"?

Most plant extracts become effective immediately they are applied to the crops. Their effects vary in intensity, however. Extracts used as pesticides will act in different ways, when they act as deterrents.. It is important to note that when one sprays with deterrents for example African marigold, garlic, and chilli, it is not necessary to actually spray the insect. One sprays the crop and the resulting repulsive smell or oily feel will deter (repel) the insects.

Spray carefully

It is important when spraying contact sprays to actually spray onto the insects. Millions of litres of spray are wasted and pollute our environment by folk who do not understand the correct way to apply the active ingredients in the agro-sprays. Spraying devices such as Knapsack sprayers aim to saturate our crops and fields with these dangerous poisons. The resulting toxic overload in the environment and poisoning of the soil, animals and humans seem of little consequence to some of the companies who produce these toxins.

Tithonia can be used to make foliar feed.

Learn to be patient and to use spot spraying instead of blanket spraying, as this will ensure you do not kill off all the beneficial insects. It is also important to control the insects once sprayed.

Choose the right pesticides

If the extract is too dilute, the effect will be minimized. Note that it is advisable to change pesticides, as many insects easily build up a resistance to one product or extract if used frequently. It is advisable to spray in the early morning and late evening to avoid killing the "good guys" as they will have headed home to the hedges.

Neem affects the reproductive cycle of the insect and therefore although it begins to act on the insect immediately its effects will not be seen physically for 2 weeks. Pyrethrum-based products will act immediately - causing death, as the pyrethrin affects the nervous system of the insects. Pyrethrum, however, breaks down rapidly on exposure to the sun, thus it needs to be used more frequently than some of the other plant extracts (botanicals). Others affect the digestive system, causing the insect to slowly die of starvation, whilst oil based products cause suffocation of the pest.

Useful foliar feeds

Extracts used as foliar feeds are effective straight away although their effects may no be immediately visible to the eye. Foliar feeds can be sprayed weekly for heavy feeders like tomatoes, broccoli, strawberries, sukuma and others, and less frequently for light feeders, such as spinach.

Stinging nettles included in the foliar feed will help protect the plant against fungal problems due to the sulphur present in the extract. If you have a problem with downy mildew or powdery mildew, then nettle tea is very good. The problem must be caught and treated in its early stages, otherwise it will be difficult to contain.

One can add crushed garlic, chillies or African marigold to any of the plant foliar feeds to help protect against insect damage. However, you will risk killing all the beneficial insects as well or you may have very pungent and chilli-flavoured vegetables, for example if you are spraying sukuma! I recommend dealing with the insect problem when it occurs, and keeping the foliar feeds separate to avoid the abovementioned problems. In organic production, we must be vigilant and observant. We must seek to remedy the problem, not to treat the symptoms. It's all in the soil. If we can keep our soils healthy, all life depending on it will also be healthy.

There is no organic herbicide

Mwarari also wants to know if there are other natural methods for preparation of herbicides and seed dressers. "Please give us the recipes for their preparation in order to help us cut costs and stop use of chemical substitutes."

I do not know of an organic herbicide. Herbicides kill unwanted vegetation, for example weeds. In organic farming, weeds are useful for animal feeds, mulching, compost making, ground cover, insect repellents, and also vegetables for human consumption.

Seed dressings are products put on seeds to protect them from damage once planted or to encourage good root growth. Unfortunately I do not know of any organic seed dressings. One can, however, prepare your seed bed mixing pymac into the soil. Pymac is the pyrethrum cake left over after the extraction of the pyrethrin from the pyrethrum flowers. This will protect the seedlings from nematodes and cutworm. Generally, by creating a healthy soil, you will eliminate the chances of putting your seed into a hostile environment. It is important to use healthy fresh seed from a reputable source. It is also very important to rotate your seed in seed beds to avert thin, weak transplanting material.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Letters to the editor

Can we get certification?

Congratulations to the editorial team of The Organic Farmer. Your magazine has come at the right time when life is endangered by use of so many chemicals. Our group as the name suggests wants to deal with horticulture. We have already started growing grafted avocados through the assistance of our agricultural extension officer. We would like to have a certificate to make sure that our fruits and other crops will get into the market especially exporting without problems. How do we get the people concerned here in Eldoret? I am very much interested in the Organic Farming and long live *The Organic Farmer*.

Wilson Kamau Maina,Umoja Horticultural Group, P.O Box 1027, Eldoret

Dear Mr. Maina,
Information on organic certification and marketing was covered in our January 2006 issue (No.9). We are now in the process of assisting selected farmers groups in getting certification. Read the insert for more details.

Give more on dairy goats

We are a group of about 25 who are venturing into dairy goat keeping as a way of fighting poverty. However we don't have enough information regarding the subject. We are informed that you had covered this same very well in your issue of organic farmer No. 6. We will be very grateful if you supply us with a few copies of that issue to help us gain more insight into the kind of project that we are venturing into. We as a group would be very grateful if you include us in your mailing list to help learn more concerning organic farming and sustainable agriculture. I hope you will address my request.

Jeremiah Nduyu,
P.O Box 112, 20107, Njoro, Nakuru

Paper is very helpful

Your magazine is extremely useful and helpful to anyone interested in becoming a skillful and productive farmer. Could you please include my name in the list of the recipients of this wonderful monthly magazine.

Eldad Kanyi Macharia, P.O Box 58 10306, Kagio

More on organic farming

I am a farmer in Nyamira District. When I read issue No.6, it impressed me so much that I wished I had read your back issues. Now I have formed two groups of farmers who are very much interested in more information on organic farming. Please send us through the above address so that we can be updated on new farming methods.

Daniel Misinga, P.O Box 333, Nyamira

TOF has converted me

I am a farmer in Kiambu, after reading the September/October 2005, I was overwhelmed by the quality of information it contained. It encouraged me very much especially on goat production and pest control. I have decided to keep dairy goat from now henceforth and also practice organic farming. So if possible feed me with information on the two fields and also be supplying me with your monthly editions. You are inspiring and helpful people, excellent partners to the farmers. I will appreciate you response with a big heart.

Samwel K Mathore, Sakima Green Valley Farm, P.O Box 211 00222 Uplands

How can I get copies?

I work with farmers groups' and would like to be able to subscribe to your publication. What do I have to do? I would like between 10-20 copies preferably. Thank you.

Soren Green,

P.O Box 547, Kilifi, 0723 100809

We use it to help farmers

Thank you very much for keeping us informed and educated about organic farming. We are a Community Based Organisation in Rongo working in collaboration with other self help groups to improve soil-fertility by using local available resources to increase crop yields. We are kindly requesting you to send us more copies of your newspaper through the above address. We need your cooperation in this task.

Phillip Dande, Chairman FAARP Project, P.O Box 03- 40404, Rongo
philipdande@yahoo.com

Dear Farmers,

As part of our efforts to serve the organic farming community effectively, we would like to create a database of organic farmers in the country. We are interested in:

-Your names,
-Addresses, Location,
-Farm acreage,
-Are you an organic farmer?

To make it easy for you, we have a special telephone number: given above. All the farmers can provide these information through short messaging service (SMS). ***Come on Farmers, Tuma jibu. Asante.***

SMS ONLY

We have learnt a lot

On behalf of Kamasakwa Intensive Farmers (KIF), I am impressed to say that since we started receiving copies of The Organic Farmer, we have been able to learn a lot on organic farming. For this reason I am hereby writing to request you to send the newspaper through our own address. I am a development worker and extension officer with the Catholic diocese of Homa Bay and mainly work with farmers. The newspaper would be of much help to me and my group. Let us work together.

George Otieno Okello, P.O Box 362, Homa Bay

Farmers liked it

It was a great pleasure meeting you at Brackehurst farm. We thank you for being true to your word that you would send us copies of. I have distributed them to farmers here in Othaya and Ndaragua and farmers have received their first copy with a lot of enthusiasm. As a matter of fact they thought it was a copy of CTAS SPORE magazine and they are very happy to learn that they have a magazine so good and its locally published. They are asking why they never heard or saw it before. I have also distributed the questionnaires but since this the first copy they are at a loss to comprehensively fill it satisfactorily but they have assured me they will do their best to be as truthful as they can.

Stephen Waikwa, P.O Box 543, Othaya

Fodder trees are important

Fodder trees are a benefit for each farm Trees on the farm provide livestock feed, enrich soils and help control soil erosion.

Eric Lumosi Asilingwa

Planting fodder trees and shrubs on the homestead brings major benefits for the farmer. They provide dairy farmers with readily available, high quality, low-cost fodder for their dairy cows and goats. With most small-scale farmers having limited resources, especially land and capital, they can only afford to keep a few dairy animals that are usually fed with inadequate and poor quality fodder. This kind of feed does not meet the animal's daily requirements for growth and milk production. The main source of high-quality feed for dairy cows in eastern Africa is Napier grass. This is supplemented during the dry season with crop residues such as maize and bean stalks or hay, banana leaves and banana stems and indigenous fodder trees.

Characteristics of fodder trees and shrubs Well-managed and healthy fodder trees should have the following qualities:

- Provide large amounts of quality fodder.
- Grow relatively fast, with benefits realized within the first year after planting.
- Tolerate frequent cutting and continue providing benefits for more that 5 years.
- Grow together with field crops without competing with them.
- Easy to conserve, either by cutting and preserving them as leaf meal, or by allowing them to persist long in the field and remain green during the dry season.
- Provide the farmer with additional benefits (besides fodder) (are multipurpose)
- Be non-toxic and easily digestible for animals

Benefits of fodder trees and shrubs.

Fodder trees and shrubs provide fodder for on-farm dairy animals. Other benefits of fodder trees and shrubs are to help control soil erosion, improve the fertility of the soil, and provide bee forage, fuelwood, stakes and poles, fencing, shade and mulch. Some of them serve as ornaments and windbreaks, while others like mulberry provide fruits. In addition, the leaves of mulberry are used for feeding silkworms and sesbania leaves are used as soap. Fodder trees and shrubs that have been left to grow to maturity with the objective of producing seed, firewood or stakes, can also provide forage (nectar) for bees, which results in the additional benefits from honey production on farms. Honey is nutritious and also fetches good prices in the local market.

Seeds and seedlings of different varieties of fodder-trees can be prepared by use of crosspollination to prevent inbreeding. These can be sold for income generation.

Improved soil fertility

The deep root systems of fodder trees help collect nutrients from the soil that are too deep for crops to reach, drawing the nutrients to the soil surface where they are can be used by crops. Some nutrients are leached below the crop root zone. The deep tree roots help recover these nutrients that are recycled into the system. When leaves from these trees fall to the ground and decompose, they add nutrients to the soil. Furthermore, animals fed with tree forage produce high quality manure. These two cycles greatly improve soil fertility. Leguminous trees and shrubs also have the ability to fix nitrogen from the air and transfer it to the soil, making it available to plants.

In the May-issue, we bring you more on how to plant fodder trees.

Trees have many uses on the farm.

Market place

Seedlings: On page 4 of our March 2006 issue, we wrote about Benjamin Lugano, the farmer who produces certified fruit tree seedlings in Cherangani, Kitale. However, we gave the wrong telephone number for his contact. Lugano is offering for sale certified Fuerte and Hass varieties of avocado fruits. Apple, Tommy and Harden varieties of Mango fruits, pawpaw and tree tomato seedlings. His correct address:
Lugano Horticultural Enterprises, P.O. 323, 30200 Kitale. Tel.0733 99 05 74, 0733 39 19 07

Pawpaw: I would like to buy passion and pawpaw seedlings for planting. My contact address:
Peter Chalo, P.O. BOX 1401, 90115, Kangundo. Tel.0724 997 398

Asparagus: I am looking for market for asparagus and spinach seeds which I grow organically in Gilgil, Nakuru district. If interested, please call Tel. 0723 504 018. Ask for Chege.

Eucalyptus: I am interested in buying hybrid eucalyptus tree seedlings (South African Variety). If any farmer has the seedlings they can get in touch with me through the following address:
Jackline Kidambi, P.O Box 596, 30200 Kitale. Tel. 0735 57 84 16

Cutting: I am offering for sale an electric chaff cutter. It is fast, efficient, secure and economical. Call 0720 884549

Seeds: We have a project on indigenous vegetables in our Rural Outreach Program which is a mother project. We have the following species; spider plant, slack nightshade, amaranthus, corcorus, cowpeas, clotolaria, Ethiopian kales, amaranth spp. and pumpkin. We sell their seeds in seed banks in Butere, Mumias District and we have an information centre in Nairobi at Kenyatta Market stall No.274. If you are interested, please get in touch with us:
Thomas Wakala Mutuli, Rural Outreach Programme, P.O.Box 29086, 00625 Nairobi. Tel. 0735 56 88 24
Email: thomasmutuli@yahoo.com

Purple vetch: This legume and cover crop gives good fodder for livestock. Interested? Contact:
Ikinyukia Self Help Group, P.O Box 125, 20319, South Kinangop. Tel. 0724 492 456

The Organic Farmer

BIOVISION

The newspaper for sustainable agriculture in Kenya Nr. 3 June 2005

More drought resistant crops

Due to the unpredictable weather patterns, Kenyan farmers should grow more drought resistant crops.

By The Organic Farmer

It is sad to hear that Kenya is again faced with food shortage due to the delayed onset of the long rains in March and April this year. This is a worrying trend considering that the country has a huge potential for food production.

Whenever the rains fail, Kenyans are often faced with a desperate situation forcing the government to appeal for food aid from donor and relief agencies to save lives. This is a situation which can be reversed if only farmers and the majority of Kenyans can accept to diversify the food crops we grow and eat.

A variety of crops

For decades we have come to rely on maize as our staple food, yet this crop needs plenty of rainfall and a longer length of time to mature for consumption and sale. It is unwise for Kenyan farmers to continue relying on a few crops, that are expensive to produce and more so in a country that faces grave food insecurity..

Sorghum-the alternative? (Photo TOF)

Previously Kenyans relied on a variety of food crops that were crucial to the country's food security situation. These included cereal crops such as sorghum, millet and cassava roots and tubers such as sweet and Irish potatoes, beans and peas (see: Sorghum, page 8). The last few decades however have seen a decrease in the production of these crops as more and more farmers switched to the production of maize, wheat and rice.

Indigenous crops

Although the above traditional crops can do well even in low potential areas, many farmers in this areas still plant maize often with disastrous results. It is cheaper for farmers to grow indigenous crops which do not require a lot of inputs, care and are less susceptible to diseases. Farmers require much more education on the benefits of growing such food crops.

But one thing we should not forget: Hunger is first of all the root cause of poverty. There is enough food on the market, either locally produced or imported. But tens of thousands of families in Kenya do not have the money to buy it. This is the real scandal in Kenya.

Dear Farmers

We have a problem: Many letters are being returned to us because of wrong addresses. Please send us your correct address: Note: We have a new e-mail-address:

info@organickenya.com

In this edition:

Let's learn from each other

Last week we got a call from Charles Maina, a small-scale farmer in Karatina. He found The Organic Farmer by chance. After reading and discussing the articles with his fellow farmers in the neighbourhood, they decided to form a group, so that they can get our newspaper regularly.

By The Organic Farmer

This is exactly what we support. First, we can reach more farmers in Kenya; sending The Organic Farmer to a group is also cheaper. Second, and this is even more important, Charles Maina and his colleagues have discovered a very important message: Farmers have to join, have to build up groups. They should work together and support each other in their day-to-day life. They have to learn from each other and to unlock local skills, they have to share their knowledge and their experiences. And they have to help each other in rising the awareness for new techniques, for instance in organic farming. This grassroot-approach will not only build up the individual and collective confidence but also enhance the self-confidence of the farmers. It's them who are feeding the country, and they are the backbone of Kenya's economy.

Acting as a group will strengthen the position of farmers. As a group they have much more pressure for realizing their common goals. There are so many possibilities for change to a better livelyhood. But we have to do it, we have to push. And we have to trust in our own capabilities, and to commit ourselves to change in a free and fair way. We can not wait for somebody who is doing the work for us; nice but empty words have never changed anything.

Of course, this takes time, patience and the mutual respect even for poeple with other opinions. All of us will sometimes have to jump over our own shadow. This farmer-to-farmer approach needs a change of our attitude and of our behaviour. But we should never forget a very true and very old word: Unity makes strong.

MY OPINION

"Poverty is a major cause of food insecurity and sustainable progress in poverty eradication is critical to improve access to food. This should happen within the framework of sustainable management of natural resources, elimination of unsustainable patterns of consumption and production, particularly in industrialized countries, and early stabilization of the world population. We acknowledge the fundamental contribution to food security by women, particularly in rural areas of developing countries, and the need to ensure equality between men and women.

1996: Declaration of the heads of state on Wolrd Food Security

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly and distributed free to farmers.
The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA, Tel. (020) 861 680
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Secretariat
Lucy W. Macharia
Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA, Tel. 0721-793 759
e-mail : info@organickenya.com

Soil Fertility with Liquid Manure

You have tried chemical, compost, mulch and others, now try liquid manure for exemplary performance.

By Eric Lumosi Asiligwa

Strength of soil is determined by the amount of nutrients it has. Well maintained soil will observe fertility. If soil is overused, it loses capability to feed plants. Therefore, it is important to think in terms of liquid manure and plant teas or slurries. Liquid manures are helpful to overcome temporary nutrient shortages, they supply nutrients very fast. In organic farming they are mainly used to stimulate growth during the growing season, especially when roots have been damaged and nutrients uptake through the roots is hindered.

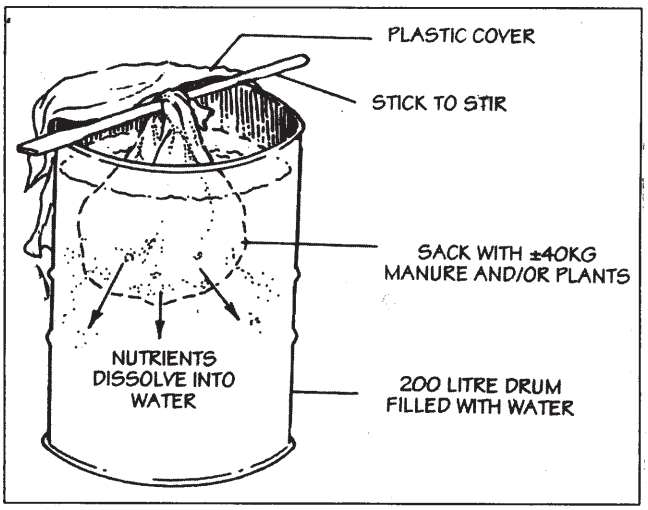
Liquid manure and plant teas are ready for use after two to three weeks, as compared to eight weeks or more for compost. Liquid manure is made from farmyard manure (i.e. cow-dung, chicken & goat droppings e.t.c.) The process is simple to understand: Nutrient rich material is soaked in water for at least 15 days to undergo fermentation. Frequent stirring encourages microbial activity. The contects mixed could produce a very strong smell, as excess nitrogen turns to ammonia. It is therefore best to keep a cover on the drum, also to prevent evaporation.

How to make liquid manure ...

1. Put the manure in a strong sack (50 kg of manure for one drum of 200 litres). Fill it in such a way that you can tie the top of the bag securely.
2. Suspend the bag containing manure in a drum full of clean water. The bag should be tied securely with a rope and suspended on a strong pole placed across the top of the drum.
3. Leave the manure stand for 15 days. Cover the drum to prevent excessive evaporation.
4. After three days and every other day thereafter, stir the drum by lifting the bag several times using the pole.
5. After 15 days the water will have turned blackish and most of the plant food in the manure will have been washed into the water. Remove the bag.
6. The mixture is a concentrate and therefore needs to be diluted to the ratio of 1:2 (to 1 part of liquid manure add 2 parts of clean water). As a rough guide the diluted liquid should be a weak tea colour.
7. Water with this liquid manure for two or three weeks. Spray the crop at the stem and not at the leaves. Water around the roots near the stem. It is effective as top dressing after planting the crop using compost.

... and plant tea

The preparation of plant teas is similar to liquid manures. Comfrey leafs are best, but you can also use the leafs of Tithonia, a bushy plant with nice yellow flowers (Maua Msandogo).
1.When preparing plant teas, branches and green sappy leaves are chopped up and placed in a drum full of clean water. It is not necessary to put the leaves in a bag.
2. Leave it covered during 15 days. After three days and every other day thereafter, stir the drum.



3. After15 days remove the leaves, dilute the content of the drum to the ratio of 1.2 (to 1 part of plant tea add 2 parts of clean water).
Water with this diluted plant tea for two/ three weeks. Spray the crops at the stem, not at the leaves.Water around the roots near the stem.Water with this plant tea for two or three weeks

Invisible poison in maize-cob

Maize contaminated with aflatoxin is dangerous. It slows down the growth of children, causes liver cancer and makes people vulnerable to infectious diseases.

By Felix Mbitu Murimi

Some weeks ago thousands of school children in the slum areas of Nairobi waited in vain for their daily meal. The maize they used to get from the World Food Program was contaminated with aflatoxin. 40'000 tons have been withdrawn - Kenyans still remember, that between May and mid-June 2004 in Machakos and Makueni, more than 150 people died after eating food contaminated with aflatoxin.

The problem is well known. In sub-Saharan Africa maize grain is chronically infected with a mold fungus, Aspergillus flavus. The fungus produces aflatoxin which enters the body through the consumption of grain-based food. Aflatoxin contamination of maize, peanut and other food crops is considered to be a major cause of liver cancer in humans. It also disturbs the immune system and people become more susceptible to infectious diseases.

Invisible danger

Researchers from the International Institute of Tropical Agriculture (IITA) in the Benin (West Africa) identified the causes of diminished growth, leading to a slower development of children in the region. "Some infants are exposed at an early age and this continues throughout life", says Dr. A. Hounsa of IITA. Besides, the study showed that growth is going on in slower steps, when the infants were weaned from mothers milk to solid food, especially when there are other hazards from a wide range of infections, that include malaria, bilharzia, diarrhoea and respiratory infections.

The problem with aflatoxin is that farmers cannot always see the fungus that produces it on the corn. Moreover, the toxin is colourless and it does not disappear after cooking or fermentation. As in West Africa, a large part of the population in East-Africa and especially Kenya might be chronically exposed to high dosages of aflatoxin, though the extent of the problem is not known yet. Consumers are not aware they are eating contaminated food. Even those who buy only from exclusive supermarkets are not spared, according to research findings by Dr George Siboe, Senior Lecturer at the Department of Botany, University of Nairobi. Dr Siboe has isolated aflatoxins, among other mycotoxins, from popular brands of maize flour currently in the Kenyan market.

In a comprehensive study, Dr. Siboe and his colleagues collected 174 samples of flour packed in 90 kg bags and 2kg packets in Nairobi from different selling points that included ordinary grocery stores, kiosks, supermarkets and open air- markets. The samples were tested for fungal infestation and were all found contaminated with molds that produce, among others, aflatoxin. 70 per cent of the 174 samples were found to be contaminated with aflatoxin, 55 percent of the samples contained similar poisonous substances produced by a fungus.

A good harvest – but aflatoxin in maize-cobs can affe the growth of children. (Photo BioVision/P.Lüth

Start on the field

The role of insects in the contamination of maize by the mold and aflatoxin has long been recognized. The more beetles and weevils in the store, the higher is the threat of aflatoxin. In addition, the researchers in West Africa showed that the aflatoxin problem starts in the field. Pre-harvest grain damage by stem-borers (for example the spotted stalk-borer) makes grain more vulnerable to infections by molds, and this leads subsequently to a higher contamination with aflatoxin. Aflatoxin levels increase rapidly with grain damaged by stem-borers. That means: a reduction of field pest, such as the spotted stalk-borer, through biological control would also lead to a reduction of aflatoxin in stored grain.

Watch the maize cobs carefully

- Don't keep maize in the field after maturity. It will be attacked by birds; the openings allow access for storage beetles, which will carry fungal spores.
- Plant varieties with good husk cover (i.e., length of husk leaves above the tip of the ear more than the width of two fingers). Bad husk cover gives insects and fungal spores easy access to the cobs.
- When removing husk leaves at harvest, do not throw the naked cobs to the ground; they might get infected by the fungus, which comes from the soil.
- Only store properly dried cobs.
- Do not store maize cobs containing grain damaged by insects, birds or rodents, as they might already be infected by the fungus. Remove damaged grain immediately and feed them to the chicken and consume the remainder immediately.
- If you store with the husk leaves on, carefully check cobs for exit holes of stemborers and the tip of the cob for insect damage. Do not store such cobs.
- Do not store maize with leaves/herbs; they are no protection against beetles and increase fungal infection.
- In general, do not consume any grain that has been damaged by insects (borers and beetles).
- Clean the store thoroughly before filling it.

These tips are given by ICIPE-scientist Dr. Fritz Schulthess

Michael Waweru (left) with members of Oloirien Organic Farmers Welfare Group. *(Photo: P. Kamau)*

Group changing drought prone district

They have turned a desolate place in the dry plains of Kajiado district into a rich agricultural land.

By Peter Kamau, Kajiado

Water is scarce in much of Kajiado district, but this has not stopped Michael Waweru and his farmer group, The Oloirien Organic Farmers Welfare Group from going into organic farming. So when he heard friends discussing the benefits of organic farming 3 years ago, he decided it was the way to go.

"When I realized that it is possible to grow crops without the use of chemical fertilizers and pesticides, I decided we were going to try it", he quips. Together with 5 members of his village welfare group, they invited extension staff from the Kenya Institute of Organic Farming (KIOF) who taught them organic farming. It was then that they formed the farmer group.

Revolving fund

Today the group, with 60 members has turned a desolate place, 70 kilometres from Nairobi, in the plains of Keekonyokie location of Kajiado district into a rich agricultural land, teeming with healthy organically grown maize, beans, potatoes, peas, onions, avocadoes, papaws, water melon and bananas. They have also set up a revolving fund to assist needy members in buying farm inputs, school fees or development.

The 58 year old Waweru, a father of five, is the group chairman. The group has a ¼ of an acre plot which they use for demonstration while each member owns an average of 3 acres where they grow their own crops. Although market for their organic produce is still a problem, the farmers sell their produce to selected grocery shops in Kiserian market.

"The most important thing for us is that we can now grow healthy food for our own consumption. We know what chemically produced food is doing to people's health", says Waweru.

Manure

Each of the group members keeps a few sheep, goats and chicken which provide the manure for use in the farm. The manure has helped improve the texture of the area's clay soils and its productivity. "Before I could only harvest 5 bags of maize in one acre. After using manure on my farm, now I can harvest 10 or more bags. We have seen a big difference with organic farming", says George Ndungu, a group member. Although labour intensive at the beginning, organic farming has assisted the members reduce the cost of inputs by use of farm manure to boost soil fertility including natural methods of pest control.

Water problem

Oloirien Village has a big problem of water, but the group members have learned to conserve the little moisture available through mulching methods to grow crops. They have built small water pans near their farms or use house roofs to harvest the little rainwater available for irrigation and domestic use.

The American Embassy had promised them pipes for the water project, but none of the donors they have approached, can sink a borehole for the community. The demonstration farm provides the members with seedlings. It is here that new members learn new skills and exchange ideas on organic farming.

Market

To address the problem of market for their produce, Waweru says plans are already under way to open a shop at the Kiserian town where they will exclusively sell organic products.

"Through the shop we hope to educate the public on the benefits of eating organic food to remain healthy. In this way we will have solved the problem of market for our produce", he says.

Expanding groups

Already the group is trying to reach out to more farmers in the area to increase membership with the aim of producing more organic food for sale locally and for export. Part of this arrangement is to purchase a 10 acre plot near Kiserian town, where they could grow food commercially for sale to exporters.

The group hopes this will help boost the income and living standards of its members.

Many ways for natural crop protection

Natural crop protection is good for human health and the environment. Farmers need a lot of knowledge on these protection methods..

By The Organic Farmer

When Isaac, Eric, Aggrey, Richard and other friends went up country to distribute *The Organic Farmer*, they were asked by so many farmers: "What do you use against this pest, or against that one?" We got similar questions by farmers in mails and Letters to the Editor. That's why we decided to carry in the coming issues some articles about natural crop protection. In this June-Issue we lay the ground for this articles. We begin with the principles of preventive crop protection.

Agriculture and environment should be ecologically associatted. (Photo N. Wasem)

A combination of methods

In agricultural systems where synthetic products are not used for crop protection, farmers use a series of direct and indirect measures to safeguard their crops from the ravages of enemies. Crop protection is a complex process which requires an understanding of the interaction between the environment, methods of farming and the predominant system of cultivation. Hence, crop protection cannot consist in only one specific measure, but requires a suitable combination of methods depending on crop, climate and region. These factors play an important role in the way a farmer decides to protect his crops. That means, farmers should have a strong knowledge on these aspects.

Ecological relationship

It is not the function of plant protection to ensure maximum production. This is an aim imposed by man. It is better to strive for an optimum ecological and economical relationship which leaves other life forms space and resources. But when pests threaten the safeguard of food and human existence, it is not easy to not regard them as enemies.

Many measures

First of all it is important to recognize that a natural crop protection measure as we will introduce to you in the coming issues of *The Organic Farmer* is to be understood as one measure amongst many. Generally, the short term effectiveness of natural measures is not as great as that of synthetic pesticides (chemicals). But in the long term run it is obvious that they have the following advantages:

- they diminish the risk of pests building up an resistance to treatment.
- they have a less destructive effect on the natural enemies of the pests,
- they diminish the risk of secondary outbreaks,
- they are less harmful to the health of either humans or farm animals,
- they cause no damage to the environment or to water supplies,
- they mean no dependency on a constant supply of agricultural chemical to the farmer, and
- they cost much less.

Let us now look at the essential principles of preventive crop protection measures through cultural practices.

Mixed farming

It is good for a farmer to have some knowledge of the way in which cultivated fields and the surrounding countryside are ecologically associated. Constant observation is very important to gain a vital awareness about the interactions. This is a valuable instrument for the proper decisions and measures most suited to local conditions.

Traditional agriculture systems present a landscape of great variety. In the fields many different crops grow simultaneously side by side, and wild flowers and plants add to the diversity. The greater availability of small habitats maintains a higher permanent population of the predators and parasites of pest. This is one principle of mixed farming: Pests can become confused or disoriented and thus are not able to detect or discover their food plant. Repellent effects also reduce the spread of pests.

For instance, maize and cowpeas planted together are subject to significantly less damage from the stalk borers. Or a mixture of maize and beans reduces infestation by the fall army worm. Potatoes planted in conjunction with onions, beans, Soya beans, tomatoes and maize were significantly less affected by the potato tuber moth.

But farmers should understand that the opposite effect can also take place. In some cases mixed cultivation increases infestation. That means, farmers have to sobserve carefully.

We have obtained these tips from a very informative book, "Natural crop Protection" by Gaby Stoll, published in 1987. In the next issue of The Organic Farmer we will write about the importance of crop rotation and the choice of plant varieties.

Letters to the editor

Farmers in Limuru go through a copy of Organic Farmer (Photo F. Murimi)

More information, please

Dear Sir's

Congratulations for launching the Organic Farmer newspaper. After working in an organic farm- Moof Africa in Nanyuki since 1999 I have developed an interest in this farming system. Right now I am the patron of Kaaga Organic Farmers Self Help Group and therefore I request you to provide with more information on this method of agriculture. My fellow farmers would also be grateful if you can assist us supplement what we already know in this field.

Phillip Mukiri Mwangi, Nanyuki

We are unable to carry all the information you may need. However you may order a book by the title "Field Notes on Organic Farming", edited by the Kenya Institute of Organic Farming (KIOF) whose address is: Kenya institute of organic farming, P.O Box 34972, Nairobi, Tel: 732487,580450; E-mail: kiof@elci.gn.apc.org

Useful

Dear Peter,
This is to confirm receipt of your second issue of The Organic Farmer Newsletter. Kindly retain us in your mailing list. The information is very useful to us and those we closely work with especially in the field. Thanks so much!
Karanagthi, Green Belt Movement

Dear Farmers

Do you have anything to offer? Are you looking for something? This column is your market place. Letters must be brief, do not forget your address! We also would like to remind you of our new e-mail-address: info@organickenya.com

Educative

Dear editors,
I wish to thank you for sending the newspaper on organic resource management.I has distributed the copies to farmers groups and a secondary school. The article by Su Kahumbu was very educative especially on pollution caused by agro-chemicals.On behalf of the AGRO-CONSERVE YOUTH FORUM I wish to thank you for creating a forum for exchange of information in organic agriculture.
Mathew Kemboi Kwambai

Please in English

Dear Organic Farmer editors,
As for the language matter in the current issue I would like to advise that most farmers with difficulty in reading English have even more difficulties in reading Kiswahili, and they would be more comfortable dealing with English. The exception is the coastal region. So please continue publishing in English unless you are doing so for the coastal region. My advice is based on years of working with farmers and involvement in production of extension materials.
Thank you for the good idea of producing the Organic farmer.
Dr. Joseph Methu PhD, Nairobi

Some farmers from Embu called us. They were not very happy with English; they would prefer Kiswahili. What do you think? The disucssion is still open!

Bacterial wilt

Dear sirs,
The Organic farmer last month was well received by farmers, especially the practical tips in the control of potato bacterial wilt disease. However, the farmers are wondering if the same methods can be used to control the disease in other crops in the same family. We hope that in the coming issues you will deal much more in that area. I must thank you and urge you to keep up the good work in alleviating poverty.
Jotham W. Namasambu

We know the seriousness of the problem, Namasambu. We will consult experts and give you the right answers in one of the coming issues.

Encouraging

Thanks you very much for sending me your newspaper. Organic farming has been of great help to us. I know many farmers will be encouraged to practise organic farming after reading the paper.
Godfrey Gichuhi, Karatina

Very "glossy"!

Dear Sir's,

Thank you for sending me the Organic Farmer, I have received both issues.I thought the article very well done regarding compost in this issue, but would comment that compost should be ready in three weeks not months in Kenya if made and turned well. I use it within that time made in Limuru and I do use EM. I do not know if you have seen 'Acres' the 'voice for sustainable agriculture' in America ? it is published exactly like a newspaper and no colour pictures, it is an inspiring paper and if you published that way you might be able to find funding for a paper with a lot more useful content. Yours is very 'glossy' and we are not a 'glossy' section of society !
Well done! Susan Brown, Nairobi

Farmers are now producing potato seed

Because of landgrabbing the Government can no longer meet the country's potato seed demand.

By Peter Kamau

An acute shortage of potato seed has forced research and multiplication centres to allow the production of seed by selected farmers for sale to growers.

Private individuals have grabbed large portions of research land that was previously used by the Kenya Agricultural Research Institute (KARI) to multiply seed for farmers. The farmer-based multiplication of seed has been started by the National Potato Research Centre (NPRC) in Tigoni, Limuru to increase both the seed quantity and quality available to farmers countrywide.

"We realised many farmers were planting normal potato due to lack of quality seed which has led to an increase in potato diseases. We want them to renew their seed every time they plant to ensure the diseases are controlled" says John Karinga, a potato expert at the centre.

Due to lack of land, Karinga says the government's seed multiplication program can only cater for 1 percent of the country's seed requirements.As a result, the majority of farmers in the country do not have access to quality seed. "By allowing them to produce seed, we help them to increase clean seed and facilitate its access by a larger and more diversified group of farmers across the country", he adds.

Renew the seed

The centre closely monitors farmers to ensure that production standards are maintained. Most growers in the country have been using recycled potatoes as seed and when the productivity of a variety decreases, they buy the seed from a different region or exchange it with neighbours. Apart from spreading diseases, such seed will often reduce the overall yield.

"Farmers should renew their seed every season in order to reduce the incidence of diseases and improve harvest" says Karinga.

There are many varieties

The following are some of the seed varieties being produced by farmers:

Tigoni: The Tigoni seed variety was released in 1998 and does best in areas with an altitude of 1800 to 2600 metres. It matures in three to four months. The variety is good in making chips, boiling and mashing . It is tolerant to most of the potato diseases such as late blight and does not rot fast during storage. It is mainly grown in Kiambu, Nakuru, Uasin Gishu and Narok areas but still does well in most potato growing areas.

Asante, Furaha: It has all the qualities of the Tigoni variety but it is mainly used for domestic consumption as it is not good for industrial processing. It can also tolerate most potato diseases. The variety does best in Meru, Mt. Elgon, Nyeri, Mbooni, Ndeiya, Machakos, Laikipia and Taita Taveta districts. It still does well in most of the potato growing areas.

Dutch Robjn: This is one of the old varieties. It was released in 1960 and it does well in areas with an altitude of 1600 to 2600 metres . It takes 4 to 5 months to mature. It can be stored longer and is suitable for industrial processing such as in the making of potato crisps. It does best in Mt. Elgon and Bomet areas.

Kerr's Pink: The variety does well in areas with an altitude of 1400 to 2700 metres. It is tolerant to drought and is mainly suitable for domestic consumption. It is grown in Meru, Nyeri and Nyandarua.

Desiree: This is a variety that grows in high altitude areas. It is suitable for industrial processing and can be stored for a longer period.

Seed Producers

The most commonly grown varieties, mainly preferred because of their tolerance to diseases are the Tigoni and the Asante varieties. Farmers interested in acquiring clean seed should get in touch with the following producers:

Central Province
Vincent Mbugua P.O. Box 29
Miharati Tel.0734-605876
Patrick Ndungu P.O. Box 204
Limuru Tel.0722-748745
John Kimaru P.O. Box 159
Nyandarua Tel.0720-926227

Eastern province
Beatrice Mburugu P.O. Box 120
Timau Tel.0721-673914
David N M'Nguthari P.O. Box 3176
Meru Tel.0720-376478

South Rift Valley
Ann Mbugua P.O. Box 466 Molo
Tel.0722-691245
Ezekiel Saoli P.O. Box 592 Narok
Tel 0735-493306
Samuel Ketyenya P.O. Box 104
Keringet Tel.0722-898805

North Rift Valley
Mr Powon c/o KARI P.O.Box 450
Kitale Tel.0733 893140

Mr. Komen c/o Kenya Plant Health Inspectorate Service Kitale.

NEWS - CORNER

Victory for Third World

The European Patent Office, based in Munich, Germany, has upheld a decision revoking a patent on a fungicidal product derived from the seeds of the Neem tree marking a milestone in the struggle against theft of biological resources of indigenous peoples. According to a press release jointly issued by the petitioners seeking repudiation of the patent claimed by the US and the company Thermal Trilogy, the historic decision resulted from a legal challenge started ten years ago. The plaintiffs contended that the fungicidal properties of the Neem tree had been public knowledge in India for centuries, a fact that undercuts the patent holder's arguments of inventiveness and novelty. Such a patent, they said, merely manifested the crafty skewing of international law by powerful corporations and opportunistic scientists from the US and EU to steal biological resources from poor countries and peoples. It was the first successful biopiracy-case - the theft of biological material - since indigenous peoples across poor parts of the world started to wake up to the clandestine transfer, appropriation and commercialisation of their biological knowledge.

DDT a threat for exports

Uganda will lose some major export markets if the Government goes ahead with plans to spray the chemical DDT, an official of the Uganda Exports Promotion Board has said. Europe and the US will not accept products with pollutants. Because of its danger to human beings and the environment the use of DDT is forbidden in Europe and in the US.

Sorghum needs little rain, is nutritious

It is not only drought resistant, sorghum is also nutritious and can grow in most of Kenya's climatic zones and soils.

By Abisae Amugune, Arorr

Sorghum has to be stored in a dry place. *(Photo BioVision/P.Lüthi)*

Sorghum is Africa's oldest food crop. It is often referred to as the continent's food for the poor. However many Kenyan farmers do not grow it. Yet this crop holds the answer to the country's food security. It is not only drought resistant and adaptable to most of Kenya's climatic zones and soils; it is also full of energy giving nutrients and has many uses unlike common cereal crops such as maize and wheat.

The high concentration of potassium and starch in sorghum, a less acidifying effect and the fact that it is easily absorbed and well tolerated is a reason, why it is given to sick people such as diabetics, adults and children alike. Bakers use it to add flavour and colour to bread and other confectionaries such as pancakes and doughnuts. Traditionally sorghum is used to make ugali or fermented to make porridge. Yeast is sometimes added to make sorghum beer. It can be processed into a variety of whole grain products similar to those used traditionally or just chewed as a mouth freshener.

Organic method

In Kenya it is grown in low and medium altitude areas with a minimum of 600 mm of rainfall but it can still grow in areas with as little as 250 mm of rainfall. Most Kenyan farmers use organic methods in the production of sorghum since it does not use a lot of chemical fertility in the soil. The farmers use manure prepared from animal by products.

Research has shown that local varieties of sorghum are less prone to bird damage compared to hybrid ones. To get a good yield, farmers should buy seed varieties suitable to their ecological zones.

Useful tips for planting and harvesting sorghum

Land preparation: All seed varieties require a fine seedbed for better seed establishment. If a tractor or oxen plough is used, it is advisable to harrow. The field should be prepared after harvesting.

Planting: Dry planting is highly recommended. Plant before or at the onset of the rains in the furrows made by the tractor or oxen plough, hill plant in the holes made by jembe or panga. Seed should be applied at 3 to 4kg per acre. When dry planting the depth should be 5 cm but in moist soils it should be 2.5 cm to 4 cm.

Spacing: Row spacing is 75 cm and between plants at 20 cm. Row spacing of 60 cm and between plants at 20 cm is recommended when using wheat planter. In semi arid areas the oxen yoke is fixed at 90 cm especially in Machakos, Makueni, Kitui and Mwingi districts.

Intercropping: Sorghum can be intercropping with grain legumes such as beans, cowpeas, and pigeon peas. Alternate single row of legume between 2 sorghum at 90 cm and legume row at the centre. For double rows of legume, spacing will be 150 cm by 20 cm – that is two rows of legume between rows of sorghum. For semi arid lowlands and coastal areas, intercrop at single row of legume between 2 sorghum rows.

Manure application: Most soils in sorghum growing areas are low in soil nutrients including nitrogen and phosphorus, which are important for adequate crop growth. To alleviate this deficiency a wide range of manures and fertilizers are used. Manure improves the organic matter content of the soil, soil moisture retention ability and structure. Manure can be broadcast in the field and mixed with soil during ploughing It can also be spread along the planting furrows and mixed with soil before seeds are placed.

Weeding: The parasitic striga weed attaches itself to the roots of sorghum depriving it of nutrients and reducing the yields sometimes by up to 50 per cent. The weed can be controlled by crop rotation with legumes and cotton.

Thinning: Sorghum seedlings can be thinned to one plant per hill 3 weeks after emergence in semi-arid warm areas or 4 weeks in cooler areas when the new plant has 2 to 3 leaves. It should be done when the soil is moist to reduce moisture loss.

Harvesting: Harvesting should be done when the grain is hard and does not produce milk when crushed. Cut the heads with sickles or a sharp knife when the plant is still standing or on the ground.

Drying and storage: The harvest can be sun dried in the same way maize is dried. It can be dried in panicles (sorghum heads) or threshed into grain.It should be dusted with super actellic at 50 g per 90 kg bag to kill pests before storage. Clean the store before storing the grain. After every 2 or 3 months the grain should be removed from the store and dried for 2 or 3 days to protect it from mould.

The Organic Farmer in July.

What does it mean to be an organic farmer?

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 10 February 2006

Ticks cause huge losses

Kenyan farmers are loosing billions of Shillings every year because of ticks and tick-borne diseases. Ticks are becoming resistant to chemicals.

The Organic Farmer

Thousands of farmers in Kenya can talk of their bitter experiences with a pest only a few millimetres in length and the tongue-twisting name of *Rhipicephalus appendiculatus*. In Kenya as well as in several other East African and Central African countries this pest is better known as the Brown Ear Tick. It is the most dangerous of the 70 or so tick species found in Kenya. The Brown Ear Tick transmits the parasite *Theileria parva* to cattle and causes the notorious East Coast Fever (Ndigana, - in Kimaasai and Kikuyu).

A million cattle affected

Although there are no accurate figures, experts estimate that several thousand cattle in Kenya die each year from East Coast Fever. Other sources put the number at up to a million cattle. Kenyan farmers purchase chemicals (known as acaricides) to control the tick, worth about Ksh 400 million every year. Once the cattle catches the East Coast Fever, the economic damage rises into millions of shillings, since the cattle take a long time to recover. During recovery, almost no milk is produced, and the animals lose weight. When the disease affects calves, even if they recover, they become stunted. The treatment for a single cow costs more than Ksh 4,000.

A cow's ear infested with ticks (Photo ICIPE)

The organisation Veterinarians Without Borders-Germany in collaboration with the Kenya Agricultural Research Institute (KARI) and the International Livestock Research Institute (ILRI) have recently carried out large-scale tests in parts of Narok and Kajiado districts with a vaccine against East Coast Fever. One dose costs between Ksh 600 and Ksh 800.

Life long immunity

It involves injecting an animal with the parasites together with an antibiotic. The immunity induced protects the animal for its entire life. It protects the animals from the disease, but not from the tick infestation which weakens the cattle and causes other infections, and therefore affects the health of the animals. That means even if the cattle are vaccinated, they still need to be protected from ticks. But the frequency of treatment with acaricides can be reduced from weekly to once every three or four weeks, depending on the area and season both of which influence the availability of ticks.

This vaccine is not yet available countrywide. There are plans by KARI, the private sector and ILRI to conduct similar large scale tests in other areas of the country so that the vaccine can be available. Since the producers of the vaccine are the same ones as those who sell the chemicals against ticks, some experts fear that these producers might not be interested in promoting the vaccine because the demand for the acaricides would decline. *(See page 5)*

in this issue

Dear farmers,

First, we would like to thank all those who have filled the questionnaires and returned them to us. We kindly appeal to all the other farmers who have the questionnaires to make sure they send them back to us as soon as possible. Your answers will enable us to respond better to your needs and ensure you receive the right kind of information to use in your day-to-day farming activities.

After reading a few of the questionnaires the farmers have sent back to us, we are glad to note that many of you have embraced organic farming and are already making use of the information our newspaper provides such as the tips we give on pest and disease control. This clearly shows there is a bright future for organic agricultural production among our farmers. We will give you the true picture once we have received all the questionnaires from the field.

Our sympathy goes out to our brothers and sisters in Northern Kenya. They have to endure another devastating drought and famine. This has led to great suffering and deaths of livestocks and even humans. We may not want to go into the details of what is happening but we are really disturbed to know that while these people suffer, the National Cereals and Produce Board stores in the affected areas are full of maize that is yet to be distributed. This shows that Kenya badly needs a streamlined distribution system and less bureaucracy.

As we have said before, the policy makers need to take agriculture more seriously as the important sector it is. The government should formulate strategies that help boost food production in the long term. Being the backbone of the economy, any small disruption, lack of proper planning or implementation of policy in this sector affects the whole economy. It also threatens the country's food security. While we support increased agricultural production, this does not mean there is inadequate food in the country. Food is available but the starving people in most parts of the country cannot afford it because they live in extreme poverty. Only a stable economy can improve their incomes.

MY OPINION

By Mary Wanjiru

Sometimes I find it difficult to understand my fellow Kenyan farmers. The world over, farmers are adopting new methods of agricultural production which improve human health, protect the environment and increase crop yields. But not our farmers; here a farmer will learn how to make a natural pesticide to control a particular pest, but when the pest strikes he will go to the nearest shop to buy a chemical pesticide, although he knows the dangers of using chemicals! He will spend every penny he has saved to buy DAP fertilizer, although there is good manure in the cattle shed.

Mary Wanjiru is a farmer in Kitale

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

Good nursery ..... good start

Most plants can be propagated with seeds. The work has to be done carefully; seeds need moisture, warmth and darkness to germinate.

The Organic Farmer

After publication of an article on seedbeds in the December issue, many farmers asked for more information. With good reasons! Managing the propagation of plants is very important work for every farmer and should be done with great care.

Every farm needs a well established nursery as a place for germinating seeds and producing seedlings. Plants will benefit from developing in a protected, shaded area with good soil. The seedlings raised on rich soil benefit throughout their life cycle even if they are transplanted to less fertile soil. In a nursery, the first signs of pest or disease attack can be dealt with more easily.

Guidelines for a nursery

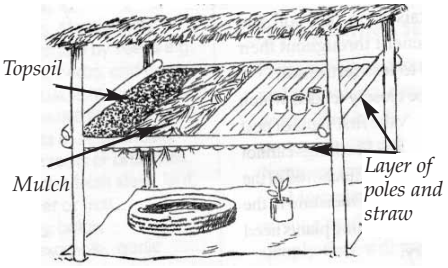
Spacing: Give seedlings space to grow. Densely sown seedlings compete for light, water and space. The healthiest plants can be selected and the weakest eliminated.

Water: A nursery needs regular watering and control of moisture in the superficial (top) soil layer. It is essential that the soil is kept evenly moist at all times. It may be necessary to water twice a day in hot weather. The ground should be level to avoid run-off damage. Cover the soil with a thin layer of dry grass or mulch. This keeps in the moisture; when there is no nursery shed, it protects the soil surface from rain splash and crusting over. Attention: if the mulch layer is too thick the seedlings can not grow!

Shade: An nursery needs different degrees of shade. It is not expensive to construct some kind of shade house from a framework of poles. Long grass or palm fonds, laid in varying thickness, helps to regulate the shade intensity for different stages of growth.

Soil: For proper germination of seeds, the soil is very important. The seedbeds and the containers should have fertile soil with loose tilth (texture) for at least 10 to 15 cm depth. The soil should be mixed with well-decayed organic matter or humus. The soil should be free of anything that may hinder growth, such as stones, gravel and hard clods of clay.

Special beds: Apart from having specially-prepared seedbeds, the enriched soil can also be put between small stone walls, in wooden boxes or in old car tyres. The tyres should be placed on a plastic sheet to avoid the roots of the seedlings touching the ground. For a bed on a wooden table



sieve the soil and mix well with straw. Make a layer of 15 - 20 cm of the soil mix and compost. The system has good drainage and avoids many pests from ground level. Water twice a day. You can also use other kinds of containers, such as milk cartons or clay pots.

Protection: Protect the nursery as a whole from invasion of animals with a wall of stones or with hedges made from thorny branches. Strong smelling plants (such as marigold) can be planted in the hedge to prevent some pest problems.

Strong seedlings can resist pests

Well prepared seedlings and good soil preparation with compost or manure create the ideal conditions for crop growth.

The Organic Farmer

Transplanting has to be done with the same care as the preparation of seedlings (see page 2). Transplanting is the removal of a young plant from the nursery in order to plant it in a permanent place. Plants raised in nurseries must not be kept there too long. Eventually they will need more space to develop normally. If transplanting is delayed, the seedlings start to compete for food. The roots get tangled and the plants are then hard to separate. They come deformed. Dwarfed and twisted plants must not be transplanted as they will not do well.

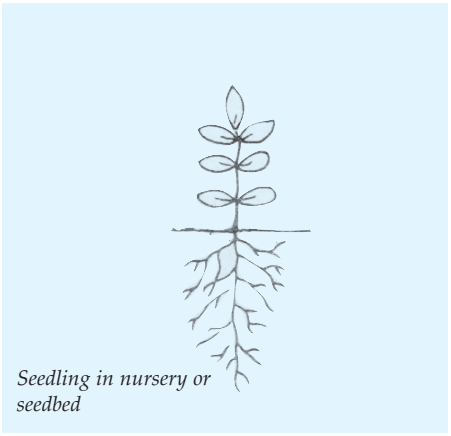
Before transplanting, enrich the soil in the new site with compost and water it well. Transplanting is done at the end of the day to allow the plant to recover in the cool night hours.

Seedlings from a seedbed

Seedlings from a bed are transplanted with their roots exposed and most soil removed. The time to transplant is when they have 2 to 6 true and well grown leaves and several well-developed roots. The stem should be firm, sturdy and erect. Using a trowel will help to crumble away the soil and lift the plant so that the roots remain intact (see illustration on the right).

Seedlings should be transplanted immediately and not left in the sun to dry out. Take a wet cloth and wrap it around the seedlings if planting is delayed. When there are too many roots they should be trimmed with scissors or a knife, not by pulling or tearing them.

The seedlings should be planted in well-loosened soil so that the small rootlets can penetrate easily. The depth of the planting hole should be greater than the length of the transplanted roots. The roots should be positioned properly. Then pull the plant half a centimetre gently upwards to put the roots in place before firming them with soil. The collar of the seedling (link between stem and roots) should be exactly level with the ground after compacting the soil by stepping or pressing it around the plant.



Carefully planted seeds grow well (Photo TOF)

The transplanted seedlings need shade and generous watering. This also helps compact the soil. Cover the soil with mulch or grass. This keeps the soil moist.

Seedlings from bags or pots

Plants started separately in bags or in pots have a root ball protecting their roots with soil. Transplanting is less risky, but take them carefully out of the bag or pot. The roots do not need trimming unless transplanting was late. When seedlings are held too long in pots or bags, the roots grow in circles. They will have to be untangled and trimmed (with scissors or a knife!) to ensure normal growth. The collar is easily positioned level with the ground. These transplants need less shade, but they should be pressed firmly into the earth and watered well.

Watch the environment

Good growth in the seedbed and later on in the garden is the best defense against pests or disease attack. Make sure that you start with healthy, viable seeds, a well prepared soil, and clean, disease-free pots and utensils. Washing pots and utensils in soapy water will normally remove most potential hazards.

Sources: Production without Destruction, Natural Farming Network, Zimbabwe 1995; Organic Gardening, Dorling Kindersley, London 2005

AIDS-widows learn to grow health foods

People affected by HIV/AIDS need nutritious food. A group of HIV-positive women in Kisii are producing their own rich food.

By Peter Kamau, Kisii

Nyaura Women Group members pick indigenous vegetables in a member's garden (Photo TOF)

It was a double blow for 33-year-old Rose Kemunto following the death of her husband six years ago from AIDS-related complications, as he was the family's breadwinner. For a start, relatives and friends shunned her, for she too was ailing and had been in and out of hospital several times. And though weak and helpless, with no-one else to turn to, Kemunto had to fend for her three children, including her last-born son of nine years who was also ailing. There were essential medicines to buy, school fees to pay and other bills to settle at home.

Group changed her life

But hope was in sight. Rose learnt that a group of women widowed by AIDS in her Nyaura village in the outskirts of Kisii town had come together to start the Nyaura Women's Group. They too had been subjected to the stigma and deserted by people previously close to them and their families. The Group welcomed her with open arms. She has now made new friends who have also taught her how to identify, grow and prepare nutritious foods that have greatly improved hers and the children's health. She has also had the courage to undergo an HIV test, and having confirmed her status, is now on antiretroviral drugs (ART). More importantly, she is now living with confidence.

"Belonging to the Group has changed my life. Colleagues help me in the garden when I am sick and advise me on the right kind of food to eat. This has improved my health and that of my children", she says.

Contributions help members

The Group started informally as a merry-go round in October 2004. Since she lost her husband to AIDS in 1997, Alice Ontuga, who is also the Group's chairlady, says that she had on many occasions depended on other people's goodwill to educate her six children, three of whom are in secondary school. But all this changed when she and other AIDS widows formed the Group. "Now I can grow the right food and even get assistance from other members to settle the school fees arrears", she says.

"We discovered that nobody wanted to associate themselves with women who were affected by the disease. We therefore decided to come together, share our problems and encourage each other", Ontuga says.

Every Tuesday they hold a meeting where each of the members contributes Ksh 10. In addition, each of them contributes Ksh 50 monthly, money they deposit in the Group's account at a local bank. To raise the money, the members have to work hard in their kitchen gardens where they grow a variety of indigenous vegetables, avocado, sweet potatoes and bananas, which they sell in the local market. In May 2004, each of the members contributed Ksh 100 for a poultry project where they bought 50 layers. These were housed in one of the members' homes, where the women take turns to care for the chickens. The Group, which is already registered with the Department of Social Services, also rented a quarter-acre plot of land from one of the local farmers where they grow Napier grass for sale to local farmers to earn extra income.

Growing indigenous vegetables

Money from the Group's various income generating activities is used to assist members to sort out their financial problems. These include buying drugs for those who are sick, assisting orphans with food, and paying school fees for those already in school. The money also helps to buy fertilizer and seeds for needy members.

The Kisii District Home Economics Officer, Hellen Biyogo says the women are trained to grow and prepare selected food crops to improve their health. These include legumes such as soya beans and indigenous vegetables, such as grain amaranth, carrots and beetroots. They also produce orange-coloured fresh sweet potatoes which have a high vitamin A content. These food crops help meet their nutritional requirements, while the surplus is sold to meet their other needs. "Value addition is also an important part of the training as it helps increase their earnings from the various products that they grow", she adds. The women are trained on how to make avocado, carrot and banana juices and jams. They are also taught commercial home baking and energy conservation methods in their homes.

They would like to diversify their activities such as in assisting each of the members to buy a dairy goat or cow to give them milk for consumption and sale. They would also like to acquire a small plot of their own where they could carry out development activities such as knitting, cookery or even operating a posho mill. They have already made proposals to several donors including the Constituency AIDS Committee, but none have yet responded. "If we get support we can achieve a lot despite our status", Ontuga concludes.

With their determination, the sky seems to be the limit.

Many tick control chemicals are not effective

Ticks have become resistant to most of the chemicals available in the market. Farmers should try other cheap tick control methods.

The Organic Farmer

The Brown Ear Tick: The female (left) after feeding on blood. The male (centre) and female (right) before feeding.

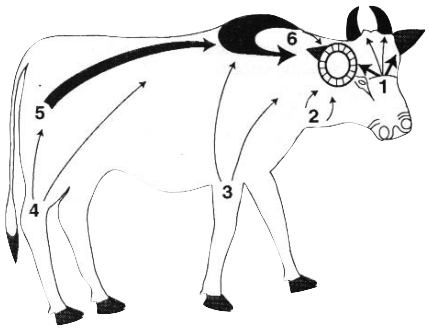
Photo courtesy of University of Edinburgh

There are many cost effective methods small scale farmers can use to control ticks. First of all, farmers need more information about tick behaviour. Ticks are not only able to adapt to the chemicals commonly used by farmers to control them, but they can even survive for up to two years without food. During this period, they can hide in pastures until they find a host to suck blood. Ticks are able to locate a cow from a distance up to ten metres. Current research is focused on controlling their capacity to reproduce following their resistance to most of the chemicals in the market. Many farmers often burn down pastures in order to control ticks. This cannot work because the ticks hide below the soil. They reappear when the grass starts growing.

To control the Brown Ear Tick that spreads the parasite causing East Coast Fever, knowledge about ticks is important. In his study, ICIPE scientist Ahmed Hassanali set ticks free on the legs and the back section of animals (see illustration below). They instantly made their way to the cows's ears. The ticks primarily fled the anal section since they did not like the smell of cow dung. That makes it necessary for the farmers to check especially the ear section of their cattle to prevent East Coast Fever infection.

Useless chemicals

But it is not only the Brown Ear Ticks that cause disease. Ticks in general are a plague and degrade the animal's health. Their bites can cause wounds on the skin and reduce the quality of the hide, inject poisons into the animal, suck blood and interfere with the normal growth of an animal.



Pathways of Brown Ear Ticks on a cow. They move directly towards the ear-region. Numbers indicate points where the ticks were released. (Fig. ICIPE)

When buying tick control chemicals, farmers need to be very careful. When *The Organic Farmer* inquired from different agro-vet-shops on the most effective anti-tick chemicals, it made a very surprising discovery. Some shopkeepers told us frankly not to use some of the chemicals they were selling, since they do not help the farmers. The ticks had become resistant. One shop attendant pointed out clearly: "These products should be removed from the market, the farmers are being cheated".

Pour-on oils are effective

The only effective tick control chemicals are those made from synthetic pyrethroids (chemicals that act in the same way as pyrethrum). These chemicals also come in formulations known as pour-on or spot-on. The pour-on oils are easy to use because all a farmer needs to do is to pour and rub on the animal's back. The oil spreads throughout the animal's body repelling any ticks that come into contact with the animal. The pour-on oils are especially suitable in areas where there is inadequate water as they do not require diluting. But they are three to four times more expensive than the synthetic pyrethroids.

Farmers, if you really want to protect your cattle, you are advised to insist on effective acaricides (tick control chemicals), either the pour-on oils or the synthetic pyrethroids. But even these have to be applied once a week to eradicate all ticks on the cattle. Unfortunaltely the government does not allow these effective chemicals to be sold in all parts of the country. There are areas where farmers are told to continue using the chemicals, which have been shown to be useless.

Helpful plants

There are quite a number of plants which are useful in the fight against ticks. Various communities across Kenya have a wide knowledge of tick control and management, as Prof. Hassanali found out among the Bukusu community in Bungoma District. Many times this knowledge is only available in particular areas, or it is being kept as a closely guarded secret by those who know and do not share it with the others.

One of those plants is the molasse grass. Its smell does not only drive away ticks, they simply cannot survive in the grass. A small scale farmer can plant the grass around the cattle boma which works as a barrier against the ticks. The cattle on the other hand avoid feeding on the grass since they also do not like its smell. Molasse can only be effective on zero-grazing animals since free-range animals are not confined to one place (molasses grass is available at ICIPE and at most KARI stations). In this context, the zero grazing system, as practised by many small scale farmers, has many advantages. Farmers who let their cattle roam freely should consider switching to zero grazing as it is much safer.

Our research shows that up to three quarters of zero grazing farmers do not experience problems with ticks anymore even though they do not use chemicals. However, grass from outside the farmstead may carry ticks. Farmers have to be careful especially with grass obtained from roadsides where ticks reside.

Scientists have also found out that plant extracts made from neem (Muarubaini) and pyrethrum repel

Continued on page 7

To sell, you must know your customer's needs

I have decided to rear milk goats and want it to be a business. I will keep about 10 goats. Please help me with advice on where I can sell that milk. I also want to grow capsicums and cabbages organically, so please help me to market my crops. Marketing is a problem.

Francis Kungu of P.O. Box 69 Solai

You are right, Francis, marketing of farm produce is a problem faced by many Kenyan farmers. This has often led to frustration, with some of them giving up the whole enterprise altogether. But this need not be the case. Before venturing into any enterprise, we need to look into a number of factors that will help us make an informed decision.

For farmers, it is important to consider a number of issues when it comes to marketing:

1) Identify your market.

The first plan of action when trying to start any commercial venture is to identify your markets. The biggest mistake is to start producing a perishable product without any market in mind. Unless you are able to extend the shelf life of your product by processing, drying, salting, pickling, fermenting or canning, your product will expire, resulting in losses.

Always think "out of the box". Sometimes it is better to look at what is needed and try to produce it rather than to produce what is already available. By doing this you will have reduced the risk of competition for your products.

How do you identify your market? If localized, go around and see what is available, why it is in demand, whether it is profitable, and if it is seasonal. Also ask yourself if your product is not available yet required. Talk to producers and consumers. Ask yourself, "What is needed in the market?"

Once again, think out of the box. Think of growth. What will people need in a few years? Why? Take the risk of bringing them something new.

2) Identify your competitors

As in any healthy business environment, competition is rife. You must therefore get to know who your competitors are. Can you compete, or would it be wiser to join their supply chain and become a producer for an already established entity? Sometimes we fail to realise as business persons that it can make more financial sense to concentrate on production and leave the other necessary logistics (and business problems) to someone else.

3) Do some costing

When doing costing, make sure to cost everything - inputs, seeds, manure, biopesticides, water, electricity, etc. Your time and other family members' time is not free. Realistically how much would it cost to replace a family member? Could that family member be more productive in another area of the business other than what he or she is currently doing?

4) Plan to be better than your competitors

Try to find innovative ways of bringing your products to the consumer that will give you an edge over your competitors. It could be better packaging, better quality, value added etc.

5) Know your customers and give them good service

Sukumawiki (kale) today is sold ready to cook, already shredded. Are there other products that can be sold as conveniently? Consumers of today have such heavy work schedules and are now recognising the value of convenient products. Such products are also proving to be cost effective in the long run.

Francis, I hope this information will help you to make a decision on your desire to produce goat milk, capsicums and cabbages. Nairobi is too far away to market the milk, as it is perishable. My suggestion would be to look around you in Solai and see if you can create a market for yourself. You could also try to add value by making goat cheese or goat "mala" for local consumption. You may find that after reading this information you may want to produce something else all together. What ever you do, do it well.

Local sales should be your first option. Finally, by creating awareness in your area of the benefits of organic produce and by producing good quality at affordable prices, you will eventually create your own market.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

How can I use diatomite...

Francis Ndungu has another question. He read in the The Organic Farmer No. 6 (September/October 2005) that diatomite powder is good for pest control. He asks: "How can I use it? With a knapsack sprayer or through dusting to crops as powder? What is the recommended quantity while mixing?"

Diatomite should just be dusted on insects. It is best to use it on aphids, termites, and around a ground area

softbodied insects may pass. It is best to get the insects in their larvae stage, as it is difficult to apply diatomite on flying insects. It is not good to use diatomite in sprayers as it absorbs water and will block nozzles.

…and how about Pyrethrum?

Francis also wants to know more about the preparation of the pyrethrum extract for pest control. He asks: "How long should I ferment it to be ready for use? Will I dilute the mixture? What is the shelf life?"

Pyrethrum does not need fermenting; it is soaked just so as to release the pyrethrins into the water. Four hours of soaking, or even overnight soaking is adequate.

The pyrethrum water extract mentioned in Vol. 5 does not need diluting. In addition, it should not stay too long before use as it expires or becomes inactive after extraction. I would suggest it is used as soon as possible as the natural pyrethrins break down quite rapidly. Use within 3 days.

Letters to the editor

Kindly acknowledge receipt of our letters

As a follow-up to what you inquired from me at the seminar, I am sending copies of two letters dated 24th June 2005 and 20th July 2005. One was to your secretariat and the other was meant for publication in the editorial section. There is also another recent one (not enclosed) on organic cotton management. I shall enquire from the group leaders who receive the newspaper on whether they are working on written responses to you on issues raised in the newspaper on matters affecting our farmers. I shall definitely impress on them the need to do that for you to assess the impact of the newspaper. I would suggest however that on receiving letters (two or three) from an individual you acknowledge receipt in order for the writer to know they are receiving your attention particularly on important issues.

J. T. Muriithi Simba, SOHGRO

Dear Mr. Simba
*Thank you for your advice. Your article on organic cotton production will be used very soon. We get dozens of letters from farmers from across the country but we cannot use them all due to lack of space, so we keep them for future use. We hope you will be patien*t.

In Search of Katumani maize

Thank you for extra copies, due to shortage of the rains in this season, there will be no harvests. Please let us know of highland Katumani maize that matures in 100 days and where farmers can buy it.

John Njoroge, 3N Harvest, 0721 638034

Dear Mr. Njoroge,

The Katumani variety of maize seed is available at Kenya Seed Company stores in Karatina, Sagana and at Simlaw Seeds near Globe Cinema round-about along Kijabe street Nairobi. It is advisable that farmers buy their seed early to avoid the rush during the March- April planting season.

Increasing Knowledge

I recently came across a copy of your magazine and learnt that they are given out to farmers. I came across the August edition while attending my regular weekly extension courses offered by our field extension officers. I am interested in getting *The Organic Farmer* since the courses I attend do not offer all one needs. Is it possible to get your last year's supply and continue through this year.

Mrs. Pauline Ondiek, P.O Box 92, 30215, Kesogon

Dear Farmers,

As part of our efforts to serve the organic farming community effectively, we would like to create a database of organic farmers in the country. We are interested in:

-Your names,
-Addresses, Location,
-Farm acreage,
-Are you an organic farmer?

To make it easy for you, we have a special telephone number: given above. All the farmers can provide these information through short messaging service (SMS). ***Come on Farmers, Tuma jibu. Asante.***

SMS ONLY

Where do I buy EM1?

Thank you for a copy of the December issue. I find the article on Page 4 on the benefit from growth activators very interesting. My compost lasts about nine weeks to be ready for use which limits my supply for each season. However, with the application of EM it would appear I should make enough compost manure for use every season. Please let me know where I can purchase the stuff (EM) from in Nairobi..

Joseph N Nyamai, Chairperson / Project Coordinator, MARIODEFA

Dear Mr. Nyamai,
EM1 is available in all the major town in agro-veterinary shops. Please get in touch with Edward Kamau of Organic Solutions P.O.BOX 59843, 00200 Nairobi or Tel: 0733 998 245. He will direct you to the nearest distributor.

Tick control chemicals not effective

continued from page 5

ticks by their smell. Cattle which are regularly sprayed with a diluted extract of any of these plants hardly suffer from tick infestation. In addition, the extracts are more environmental friendly. Another two plants that can be used to repel ticks are the *Gynandropsis gynandra* (Kikuyu: Thageti; Kamba: Mukakai; Kisii: Chisaga; Luo: Akeo) and *Ocimum suave* (Luo: Bwar; Kikuyu: Mukandu; Taita: Murunde; Kamba: Mutaa; Masai: Sunoni; Pokot: Chemwoken). The smell of these plants drives away ticks. If they are grown in a shamba, especially around a zero grazing area, ticks stay away. This is important since ticks are also dangerous to human beings.

It is also known that indigenous breeds such as zebu are able to resist tick infestation more than the exotic breeds (European breeds). So in areas where smalls-scale farmers are not able to control ticks, it is better to keep zebu breeds or at least cross-breds rather than pure exotic breeds.

Farmers, do you have your own ways of fighting ticks? Please share your experiences with us, so that we can pass it on to fellow farmers!

A cover to cover success

Please could you put me in your mailing list. I only have your August 2005 issue and have found it enormously informative and interesting, a cover-to-cover success. From this one issue we now regularly make and apply the water extract pyre-thrum pesticide recipe. Have you previously written anything about the same uses and method of preparation for *Tephrosia vogelii.* It has been very good against aphids on sukumawiki and broccoli here, although our main problems here arise from the hot, dry weather that brings in the red spider mite plaque. How best do we control the pumpkin fly or "dudu" that stings and lays its eggs in courgette gem squash and butternut squash. Thank you and we eagerly look forward to receiving *The Organic Farmer* throughout the year.

Mrs. Rosalie Faull, Mugie Ranch Ltd., P.O Box 30 20321,Rumuruti

Dear Mrs. Faull,
We are glad to hear that you have tried some of our plant extracts recipes. We plan to feature Tephrosia vogelii in one of our future issues. As for the pumpkin pest, we will research on it and give you the answer soon.

No, farmyard manure is not a waste product!

Organic farmers should make every effort to use farmyard manure productively and to protect it from loss of nutrients.

The Organic Farmer

Manure is a valuable resource on an organic farm. Farmyard manure consists of animal excreta (dung) and bedding (usually straw or grass). In many places farmyard manure is dried and burned for cooking or is simply not recognised as being a useful source of nutrients and organic matter. By drying or burning farmyard manure, large quantities of organic matter and nutrients are lost from agricultural systems. Farmyard manure is an extremely valuable organic manure.

What are the characteristics and effects of farmyard manure?

- It contains large amounts of nutrients.
- Only part of the nitrogen content of manure is directly available to plants while the remaining part is released as the manure decomposes. The nitrogen in animal urine is available in the short term, or soon after excretion by the animal.
- When dung and urine are mixed, they form a well-balanced source of nutrients for plants.
- The availability of phosphorus (P) and potassium (K) from farmyard manure is similar to that from chemical fertilizers. Chicken manure is rich in phosphorus.
- Organic manures contribute to the build-up of soil organic matter and thus improve soil fertility.

How to store farmyard manure

Organic farmers rarely apply raw manure to their fields; they use composted manure. As composted manure is the primary source of fertilizer for an organic farm, care should be taken that nutrients are not lost from the raw manure. Farmyard manure should be collected and stored for a while so as to obtain a manure of high quality. The best result is achieved if the farmyard manure is composted. Manure stored under anaerobic conditions (for instance in water- logged pits) is of inferior quality.

Collection of farmyard manure is easiest if the animals are kept in stables. For storage, the manure should be mixed with dry plant material (straw, grass, crop residues, leaves, etc.) to absorb the liquid. Straw that has been cut or mashed by spreading it out on a roadside can absorb more water than long straw. The addition of rock phosphate, bone meal or other minerals improves the quality of the manure.

Usually, the manure is stored next to the stable, either in heaps or in pits. In any case, farmyard manure should be protected from sun, wind and rain. Water logging as well as drying out should be avoided so as to avoid nutrient losses. The storage site should be impermeable and have a slight slope. Ideally, a trench collects the liquid from the manure heap and the urine from the stable. A dam around the heap prevents uncontrolled in and outflow of urine and water.

Storing manure in pits is particularly suitable for dry areas and during dry seasons. Storage in pits reduces the risk of drying out and the need of watering the pile. However, there is a greater risk of waterlogging and more effort is required as the pit needs to be dug out. For this method a 90cm deep pit is dug with a slight slope at the bottom. The bottom is compressed and then first covered with straw. The pit is filled with layers about 30cm thick and each layer is compressed and covered with a thin layer of earth. The pit is filled up until it stands about 30 cm above ground and then covered with 10 cm of soil.

Moisture and aeration

Turning the pile is not needed if optimum conditions are met. The moisture content of the pile will often determine if turning is necessary. This can be tested by squeezing the material in your hand -- if it shines and small moisture droplets appear, the moisture content is sufficient. Beginners at composting tend to have piles that are either too dry or too wet.

If the pile is too moist, water replaces the air in the pile. These are bad conditions. You have to turn the pile to reintroduce air. The smell of the compost should be your guide; it should be sweet-smelling. An unpleasant smell indicates that decomposition suffers from a lack of air. If you are in a wet area, either

build a roof over the pile or cover the pile with straw or black plastic to avoid leaching of potash (K) and trace elements.

On the other hand, if the pile is too dry, biological activity will cease. In this case, water will have to be added. This is best done when the compost is being turned.

Application of compost

Farmyard manure takes about three months to mature and should be black to brown in appearance with a crumbly texture. Ideally, it should be spread as soon as possible after it is finished. The longer it sits, the more it mineralizes and loses available nutrients. The presence of weeds on the pile indicates that mineralization is occurring and that the compost should have already been applied to the land. Application rates vary depending on the crops, the needs of the soil and the age of the compost.

Mature farmyard manure should be spread evenly on fields. Hoe lightly into the soil as a top dressing without disturbing the root area of the crops. In lighter soils the manure can be incorporated deeper (up to 20cm) and mixed well with the soil.

A special way of applying farmyard manure is as surface compost mulch. On heavy soils this kind of application stimulates soil life. However, the loss of nutrients with this method is high. Adding a grass mulch on top of the manure is recommended in this case, although this adds to the labour inputs.

Sources: International Federation of Organic Agriculture Movements (IFOAM), Training Manual on Organic Agriculture in the Tropics, October 2002

The Organic Farmer

The newspaper for sustainable agriculture in Kenya BIOVISION Nr. 14 June, 2006

Healthy cows give more milk

Integrating animal husbandry into crop producing farms is one of the principles of organic farming. Animal husbandry plays an important role in the recycling of nutrients. In organic farming, animal husbandry is different from both *extensive* animal husbandry, which is often environmentally damaging (for instance overgrazing of common lands), and from *intensive* animal husbandry, which keeps animals under ethically unacceptable conditions. According to the standards of organic farming, zero grazing is only allowed if livestock have sufficient free movement and opportunity to express normal patterns of behaviour, sufficient accesss to clean drinking water, and clean sheds of sifficient size and with adequate light and fresh air. Landless animal husbandry is not permited in organic farming.

Page 6: Which cow breed is best?

Plants tell you what they need

Attentive farmers can detect mineral deficiencies, if they watch carefully the leaves of their plants

The Organic Farmer

Plants require three factors for growth and reproduction: light, water and nutrients (minerals). They obtain the nutrients they need through root uptake from the soil in which they grow. Since nutrients are essential for healthy plant growth and an optimal yield, it is important to maintain a high fertility of the soil, which includes a balanced nutrient supply. If a plant lacks a nutrient, it shows clear signs on its leaves and stems. The most needed nutrients are nitrogen, phosphorus, potassium and magnesium, but also boron and iron are of valuable benefit to the plant.

Organic agriculture's approach to fertilization is to feed the soil and let the soil feed the plant. The soil is provided with minerals through decomposition of plant residues and animal remains, weathering of soil minerals, through manures, composts, biosolids (sewage sludge), other organic amendments. Other food processing byproducts and ground rock products including lime, rock phosphate and greensand can be added.

Our article about mineral deficiencies on pages 4 and 5 gives advise on how to fight the lack of minerals in maize, beans and cabbage.

in this issue

Dear farmers,

When I was young, there was one thing I learned from my late grandfather. Each afternoon, he would walk around the family shamba and carefully examine every plant to see if there was any problem. If he noticed any sign of disease or pests, he would take action immediately to prevent it from spreading and damaging the rest of the crop.

Of course he had one big advantage. He knew most of the insect pests and diseases that affect various crops in our home region. In other words, he was well equipped with the appropriate knowledge that every farmer needs in managing their shamba. Many farmers may not possess the same level of knowledge, but there are various measures they can take to ensure their crops are safe from pests and diseases.

Careful observation of the crops in the farm on a regular basis is a very important exercise in modern farming. There are many benefits farmers can get from this simple activity. One of these is that diseases and pests are detected early and remedial measures can be immediately taken to prevent them.

The practice in Kenya, and indeed in many African countries, is that farmers do not pay much attention to crops once they have been planted and weeded. They focus their attention elsewhere or sit back and wait for the crop to mature and be harvested. When they finally identify an insect pest or disease, it is often too late to save the crop; a large portion of the crop is therefore lost, and with it, their investment in its production. The use of pesticides and chemicals is an added cost to the farmer.

Just in the same way we take care of our children, livestock and our other valuable possessions, plants need special care for proper growth. If a farmer notices an insect pest or disease they cannot identify, it is always wise to seek expert advice from the agricultural extension officer near their area or even a research institution. These experts publish a lot of good information. Nobody is too old to learn new things. Farming is a profession, it is a business. If we do not see it this way, African farmers will never increase their yields and income. They will remain poor.

MY OPINION

Traditionally, homestead waste used to be dumped in one place. Over a period of time, the accumulated garbage turned into good compost. Families could then move this heap, scatter it and dig it up. Crops planted in this area did well. However such a dumping site today cannot become good compost because the garbage is mixed up with nylon bags, plastic containers and related toxic material. Families can carefully sort out such wastes and make good compost that can be used as organic fertilizer. Let us improve the environment by making use of kitchen waste to grow food.

Charles Kimani, farmer, Wangige

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org
Editors
Peter Kamau, Peter Baumgartner
Secretariat
Lucy W. Macharia
Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Charles Kimani, Farmer, Wangige
Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com
Layout
In-A-Vision Systems(k)

Suitable language for farmers

Although farmers prefer Kiswahili to English, most readers understand English.

The Organic Farmer

Language is an important tool of communication, so when we started *The Organic Farmer*, one of our main concerns was which language to use to ensure the newspaper is understood by the majority of the Kenya's farming community. When we chose to use English, a number of readers wrote to us requesting that we consider using Kiswahili in order to improve information access to more of the farmers.

Many prefer Kiswahili

When we sent out the questionnaires at the beginning of the year, one of the questions we asked farmers was what language they thought was appropriate to use in future. As it turned out, more than 80% of the farmers were in favour of Kiswahili, 10% their vernacular languages, while 10% preferred English. We know the issue of language is such an important one because it determines the extent to which our readers understand what we write and are able to apply it in their day-to-day farming activities.

Kiswahili has changed

However, we also know the limitations of the use of Kiswahili, especially in defining the names of pests, diseases, botanical (scientific) names and other terms we use in our newspaper. No doubt, many farmers would find it difficult to understand these terms unless they were translated into a language they all understand.

Kiswahili as a language has changed a lot over time; this is likely to make it extremely difficult for farmers to understand the modern terms and phrases used in the language. Indeed, one only needs to listen to local radio and TV broadcast stations or read newspapers to appreciate what we are talking about.

Research undertaken on this subject shows that most of the readers in Kenya can comfortably read and understand the English language. We know that many of our farmers were not able to acquire any formal education. Therefore they may not be in a position to read and understand material written in English. This is why quite a number of them want the newspaper written in their local languages to enable them understand it better.

However, we are happy to note that an equally large number of our farmers have attained at least primary and post-primary levels of education and therefore are at ease with the English language. This group of readers is already active in the agricultural sector. They can therefore play an important role in disseminating information to those who cannot read and write. They can also help those who may be in difficulty with some of the technical terms used in the newspaper.

We use simple language

For our part, we have tried to do as much as we can to ensure that the language used in the newspaper is made as simple as possible. We always strive to explain any difficult terms for the sake of those who may be challenged by the language we use.

Even as we take these measures, we are also aware that there is a section of farmers who cannot read and understand English at all. For this section of readers, the newspaper plans to strike a balance in the use of the two languages in order to serve everyone better.

Translating selected articles

To this end, the paper intends to translate into Kiswahili some of the articles that we have already carried in our previous issues and which we feel need to reach a wide cross-section of the farming community. The articles, in brochure format, will be selected on the basis of their importance to farmers. These will include important diseases or pests affecting farmers and ways of controlling them. In this way the newspapers will become an important medium of information to all farmers in the country.

Wasp has reduced diamondback moth

The successful reduction of the moth demonstrates the benefits of using biological pest control.

The Organic Farmer

A healthy cabbage crop one year after the release of the wasp (below). Photo ICIPE

"The wasp that saves the cabbage"- this was the title of the story we wrote last year on a wasp that kills the diamondback moth (DBM). Now scientists at the International Centre of Insect Physiology and Ecology (ICIPE) have released results of their research on the use of the wasp for the eradication of the pest. They are amazing, as we will see in the following story.

A dangerous pest

Cabbage is one of the most important vegetables grown in Kenya. The average annual production is 256,000 tonnes. In the local farming system, cabbage is usually part of a mixed cropping pattern, and is mostly grown as a cash crop for the local market

The most devastating pest to affect the cabbage crop is the diamondback moth. Its control by chemical means had become difficult and uneconomical. ICIPE had been seeking an effective, economical and environmentally acceptable control method for the pest. They finally found a small wasp by the name of *Diadegma semiclausum*, which is a natural predator of the diamondback moth.

The way the wasp acts is so lethal to the moth; first it lays its eggs in the larvae of the diamondback moth. After a few days, the larvae of the wasp come out of the eggs and start feeding on the larvae of the moth, killing it. This process is called parasitism. The larva is the harmful stage of the pest, which eats holes in the leaves of cabbage and other kinds of brassicas (for instance sukumawiki, or kale).

Good results

The wasp is very common in Asia but ICIPE have now shown that it is also well adapted to conditions in Africa. The two sites selected for the research (Weruga in Taita Hills and Tharuni, Limuru in Central Province) are about 500 km apart and are known for vegetable production all year round. They are the main suppliers of kale and cabbages to Mombase and Nairobi, respectively

The scientists released the wasps in July 2002 in Weruga and in September of the same year in Tharuni. According to the research findings, the population of diamondback moths in Weruga has been reduced by more than 50 percent within one year, despite the low number of wasps released (100 females, 100 males). In Tharuni, the diamondback moths were reduced by 18 percent within one year. One of the remarkable findings of the research is that half of the moths died on the ground. They abandoned the cabbage and died after the attack by the wasp.

Environmental factors seem to play a big role in the speed of the establishment of the wasp. Weruga is a relatively cool place with good rains. Tharuni is much drier and was very dusty and windy during the two dry seasons when the trials were carried out. Insects do not like wind and dust, which might explain why it is taking longer to have the same impact in Tharuni as in the wetter Weruga site.

Economical benefits

A very remarkable factor of these ICIPE findings is the economical impact. In an additional study, the scientists calculated the potential impact of biological control of the diamondback moth in cabbage production in Kenya. On average, the crop losses due to the moth are close to 31 percent. The yield loss was estimated at 6.8 tonnes per hectare or KSh 32,616. That means that the losses for the cabbage producers throughout the country are around KSh 570 million! If these losses can be avoided with the help of the wasp, then farmers will see for themselves and easily understand the benefits of biological pest control.

Biological control agents

There are many pests threatening crop production that can spread very fast because they are not controlled by any enemy. One of the most common methods used by farmers is the use of chemicals. This is exactly the point the scientists of the ICIPE are starting from. They intensively search for natural enemies or biological control agents which are able to reduce the pests and which pose no danger to the environment. One of the best-known examples of biological control programmes was the fight against the cassava mealybug in the 1980s.

There are natural native (local) enemies of the diamondback moth in Africa. Unfortunately they have failed to control this pest. However, the wasp *Diadegma semiclausum* is well known in Asia. The earliest introduction of this wasp as a control agent against the moth was made in New Zealand. In Taiwan and in the Philippines the wasps reduced the moths by 70 percent and 64 percent, respectively. The ICIPE scientists tried to find out if the wasp could also act as a biological control agent under African conditions. It can, as the results have shown in the separate story above.

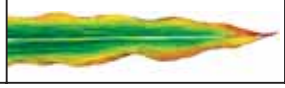
One might fear that new problems are bound to occur, for instance when the introduced predator insects themselves become a problem. This may not necessarily be the case. If the number of diamondback moths goes up, the number of wasps increases also. This is because they can find a lot of larvae in which to lay their eggs. If there are only few moths, the number of wasps does not increase because they cannot find enough larvae of diamondback moths for egg laying.

Mineral deficiencies and organic solutions

When managed organically, most soils will provide all the nutrients plants require. Diversity in material used in compost, crop rotation and the use of green manures on a continual basis will raise the fertility of the soil. Organic material is made up of many elements, including minerals. By recycling these materials back into our soils, we automatically include the addition of minerals. Prevention is the key when it comes to mineral deficiencies. Mineral deficiencies are quite hard to confirm from symptoms alone. They are often confused with diseases, especially viruses. Weather also temporarily affects the plant uptake of minerals. Too much rain causes leaching of minerals away from the root zone as well as causeing root damage as the roots cannot breathe. Drought works in reverse, where plants are unable to access soluble minerals due to lack of water. It is important therefore to take these factors into consideration when diagnosing our plants.

Plants use macronutrients for the following reasons

Nitrogen (N) fuels growth of leaves and shoots.
Phosphorus(P) is essential in growth of roots.
Potassium(K) is vital to flowering and fruiting and hardens growth, increasing resistance to pests, disease and frost.
Calcium(Ca) is needed for cell division, plant growth and balancing nutrient uptake. Vital to the microbes in the soil.

	Maize	Symptoms	Cause	Prevention
Nitorgen deficiency		The leaves turn yellow starting from the tips. Plant development is reduced.	Shortage of available nitrogen in soil can occur on any soil but is more common on light soils, low in organic matter and where rainfall is heavy. Cold weather can cause a temporary shortage. Wood shavings and similar woody material added to the soil may cause 'nitrogen robbery' where soil microorganisms are using up all the available nitrogen to help them break down the woody material first.	Build up organic matter levels in soil. Grow green manures to reduce leaching of nitrogen from soil. Grow nitrogen-fixing green manures. Apply composted green waste and animal manures. Mulch plants. Apply nitrogenrich organic liquid fertilizers
Phosphorus deficiency		Poor growth. Leaves turn bluish purple starting from the tips. This deficiency can be mistaken with drought, root damage, or nitrogen deficiency.	Soil may be naturally deficient, particularly acid soils, poor chalk soils and in areas of high rainfall. Cold weather can cause a temporary deficiency.	Apply Minjingu rock phosphate.
Potassium deficiency		Leaves turn yellow from the edges. Growth is affected.	Most common on light sandy soils or those with low clay or high chalk content.	Improve soil structure. Use plant-based potash e.g. comfrey leaves or comfrey liquid. Apply well rotted compost or manure, add wood ash to compost heap (do not add directly to soil as it is very soluble

	Beans	Symptoms	Cause	Prevention
Nitorgen deficiency		Lower leaves turn yellow starting from the tips. Plants are stunted. Flowering or fruiting may be reduced or delayed.	Shortage of available nitrogen in soil can occur on any soil but is more common on light soils low in organic matter and where rainfall is heavy. Cold weather can cause a temporary shortage. Wood shavings and similar woody material added to the soil may cause 'nitrogen robbery' where soil microorganisms are using up all the available nitrogen to help them break down the woody material first.	Build up organic matter levels in soil. Grow green manures to reduce leaching of nitrogen from soil. Grow nitrogen-fixing green manures. Apply composted green waste and animal manures. Mulch plants. Apply nitrogenrich organic liquid fertilizers
Phosphorus deficiency		Poor growth. Young leaves are small and dark green. Plants have short internodes and reduced branching.	Soil may be naturally deficient particularly acid soils, poor chalk soils and in areas of high rainfall. Cold weather can cause a temporary deficiency	Apply Minjingu rock phosphate.
Potassium deficiency		Leaves turn yellow from the edges. Growth is affected.	Most common on light sandy soils or those with low clay or high chalk content.	Improve soil structure. Use plant-based potash e.g. comfrey leaves or comfrey liqui d. Apply well rotted compost or manure, add wood ash to compost heap (do not add directly to soil as it is very soluble

	Vegetables	Symptoms	Cause	Prevention
Nitorgen deficiency		Poor growth. Leaves are pale green, in brassicas leaves may have tints of yellow, red or purple. Lower leaves are effected first. Flowering and fruiting may be reduced or delayed.	Shortage of available nitrogen in soil can occur on any soil but is more common on light soils, low in organic matter and where rainfall is heavy. Cold weather can cause a temporary shortage. Wood shavings and similar woody material added to the soil may cause 'nitrogen robbery' where soil microorganisms are using up all the available nitrogen to help them break down the woody material first.	Build up organic matter levels in soil. Grow green manures to reduce leaching of nitrogen form soil. Grow nitrogen fixing green manures. Apply composted green waste and animal manures. Mulch plants. Apply nitrogenrich organic liquid fertilizers
Phosphorus deficiency		Poor growth Leaves turn bluish - green with purple tints, but not yellow. This deficiency is not easy to diagnose and can be mistaken with drought, root damage, or nitrogen deficiency	Soil may be naturally deficient particularly acid soils, poor chalk soils and in areas of high rainfall. Cold weather can cause a temporary deficiency	Apply Minjingu rock phosphate.
Magnssium deficiency		Symptoms first develop on older leaves, then spread to younger leaves. Leaves turn yellow, although sometimes red, purple, or brown, between the veins and around the margins, whilst the veins remain green.	Acid soils. Magnesium is easily washed out of light soils by heavy rain. Over use of high-potash feritlizers can make magnesium unavailable to plants	For immediate effect, foliar feed with Epsom salts (available at most chemists) diluted at 200g per 10 litres of water after flowering. Reduce use of potash fertilizer. If pH is too high use dolomitic limestone to reduce acididty

Choosing the right cattle breed

Ronald Nyabuya from Kitale is interested in livestock keeping. "We want to know how to rear modern breeds of Friesian, Guernsey or even Jersey. What are their advantages and disadvantages compared to traditional cattle?"

Unfortunately, it would be unwise to make a decision based on the financial advantages alone, especially when considering organic production. I buying a cow, one must look at the overall picture including organic requirements, environmental conditions, disease resistance, markets for products, operational costs and animal management requirements.

Rearing cattle the organic way

Organic standards restrict the routine use of preventative medicines, the use of synthetic herbicides, minimum amount of purchased feed, minimum proportion of forage in ruminant diets and prohibit the use of certain high protein feeds. This is to ensure the animals live at optimum health under natural conditions (see page 1). Healthy animals cost less to care for and provide by products that are healthy.

In Kenya we have many diseases affecting our cattle. Foot and mouth, Anthrax, East coast fever, Tsetse Fly (Nagana), brucellosis, as well as many other tick-borne diseases. Different climatic conditions also affect the health and productivity of our livestock. Some local breeds of cattle are more resistant to diseases than others. The advantage here is that mortality and veterinary costs are low. Purchase and sale price of indigenous breeds is lower and so too is milk production compared with exotic breeds.

Exotic breeds costs more

Exotic breeds require a lot of care and their maintenance costs are high in comparison as they are not adapted to local conditions. They succumb to local diseases quite easily. To reach their potential yields of beef and milk, their feed needs are greater than native breeds too. They also cost more to purchase as well as the costs of their semen through artificail insemination services.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

However, exotic breeds are genetically predisposed to produce optimum yields of either beef or milk, which are far greater than our local breeds and also fetch a better sale price when sold for breeding stock or milk production. Ideally, a local farmer would need a breed that will produce like an exotic one but which will be as resilient and cheap to maintain as a local breed. Middle of the road crosses of any exotic with native breed will produce an animal with some immunity and tolerance of local climatic conditions. This would be a preferable option for a local farmer. It will, however, produce less milk than the exotic breeds. From these crosses, one can then crossbreed them further.

The offspring of poor yielding cows very rarely produce good yielders. Another option is that crossbred bulls can be raised for beef. Exotic bulls are too expensive to raise and grow very slowly, as they are not genetically designed for beef production, if they are descendants of a diary cow. It would be wise to seek advice from the Department of Livestock extension services in your area, armed with the knowledge of requirements for organic production. Ask for information on maintenance and feed requirements, dipping schedule, and the breed you choose to keep. It is very important to know the cost implications before starting, and also to identify the potential markets for your cattle, milk or beef – and even manure!

Rearing cattle

Rearing healthy cattle requires good grazing land, or access to healthy forage, and access to clean fresh water. You would also require a secure area for calves and a milking shed for the dairy animals. Keep in mind that if your cow is healthy, your maintenance costs will be lower. A veterinarian close to your area is useful, especially if you are a beginner. Some cattle illnesses strike very quickly resulting in mortality if not noticed early. Vigilance will tell you if an animal is ill, signs of which may be a raised temperature or reluctance to feed, drink or even stand. It is wise to have a thermometer close at hand. Learn how to use this as most animals may not show signs of a raised temperature, which could indicate the need for medical attention.

Holstein-Friesian
Black and white, common in many Kenyan dairy herds; major dairy breed in the US and most Western countries; largest volume producers of milk of any breed.

Jersey
Golden brown in colour with a white ring around their nose; their milk has the highest level of milk solids (proteins and minerals) and vitamins, as well as butterfat, of any breed of cattle. It is easier to manage than Guernsey.

Guernsey
Closest to the Jersey in the butterfat content of milk; larger and heavier boned than the Jersey.

Ayrshire
Dual purpose breed, both good milk production capacity and quality in terms of butterfat content and milk solids. It is easier to manage than Holstein-Friesian and good for small scale farmers.

Letters to the editor

I have formed group

This is to inform you that I have already formed a group of 25 members who have a lot of interest in organic farming. Please do supply us with the newspaper as a group through my address. I promise to be distributing it to them immediately I get it.

Paul Muema Kimanzi, P.O Box 263, Kitui Tel. 0721 691 798

Cattle breeds

continued from page 6

Zebu
Small local cattle mainly raised for beef. It has less milk than Zahiwal; also has a humped back. It is the hardiest of all native cattle breeds.

Zahiwal
Large local cattle mainly raised for beef but also used for dairy. Milk production is average. It has a hump like a Boran.

Boran
A local breed, the same size as Zahiwal. It is mainly raised for beef although is also used for milk, and will yield more than Zebu.

Breed	Origin	Climate	Use	Size	Costs
Holstein Freisian	exotic	cool	dairy	large	high
Jersey	exotic	cool	dairy	small	high
Guernsey	exotic	cool	dairy	medium	high
Ayrshire	exotic	cool	dairy/beef	medium	high
Zebu	exotic	hot arid	dairy/beef	small	low
Zahiwal	exotic	hot	dairy/beef	large	medium
Boran	exotic	hot	dairy/beef	large	medium

We need market

We are a group of 1800 members who grow French beans in Kamukuywa location Kimilili Division Bungoma District. But the problem is that we lack market for the produce. Please assist us get the market for our farmers who are exploited by middlemen who the buy the produce at around Ksh 20 per kilo. I belong to Nama Self -Help Group with around 20 members. I attended the organic workshop at ICIPE 2004 and it really helped me in organic farming. I request you to assist us get buyers of our produce. We need buyers who can supply us with seeds and buy our crop at reasonable prize. We have been exploited by a company from Nairobi called who pay Ksh20/= a kilogramme. We also want buyers who can offer good prices for our goats and sheep. Your paper is okay and contains useful information. We do not want to miss a copy. Just publish every month.

Ambrose Majani, P.O Box 70
Kamukuywa
enyongesa2000@yahoo.com

We are selling seeds

I thank you for keeping us in touch with you and other fellow farmers through the TOF newspaper. Also by publishing our article on growing purple vetch. We are now selling the beneficial seeds to farmers around our country. Some come from Karatina, Elburgon and as far as Kitale. We use the few issues to have a discussion agenda in our meetings and we have started mobilizing and making awareness on organic to other farmers outside our group. It is our suggestion if you organize field days on organic farming we may reach more farmers also if possible arrange for inter group visits. We use both conventional and organic farming methods due to the available market in our area. If you please know of any donor who can assist us financially or through farming materials give us the contact or make us in touch with any of such organization. Wish and hope to meet you.

Benson Maina, Ikinyukia Self Group
P.O Box 125, S. Kinangop

Dear Farmers,

As part of our efforts to serve the organic farming community effectively, we would like to create a database of organic farmers in the country. We are interested in:

-Your names,
-Addresses, Location,
-Farm acreage,
-Are you an organic farmer?

To make it easy for you, we have a special telephone number: given above. All the farmers can provide these information through short messaging service (SMS). ***Come on Farmers, Tuma jibu. Asante.***

SMS ONLY

I need back issues

A friend of mine last month gave me a copy of your newspaper and it was wonderful. Let me thank you very much for your effort to teach an ordinary man simple and health ways of farming. Mine request to you is, please put me on your distribution list and please send me already issued newspapers and also as you distribute to others remember me. Thanking you in advance.

Joseph K Njeru, P.O. BOX 927, EMBU,
jkinyua@Mungania.ktdateas.com

Consider me

I am an agricultural extension worker and have lots of interest in organic farming. Could you please be sending me a copy of your monthly publication of the organic farmer magazines. I will be grateful to be receiving a copy of the same.

Grace W Mburu, P.O Box 6, Kiria- Ini, Muranga

Send copies

I intend to start practicing organic farming, please send me past and future copies of *The Organic Farmer.*

Githinji Muthima, Yes farmers group
P.O Box 162, Subukia.

Tend your fodder trees

Fodder trees need protection. If attacked by pests and diseases, their growth is also affected.

Eric Lumosi Asiligwa

"Prevention is better than cure". This is a common saying of people all around the world. After the planting and establishment of fodder trees (see TOF Nr.8, May 2006) protection against pests and diseases is needed so as to realise higher yields. Among the best tree management practices, coppicing (cutting back) of the fodder trees works wonders in increasing yields.

Coppicing

Coppicing is done to force new growth of multiple shoots and branches that provide more forage. This is done when the trees are growing vigorously. Cut down the trees to about 6 inches (15 cm) from the ground. Make a clean cut at an angle that allows water to drain off the stump to prevent rot.

Coppice for the first time when trees reach a height of about 6 feet (2 metres), usually 9 to 12 months after planting. The aim of coppicing at this stage is to encourage abundant branching for fodder production. Coppicing can also be done when trees grow old and forage production falls, possibly after 7 years.

Pests and Diseases

Pests can destroy fodder trees. Diseases can also keep the trees from thriving and lower their optimum production. They attack the fodder trees and lead to reduction of foliage and even to plant death. Fortunately only a few pests and diseases are known to cause serious damage to trees. Some trees, e.g. gliricidia and leucaena, are resistant to attack by pests such as termites. Pests and diseases of mature trees include scales, black ants, termites, crickets and hoppers.

Scales are white, powdery insects that attack plant stems, especially calliandra. Scale attacks occur during the dry season. Control scales with washing detergents dissolved in water. Sprinkle the detergent solution onto the affected plants using leafy branches or a knapsack sprayer.

Black ants damage the tree by debarking the stems. To control the ants, dig out and destroy their nests. Smear wet dung or used motor vehicle oil at the base of the tree or sprinkle some fresh ash to repel the ants.

Termites are destructive and cause serious damage by debarking the tree and may lead to its death. Control them using the methods for controlling black ants. Some farmers use fresh urine from cows diluted with water to repel the termites once they are noticed to affect trees.

Crickets and hoppers are harmful to young and succulent seedlings at the nursery stage and immediately after transplanting. To control them use the pest repellents used in vegetable farming.

Armilleria mellea is a fungus that attacks the roots of plants, causing root rot and eventual death. It's common in areas where forests have recently been cleared. To control this problem, uproot the affected trees and burn them. Avoid planting trees areas that have been affected by *Armillaria mellea*.

Caution: Avoid using chemicals to control pests and diseases on forage materials that are about to be fed to livestock. Such chemicals may affect the health of the animals and could eventually be transmitted to human beings through milk and meat.

With this article we close our series on agroforestry. If you would like to read more, consult the book "More forage, more milk", Technical Handbook Nr. 33, published in 2005 by World Agroforestry Centre. The book is available at the World Agroforestry Centre bookshop, P.O.Box 30677, 00100 Nairobi.

Market place

Seedlings: Benjamin Lugano has several varieties of conventionally certified fruit seedlings of Fuerte and Hass varieties of avocado, apple, tommy and harden varieties of mango fruits. He also has in stock pawpaw and tree tomato seedlings. Farmers interested can contact him on the address given below:
Lugano Horticultural Enterprises
P.O. Box 323, 30200 Kitale.
Tel.0733- 99 05 74, 0733-39 19 07

Borer control: Mr. John Sprite from Kitale has advice for fellow farmers who want to control stalk borer in their maize crop. He advices farmers to use tephrosia dust. The soft part of tephrosia stem and leaves is used. The stem and leaves are crushed, dried and then grounded. The dust


Stem borer on maize leaf

is put in the maize funnel. Application is repeated after every three weeks. He says farmers have the alternative of using liquid tephrosia extract. About 1 kg of leaves and stem are crushed. They are then put in plastic container to ferment. Later, they are mixed with 5 litres of water for a day. Sieve and apply in maize funnel drops. He says the extract can eliminate the borer completely especially when applied early.

Cutworm control: Joannes Samikwo of Endebess Kitale has an interesting way of controlling cutworms to prevent them from destroying his medicinal plants. He places a Kerosene lantern in a tray of water near the plants. The cutworm moths are attracted to the light and drown in the water. This method has kept his plants safe from this destructive pest.

Controlling aphids and thrips: Caroline Kawira of Gacoka Organic Farmers group from Embu have been using a number of plant extracts to control aphids, thrips and caterpillars and nematodes. To kill aphids and caterpillars, she advices farmers to use rhubarb. The leaves are soaked in hot water at the ratio of 1:3 for 20-30 minutes and then sprayed on crops.

The Organic Farmer

BIOVISION

The newspaper for sustainable agriculture in Kenya Nr. 4 July 2005

Implement agriculture policy

Kenyan farmers are hard working people. But they face a lot of problems, for instance the access to credit.

By The Organic Farmer

Will the Kenya government ever implement any of its well-prepared policy documents on agriculture? Where are the priorities of this government? Despite many policy initiatives launched in recent years to improve the country's food security, small-scale farmers continue to operate in a difficult environment. Yet they produce nearly 80 percent of Kenya's food requirements.

Of course, we can see some improvements in the dairy-industry. Now the farmers are getting good prices for their milk. And this has slightly improved their income. But look at the sugar and pyrethrum farmers: They are yet to be paid months after they delivered their produce to the factories. When they are not paid on time, it means that other economic activities are also affected.

Lack of access to credit

We are sure, that a lot of small scale farmers could do much better if they had access to affordable credit. This would enable them to purchase important agricultural inputs to improve crop yields. It is a pity that there is no more any government supported credit-system, that can cater for this category of farmers; remember the benefits farmers in the whole country gained from the Guaranteed Minimum Return (GMR) of the 1970s. However we cannot turn back the wheel. Following the collapse of many cooperative societies, there is a need to rethink the way forward.

Small scale farmers urgently need inputs to improve yields. *(Photo TOF)*

Nowadays there are many institutions ready to offer credit facilities to small scale farmers (read the story on page 3). But most of the institutions only give loans to farmer groups. And here lies the problem; farmers in Kenya prefer to work individually.

The farmers should change the way they have been operating. They should lobby for their interests. They should come together and look for solutions. One way in which they can do this to set up their own credit systems such as revolving funds or set up their own Savings and Credit Cooperatives (SACCOs). We will give you more on these in our next issue of *The Organic Farmer* . As we have told you before, farmers have to help themselves. It is time that they determine their destiny.

BIOVISION

The menace of hunger

In a recent tour in the Western Region of the country, I couldn't believe my eyes the abject of poverty that could be read direct

By The Organic Farmer

from the faces of the people in this crowd I was attending. They were so thin and emaciated, and their dry skin forming lines in the bright sun. This big crowd formed the majority of the members present in the meeting. They looked at their (minority) pot bellied leaders at the podium with a lot of expectation, only to be given promises that could not help their immediate problem: hunger.

Hunger has remained the greatest menace to the lives of many Kenyans. Poverty in Kenya is growing. Slow or negative economic growth in the last 15 years has meant that there are few new jobs to engage the growing population. People have lost vocabulary of balanced diet: it is anything that can fill their tummies.

The Government's free primary education increased enrolment in the schools, but still poverty forces children out of school. This in itself does not help them either for it condemns them to remaining poor and poor. Some of the youths who are forced out of the school due to hunger, engage in the jungle survival skills, where they will hunt other people and steal their property to survive.

The situation is made worse such that, while some people do not value a shilling; some people value it so much. Commodities in shops have been subdivided into very small quantities.

All the same, farmers should be encouraged to use proper farming methods. This can help a bit to alleviate this problem. No one will come from the blues and do it for you. "Kila mtu na mzigo wake" as per now.

MY OPINION

By Z.M. Kinyua

Among other considerations, profitable farming demands efficient prevention of crop yield losses. Since accurate and timely identification of a problem is important for its management, farmers should be proactive in seeking and utilising information from relevant sources, for instance from local agricultural extension officers and experienced farmers near them. More challenging problems may need specialized investigations and advice. Among other reference points, the National Agricultural Research Laboratories (NARL) of the Kenya Agricultural Research Institute (KARI) offers crop protection advisory services.

Dr. Z. M. Kinyua is a plant pathologist based at KARI-NARL Nairobi

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly and distributed free to farmers.
The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development. BIOVISION

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA, Tel. (020) 861 680
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Secretariat
Lucy W. Macharia
Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA, Tel. 020 445 30 98
e-mail : info@organickenya.com

Maintaining the Earth's fertility

What is organic farming? Enrich yourself with facts about organics and apply it on your shamba.

By Eric Lumosi Asiligwa

Many are in bewilderment trying to figure out what is this monster invading our long time farming, Organic Farming? In the recent years farmers have embraced the modern kind of farming where much effort is put into application of expensive chemical fertilizers, sprays, vaccines and medicines. The soils are normally compacted on by heavy machinery making it impossible for almost any form of life (micro-organisms) to live in it. The increased uptake of fertilizers and pesticides in order to keep the yields high, boosts the production of yields while compromising the water-soluble chemical fertilizers which may be harmful to the soils which will loose its fertility gradually, therefore becoming very expensive to maintain and sustain the fertility. This is due to the financial dilemma the farmer will find him/herself.

Owing to inherent weakness of the artificially fed plants, new pests and diseases are occurring all the time, while beneficial soil organisms may be killed. That is the reason why the Organic Farming tries to answer to some of these problems. "Feed the soil" is the organic farmer's maxim. Give the soil a good supply of organic material and good soil structure will gradually develop.

Natural balance

Organic Farming emphasizes on the development of the soil fertility using a blend of new and traditional farming systems. This enhances the building of fertility and not destroying it. Fertile soil needs, plants, animals, water, air and warmth. Human beings have had the task of cultivating and maintaining the Earth's fertility. This is the biggest objective of the organic farmer where good agricultural traditions are kept. On an organic farm, because of the more natural balance, crops, animals and human beings get fewer diseases without the use of dangerous and expensive inputs.

The word "organic" means "of plant or animal origin" i.e. organisms. Organic agriculture therefore deals with organic manures and other natural inputs (minerals or pesticides of plant origin locally). Organic agriculture is a holistic way of farming: besides production of goods of high quality, an important aim is the conservation of the natural resources fertile soil, clean water, and rich biodiversity.

In circumstances where natural conditions are maintained, nature provides abundant production of healthy crops and animals. Converting a farm from "chemical" to organic is not just a question of exchanging one method of farming to another or from one spray for another which might look less harmful. The major aim is to create a healthy balanced environment in which plants can grow and thrive, without any artificial synthetic inputs.

Not all insects are pests

Choosing organic may also require the farmer to change his/her attitude. It is essential for the farmer to imagine that every insect is a pest, or every plant growing in the farm is a weed and therefore every solution to a problem needs spray. Insects have not been created to bring destruction to the plant world or to make life troublesome for the farmer. On the contrary, their function is to destroy the unfit. If your soil provides the right balance of nutrients, your crops will be healthy and resistant to pest control.

In natural landscapes like forests and savannah nature maintainsa plant cover everywhere all through the year. The animal populations in such landscapes do not destroy vegetation but only graze it. The soil remains covered, no soil is ever exposed, humus is created, no erosion takes place, no artificial fertilizer is applied and yet there is plenty of healthy vegetation. This is termed as balanced environment.

To farm and feed ourselves we have to destroy organic natural vegetation. But in organic farming, soil is kept fertile. To keep soil fertile we have to learn what the soil needs.

In situations where the farmer has chosen to change to organic farming, many of the complaints and problems experienced in farming are solved. Choose it, dear farmer, and you will not have regrets.

Tough loan conditions for small farmers

Farmers need to be careful before taking a loan from any lending institution to avoid repayment problems .

By Patrick Mwangi

When he secured a Sh20, 000 loan to rear chicken five years ago, David Githigi dreamt of becoming one of the most successful poultry farmers in Nyeri district. He was a member of the Kiawaithanji Muguna Self Help Group who had been convinced by officials of Faulu Kenya to register with the organization to qualify for loans.

"The conditions of the loan were very tough as I had to pay Sh700 weekly. I could not make that kind of money," Githigi said at his home in Kiawaithanji village in Tetu division. He explained that to qualify for a loan, members of the group had to guarantee one another. Further, one was required to open an account with Faulu.

Things worsened when some members failed to service their loans, which meant the organization had to recover its money from other members' savings. "Although I struggled hard to repay the Sh20, 000 loan, I lost a similar amount in servicing the defaulter's loans," said Githigi.

Group collapsed

Faulu had given him three weeks to start repaying, which he feels was a short period because farming does not make returns as quickly as a business would. Githigi also thinks the 22 per cent interest on loans was too high especially for a small-scale farmer like him. The group has since collapsed and each of the 24 former members have abandoned farming.

An official of Faulu Kenya says it would never give farmers conditions they cannot fulfil. But Faulu refused to comment Githigis complaints about the high interest rate and payback-rhythm.

Many lending institutions

Faulu is one of the some dozens micro finance institutions, like Equity, K-Rep, Sisdo, Pride, Kadet, Jitegemee, Bungoma Family Development Programme and others. The government owned Agricultural Finance Corporation, which was not operational for a long time, started lending farmers in 2003. But it cannot cater for farmers with less than 5 acres of land. From the big banks only Co-operative Bank is giving loans to small-scale farmers. Savings and Credit Cooperatives (SACCOs) play an important role in provision of credit to small scale farmers. The Catholic Church also has a credit scheme for members including farmers who would like to take soft loans (We will feature these credit schemes in the next issue)

Important questions...

But the farmer has to ask himself the following questions before he takes loan?

- Do I really need to take a loan?
- Will the loan improve my farm?
- Will the loan improve my income?
- Will I be able to pay back the loan?
- Are there farmer groups I can work with to guarantee the loan?

Some farmers take loans without any plan on what they want to do and end with repayment problems. Others take the loan and do not use it for the intended purpose.

...and reliable guarantors

If the farmer is sure of what he intends to do then he can go for the credit. He will need fellow farmers to guarantee him. What every farmer should know is that the lending institutions will do everything to ensure their money is recovered. From the interest the bank will make some profit and recover some of the costs it incurs in lending.

All lending institutions give tough conditions for their loans to farmers; those seeking loans must therefore be ready to fulfil the conditions. All the Micro finance institutions give almost similar conditions:

- The farmer must have regular source of income on daily basis and with records to prove if he is a farmer,
- He has to be in business that has been in operation for at least six months,
- He has to be guaranteed by other trustful group members,
- The group has to be registered with the ministry of Culture, Gender and Social Services.
- The borrower has to give initial contributions for sometime before one qualifies to get the loan,
- The borrower has to become a member in these organizations.

To understand these conditions farmers are made undergo training which also teach them financial and business management skills. The group members have to guarantee the borrower. The interest ranges between 10 and 22 percent and the time for repayment depends on the amount borrowed. To borrow a loan can be helpful for many farmers, but it is a heavy burden. They therefore need to think about carefully before making a decision.

Growing flower exports

Kenya's flower exports have doubled in the last three years. More than 88,000 tonnes of cut flowers were sold in 2004, a 45 per cent increase over 2003. But the export value rose by only 13 per cent. Kenya is the largest exporter of cut flowers to the European Union. 65 per cent of the business goes to Holland.

Newspaper helps solve farmers problems

After reading The Organic Farmer, some farmers in Karatina have taken action; they have formed a group.

By Peter Kamau, Karatina

Joseph Kiragu at work on his farm in Karatina. *(Photo: P. Kamau)*

On a market day last month, Joseph Kiragu from Ihwagi village in the outskirts of Karatina town had gone to town to buy fertilizer. He found people distributing the The Organic Farmer newspaper. He picked it and tucked it in his side pocket thinking it was just one of the brochures that are often distributed by sales promotion people from local companies.

"On reading it while at home I discovered it had answers to some of the questions that had bothered me for a long time. So I got a piece of paper and decided to ask about some of the crop diseases that are destroying my cabbage crop here", he says.

Farmer group

The 55 -year old farmer did not keep the information to himself. He immediately visited his neighbour Joseph Wangai, also a fruit and vegetable grower and showed him the newspaper. Now they have formed the Gachatha Green Farm group and are busy lobbying other farmers to join them. They will now to solve their problems as a group.

"Our soils are poor because of using chemical fertilizers for many years. Now I have come together with other farmers and our aim is to buy the neem fertilizer to see if it can improve the soil" he says. Since it is cheaper, the group plans to buy the fertilizer from Nairobi and sell to other farmers in the area.

"For the 30 years we have practiced farming here, each of us has worked individually. But now we are discovering the advantages of working as a group." He says if more farmers joined the group, they would share ideas and even grow a particular crop in sufficient volumes for sale to exporters or transport it to markets where prices were favourable.

Although he has been using farmyard manure on his crops, Kiragu says he has gained additional knowledge on how to make compost from the newspaper articles. He will also teach group members on how to use waste to make compost. "Previously we have used manure on the crops before it has decomposed completely. Now we know how it is done", he says.

Extension officers

His 5-acre farm is an intercropping of cabbages, tomatoes, carrots, potatoes, beans and maize. Most farms here have adequate piped water for irrigation. Kiragu has five head of cattle under semi zero grazing. He sells their milk. Seven hybrid goats - also under zero grazing, provide milk for his family of five. But from his point of view all this is wasted effort because whatever amount of food he produces, market prices have been lower than the production costs.

"When the prices were good I could make up to sh100,000 from a 1 1/2 acre portion of cabbage crop, but this is no longer possible because of the poor prices offered by middlemen and the devastation by the cabbage disease," he says. This year he has not planted any cabbage after disease destroyed his crop last year. He had tried to diversify by growing passion fruit two years ago, but the crop was attacked by fulsarian wilt, a bacterial disease forcing him to abandon the whole venture.

Joseph Kiragu

Despite being only five Kilometres from his farm in Karatina town, no personnel from the divisional agricultural extension office ever visit farmers to give technical advice. This is what prompted him to write to *The Organic Farmer* Newspaper in Nairobi after trying various chemicals to treat the cabbage disease with little success. "Although we raise our problems during field days, no extension officer has come to assist us with advice", says Kiragu.

"We need buyers"

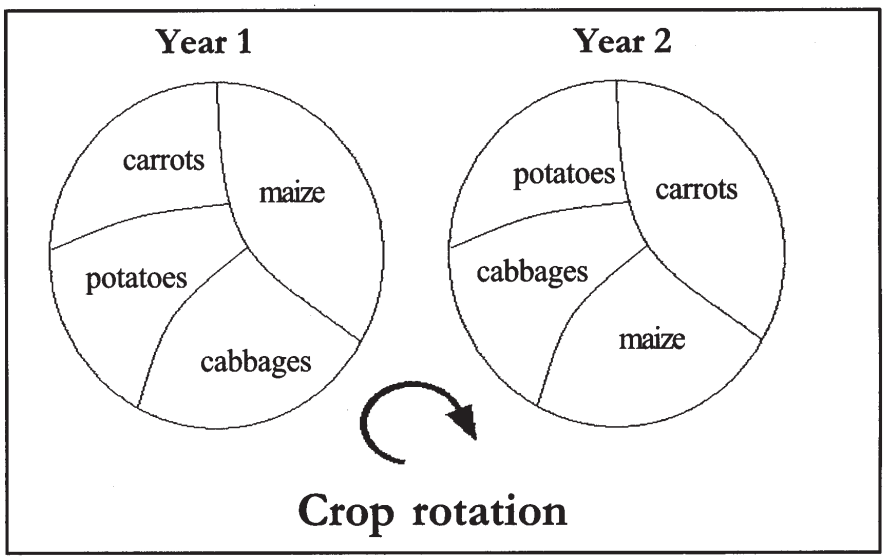
Karatina market is said to be the biggest in Sub-Saharan Africa, but farmers in Ihwagi village face the same marketing problems as their counterparts in other parts of the country. There is overproduction of fruits and vegetables. As a result the prices are low, making it difficult for many farmers to recover the money used for labour and other inputs.

Middlemen from as far as Mombasa, Nairobi, Nakuru, Kisumu and other towns buy fruits and vegetables from desperate farmers at throw away prices and make hefty profits, when they sell in those towns. Others approached the farmers to grow French beans for them and disappeared with the money, after the crop was delivered. Kiragu says farmers have lost hope, but adds that the situation would be different if there were food processing companies in rural areas to process agricultural produce and pay farmers promptly. This would have stabilized prices and offered them an incentive to grow more food.

Crop rotation helps increase soil nutrients

Fertile soil, less diseases, natural ways to fight pests: these are the results of crop rotation.

By Sandra Zumpano



In June, *The Organic Farmer* informed you about the natural ways of crop protection. There are two excellent methods to get the most out of your food crops: crop rotation and intercropping (see August edition). They allow the soil to recover and promote an increase of crop yield from the soil. These practices are not new. In Kenya they are even more important since most of the farmers do not have enough land to practice the fallow system. Rotating and intercropping help to maintain a plant friendly environment. In this edition we will inform you in detail about crop rotation.

Different use of nutrients

Crop rotation is defined as planting different crops over time on the same land. All of us know: growing the same crop repeatedly in the same place eventually depletes the soil. One way that farmers can avoid a decrease in soil fertility is to practice crop rotation. That means different crops are planted in a regular sequence (see box). Why? The principle is easy to understand: Each species of plant needs a different mix of nutrients. A crop that leaches the soil of one kind of nutrient is followed during the next growing season by a crop that returns that nutrient to the soil.

For example: legumes such as beans, peas, peanuts, soybeans or lentils have nodules on their roots which contain nitrogen-fixing bacteria. It therefore makes good sense to alternate them with cereals (grasses such as maize, sorghum, wheat) and other plants that need nitrogen. A common modern crop rotation is alternating Soya beans and maize. If crop rotation is done properly, farmers can keep their fields under continuous production, without a need to let them lie fallow or to apply artificial fertilizers, both of which can be expensive for the farmers.

Protection against pests

Crop rotation is also used to control pests and diseases which establish themselves in the soil. Plants of the same families tend to have similar pests. By regularly changing the planting location, the pest cycles can be broken or limited because it removes the food for the pest. For example when cultivating potatoes: the life-cycle of the Bacterial Wilt (see May edition) can only be interrupted by planting another crop on the same field the next season.

An example of a crop rotation pattern is: potatoes followed in the next planting season by beans and then followed by maize. This principle is of particular use in organic farming where pest control is achieved without synthetic pesticides, herbicides and fungicides.

We have obtained some of the information from two books: Gaby Stoll, Natural crop protection in the tropics, and: IFOAM Training Manual for Organic Agriculture in the Tropics.

If you have your own experiences please share your knowledge with your colleagues by writing to The Organic Farmer.

Planting the same crop over the years on the same land leads to poor harvest. (Photo TOF)

Your questions, our answers

Our newspaper is receiving a lot of letters with questions on problems facing farmers across the country. We are lucky and thankful that Su Kahumbu, the commited and successful organic farmer from Limuru, will in future give answers to the readers of our newspaper. Please write your questions direct to *The Organic Farmer* , P. O. Box 14352, 00800 Nairobi. We will forward them to Su Kahumbu. And please notice our new Telephone number: 020 445 03 98.

In one of the next issues we will carry a story on the biological control of pests in the cabbage crop, based on research by ICIPE.

We request all farmers, who have written Letters to the editor, to be patient. We will publish them in the coming issues.
The Editors.

What helps against rotting cabbages?

Patrick Macharia, Nyeri, Joseph Gachie Kiragu, Karatina, John Karangu, Nanyuki and so many other farmers are asking, why their cabbage crop rots on the lower surface just before harvest. What can they do?

Cabbages can rot where the root meets the stem for various reasons:

1. Waterlogging: During the rainy season, high humidity in soils with poor drainage result in poor soil aeration. This can cause rotting of the plant area under the soil, followed by that above the soil. This can also be a problem of too much irrigation in soil with poor drainage.

2. Boron Deficiency: Slice the head off the cabbage where the stem meets the head. If there is a black circle running around the dissected stem, this is a sign of Boron deficiency. In cauliflowers which are of the same family, the heads will remain small and bitter, young leaves become distorted, and curds develop brown patches. Boron is a trace mineral needed in minute quantities by plants. Too much can be toxic to the plant. Borax bought from the chemist can be incorporated into the soil at 30grams raked into 15 square meters.

3. Black Rot
This is a fungal infection which shows as small specks on leaves which turn yellow and drop, internal root and stem tissues become black.

If all of the cabbages are effected, I would advise you to uproot your crop before you loose it entirely. Incorporate good organic matter with well decomposed nutritious compost into the soil ensuring good drainage before your next planting. Your next crop should be from an entirely different plant family group. I would suggest beans if possible, so they may help the soil recover. If the problem is only on random plants, lift them and burn them before the problem spreads.

Diseased cabbage (Photo P. Kamau)

Bacterial wilt

Jotham W. Namasambu and some other farmers want to know, if the same method we mentioned in the last editions on the control of the bacterial wilt disease in potatoes can be used in other crops in the same family.

Yes, the same methods used to control disease can be adapted on all of the crops in the tomato family. These are Potatoes, Aubergines, Peppers, Chillies. This is like wise for all family groups, e.g. solutions to problems for the Brassica group would be the same. Brassicas include, Sukuma, Cabbage, Cauliflower, Broccoli, Brussel Sprouts, Khol Rabi, Kales.

Regardless of whether your problem is due to waterlogging, boron deficiency or Black Rot, the underlying problem is plant health. The plants immune response to pest and disease is compromised due to poor nutrition during its growth period. *Prevention is cheaper than cure.*

Prevention lies in **COMPOST.** We must strive to make the best composts possible thus providing our crops with excellent nutrition. A healthy plant will fend off pest and disease, and in turn pass those vital healthy nutrients to the consumer. Life begins in the soil. If we look after our soils we are looking after ourselves.

Marketplace

Potatoes: In the last two issues of The Organic Farmer we informed you about the lack of clean potato seeds due to the bacterial wilt disease in all parts of the country. The Gathaithi Pioneers Farmers group in Githunguri, Kiambu, called us. They have potato seeds of Tigoni and Asante varieties for sale to farmers. Those interested should get in touch with the group through this address:
Samwel Gathuru Karonjo,
P. O. Box 146 Kiambu
Tel. 0721-341 655.

Market: Any organic grower wishing to be helped with markets, can contact
Su Kahumbu, Green Dreams Ltd,
Box 1403 Limuru, 0722 70 4488

Farmers check list

Su Kahumbu

Thank you, editors, for giving me the opportunity to share my experiences and knowledge with the readers of *The Organic Farmer* . As a dedicated organic farmer, I have been extremely frustrated and thirsty for material, advice, examples, information on all aspects of organic production. I have been lucky to stumble across some very inspiring like minded friends on my quest for all information organic.

I feel honored now to share all I know with *The Organic Farmer* readers, and hope, that my experiences and recommendations are useful in the field. For areas beyond my scope, I shall refer to my friends for advice. I hope with the help of *The Organic Farmer* , we can impart this useful information to other organic farmers and beyond.

It would help greatly if farmers would use for their questions this check list or at least some points of it. It will help to identify the problems.

Su Kahumbu

Farmers check list for diseases

1) Absolute area of disease, e.g. stem, root, leaf, fruit etc
2) Colour and smell if any of diseased area, e.g. yellow rotting smell, black ring, no smell
3) Soil humidity, drainage and texture, e.g. wet, good drainage , much organic matter
4) Plant nutrition, e.g. compost, rock phosphate
5) Compost compilation, e.g. green manure, weeds, Tithonia
6) Plant 2 crops on same land
7) Seed condition at time of planting, and germination
8) Any other abnormalities identified during crop growth? E.g. specific insects?
9) Temperature in area, e.g. hot days freezing nights, hot in green house etc.
10) Growing area e.g. open field, green house, under netting, shaded area

Farmers check list for pests

1) Name of insect if known, detailed description if not known e. g. size, colour, soft or hard body, number of legs etc.
2) Population density e.g. all over crop, in few patches
3) Crop effected
4) Specific area of damage and damage seen e.g. roots, leaves and stems.
5) Solution tried e.g. garlic spray, neem

Early and Late Blight in tomatoes

Isaak Maina Munyari, Subukia, wanted to know more about Early and Late Blight. "What can I do against this problem?"

As the names imply, usually early blight affects tomatoes early in the life cycle and late blight later on. Tomatoes are one of the most difficult crops to grow organically. Blights being the biggest problem. This season we thought we had it right. We produced tomatoes this time in our small green house trying to keep the plants 'warm' as the night temperatures plummet in Limuru. Up to the fruiting stage we were winning, no problems, very healthy plants. We had managed to keep the white furry fungus on the stems at bay by spraying with milk. Yes milk! Diluted 1:10 with water it seemed to work.

Spectacular crop, but.....

We were happy to have made it through the early blight stage. Feeding was done with a seaweed foliar feed and EM2, (Effective Microorganisms). Our crop was spectacular, big green tomatoes dripping off the healthiest tomato plants we have ever grown. Then the late blight struck. We noticed the first signs just 3 weeks before ripening! We tried everything, Thiovit, a sulphur spray, more milk, thinning of already mature plants to stop the contact and increase aeration. Complete plant crop hygiene, the green house was a abandoned and contact contamination was totally minimised. Finally we resorted to harvesting green tomatoes in the hope of them ripening ok, but alas, this did not happen. As they ripened they grew blighted areas. However, instead of losing the entire crop, I have cut off the good bits and blended them to a tomato paste that I have frozen for use in cooking later. So near yet so far!

Am I disappointed? Not really, in fact we are proud to have gotten this far. All four other times we have lost the entire crop!!

What will I do differently next time?

Next time I will try a Neem and garlic spray as has been suggested by a friend, I will spray this concoction

plus my others... (I firmly believe in the milk one, it's great,) ... weekly as a preventative before I can visually see the problem. To ensure some tomatoes on the table, I will continue to grow the smaller wild cherry tomatoes which seem to cope better outside. I'll also get my planting right and grow towards and during the hot season. I would love to hear from successful organic tomato growers. Is there a secret?

Organic farming reduces soil acidity

After years of using chemical fertilizers, farmers are being advised to use organic methods to reduce soil acidity.

By David Macharia, Eldoret

After many years of using fertilizer in the maize and wheat growing areas of Uasin Gishu, Trans-Nzoia and West Pokot districts by farmers, the soil acid levels are too high. The farmers are being advised to adopt organic farming methods to rejuvenate the soils.

Agricultural experts say that organic farming is the cheapest method to bring down the acid levels in the soil. By using organic methods, farmers need not carry soil samples to researchers for analysis. Used over time, organic material gradually balances acid levels while maintaining the soil structure and fertility. Kenyan farmers are used to burning crop residues during land preparation. Many have used chemical fertilizers for more than 40 years to grow maize and wheat, as a result, crop yields in much of the region has reduced to a level that is causing concern in the agricultural sector.

"The problem is not confined to the North Rift region alone", says S. M. Kanyanjua, a soil scientist at the Kenya Agricultural Research Institute - National Agriculture Research Laboratories (KARI-NARL) Nairobi. "Other agricultural areas are also affected, but many farmers do not understand why crop yields in the affected areas are decreasing". Even if the government knows about the importance of agriculture, up to now it has done a comprehensive soil survey in all agricultural areas. Although any fertilizer containing Nitrogen acidifies the soil, it is important to note that other factors could also be responsible.

Adding lime

The alternative to reducing the acid levels is the addition of lime. The problem is, that most farmers in Kenya do not even know what lime is, or where to buy it. Due to low demand, many agro- veterinary shops do not stock it; farmers should enquire in major towns which shops sell lime. But it is even trickier because they may not be able to use the right quantities. Too much lime destroys essential micro-nutrients that sustain plants. Agricultural extension personnel need to advice them on the right quantities to use. Alternatively they could use only very little lime and supplement this with organic manure to reduce the acid levels.

Many farmers do not know the acidity level in their soils (Photo TOF)

Tolerance to acidity

One of the critical variables that affect how nutrients can be made available to plants is the amount of acid in the soil. Too much acid causes available nutrients to dissolve quickly; too little may mean that minerals may not dissolve at all and thus not provide plant nutrients. Soil that has too much acid is called acidic soil; that which has too little acid is called alkaline soil. Basically acidity is the amount of lime (calcium) in the soil. The amount of acidity can be measured on a mathematical scale called pH. At one extreme is acid soil with a pH of 1. At the other extreme is alkaline soil with pH of 14. At pH 7 the soil is said to be neutral. Most healthy soils range between pH 5.5 and pH 7.5. The absorption of minerals can only take place within this neutral range of acidity or alkalinity; therefore the right pH number can be critical to the health of a particular crop. It is important to note that various minerals dissolve differently in more or less acid or alkaline soils. Reducing the pH of alkaline soils is difficulty but alkalinity is not a big problem in most of the agricultural areas in the country. Generally, soils in the moist climates tend to be acidic, while those in dry climatic zones are alkaline.

Farmers are advised to take soil samples of their farms to agricultural research institutions near them for laboratory analysis. This will help them identify causes of reduced crop yields in their farms. Why they should do this is because different crops have various degrees of tolerance to acidity.

For example crops such as chillies, sweet potatoes and Irish potatoes are tolerant to acidity and can do well in soils with pH values below 5.5. However horticultural crops such as onions, spinach, carrots, cabbages and cauliflower do not tolerate acidity and can only grow well in soils with pH levels above 6.0. Cabbages, maize and flowers grown for export are highly sensitive to acidity. Farmers growing such crops need to have their soils tested regularly to maintain their crop yields. But if a farmer has no access to any soil analysis facility or a shop where he can buy lime, the use of organic fertilizers such as compost will help to reduce the acidity.

The Organic Farmer in August

What are the benefits of intercropping?

The Organic Farmer

The newspaper for sustainable agriculture in Kenya Nr. 7 November 2005

Disease threatens Napier Grass

In the last decade, cultivation of Napier grass has boomed in East Africa, as small-scale farmers have shifted to zero grazing. With the expansion of this fodder crop, however, has come a new disease called 'Napier Stunt'. The disease causes healthy thick Napier grass leaves to turn thin, yellow and weak; a special indication of the disease are the short internodes as the picture shows.

The disease has been present in eastern Africa for about 30 years but it has become more noticeable in the last few years. If nothing is done, this disease will seriously affect the livestock industry in eastern Africa, including Ethiopia. In parts of eastern Uganda and western Kenya, market prices for fodder grass have doubled in the last year; the farmers have been forced to buy grass to compensate for declining production. While a healthy acre of Napier grass should provide enough feed to sustain four productive cows, plots affected by the disease may support only one or two animals, greatly reducing milk yields and income for Kenyan farmers. *See page 5.*

BIOVISION

In this issue

Insemination too costly

Small-scale farmers trying to improve their livestock breeds are faced with a big challenge. The private providers of Artificial Insemination services charge between Ksh 600 to Ksh 1000. Most farmers cannot afford to pay this amount. Preservation equipment for semen handling has to be imported. Kenya used to make its own nitrogen for preservation, but the plant broke down after donor support was withdrawn. Plant rehabilitation is important to make the service affordable. *(TOF)*

Dear farmers,

While travelling around the country in the last few weeks, we have had many fruitful discussions with farmers in various regions. Similarly, we have received letters, telephone calls and short messages, all commending and encouraging us to continue producing the newspaper.

We have seen many farmers who are taking our advice seriously. However, we still feel that farmers can do more. Take the problem of marketing, for example. After receiving many questions three months ago from farmers on where they could sell their organic produce, we created a column called "THE MARKET PLACE", where farmers with any produce to offer could advertise their products. One of the buyers, Su Kahumbu, even put an advert in our newspaper asking farmers to contact her if they had anything to sell. Up to now not a single farmer has done so. Recently, farmers have written to us again with queries on where they could sell their products! Of course, we know that Kenyan farmers face enormous hurdles as they try to find a market for their produce. However, they can make better use of the column in our newspaper to look for buyers.

Most Kenyan farmers are hard working people. But to be a successful farmer in today's world, one has to be aware of the changing market demands. The problem is that there is a generation of farmers who do not accept change; to them, farming will remain a loss-making enterprise as it has always been. On the other hand, it is encouraging to see an upcoming generation of young farmers in many parts of the country. They have adopted the latest farming methods, and raise several different crops. They grow what the markets needs every season. If you read the story on page 4 in this issue, you will understand what we are talking about. A lot of things will change if farmers will be a little bit more forward-looking. We as editors will continue to support your efforts in making organic farming the most sustainable method of agriculture in the country.

MY OPINION

By Michael Wafula

Many of us farmers do not take the health of our animals seriously. Everywhere you go you find people grazing their animals by the roadside. Most of these farmers have enough land, on which they can plant fodder crops such as Napier grass. But they choose to spare the land for other uses. If the quality of the grass is poor, so the quality of milk produced will be poor. Fellow farmers, let us feed our animals properly, they will pay back by producing more milk for our consumption and even sale.

Michael Wafula is a farmer in Kitale

The Organic Farmer

Nr. 7, November 2005

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly and distributed free to farmers.

The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch BIOVISION

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Secretariat
Lucy W. Macharia
Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com
Layout:
James Wathuge

Organic farmer's "wild" friend

Tithonia, or wild sunflower, is easy to grow and is rich in phosphorus and nitrogen.

By Daniel Wanjama

Tithonia diversifolia, a nice wild shrub with yellow flowers, is found almost all over Kenya. It is often used as a hedge plant and grows wild in roadsides near rivers and on waste ground. Over the years some rural communities of Kenya have known Tithonia as a remedy for stomach ailments; farmers used it on fences or on ridges to check surface runoffs.

Alternative to chemical fertilizer

They were however unaware of its potential to enhance soil fertility. Research scientists explain that the Tithonia plant contains 80 per cent more phosphorus than legumes. It also contains enough nitrogen and potassium to promote crop growth. So Tithonia is an alternative to chemical fertilizers. 5 tonnes of the green foliage in-corporated into 1 hectare of land is equivalent to applying the following rates of inorganic fertilizer: 159kg Nitrogen, 10kg Phosphorus, 161kg Potassium, 18kg Calcium, 22kg Magnesium.

The most popular application is in the making of compost where it is used with dry plant material. It feeds microorganism with phosphorus and nitrogen. But you can also use it directly by slashing young plants and incorporating the green foliage in the soil at any cultivation stage.

In western parts of Kenya it is used against termites, and scientists discovered that powder and extract of Tithonia is a repellant and has been found to be an effective biopesticide against cow pea seed beetle.

Plant tea

Tithonia is also used in making plant tea (plant extract) for top dressing. Chop Tithonia vegetative parts and soak them in the water at a ratio of 1 part in 4 parts of water. Let it stand in a tightly covered container for at least 7 days. Apply it within the 5 days diluting it with equal amount of water and spread at the root base of the desired plant.

Why use Tithonia?

- It is used in compost making because it is rich in phosphorus and nitrogen.
- Tithonia plant grows very fast enough to supply quantity materials through out the season.
- Tithonia has the ability to regrow after cutting, which ensure continuous supply of vegetations.
- It is a wild plant, which requires little or no attention from the farmer.
- Tithonia decompose fast because it has succulent tissues.
- Tithonia plant is easy to handle and cut.
- Propagates vegetatively through stem cutting, which makes it establishment easier.
- It is also used as fodder for goats.
- When used for making hedges tithonia flowers attracts beneficial insects e.g. wasps and bees which are important in crop pollination.
- The plant also forms a thick hedge.
- It allows other crops near the hedge to grow without interference. The flowers also look nice in the garden.

Dear Farmers,

Paul Ndung'u, a small scale farmer from Molo, gave us the idea for this article on Tithonia. He has a beautiful Tithonia hedge around his shamba. He uses Tithonia hedges to separate the various crops such as maize, cabbages, tomatoes, peas and beans in the shamba. They do not only help to break the wind, they also reduce the spread of pests from one crop to the other. Of course, Ndung'u also uses the Tithonia leaves to enrich the soil.

If you know of any other plant that has the same useful purpose as the Tithonia, write to us and let us share your experience with other farmers in the country. (*TOF*)

How to identify early and late blight

In organic production systems, prevention is the best way to control the two diseases

By *The Organic Farmer*

Early and late blight diseases give farmers a lot of headache, as we discovered in our many discussions with farmers when we visited them in the last few weeks. Many other farmers have also called us with questions on how they can protect their crops from these diseases. Although we provided some information on this subject in the July issue, we have decided to revisit the topic to make it easier for farmers to diagnose these diseases and take preventive measures. Careful observation of the plant is the best way farmers can tell which of the two fungal diseases is affecting their crops so that they can deal with them. Below are some control methods farmers can use.

Early blight

In our July issue Su Kahumbu gave an account of her own struggles with the early blight. She has managed to control the disease by spraying the tomatoes with milk (diluted with water at the ratio of 1:10). To strengthen the plants, she has used seaweed foliar feed together with EM2 (Effective Microorganisms). The German Information Service OISAT (www.oisat.org) recommends use of Marigold extract for the same purpose (see box on page 6). What can a small-scale organic farmer do to avoid losing their crop? If the milk solution does not help, one can apply copper, as you can see below.

Late blight

Even worse than early blight are the consequences of late blight. This is the most devastating of the two diseases affecting both organic and conventional potato and tomato production. It is spread by wind and rain.

Many well known agricultural research institutions in Europe have done a lot of research on early and late blight. However, they have not found any effective treatment so far - except the use of copper. Up to now there are no successful organic control methods available when a crop is already infected with early and late blight. The use of organic control methods has only worked in laboratories but has failed in field trials. That is why nearly all European countries allow the application of copper in biological agriculture. But copper is harmful to human beings, animals and even soils. The European Union has reduced the use of copper to 3-4 kg/ha, but plans to replace it altogether in future. The Kenya Bureau of Standards knows about the problem of late blight and allows copper use in organic production (Draft Kenya Standard, Annex B, Kebs April 2005). In Kenya, farmers are advised to use copper oxychloride 50WP at the rate of 2-3 kg/ha in 1000 litres of water sprayed on tomatoes and 3-6 kg /ha in 1000 litres of water. Please read the labels carefully. It is available in agro-veterinary shops.

Early blight
Caused by a fungus called *Alternaria solani*
Symptoms on leaves include:
- Small brownish black spots, mainly on older leaves.
- Yellowing of tissues surrounding the lesions.
- Concentric rings in dark brownish portions of the lesions.
- Dropping of leaves.

Symptoms on stems include:
- Small, dark, and slightly sunken wounds (lesions).
- Pronounced concentric rings in enlarged (mature) lesions with light coloured centres.

Take preventive measures

As we have explained earlier, control of late blight, once it has affected the crop, is very difficult. But farmers can take a number of measures to prevent it or to ensure it does not spread to the other healthy plants. First of all, farmers need to know that supporting tomato plants with sticks is very important. The sticks prevent the leaves from coming into contact with the disease-causing fungus, which is mainly deposited by wind and running water on top soils or on the lower surface of the plant. Some varieties of tomatoes do not require propping with sticks and these are the ones most prone to infection. Growers using these varieties should find ways of raising the plants from the ground to prevent the disease.

They should observe the following guidelines:

- When watering the plants, do not water the leaves. Water the base of the plant or direct the watering hose diagonally to the ground to reach the roots. If the leaves are infected, wetting them facilitates the spread of the disease to the soil (which could also infect potato tubers).
- Remove and burn infected areas and plants as soon as infection is detected.
- Avoid growing potatoes or tomatoes in the same field year after year. New tomato fields should be far away from old fields to stop transfering the disease to new crops.
- Always grow tomatoes or potatoes in fields where other crops, which cannot be affected by early or late blight, were planted in the previous season. This crop rotation helps to reduce the disease from plant residues.
- Use clean and disinfected seeds.

Late blight
Caused by a fungus called *Phytophthora infestans*
Symptoms on leaves and stems include:
- Irregular spots with a water-soaked appearance.
- Enlargement of the spots into pale green to brown lesions that may cover large areas.
- Whitish to grey moldy growth on the underside of leaves under moist conditions.
- Browning, shrivelling and death of affected leaves.

Symptoms on fruits include:
- Irregular, dark, water-soaked lesions with a greasy appearance.

Diversification changes farmer's fortune

He took technical advice seriously and today he is one of the most successful farmers in Kisii district

By Peter Kamau, Kisii

For 36-year-old Ronald Nyagaka, farming in the hilly highlands of Kiogoro division of Kisii district had been a continuous nightmare of loss-making ventures. Despite striving hard, crop yields in his three-acre farm dwindled while prices kept falling.

He grew maize for successive years on a large portion of the farm, but the prices were discouraging. When he ventured into tomato farming, disaster struck. This was three years ago when his entire tomato crop was wiped out by a "strange disease".

He heeded advice

But unlike fellow villagers who would have explained it away as the work of an evil spell, Ronald sought advice from the local Ministry of Agriculture office in Kisii town, 6 km away. It is then that he developed a working relationship with the agricultural extension personnel. Nyagaka is now a beneficiary of the second phase of the National Agriculture and Livestock Extension Programme (NALEP II), a project funded by the Swedish International Development Agency which is trying to revive agricultural extension services to Kenyan farmers.

"We visited his farm and diagnosed the problem to be bacterial wilt. We advised him to practise crop rotation and diversification to check diseases and boost his earnings", says Atieno Achieng, the divisional agricultural extension officer.

The hardworking father of four heeded the advice from the official and went to work immediately. The results were tremendous and now

Feeding the fish (Photo TOF)

Nyagaka tends the tomato crop at his farm in Chinche (Photo TOF)

Nyagaka is the envy of many a farmer in the neighbourhood and afar.

Many different crops

His farm, perched on a steep hillside, now holds a healthy crop of bulb onions, sukumawiki (kale), tissue culture bananas, improved orange-fresh sweet potatoes, passion fruits, traditional vegetables, avocadoes, sugarcane and many other crops at various stages of growth.

On the lower slopes is a portion with 1000 well-tended tea bushes. An abandoned brick quarry at the river frontage, which has been a mosquito breeding ground, is now converted into a fish farm stocked with 1,665 tilapia fingerlings. On the lower part of the tea plot are seven beehives, which provide honey for sale.

Upgraded indigenous chicken

To avoid the heavy capital investment in modern poultry keeping, Nyagaka has learned new skills of improving the quality of indigenous chickens. He has identified good layers and brooders in his indigenous stock that he is upgrading through crossbreeding and quality feeding with organic green material, cereals and chicken mash. The brooders are housed in earthen notches made in the family kitchen walls to keep them warm and safe from thieves and predators such as dogs and wild cats.

Shrewd and hardworking

Nyagaka is today one of the most successful farmers in the densely populated Chinche village. His success is primarily because of two reasons: First, he plants many different types of crops, such that when the price is not good for one product, he can sell the other. Secondly his farming is market-driven. Through meticulous timing and knowledge of what the market needs, he produces fruits and vegetables when they are off-season (mainly through irrigation) and sell them at premium prices. These he sells in Kisii and surrounding towns when the demand is high.

"From the sale of various farm products I make an average of Ksh 200,000 every year. Farming can be so profitable but it needs commitment and hard work," he says. He has built a permanent house, a modern zero grazing shed for cattle, pays school fees and is supporting his extended family.

Two years ago he joined a few neighbours in setting up the Chinche Self Help Group. The group with 32 members to date started off as a merry-go round where each would contribute Ksh 50 monthly, money that would assist them pay school fees, settle medical bills or buy household items. It is now registered with the Department of Social Services. That is why it is recognised as a focus group by the Ministry of Agriculture under the NALEP II programme.

A model for other farmers

Members of the group are learning new farming methods from Nyagaka. Farmers from many parts of the district also visit the farm to learn from him.

After reading the story on dairy goat keeping in the September issue of *The Organic Farmer*, the group plans to start a similar project.

Through the NALEP II programme, the farmer's group receives training on a regular basis on new agricultural methods, exchange visits and field days. The project plans to transform the group into an interactive learning site where farmers from other parts of the district will be trained in sustainable agriculture.

Farmers can control spread of Napier disease

Scientists from East Africa and UK are trying to find ways to control the disease 'Napier-Stunt'.

By Felix Mbitu Murimi

'Napier-Stunt': Yellow leaves and lack of roots (Photos courtesy Dr. Zeyaur Khan, ICIPE)

The disease called 'Napier Stunt' was first observed in Kenya in 2002, although it is thought to have been present for much longer. According to ICIPE-Scientist Dr. Zeyaur Khan is has spread now to Ethiopia and Tanzania. Until a year ago, the cause of the disease, which turns healthy thick leaves into thin, yellow and weak leaves, was unknown. Agricultural staff thought that the cause might be either a fungus, nematode damage or a nutrient deficiency. However they were not sure and therefore were unable to offer advice to farmers. The breakthrough came in 2004. Professor Phil Jones of the Global Plant Clinic, based at Rothamsted Research in the UK, identified the cause to be a phytoplasma. Phytoplamsa are similar to bacteria and live in the phloem of infected plants. (Phloems are the tubers inside the plant stem.)

The disease 'Napier-Stunt' could be spread in two ways. Over longer distances the primary means of spread is farmers themselves. Napier is vegetatively propagated, so farmers take either a slice of cane, or split a clump, in order to plant on. Kenyan farmers obtain their planting material from neigbours. If unaware of the dangers, they can inadvertently introduce a diseased plant into their fields. Over shorter distances, such as between plants within a field, the disease could be primarily spread by plantsucking insects such as plant hoppers. These insects feed on the sugar-rich sap in Napier phloem, and can transfer the bacteria (phytoplasma) in their saliva to other plants.

Now that the cause of the disease has been recognised, promoting control measures among farmers has become a priority. Digging up infected plants and replacing them with healthy canes is the basic strategy. The soil around infected plants cannot harbour the disease, so replanting in the same place is possible. The leaves of diseased plants can be safely fed to livestock - the phytoplasma (or the bacteria) does not persist in their manure. However the roots should be burned or buried, so they will not affect other plants.

Uprooting and replanting

Farmers are encouraged to identify clean planting material, either by selecting canes from parts of their land that are some distance from any infected plants, or by buying planting material from other areas where the disease incidence is low. District agricultural offices have also been urged to create 'designated clean zones' where unaffected planting clean material can be obtained for distribution.

Search for strategies

In the long term, ICIPE Scientist Dr. Zeyaur Khan believes regional collaboration will be vital to controlling the disease. Several institutions (ILRI, ICIPE, Rothamsted Research, KARI and others) are working together to develop a regional research programme. Research priorities will include identification of the possible insect vector and screening for Napier varieties that show resistance to both the disease and its vector. Scientists also need to develop a strategy for distribution of clean planting material.

Napier is an important fodder crop

Napier or Elephant grass (*Pennisetum purpureum*), is a native clumping grass of tropical Africa that grows 3 to 5 metres tall and is mainly propagated from cuttings of 3 to 4 nodes in length. It is widely used as a fodder crop and is also planted for environmental protection, to stabilise soils and act as a windbreak. In Kenya, it has been used in a novel 'push-pull' pest management system for cereal stemborers.

Napier grass is a forage plant of considerable importance in several parts of the world. It is one of the most valuable forage, soilage and silage crops in the wet tropics. This very vigorous grass provides a great bulk of feed and is commonly used in a cut-and-carry system, for feeding animals in stalls. For grazing, it should be heavily stocked to maintain it in a lush vegetative form. The mature leaves are razor sharp and sometimes provide a problem for grazing cattle. The coarse stems produce new shoots and leaves. The grass is best grazed when the new growth consists of five new leaves. A stem plus leaves takes a year to grow. Grazing at six- to nine-week intervals at a height of about 90 cm gives good utilization. The highest yields can be expected from cutting at 12-week intervals and applying nitrogen after every cut. Nitrogen fertilizer can be applied after each grazing or cutting in high-rainfall areas. Any coarse, leafless stems should be mowed.

Napier grass is a rapid colonizer of disturbed areas and prospers in a broad range of conditions. It tolerates periods of flooding and drought and fire, although it grows best in high-rainfall areas (in excess of 1 500 mm or 150 cm per year). Its deep root system allows it to survive in dry times. It grows best in deep, fertile soils through which its roots can pass easily. *(fmm)*

You have to feed the soil

"Onions tend to do well when planted, then after one or two months , they turn yellow. The same happens to capsicums. What is wrong?" asks Evelyn Heyi from Bomet. Similar questions were coming from some other farmers.

This sounds like a nutrient deficiency. Healthy plants are a deep green colour. Any signs of yellowing or purple colours indicate that the plants are hungry. Most of our tropical soils are not automatically very fertile. We have to both dig or plough the soils to give the plants air and loosen the soil for good root growth. And we have to feed the soil with good compost, manure or green manure (this means digging in live green plants) to activate all the good soil micro organisms, so they can help make the soil productive.

The quickest way to restore a healthy colour and good production to a discoloured crop is foliar feed. There is one on the market, which is approved for organic farming, called "Freegrow" and is made from seaweed. However foliar feed can be made at home from any good smelling compost or dried manure. Put 5-10 kg compost or dried manure in a gunny bag and immerse in a drum of water. If EM (Effective Microorganisms) is available add about a cup to a drum of water, this will help extract the good nutrients while fermenting the mixture in a healthy way.

Leave the bag in the water for some days - up to a week, then spray the solution - a cup in 20 l clean water on to the crop. (If you need more Information on EM contact Peter Chandi 0733 546491)

In the long run though there is no shortcut to feeding the plants well from even before planting. Compost making and/or green manuring and rotation of the crops is the backbone of organic farming. We have to feed the soil so it can feed us. The peppers above turning yellow in the third year have by then used up all the nutrients that the soil had to begin with, and unless more nutrients are fed to the soil, yields will continue to go down. Compost, manure and green manure also helps the soil to absorb water better during rains, and to hold more air for root growth.

Nutrient deficiency symptoms

Some of the most common nutrient deficiency symptoms:

a) Nitrogen deficiency: Yellowing of older leaves first, then if serious all leaves turn yellow and the plant does not grow well.
Nitrogen is found in urine, manure - especially chicken manure (careful - it might burn the plants if you put too much), compost and foliar feed.

b) Phosphorous deficiency: Purple colours are seen and the plants grow slowly. Phosphorous is found in Majingu rock phosphate as well as animal manures.

c) Potassium deficiency: Yellow spotted leaves with wilted leaf margins and tips. Sometimes leaves curl or crinkle. Often seen on brassicas, who really like their potassium. Potassium is found in wood ashes.

d) Copper deficiency: First symptoms are wilting of leaf tips, yellow patches in the field when seen from far, and stunted growth. Copper is found in small quantities in animal manures, but the organic system allows the use of added copper when needed either as a seed treatment (copper oxychloride) or as a spray on young crops (see also page 3).

Damage by bean aphids

Isaak Maina Munyari from Subukia had his beans infested with dull-black small insects, and afterwards the beans were covered with a liquid like honey and did not do well.

These insects are bean aphids. It is always useful to look carefully and control aphids at first signs of infestation as otherwise they will spread to the whole crop. If caught early the insects can be sprayed with either natural pyrethrum or neem in the spots where they are seen. But remember, if all plants are sprayed, we also kill the good insects that actually eat aphids, and so in the long run make a bigger problem for ourselves. Ladybird beetles (small red round beetles with black dots) eat aphids, and keeping a good population of ladybird beetles is a good insurance against heavy aphid infestation.

MARIGOLD EXTRACT

In page 3 we informed you on early and late blight. For lack of space we shifted one important advice to this page: Online Information Service for Non-Chemical Pest Management in the Tropics, OISAT, recommends the use of Marigold extract against early blight in tomatoes (see also www.oisat.org). Below is the recipe:

Materials: Whole flowering plant Soap, Water, Strainer, Drum

Preparation: Fill-in drum with ½ - 3/4 full of flowering plants. Leave to stand for 5-10 days. Stir occasionally. Strain before use

Use: Dilute the filtrate with water at a ratio of 1:2. Add 1 tsp soap in every litre of the extract

How to control thrips?

Cowpeas do well in Bomet, however, farmers here abandoned growing them due to the problem of thrips. Evelyn Heyi from Bomet asks: "How can we control this pests?"

Thrips are very difficult to control. The best solution so far is a good rotation with non-legume crops, removal of all unused vines and leaves and composting or burning them, then planting a different crop in that area. However it is rumoured that ICIPE is doing research on thrips control, so the question is hereby forwarded to them.

We will carry a story on thrips in the next issue. The Editors

Su Kahumbu answers your questions assisted by Anne Nganga

Write to:
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com

Letters to the editor

New insight on goats

First and foremost I would like to congratulate you for your effort to make us more knowledgeable in farming. Keep it up. I came across your No. 6 Sept/Oct. 2005 issue through a neighbour, after reading a topic on dairy goats I was really impressed because we only rear goats for slaughter during Christmas and related ceremonies. But after realizing that it can produce up to 3 litres of milk a day, my perspective towards them has changed. Already I have sent a letter to the Kenya Dairy Goats Breeders Association for more information on how I could obtain at least one.
With these remarks I say thank you for enlightening the farming community. My group though young will benefit.

Francis K. Kemboi, P.O Box 301, Moi's Bridge, 0723 373 420.

Dear Mr. Kemboi, a lot of farmers have written to us giving positive comments on the dairy goat story, others have requested for more information on value addition of goat milk products. In one of the next issues we will bring some more information on dairy goat farming. In the meantime we wish you good luck.

THE MARKET PLACE

Any organic farmer with products for sale can contact the following buyers:

Su Kahumbu,Green Dreams Ltd,
P.O. Box 1403. Limuru,
Tel-0722-70 44 88.

Mr. Mathenge, Super Veg, Ltd,
P.O. Box 41876-00100, Nairobi
Tel-823 234 Fax 823 236
Cell- 0722 315 063.

Distribution

I am writing to acknowledge receipt of the 300 copies of The Organic Farmer magazine that you had sent us. We have so far distributed 270 of the magazines and we intend to issue the balance this week. We also designed a distribution form for the farmers to sign when getting the copies hereby attached for accountability purposes. We will send you all the filled copies once collected from the filled by the 15th of October, as part of our distribution report. It is our hope that the report will help you in your future supervision and monitoring of the project as well as accountability to your donors. The current issue was very interesting to our farmers and us, especially the articles one the dairy goat keeping and poultry production for they are good sources of income in Ukambani and are important in drought copying mechanism.

Elijah M. Mutungi, Director MAEEO, Kitui

Dear Mr. Mutungi, we are impressed with your commitment. We would like other farmers to prepare a list showing who is receiving the newspaper for record keeping purposes. In this way it will be easy to streamline the distribution in order to serve you better.

Organic fish farming

I am starting tilapia breeding and growing enterprise and I would very much like to get it right from the outset. Please can you advice me on whether there are established and commercially accepted guidelines for organic freshwater aquaculture. I would appreciate any contacts you may know of in tilapia farming. I would also be very pleased to receive your publication. Congratulations on providing a much-needed light.

Anthony Dodds, Balakwasi Enterprises, P.O Box 15, Rumuruti, Tel. 065-20321.

Dear Mr. Dodds, fish farming is relatively new in Kenya although quite a number of farmers practise it. Information on organic fish farming is even scantier. Perhaps you could get in touch with Fisheries Department in Nairobi for additional information and advice in this field. Contact Mbugua Mwangi (an Aquaculturist) P.O Box 58187-00200 Nairobi Tel 254-020-3742320/49 Mobile 0722-357980. Another good source of information is the Internet. There are many sites that contain information on organic aquaculture.

Good for farmers

Receive many thanks for The Organic Farmer copies, on behalf of KOAN. I request you to increase the number of copies of the magazine being sent to me, since the demand for the same has increased very much. I am currently in contact with an international development organization, which interacts with over 4,500 small-scale farmers in Nyanza, that predominantly produce, organic. These farmers have found the newspaper invaluable in refining their agricultural practices, and I can assure you, we are no doubt a team, working for a better future. Once again thank you.

Dominick O. Ogut, CARE-KENYA, P.O Box 526, Homa Bay, Tel: 059 22433, 0721 368 338.

Looking for markets

I work with a company called Organic solutions LTD, which deals with organic farming and products. We are currently introducing the E.M technology in farming. I am very impressed with the work you are doing in promoting organic farming. I am working with 40 farmer groups that are strictly in organic farming in Mt Kenya region. Their biggest problem is market for the products. I would like to start with groups in Othaya and Kangema. I have given out all the magazines you sent me and I need more of them if you have. I would also like to know if you advice farmers on what to grow for you to buy. Is it possible for you to visit some of my groups?

Georges Mugambi,
georgesmugambi@yahoo.com

Dear Mr. Mugambi, we understand the problem farmers are facing in marketing their produce. But as we try to assist, our capacity is limited, for example all we can do is to give them space in the market place column on this page where they can advertise their products.

But it is up to the farmers to make a follow up and establish contact with the buyers (Read our Editorial on page 1).

The beans that can reduce malnutrition

Soya beans are of great value. They have the highest concentration of proteins, vitamins and minerals of any crop.

By The Organic Farmer

Despite its high nutritional value, many farmers in Kenya and many other countries in Africa do not grow soya beans. This is mainly because most people do not know its value. Another reason is that unlike other food crops such as maize and beans, it needs processing into flour before it is consumed. In recent years, however soya bean is becoming increasingly popular with farmers who have discovered its importance as a source of cheap protein. It has the highest protein content of any food crop.

Soya beans have all the nutrients required by the body including proteins, fats, carbohydrates, vitamins and minerals. Just to show its value, 1 kg of Soya bean has the same nutritional value as 2 kg of meat or 40 eggs. It is free of cholesterol and is therefore a healthy food crop. Its oil is easily digested in the body. People now grow it for

blending with traditional food crops such as maize or sorghum to make highly nutritious porridge or ugali. Many Kenyan families use roasted ground soya beans to make a healthy caffeine-free drink that they prefer to tea or coffee.

Besides improving the diet, soya bean can also contribute to soil fertility by fixing nitrogen through rhizobium bacteria in the roots. Maize and sorghum yields can be increased by up to 25 percent if intercropped with soya beans.

Varieties for all regions

There are many varieties of soya beans that have been developed in Kenya to suit the various climatic regions and soils in the country. The Gazelle variety is mainly grown in parts of Central Province and Laikipia region. The SCSI and Nyala varieties have been found to do well in Kitale area. The German Technical Cooperation Agency (GTZ) has developed the promiscuous soya bean variety that can grow anywhere in the country. Farmers are advised to confirm varieties suitable to their areas before purchasing seeds.

Alternatively farmers can obtain high quality seed including rhizobium from Kenya Seed Company agents near them (Seeds will be available before the planting season in 2006, since they have run out of stock at the moment). Most other seed companies also stock seeds.

It is easy to grow Soya

Soya beans can grow well in deep, fertile and well-drained soils. They prefer slightly acidic soils - basically they can do well in all maize-growing areas of the country. They grow best in a humid climate with plenty of rain during the growing period (35-60 cm of rain is adequate). Plants can tolerate drought conditions after the seedling stage. However they can perform better when the rainfall is well distributed during the growing period.

Land preparation: Prepare a well-drained area of land and ensure green matter residues are well decomposed before planting.

Planting: Before planting, test the viability of the seeds to ensure it will germinate. The test is important because soya bean seed looses its viability 6 months after harvesting. This can be done by planting 100 seeds, if 75 of the seeds germinate, then the viability is acceptable. You will need 25-30 kg good quality seed per acre. Plant at a depth of 5cm in rows 45-50 centimetres apart. Plant two seeds per hole.

Fertilizer application: Farmers are advised to use farmyard manure if available at the rate of one handful per hole. They can also use 50 kg of DAP fertilizer per acre. Use one packet of rhizobium inoculants for every 100 kg of soya seed. (A 100-g packet costs Ksh 80). If the soil is poor, potassium can be added at the rate of 20-32 kg per acre. Mix fertilizer with the soil to avoid direct contact with the seed. Soya beans can also be planted in rotation with a well-fertilized cereal crop such as

Soya beans *PhotoTOF*

maize wheat or barley to avoid the use of fertilizer.

Spacing: The holes should be 5-10 cm apart within a row.

Intercropping with maize: plant two rows of soya between the maize rows. When intercropped with maize there is no need of applying extra fertilizer as the beans can use the fertilizer applied to maize.

Weeding: The crop should be weeded two times during the growing period .

Harvesting: Different soya bean varieties mature at different times. The early maturing types take about 75 days while the late ones take about 100 days. Harvesting should be done when the leaves turn yellow. Yields of up to 11-90 kg bags per acre can be attained depending on the variety and region of the country grown.

Storage: The beans should be stored in a cool dry place to ensure the seeds are not spoilt (preferably at 10% moisture content). As human food, it can be stored for up to 3 years without chemical dressing or change in nutritional quality.

The Organic Farmer in December

How to reduce post-harvest losses?

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 13 May, 2006

Weeds reduce your harvest

Weeds cause great loss to farmers if they are not controlled early and disposed in the right way.

The Organic Farmer

Like a thief who steals in the night, weeds take away a large portion of a farmer's crop yield if they are not controlled on time and in the right way. Every year, smallscale farmers in Kenya and in most African countries lose between 15 and 90 percent of their crop due to weeds. Research shows that farmers can harvest up to 2.6 tonnes of maize per acre if they practised timely and proper weed control methods. However, the average maize yield in most parts of the country is 0.8 tonnes per acre which is a result of poor weed management, among other factors.

One of the causes of this loss is lack of knowledge on the dangers posed by weeds in our farms today. Unlike diseases or pests, weeds do not show any symptoms, but they compete for essential nutrients that the crops need for proper growth. They take light and water from the crops and push them out of their growing space. They also shelter pests and diseases that attack the crops.

Hottensiah Mwangi, a weed scientist at the Kenya Agricultural Research Institute (KARI), says many farmers do not regard weeds as a major problem. After planting their crops, they ignore the weeds and only start weeding after the weeds have completely covered the crop, which by then have taken away the nutrients, light and water that would have been utilized by the crop. The crop becomes weak, in the process reducing the overall yield. According to Hottensiah Mwangi, smallscale farmers weed late because they have to work elsewhere to raise money for other pressing needs such as food for the family.

Poor weeding methods also play an important role in promoting the regeneration of weeds. "When weeding, many farmers tend to cut down weeds, such as couch grass, into small pieces which are then thrown away around the farm. Many of these weeds do not die but instead sprout and spread", Hottensiah Mwangi adds. Careless disposal of weeds after weeding is another factor responsible for weed transfer from one part of the farm to the other. Many farmers throw weeds by the roadside after weeding. These weeds are then washed away by run-off water to other farms where they grow and spread. *See page 3*

in this issue

Deworming

Regular deworming of livestock is important to improve their health and production. *See page 4*

Dear farmers,

Kenyan farmers believe agriculture is the most important economic activity in the country. Most farmers would like to transform this sector into a sustainable mode of production that helps to improve the living conditions of their rural communities. Many have formed farmers' groups and even established Savings and Credit Cooperatives (SACCOs) to attain these goals. But they are frustrated in their quest for better returns due to lack of reliable markets for their agricultural produce. These are some of the insights we have gathered after going through the answers to the questionnaires we sent out to you. Hundreds of farmers completed the questionnaires and sent them back to us. We are very grateful and thank you all for making this exercise a success.

The analysis of the questionnaires (see page 2) was an interesting and instructive experience for this newspaper. Not only do the farmers appreciate the information we give in The Organic Farmer, they also put into practice the many useful tips we give in every issue. The feedback from the farmers points out areas that need improvement. One of the recommendations is that the Government needs to do more in support of agriculture, mainly through rehabilitation of roads and provision of credit to smallscale farmers. Although all farmers are happy with the information we give on crop production, many feel that we need more coverage on the problems facing the livestock sector. We have responded to this request immediately, as you can see on page 5.

Close to 94 percent of the farmers who answered the questionnaires would like us to organize workshops where they can gain more experience in organic farming. Due to our limited resources, we may not be able to organize such training courses at the present time. The newspaper is already giving you a lot of practical information on farming. What we request of you farmers is to ensure that you work together, share your experiences among yourselves and with those who have not understood the benefits of organic farming. In this way we will build a strong organic farming community in the country.

MY OPINION

By Michael Korkoren

The long rains are here with us again. It is so good to stand outside and watch the green surroundings of my home. The shamba is flush with the young maize and beans planted a few weeks ago. The animals also seem to rejoice in the new pastures that have just sprouted. Now is the time to fulfill all the promises the government made to counter the effects of drought. for instance to build dams and give farmers seeds. But now that the situation has improved, these things have been forgotten. But remember, the next disaster is waiting.

Michael Korkoren, Farmer, Kapsabet

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Charles Kimani, Farmer, Wangige

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

Farmers like their occupation

The readers of our newspaper have to struggle hard, since every shamba has to feed an average of 9 people.

The Organic Farmer

When a newspaper like *The Organic Farmer* carries out a survey of its readers, it is not because the editors are curious or are trying to spy through the keyhole. Rather, we want to know a few things: Who are we writing for? What are their needs? What are their problems? Can they be solved with the information we give? How can a newspaper like *The Organic Farmer* help to improve the income of smallscale farmers?

The questionnaires we received from you farmers gave us the answers to all these questions. We sent out 500 questionnaires, and 323 farmers answered and sent the questionnaires back to us. We thank you, the farmers, for the feedback! In this first article we will inform you about the social structure of our readers. In the June issue of *The Organic Farmer* we shall write about the critiques on our newspaper and the areas in which the farmers want us to improve.

Proud to be farmers

Most of our readers truly are smallscale farmers. There are huge differences in the size of the shambas. Shambas vary from 0.8 acres to 19 acres (0.32 to 7.6 hectares). On average, our readers own a shamba of 4.74 acres (1.9 ha) and 9 people live on the income from the shamba (We calculated these averages by adding together the total of the sizes of the shambas or the numbers of dependants or animals of all responding farmers together, and dividing it by the number of responding farmers). The families have on average 4 to 5 children, and the farmers are very eager to send them to school.

Most farmers are proud of their occupation. They would also like to see their children become farmers, because they believe farming is one of the careers that provides self-employment. Many of the people answering our questionnaire showed a preference for agriculture since they know it is the mainstay of Kenya's economy; other reasons given was for food selfsufficiency and the possibility of earning an extra income from food sales. Only 10 percent of our farmers advice their children to look for a job outside of the agricultural sector. These farmers have quite a strong point: salaried employment in industries or in offices provides a regular income - if one can find employment!

Lack of credit

Our farmers are well organized. Four out of five farmers are members of a farmers' group. Unfortunately, membership to SACCOs (savings and credit organizations) shows a different picture. Even though the farmers underline the importance of SACCOs, only one-third are members. This attitude should change, because SACCOs provide affordable credit to smallscale farmers. One of the big challenges facing smallscale farmers is the lack of credit to improve production in their farms. That is why we urge you farmers to join a SACCO and to support each other in accessing credit for farm development.

Organic farming is widespread

About a third, or 100 farmers responding, have an additional job, and only 102 can rely on a relative (son or daughter) working in town. Only 10 percent use an irrigation system. More than half of the farmers have a mobile phone, and one-third own a bicycle. Our farmers live an average distance of 6.8 km away from the nearest market, a walking distance that takes 55 minutes. This explains why so many farmers complain of the bad roads interfering with marketing of their produce.

One-third of the farmers practise conventional farming, and two-thirds use a mixed system of organic and conventional production methods. The main crops planted by most farmers are maize and beans, half of which are sold and therefore contribute to the farmer's income. Nearly two-thirds of the farmers sell their products through middlemen, while only 10 percent sell directly to schools, churches or similar institutions. The farmers who responded to our survey own on average 3.7 cows, 2.5 goats, 2.3 sheep and 7.9 chickens. This explains why farmers have requested the newspaper to write more articles on livestock keeping. If you look at page 4 in this issue, you will see we have done exactly that. We will have more articles on livestock health in future issues.

June issue: what farmers want to read in our newspaper.

Increasing yields through strict weeding

If a farmer does not control weeds early and in the right way crop yields are drastically reduced.

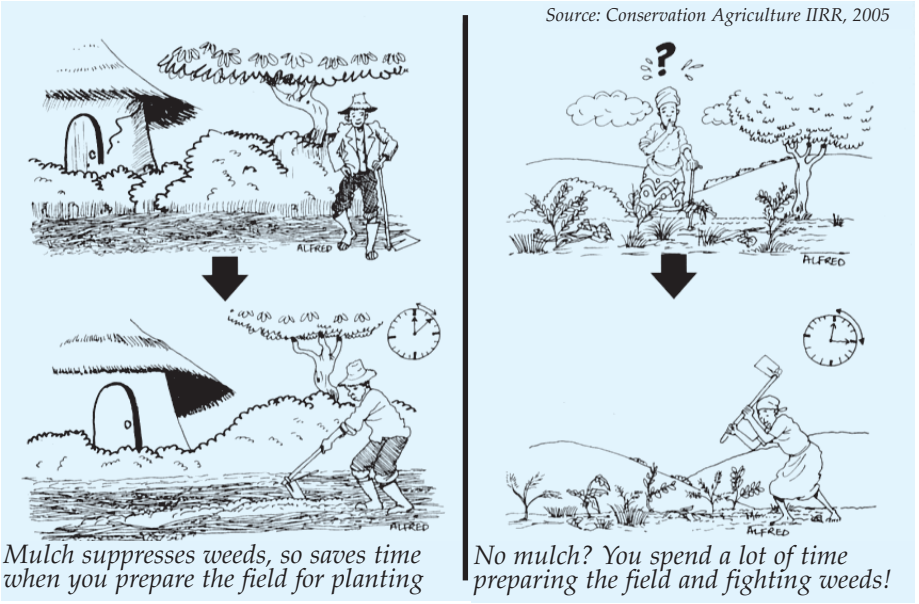
The Organic Farmer

A weed is any crop that grows where it is not needed. Weeds compete with cultivated crops for nutrients, moisture, sunlight, and space. They shelter pests and diseases that attack the crop while reducing crop yields and farmers' income.

In Kenya, ploughing the land is the most common practice used by the farmers to control weeds. They plough several times to remove weeds during land preparation. What they do not know is that ploughing buries many weed seeds. At the same time, it brings other seeds buried in the soil to the surface where they germinate. Tractor and ox-drawn ploughs also play a major role in spreading weeds in cultivated fields. The plough cuts down the weeds and pulls them along, as it is pulled by the tractor or oxen. The small pieces are then spread across the field. They grow vegetatively and cover parts of the farm that were previously weed-free. Burning crop residues may also stimulate the growth of some types of weeds.

In organic farming and conservation agriculture, weed control is very important. If a farmer does not control weeds properly, they may spread to a point where crop yields are drastically reduced. It is always wise to control them in their early stages of growth. A farmer should not allow weeds to compete with their crop. If they are left long enough to produce seeds, weeds tend to reproduce fast, making it even more difficult to control them. Weeds need slashing, even after harvesting, to stop them from producing and setting seed.

Source: Conservation Agriculture IIRR, 2005



Mulch suppresses weeds, so saves time when you prepare the field for planting

No mulch? You spend a lot of time preparing the field and fighting weeds!

Control methods

Minimum tillage is a system of agriculture that ensures the soil is disturbed less during cultivation. If this system is used, most of the buried weed seeds are not brought to the surface.

Good cover crops spread over the soil quickly and suppress the weeds before they can grow. The farmer should select cover crops that have several uses, for example food crops, fodder crops or those that provide firewood. Cover crops such as lablab can cover the soil completely in two months.

It is important to weed once in order to give the cover crop a chance to get established. If the rainy season is long enough, farmers can schedule the planting of a cover crop such that it will remain in the field even after the main crop has been harvested. The cover crop spreads over the soil, suppressing the weeds. Good cover crops include desmodium.

Mulching

Weed seeds germinate easily if the soil is bare. Crop residues left on the surface as mulch makes it hard for weeds to grow because they do not have enough space or light. Farmers should take care to ensure that the mulch does not kill the young crop seedlings. The mulch will not only manage weeds; it will also reduce the soil temperatures, conserve moisture, facilitate water to sink and add organic stuff into the soil.

Crop rotation and Intercropping

Planting a different crop in each field than the one grown previously breaks the life cycle of weeds. There are fewer weeds, and they are easier to control. Intercropping helps cover the soil and smother weeds that grow between the rows of the main crop.

A farmer can pull out weeds by hand; slash them with a panga, sickle or slasher. Try not to disturb the soil too much if you use a hoe or other implements.

Useful tips on weed control

1. Slash weeds immediately after the harvest and during the dry season to prevent them from producing seeds.
2. Before you plant, slash any plants (weeds, cover crop, stalks left over from the previous crop) in the field.
3. Dig planting holes with a hoe or open planting furrows with a ripper or subsoiler.
4. After the first rains have fallen, allow weeds to grow or new weeds to emerge. Then weed them out before planting.
5. Plant a cover crop between the rows of the main crop.
6. Check for weeds every week and control them by pulling them out by hand or scraping the soil surface with a hoe. Do not disturb the soil too much.
7. Harvest the main crop and allow the cover crop to grow.
8. Continue checking for weeds and pull them out before they can flower and seed.
9. Harvest the cover crop seeds. You need them for the next season.
10. Crush the mixture of crop residues and cover crops using a sickle, panga, knife roller or any other implement 3 weeks before you expect the first rains to begin.

If a farmer controls the weeds regularly, they should be easier to control in later seasons. Remember it can take 3 to 5 years for the number of weeds in the soil to be reduced to a minimum.

However it is important to check for weeds continuously and to pull out any that try to sprout. If this is done, weed control will be less work.

Worm control improves livestock health

Farmers should not treat their animals for worms without seeking veterinary advice.

The Organic Farmer

Control of worms in his cattle and sheep was for many years a problem to Johnson Mwaura, a farmer in Kiambogo farm in the Molo area of Nakuru district. The cost of deworming drugs was not only prohibitive, but also he did not know how to administer the drugs. But three years ago, a neighbour who is also a senior official in the Department of Veterinary Services advised him to try "Pymac,"a by-product of pyrethrum which is also used as animal feed. He also taught him other preventive deworming procedures.

Pyrethrum by-product helps

"Every day I feed my animals with Pymac which I mix with maize bran to reduce the bitter taste. The health of my cows and sheep has improved tremendously. I would recommend it to any farmer who wants to control worms in their livestock," Mwaura says.

Many farmers do not take the problem of worm control in their livestock seriously, yet worms play a big role in livestock health in many parts of the country. Livestock owners do not give the right doses, which has led to worms developing resistance to some of the drugs in the market. According to Dr. Gideon Kikuvi from the Kenya Veterinary Laboratories, farmers under-estimate the danger of worms.

Worms reduce milk production

Animals infested with worms are often in very poor body condition; they are weak, thin and vulnerable to all types of diseases. They lose weight and their milk production is drastically reduced. He says worms can also get entangled in the animal's intestines where they cause blockages.

Johnson Mwaura uses Pymac to fight worms in his animals. *(Photo TOF)*

The common symptoms of worm infestation are a rough hair coat – the animal's hair comes off easily. Some worms cause diarrhoea, while others cause swelling in the lower jaw. Young animals have a swollen stomach and may even die if they are not treated on time.

Advice from veterinary personnel

Dr. Kikuvi is quick to add that farmers should not rush to buy worm drugs whenever they observe these symptoms in their livestock. Indeed, he says the major problem now facing the Department is that farmers do not consult veterinary personnel whenever their animals are affected; instead, they buy and administer the drugs themselves.

He says the danger here is that there are different types of worms and each of these requires a different mode of treatment. For example, an animal could be suffering from tapeworms but a farmer may administer a drug for liverflukes. Although there are drugs that kill many types of worms, he says it is only the veterinary personnel who know which types of worms are common in an area and who are the only people qualified to administer the correct drugs at the right dosage. Liverflukes, for instance are common in farms located in swampy areas because the worm resides in snails during part of its life cycle. Many farmers in such areas may not know this and are likely to administer the wrong drugs for worm control, he says. Farmers should know that a limited number of parasites help the animals develop resistance to re-infection.

Natural remedies for worm control

Organic farming encourages the use of natural remedies for worm control. Apart from Pymac, neem cake is also a good natural dewormer. Many communities in Kenya have indigenous knowledge of plant based preparations for worm control. According to research undertaken by the Practical Action NGO (formerly ITDG) Turkana and Samburu communities use three plants to control worms. These are *Myrsine Africana* (*Segetetich*-Kalenjin, *Mugaita*-Kikuyu) *Albizia anthelmintica* (*Mwowa* or *Kyalundathi*-Kamba) and the *Hilderbrandtia sepalosa* (*Jirmach*-Orma or *Mtikiti*- Kiswahili). However it is recommended that herbal deworming is done together with other worm management procedures that reduce infestation in non-affected livestock.

Pasture management

Dr. Kikuvi says farmers should ensure that adult cows and sheep are separated from the calves and lambs. The reason for this separation is to ensure that the young animals which are more vulnerable to worms are protected. This means that if the adult cows are grazing in paddock A, then calves should be assigned paddock B. If the adults are to be moved to paddock B, then the calves should be moved to C and so on. In this way, the adult animals cannot expose the young ones to worms found in the dung.

Useful tips

- Farmers should deworm their animals two weeks after the onset of the rains. This ensures the worms do not compete for nutrients with the animals when the pasture is available. In many areas, this should be in the March - April and October- November short rains.
- Farmers should also deworm at the onset of dry season (November-December), during this period there is little pasture, so this practice ensures that the animals utilize all the nutrients they can get from the limited pasture instead of sharing it with parasitic worms.

New methods to fight bacterial wilt

Planting mustard in rotation controls bacterial wilt in potatoes and tomatoes.

Anne B. Nganga

Bacterial wilt in potatoes and tomatoes is a big problem for farmers in Kenya. So far the only control methods have been to use clean seed and use of fields that have not yet become contaminated by the disease. This is because the disease stays in the soil for a very long time infecting any susceptible crops planted there.

The Australian Center for International Agricultural Research has discovered a method they call bio-fumigation. This practice reduces the incidence of bacterial wilt in heavily infested soils from 50-100%, depending on the soil structure. It seems to work better on sandy and light soils than on heavy clay soils, but research is ongoing, so the method will be further tested and developed in Australia and in the Philippines.

Reduction by 70 %

Bio-fumigation is the process whereby naturally occurring chemicals called isothiocyanates are released from brassica crops (cabbage family). They suppress soil-borne organisms such as the bacterial wilt.

How do the chemicals get out of the plants and into the soil? The answer is short: The chemicals are released when the cell walls of the fresh plant are broken down. Chopping plants very finely is the best possible option. But there still remain large pieces of unbroken leaves in the field. Phillippine farmers use a rotary hoe or rotavator to chop leaves and mix them into the soil. With this method, they reduce bacterial wilt by 50-70%. In Kenya, several trips over the field with a light disc harrow would probably produce the same sort of result.

Potatoe farmers incur huge losses due to bactarial wilt (Photo TOF)

Mustard is very effective

The scientists tried many different brassicas, and found that mustard (a common weed in most areas), radish and broccoli were the most efficient at reducing bacterial wilt in tomatoes and potatoes. They had very good success with throwing out handfuls of seed of radish and mustard between the crop, immediately before planting the tomatoes or potatoes. Mustard is at the same time a type of green manure, which feeds the soil.

Farmers have to prepare the soil well in order to make the seeds germinate, grow and cover the soil as a lush green blanket. Farmers can then chop these plants into the soil just before planting tomatoes or potatoes, bearing in mind that the leaves have to be hacked as finely as possible. Other green manures may work as well, for instance old cabbage stems and leaves will help. Sweet potato vines seem to have a good effect, even though they do not belong to the brassica family.

Kenyan farmers with bacterial wilt problems should try out this method. It might work not only in the Philippines, but also in Kenya.

Crop rotation is important

A strict crop rotation with non-susceptible plants such as corn, beans and cabbage, provides some control of bacterial wilt for at least three years. In the case of a brassica crop, plant them immediately before you grow tomatoes, potatoes or tobacco. Care should also be taken to ensure the seed potatoes planted come from a clean source. Before harvesting the brassicas, broadcast, if possible, any brassica seeds available and let it grow to have a good soil cover. This cover is then chopped finely into the ground along with the leftovers of your cabbages or broccoli.

If the same crop is grown for several consecutive years on the same land, yields tend to decline (or more fertilizer will be needed to reach the same yield). Diseases are common and the yields are reduced. When different crops are grown in sequence in the same field, each crop uses the soil in its own particular way and thus reduces the risk of nutrient depletion. A well-balanced alternation of crop species also prevents the development of soil-borne diseases. Therefore, cultivation pauses must be respected for the same crop and among crops of the same plant family.

To avoid the development of persistent weeds, slow growing plants should be grown after crops with a good weed suppression. Change crops with deep roots with those that have flat, shallow rooting systems which also helps to suppress the weeds. (*See also page 3*).

Mustard, an old medicinal plant

The mustard family belongs to the Brassica genus, which also includes broccoli, cabbage, sukumawiki (kale), cauliflower, turnips and radishes. Mustard is one of the oldest spices and one of the most widely used. The Chinese used mustard thousands of years ago and the ancient Greeks considered it an everyday spice. The first medical mention of it is in the Hippocratic writings, where it was used for general muscular relief. Even now, milled mustard seeds (mixed with water) are used to treat rheumatism and pain in the joints.

If mustard can be used against bacterial wilt, we may suddenly get a huge demand for cheap mustard or other cheap brassica seeds, which can be collected from the wild or grown for the purpose in a small plot in a corner of the garden. Mustard produces seed within a very short growing period (usually 1-2 months).

Amaranth is healthy food

"We would like to grow Amaranth vegetables, but do not know how to do it. How is it planted and tended? How can we get seeds?" asks Ronald Mokaya of Kinyagu Self Help Group Box 995 Kitale

Ronald, I am so glad to hear you want to grow Amaranth! Our indigenous vegetables are highly nutritious and better for us than cabbage, as you will see from the table below. Apart from being easy and cheap to grow, these less costly and more environment-friendly crops help in ensuring stronger bones, lower blood pressure, fewer heart attacks, and less diabetes, less constipation and hemorrhoids. Amaranth should be part of everyones diet, more so if we are ailing or recovering from illness.

	Amaranth (*Terere*)	Cabbage
Iron	8.9	0.7
Protein (gm)	4.6	1.7
Water %	84.0	91.4
Caloris	42	26
Carbohydrates	8.2	6.0
Fibre (gm0	1.8	1.2
Vit C (M/G)	64	54
Calcium (m/g)	410	47
Phosphorus (m/g)	103	40
B-Carotene (mcg)	5716	100
Thiamine (mg)	0.05	0.04
Riboflavin (m/g)	0.42	0.10

Composition per 100 gram of edible portion of Amaranth compared with Cabbage. (Source: FAO)

As can be seen from the table, Amaranth is a much better source of minerals and vitamins than cabbage and has over 50 times as much B-carotene which is an antioxidant known to be useful for good health.

Planting can be done direct from the seeds. However, because Amaranth has a deep and wide hairy root structure, it will battle for nutrients if grown with very close spacing. My most successful crop was transplanted from a seed bed. Make sure your planting area is well prepared, incorporating plenty of well composted organic matter. When harvesting, remove the seed heads when very young, otherwise the plant will stop producing leaves as it goes to seed.

Amaranth improves nutrition (TOF)

Amaranth seed when dried and milled produces a very nutritious porridge too!

Seeds are available at the Kenya Seed Company and Simlaw Seeds.

Soil fertility tip

The Amaranth root structure is very beneficial in improving your soil structure for the crop following in rotation. A root crop would be a good choice as a follow-on crop. Amaranth can also be used as a green manure when dug back into the soil.

•Farmers who would like to know more about Amaranth, should get in contact with the NGO, Strategic Poverty Alleviation Systems, PO Box 7795, 00200 Nairobi, e-mail: spastrategysystem@yahoo.com

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Be careful with bird manure

Zachary Mwarari of Kilgoris has been advised that chicken manure if mixed with fresh cow dung and comfrey leaves can make a good foliar feed, when later on mixed with water and kept in an airtight container for three days. Does this preparation work? "I also want to know how to make other organic pesticides and herbicides. Can you advise?"

Most organic material, when composted or turned into a liquid tea, are good fertilizers. However, I would be cautious about using any of the animal manures as foliar applications. They are good as a top dressing, poured onto the soil surface. As a foliar feed, you risk not only burning of the leaves due to the high nitrogen content, but also contamination of the crop with pathogens for instance E. Coli, a very harmful bacterium. I would rather use green manure teas, which are liquid manure made from the decomposition of green vegetation as foliar applications. The material used can be lucerne, tithonia, comfrey, nettle, weeds or any other suitable plant. A combination of these is better than any one used singly. And you should use it within one week of preparation of the teas! Remember, foliar feeds on products like sukumawiki can be quite harmful if not washed properly, and this may be the case during times of drought. I personally feel also that we must be very cautious about our use of chicken and poultry manure, due to the current Bird Flu epidemic.

What can I do against black ants?

Benjamin Lugano, Box 585, Kitale has a problem with black ants in his passion fruit garden. "I know they are beneficial because they eat aphids in the vines, but then they also sap the water from the fruits and in the process cause damage. How can I control them?"

Benjamin, your problem is actually caused by the aphids. The ants are merely taking advantage of the aphid population. Contrary to what you believe, the ants do not feed on the aphids; they "herd" the aphid and "milk" them like cattle. The aphids suck the sap from the plants and produce a sweet sticky substance, called "honeydew". This is what the ants are after. The ants become destructive when they carry the aphids to other plants and in the process transfer any other diseases or virus present on the host plant. If you reduce the aphid population, the ants will disappear. If

continues on page 7

Letters to the editor

Story on seeds helped us

I would like to congratulate you for your effort to make us more knowledgeable in farming, keep it up. I came across your March issue through a neighbour, after reading a topic on seeds I was really impressed because we only rely on local ones called 'moshi'. If the shops do not have genuine labels as we saw in the picture then we do not buy the seeds. Already I have sent a letter to the western seed company and the lot number I planted. With this remarks I say thank you for enlightening the farming community. My group through you will benefit. Thank you.
Mark Otieno Owuor, P.O Box 45, Homabay Tel. 0735 691140

Copies not enough

Thank you for the farmers' newspaper you sent to our group. Please we would like to have more copies for our group and other groups because when we received them all the 24 member wanted but only 5 members received the copies you sent. Presently we are training farmers in our location. Each of the blocks require copies of the newspaper to update their skills. Please send us more copies, preferably 200 copies. Later we will provide you with a list of farmers who have received the copies.

Evans Konjae, Obwanchani youth group, P.O Box 18, Karota.

Black ants ...

continued from page 6

the problem is disastrous, one can spot spray the aphid with a pyrethrum based spray. I like pyrethrum, as it breaks down within hours and does no damage to mammals. Alternatively, you can sprinkle the aphids with diatomite; this will not kill them immediately, however and they may still walk off, spreading viruses until they die. The sharp crystals of the diatomite shred the bodies of the aphids, causing them to lose their body fluids and leading to eventual death. If the problem is not severe, look around for ladybirds on your other crops and transfer them to your plants with aphid problems. Ladybirds feed on aphids; however it is their larvae that do most damage to aphid. The larvae of the lady bird beetle is small an speckled black and white.

Strengthening agriculture

We here at Ukambani Christian Community services are happy to have received several copies of the organic farmer newspaper January 2006 issue. Thanks a lot and there materials will strengthen our sustainable agriculture component in training and sensitizing our farmers in this semi arid area of Kenya, as the country goes organic in farming. This is an assurance that the information and experiences will be disseminated to the farmers and be of help. Thanks again for being associated with you. We need more support and collaboration in terms of material and experience sharing.
John Mutua, For Director UCCS
email: uccsack@swiftkenya.com

Learning new methods

The Multi-plant International Medicinal Conservation is a community project with 30 members. We came across your November 2005 issue and the farmers were very much interested in the information it contained. We request you for monthly copies of the newspaper to enable our farmers learn new agricultural methods. P. Your assistance will be so useful to this community.

Joannes Samikwo, P.O Box 50 30201, Endebess

Let us work together

We thank you very much for your wonderful and educative agricultural magazine that we received for the first time last month through V.I Agro forestry project in Kitale. The Nabwami Community Based Organization (NACOBAO) is a non-profit organization operating in Machewa Location, Saboti Division in Trans-Nzoia District. It is an umbrella of 24 self help groups drawn from the Division. The organization has 275 registered members, A chairman, secretary and treasurer have been appointed from amongst the members. These officials run the activities of the organization on a day-to-day basis. We therefore request for partnership and a monthly supply of The Organic Farmer Newspaper for each group. Your assistance in this matter will be highly appreciated.

David Were Masibo, Chairman,
email: nabwaids@yahoo.com

Dear Farmers,

As part of our efforts to serve the organic farming community effectively, we would like to create a database of organic farmers in the country. We are interested in:

-Your names,
-Addresses, Location,
-Farm acreage,
-Are you an organic farmer?

To make it easy for you, we have a special telephone number: given above. All the farmers can provide these information through short messaging service (SMS). ***Come on Farmers, Tuma jibu. Asante.***

SMS ONLY

We use newspaper to teach farmers

I am very glad when writing this letter for the work you are doing for us. I am a volunteer field educator in our group but you have made our work easier because we get some of the details from the organic newspaper and our member are happy for that. Secondly, as you can see in the figures we have given in the questionnaire crop yields are not very high because we are in a semi arid area at the border between Nyeri and Laikipia. So we need additional advice on crop production and livestock keeping.

The members are grateful for the work you are doing to educate them on new farming methods.

Haron Mwangi Gichama,

Nairutia Primary School,

P.O Box 175, Mugunda Via Nyeri

I have received copies

Thank you very much for your quick response in sending me 50 copies of *The Organic Farmer*. I got them in good time and in good condition.

I can assure you that they are being put to good use and will be read by many farmers in the various groups in my location. I hope that we will continue to receive this publication and other information that can be of assistance to our farmers.

Chief Joseph K. Mutai, P O Box 69, Kaptagat.

How to plant fodder trees

Fodder trees and fodder hedges help farmers to optimize the use of their available land.

Eric Lumosi Asiligwa

No doubt, trees on a farm have a lot of advantages, especially fodder trees (see TOF Nr. 12, April 2006). There are more benefits if the farmer knows where und how to plant fodder trees and what type would help him most. There is always some space: a shamba of 2.5 acres has over 400 meters of external boundary, plus additional sites along the internal boundaries and around the homestead. Several sites are therefore available to plant fodder trees.

When to plant?

The best time to transfer seedlings to the field is at the beginning of the rain season, when the soil has enough moisture and continuous rainfall is expected for more than two months. Before removing the ready seedlings of around 25 cm height from the nursery to the planting site, they should be exposed to harsh field environment: remove the shading materials covering the nursery and reduce watering to only once to every 2 to 3 days. This process is called hardening of seedlings.

How to plant?

Choose a site on which to plant the fodder trees and clear all the weeds from it. Dig planting holes about 20 cm wide and 30 cm deep. Apply a 1-kg tin of manure to every hole and mix well with topsoil of the planting hole. Add a tin full of fresh ash to every 20 liters of manure. Fresh ash keeps pests like termites away too.

After planting the seedling in an upright position and mixed soil returned to cause a firm grip, water them well to enhance their chances of survival. Ensure that the seedlings retain some soil attached to their roots, to enhance their survival rates. Overgrown seedlings can be uprooted when the ground is really wet. Cut the stem to 15 cm above the ground and then cut the main root to 20 cm long. Finally cut the lateral roots 5 cm from the main root.

What next?

Fodder tress can be grown for fodder alone or to provide other products like firewood, stakes, seeds, or services like soil erosion control, shade or ornamental purposes. Whatever the case, it is important to manage the trees in the correct way. What does this mean in terms of fodder trees?

Fencing: Make a fence around the tree to prevent it from being destroyed by livestock and wild animals.

Weeding: Seedlings grow slowly and can easily be choked to death by weeds, which compete with them for water and nutrients. They can also harbour pests. Keep the area around the seedlings clear of weeds

Thinning: Trees need enough room to grow strong and healthy. If planted for fodder, space the trees about 50 cm apart. To grow trees and shrubs for firewood and stakes, space them 1 meter apart, and to control soil erosion, reduce tree spacing to about 30 cm apart.

Mulching: To conserve soil moisture, the area around the trees should be mulched. Take care: Do not place the mulch in direct contact with the trees, since the moist and cool environment could encourage pests and diseases. Also avoid mulching where there are termites, as this may increase damage of the trees by the insects.

In the next issue: Protecting the trees from pests and diseases

Calliandra: source of protein

One of the best fodder trees is Calliandra. This shrub grows to 4 to 6 meters, requires rainfall that is above 1,000 mm per year. It does better in well-drained soils, as it does not tolerate water logging. Fodder is ready for harvesting in the ninth month after planting, 4 to 6 harvests are possible per year. Calliandra is of great value because of his high protein content. It can assist a lot when the livestock are fed only on grasses like Napier, which are often low in protein.

Market place

Internet-information: Some readers have requested us to provide them with internet sites that give information on organic farming. There are hundreds of websites. Here are We give you some of the most important ones:

www.oisat.org
www.une.edu.au
www.new-agri.co.ke
www.organic consumers.org
www.organic.com
www.planorganic.com
www.ofrf.org/GENERAL
www.fao.org/ORGANICAG
www.soilassociation.org
en.wikipedia.org/wiki/organic_farming
www. ifoam.com

If you need more information, you may find it here: Soon, BioVision, the sponsor of our newspaper, will soon open a similar service for farmers in East Africa.

Traditional vegetables: The Rural Out reach Programme has seedlings of indigenous plants for sale. Farmers interested can get in touch with them through the following address: Thomas Wakala Mutuli, ROP, P.O. Box 29086,00625 Nairobi
Tel.0735 568 824;
e-mail: thomasmutuli@yahoo.com

Energy saver: James Olwangu from Kakamega sent us this photo. He wonders why many farmers throw away charcoal dust at a time when energy is becoming a problem to many rural households. He advises farmers to mix the the dust and the small charcoal particles with wet soil

and then mould them into balls. They should dry in the sun for five days. If two of the balls are placed into a burning jiko, they will burn for hours.

Tissue Bananas: In the last issue of *The Organic Farmer* I read the interesting story on Tissue Bananas. Does somebody in the Nakuru-region have seedlings? If this is so, please call Isaac, 0735 442 433. Thanks!

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 15 July, 2006

Kazi mingi, malipo kidogo

Many farmers in Kenya face the same struggle every day: Will my farm bring enough income to sustain my family? To pay school fees? To afford the long overdue repair of the roof of my house? While the government has put the minimum salary for the agricultural sector optimistically at 4812 Kenyan Shillings per month, most farmers and their families still survive with not even half of this amount. "We have no money to buy seeds or bring our produce to the markets," are only some issues *The Organic Farmer* hears its readers complain about. Bad roads, pests and diseases, losing lots of money to middlemen and unreliable rainfall are other problems which make farming in Kenya so challenging.

Why do the Kenyan farmers work so hard yet earn so little, and what can be done to change this situation? We try to answer this questions on page 3. (*TOF*)

A new maize disease in Kenya

The grey leaf spot disease has already spread to important maize-growing areas of the country.

Dr. Z. M. Kinyua

Maize farmers face a new disease that has recently hampered the production of maize grain. The grey leaf spot disease, which is caused by a fungus known as *Cercospora zeaemaydis*, appears in the form of necrotic lesions (dry brown-yellow wounds or patches) on the leaves of maize plants. The wounds may merge to cause extensive leaf blighting (burnt appearance). This reduces the plant's ability to manufacture its own food from sunlight (photosynthesis). It causes poor grain filling of the maize cobs and therefore reduces the maize yields and farmers income.

Mid-altitude areas affected

The grey leaf spot disease, which was not known to occur in Kenya before its first appearance in 1995, has become a great threat to maize production in the western and Rift Valley regions of the country, where the highest proportion of maize grain originates. Most of the maize in Kenya is produced in mid-altitude areas, which unfortunately are also favourable for the development of the disease.

The devastating disease has reached epidemic levels in important maize-producing areas such as Kakamega, Vihiga, Kisii, Migori, Lugari, Bungoma, Bomet and Nandi districts. Other mid-elevation areas are also affected, but with less damage to maize crops. *Continued on page 2*

in this issue

Dear farmers,

Every day, local newspapers are full of stories about our fellow Kenyans entrusted with leadership positions in government, parastatals, companies and even civil society organizations, who loot or mismanage public funds. Corruption is so widespread that it now threatens every sector in our country. The agricultural sector has not been spared. Look at what used to be our best performing co-operative societies— they have collapsed owing to mismanagement by the farmers elected to lead them. We have emphasised on several occasions the need for farmers to come together and solve some of the day-to day problems that they face in production and marketing. However some of these groups also have problems of leadership. This is because some farmers' group leaders put their own interests before those of their members. There are those who fight for leadership positions for personal gain. Indeed, it is our feeling that some of these groups are set up for selfish motives.

Such group leaders will attend workshops and conferences that deliberate on the critical issues that affect farmers, but they will never pass this information on to fellow farmers when they go back home. They attend these meetings only because of the benefits they receive, like allowances and per diems.

Lack of transparency in financial management is another problem. Those given the responsibility of marketing various commodities on behalf of fellow farmers often short-change their friends. The rot also extends to out-grower companies that contract farmers to grow commodities for local and export markets. Many of these companies never pay farmers the true value of their produce.

From the many letters we get from farmers, we can clearly see that they are a demoralised lot. Our advice to farmers is that they should wake up to these realities and find ways to overcome them. Only people with a known track record should be given leadership positions. Group members should always demand accountability from their leaders. How can we complain of exploitation of smallscale farmers if the farmers themselves cannot help each other?

MY OPINION

Any food that contains essential nutrients such as vitamins and minerals, promotes our health and the general well-being of our families. Many farmers know this fact but they ignore it. Despite being the producers of very nutritious farm products, very few farmers rarely consume the products. Instead they take them to the market for sale. For example, it is common to find a farmer selling all eggs and milk, leaving none or little for their malnourished children. They will then buy a kilo of sugar, soap and other household items which they think are more important. Of course, we need the money, but let us take care of our families' health first.

Michael Barasa, farmer Bungoma

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Charles Kimani, Farmer, Wangige

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

Disease remains in crop residue

There are many methods, including crop rotation, to reduce the spread of grey leaf spot disease.

Dr. Z. M. Kinyua

An infected maize leaf. (Photo TOF)

It is estimated that the grey leaf spot (GLS) disease can cause yield losses of between 30 to 50%. Higher yield losses have been recorded in other countries, where the disease has had a longer existence. The level of leaf damage caused by the disease and the resulting yield losses are higher when the fungus attacks maize plants early in the growing cycle. Unfavourable environmental conditions also contribute to its development. Severe levels of the GLS disease are particularly prevalent under prolonged conditions of high relative humidity (which is common under cloudy, misty weather conditions) and moderate to high temperatures. These conditions encourage rapid multiplication of the fungus, thus leading to the development of the disease.

Early recognition

The earliest noticeable symptoms of grey leaf spot are small yellowish dots which are the size of a pin-head on maize leaves. Slightly advanced symptoms include small, necrotic (dead), pale brown or yellowish-brown wounds that are largely rectangular in shape and generally run parallel to the leaf veins. The wounds may have a whitish-grey cast over them. This happens when the fungus that causes the disease has matured to produce spores. Such spores, which act as seeds for the fungus, are easily dislodged and carried by wind to cause new infections on leaves. The development of the disease is more readily noticeable around the tasseling stage of maize plants. The symptoms become more easily recognizable when the leaves become blighted, especially during the later stages of crop growth.

Research on control measures

Since the grey leaf spot disease is relatively new in Kenya, a lot of research towards its control is being planned. Breeding of resistant maize hybrids and varieties is high on the research agenda of the Kenya Agricultural Research Institute (KARI). This requires considerable time and resources.

Varieties such as Kakamega synthetic 1&11, KH634A, H614, SC Duma 41, and SC Simba 61 have been reported to have some tolerance to the disease. These varieties may be tried in areas where the problem is common. In the meantime, sound management of crop residues is seen as part of an integrated approach against this disease.

Destroy crop residues

The fungus that causes the disease mainly survives within infested maize crop residues on the soil surface. Removal and destruction of such residues after harvest would therefore help to kill the fungus, thus reducing the level of disease during subsequent cropping seasons. Crop rotation is also very important. Factors that favour the development of the grey leaf spot disease include over-crowding of plants with poor air flow and low sunlight penetration among plants, improper soil nutrient and irrigation management, and poor soil drainage.

Farmers unable to identify disease

Effective management of grey leaf spot requires a concerted effort among farmers within affected areas. However, investigations carried out by KARI in partnership with CAB International have revealed that the vast majority of maize farmers do not recognize the grey leaf spot symptoms on their crops. As a consequence, the farmers make little or no effort to control the disease or even seek more information about it. This lack of information and awareness is to blame for spread of the GLS disease in most of the affected maize-growing areas in the country.

Why don't Kenyan farmers earn enough?

Despite working hard to improve their income, Kenyan farmers face many problems in realizing their goals.

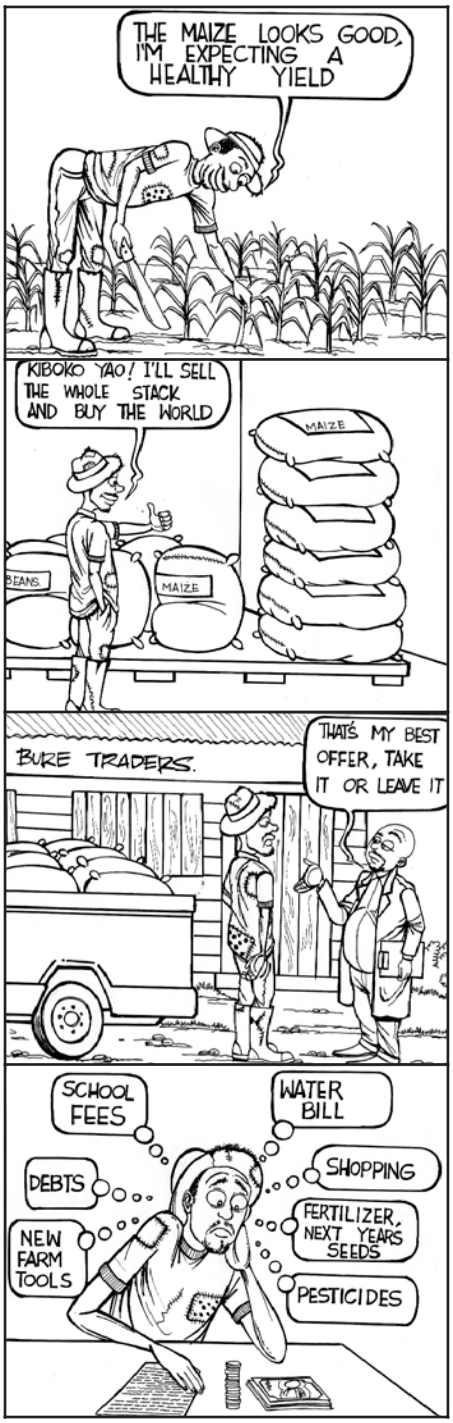
Anja Bengelstorff

Farming is a daily, labour-intensive task, and many Kenyans and Kenyan farmers are hardworking people. However, according to a Government statistic, 87 % of all poor households live in rural areas, where their main activities are in agriculture, yet about half of all Kenyans might not have enough food for their families. We need to take a closer look at how farming in Kenya is practised.

The importance of the agricultural sector in Kenya is clear: It provides the livelihoods for close to three-quarters of the population, it accounts for 60% of the country's export earnings and contributes 26% to the Gross Domestic Product (GDP) directly, plus another 27% indirectly through linkages with other sectors such as manufacturing and distribution. During the first two decades after Independence, the economy recorded an impressive growth rate of 6%, with the agricultural sector playing the dominant role. However this declined to only 3.5% in the 1980s and to even less in the late 1990s and early 2000s, to only 1.3%. What has happened?

Marketing neglected

For too long, the experts agree, the Government's policies have focused too strongly on producing agricultural goods, and by far not enough attention has been paid on marketing them. This means that vegetables, fruits and other crops were produced in large amounts, but the farmers were not able to find enough buyers. Talking to farmers all over Kenya, TOF knows that this is still one of the biggest obstacles in farming. For a long time, there was not a single expert in marketing in the Ministry of Agriculture. It is only recently that the Government took action in this regard. In its ambitious "Strategy for Revitalizing Agriculture", launched in 2004, the Government acknowledged the key role of domestic marketing and promised to give priority to developing the infrastructure and to the training of farmers. In addition, the Ministry of Agriculture now has an Agribusiness Division. Agronomist Dr. Joseph Kariuki from



the consultancy firm Agrisystems Ltd. knows that despite the good will, however, funds are lacking to make these plans come true.

To complicate matters further, the agricultural sector is currently governed by about 130 pieces of legislation, many of which are obsolete/out of date, or inconsistent. The issue of land ownership is another "hot potato" which needs to be worked on.

Soil quality declining …

Apart from governmental regulations, the natural conditions in Kenya are raising problems for farmers. Because the available land has to provide food for an increasing number of people, it is getting overused, and the soil's fertility and productivity are declining. As a result, the soil is becoming useless for farming purposes, erosion occurs more frequently and severely, and the semi-arid and arid portions of land are growing. According to Joseph Kariuki from Agrisystems, only 20% of the Kenyan land is suitable for farming today. Furthermore, the rainfall in Kenya is less available than in our neighbouring countries. He therefore strongly suggests that farmers be trained in conservation techniques.

… and not enough training

Another reason why agriculture is not keeping pace with population growth, if not the most important one, is the fact that Kenyan farmers do not consider their profession as a business. "Most of them see it as a way of life", Joseph Kariuki says. Another expert, Reimund Hoffmann from the German Technical Cooperation (GTZ), which promotes the Private Sector Development in Agriculture, agrees. "We have to see the difference between farmers and rural dwellers", he points out. One reason, both say, is the lack of sufficient agricultural training, not least in the business aspects of farming. Kariuki stresses another point: "Yes, there are many farmers' groups, but they are scattered and not organised on a higher level. A higher degree of organisation would enable them to better access markets, to negotiate with middlemen from a stronger position than individual, uncoordinated farmers' groups can do. As a larger group, they could make bigger investments at reduced costs. They need a stronger voice for their cause."

He admits, however, that the funds are lacking here as well, both on the side of the farmers and the Government. Yet something can be done. Kariuki advocates for transforming the farmer who now pays his or her small annual membership fee to their group and then leans back, "from a mere spectator to an active participant" of their farmers' group. If, for example, they suggest that the fee should be increased for the purpose of investments for the group, the individual farmer will be more interested that the money is used respon-

continues on page 7

Farmers get more money with asparagus

Asparagus growers in Gilgil want certification to reach markets and increase their earnings.

Peter Kamau, Gilgil

"This crop is now our only source of income", says Hannah Wambui, a member of Kigogo Farmers' Group in Gilgil. She is referring to asparagus, a vegetable crop that has become an important cash crop for farmers in the Gilgil area of Nakuru district. Unknown by farmers in the area before they began to grow the crop, asparagus production is now a major source of income for farmers in the region.

They were told it was fodder

Benson Chege, the Group's secretary, says he discovered it by chance: "A local farmer started growing it back in 1987, but he told the other farmers that it was fodder for his cattle", says Benson. His niece, who was working for a local flower company, saw the plant during a visit and told him that it was a major export crop for the company. She convinced him that the local farmers could grow it for the local market too, as the demand for asparagus is high in Nairobi.

"On her next visit she brought me some seeds", Benson says. "I planted and tended it, as I had been shown, and harvested. On delivery, a tourist hotel in Naivasha bought all my asparagus at Ksh 140 per kg."

A steady income for farmers

From the proceeds of the sale, Benson bought more seeds and increased the area under asparagus production on his family farm. Other farmers also learned from him and started production. Asparagus production has continued to increase, bringing a steady income to farmers in the region. The major market for asparagus is Nairobi.

At one time pyrethrum was the main cash crop for the majority of farmers in Nakuru district, including Gilgil. But farmers' earnings dwindled when the Government failed to pay them for their deliveries. Most of them stopped pyrethrum production altogether. The discovery of asparagus as an alternative crop therefore came at the right time. The crop does not require a lot of rainfall, which means it is well-suited for production in Gilgil, an area that receives moderate and sometimes below-average rainfall.

"Asparagus has really changed the financial status of most of the farmers in this area", says Benson. "Most of them now have a regular source of income, unlike in the past when they relied on pyrethrum and other farm products."

Corrupt middlemen

Overproduction and supply of asparagus in the last few years has come with its own problems. The entry of middlemen has made the situation worse for asparagus growers. The middle men have formed cartels which frustrate farmers by making it difficult for them to sell directly to buyers in Nairobi at a much higher price.

Asparagus, can fetch good prices in the market.

Su Kahumbu (right) shows Gilgil farmers a drip irrigation system. (photo TOF)

Gilgil Farmers get certification training

The Kigogo Organic Farmers' Group in Gilgil is the first farmers' group to benefit from *The Organic Farmer* Support Programme, which our newspaper launched in April this year. As part of its first anniversary gift to farmers, *The Organic Farmer* (TOF), together with the Swiss foundation BioVision, has arranged to support 10 farmers' groups in the country to help them get certification for their organic produce and at a price that is higher than that offered for conventional produce.

This capacity-building initiative will be a milestone for the organic movement in Kenya. Not only will TOF help the 10 farmers' groups start organic production according to the set standards, but it will also assist with price negotiations with the buyers. Moreover, TOF newspaper has arranged a training programme. The trainers are our newspaper advisor, Su Kahumbu; an agronomist and farmer, Anne Ng'ang'a; and the technician/farmer Dominique Wanjihia.

In the last several weeks we have received a lot of applications from farmers' groups who want to be considered in the programme. We have started with the training of the first four groups. They were the first to apply for assistance.

The Kigogo Organic Farmers Group has 44 members. Started two years ago, it is the first to benefit from The Organic Farmer Support Programme. The certification process for the Group started in the second week of June, with training sessions on organic production at Gilgil. "We really hope that the marketing of our produce will improve once we get certification," concludes Hannah Wambui, one of the Group members.

FPE energizes and protects plants

Fermented Plant Extracts when combined with EM boosts plant growth and controls diseases and pests.

The Organic Farmer

Many farmers have used Fermented Plant Extracts (FPE) for years. They are prepared from a combination of plants with medicinal properties that give the plants more energy and protect crops from diseases and pests. A farmer can use any plant that is known to have these properties to make the extract. When applied to a plant, the FPE triggers a defence mechanism which enables the plants to resist diseases and pests. One of the reasons for this response by plants is that the extract contains many natural compounds. They combine to fight harmful bacteria and fungi that are responsible for plant diseases. In addition, some of the plant extracts help to repel pests and therefore reduce damage to crops. If prepared in the correct way, FPE improves health in crops and an increase in the overall yield.

Various plants in combination can be used to make FPE (see table above). Most of them are very popular with the farmers in Kenya. Tithonia and comfrey provide the best foliar feed that can be used to enrich the FPE. It is advisable to use a mixture of weeds in the preparation of FPE, because different weeds are effective on specific pests. This also increases the variety of active substances and natural organisms that control diseases and pests. Weeds and other material to be used in the preparation are best cut in the morning.

Enrich the Extracts with EM

Effective Microorganisms (EM) are a mixture of beneficial and naturally occurring microorganisms that can be applied to the soils to improve plant growth, yield and quality. It consists of microorganisms of lactic acid bacteria, a limited number of photosynthetic bacteria (which help turn carbon dioxide and water into plant food by use of energy from sunlight) and yeast. These three groups of microorganisms help to condition the soil, suppress disease causing bacteria and speed up the decomposition of the organic matter for the benefit of plants.

If you add EM to the Fermented Plant Extracts, this makes it even more effective in promoting plant health. It also improves the ability of the plants to withstand diseases. It is not a fertilizer but it produces vitamins, organic acids and minerals essential for plant growth when it comes into contact with organic matter. This increases the humus content in the soil. EM promotes germination, growth, flowering, fruiting and ripening in crops.

EM and Molasses can be bought in all Agrovet-shops.

Some of the best plants for FPE preparation

Plant/herb	Pest problem
Marigold	Nematodes, cutworms, caterpillars, ants
Red peppers, chilies	Ants, aphids, army worms, caterpillars
Onion, leeks, garlic	Ants, aphids, army worms, caterpillars
Stinging nettles	Maize stalk borer, banana, weevils, storage pests and weevils
Black jack	Aphids ants beetles, cabbages, mites caterpillars, crickets, white flies and termites
Tomato leave solution	Cabbage butterfly, caterpillars and other insects
Lantana camara	Potato weevil, cassava weevil, grain weevils
Neem	Maize stalk borer, banana weevil, storage pests and weevils
Pyrethrum	Most of the pests mentioned above

How to Prepare FPE

Container - 200 litre drum

Ingredients

Tithonia
Stinging Nettle
African marigold
Comfrey
Optional
Onion leaves
Chilies

Preparation

1. Chop all the vegetation used for the extract into very small pieces.
2. In the drum add 4 litres of EM 1 and 4 litres of Molasses plus 20 litres of water, mix thoroughly.
3. Add chopped vegetation to this mixture, the vegetation should fill the drum approximately half full.
4. Now fill the drum completely with water and mix vigorously.
5. Cover the tank completely; fermentation must be anaerobic (with no air entering from the lid)

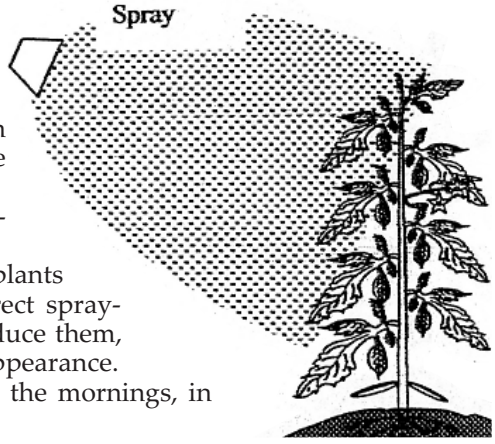
Leave to ferment for 7 to 10 days.

Mixing rates

1. For spraying crops: 200ml (two cups) of FPE/EM mixed with 20 litre of water
2. For use in irrigation on soil: 100ml (one cup) of FPE/EM mixed with 20 litres of of water (ground rule: 1 litre FPE/EM: 100 litres of water)

The correct application of plant extracts

The mixture of FPE-EM is not a chemical pesticide. Its application is different from that of the chemicals used to control pests and diseases. To ensure healthy plant growth, the solution should be sprayed as a preventive measure, regularly before the incidence of any plant pest or disease



This mixture can be applied onto plants directly once or twice weekly. Direct sprayings onto pest populations will reduce them, eventually leading to their disappearance. The mixture should be sprayed in the mornings, in the evenings or after rains.

How to control nematodes in tomatoes

Samuel Njoroge of Nakuru wants to know the organic practices that can help control nematodes in tomatoes.

1) Use Cassava (*muhogo*) obtain the juice by crushing roots. Dilute 1:1 with water, and spray immediately using 4 litres diluted extract per square metre of soil. This remedy is said to be very effective. Wait for 20 days before sowing. Also try using cassava peelings as a mulch against nematodes.
2) Grow African marigold in rotation to fight nematodes.
3) A common spray using papaya can be made by finely shredding 1 kg of leaves and adding to 4 litres of water. Shake vigorously and add a little soap (20 g or 20 ml). Spray or water into the soil (this is good for cut-worms too).

Very common: Early and late blight

"Is there an organic chemical that can be used to control early and late blight in tomatoes", asks Samuel Njoroge in Nakuru?

Controlling early and late blight in tomatoes is not easy, but you can try the following organic recipes:

1)Garlic bulbs may be dried and crushed and used as a dust. The dust can be made into a spray. This is recommended for mildew, bean rust and tomato blight.
2) Spray every 10 days with a mixture of 1 litre milk to 10 -15 litres water to control mites, blights, mildew and other fungal diseases, and mosaic virus.
3) Castor oil plant: Dig the leaves or oil cake into the soil to kill fungal diseases. (Remember castor oil seed/cake is very toxic to people and animals.)

Early blight (Courtesy Clemson Univ.)

How can I avoid damping off?

Another question from Samuel Njoroge: "Is there an organic way of treating tomato seeds while sowing the nurseries beds, in order to prevent damping off?"

Damping off is caused by a fungus. It is best prevented by using good plant management. Do not plant tomato seed in beds previously planted with same family type, for instance egg plant or peppers, or that were planted with tomatoes the previous season. Plant good quality seed, sow thinly, water carefully, and make sure seedbeds have adequate ventilation. Avoid sowing seed in cold wet soil and make sure not to over-water. If disease occurs, remove the patch of seedlings affected.

Natural fungicides can be made using sweet potato leaves, African marigold or tithonia. Try the following:
1) Crush and soak sweet potato leaves 1:1 with water (1 part leaves to 1 part water), dilute 1:1 again, use as a spray.
2) Crush 100-200 g leaves, roots and flowers of African marigold, pour on 1 litre boiling water over the leaves, soak for 24 hours, then add 1 litre cold water and use as a spray.

Chicken manure is good fertilizer

George Oyeng want to know if he can use chicken waste to control yellowing of maize?

Yes, George, you can use chicken manure as a fertilizer for your maize, since yellowing is a sign of deficiency in nitrogen.

As a compost: The manure will be more effective if it is first composted with some form of bedding material or simply added to your compost pile for some time. The resulting soil improver will supply bulk that will help to build soil structure and provide nutrients, which are made available to the plants as the manure decomposes in the soil. Urine is the main source of the plant nutrients, particularly nitrogen, and potassium is found in the manure. It is soaked up in the animal bedding. In poultry, the urine is the white portion of the bird droppings, and can be very rich.

As a liquid manure: Poultry manure can be added to water at the rate of 10 kg manure to 100 litres water. Leave this for 7 - 10 days, then dilute 1:4 and feed the plants. I would not advise you to use this as a foliar feed , but rather as a pour-on over the soil for heavy feeders. Adding Effective Microorganisms will help to reduce the smell.

Be cautious

If used alone, chicken manure may 'burn' your crops. Also, keep manures well covered at all times, as valuable nutrients can be washed away with the rain or damaged by the sun. Lastly, remember that poultry droppings can carry harmful bacteria. Therefore strict hygiene must be followed during handling of this type of manure to avoid all types of contamination.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Please, come to our aid!

Maragwa farmers sent us an SOS. Arrow roots (nduma) farming in Maragua is threatened with extinction. An unidentified insect has camped everywhere in our sprawling riverside gardens and boring holes on edible parts. Crop experts, scientists, please come to our aid!

This is bad! After I called you, I got some more information from you. With this information, I asked some agronomists since I do not know anything about this insect. Even the agronomists were helpless. So *The Organic Farmer* discussed the damaging work of this insect with specialists at ICIPE. For a clear analysis they need some living examples of this insect. If it is possible, send a dozen of these insects to: Dr. Bernhard Löhr, ICIPE, P.O.Box 30772 GPO 00100, Nairobi

Letters to the editor

We want dairy goats

We are very grateful for you have kept in touch with us. Since that time we started getting the copies, we have been practicing organic farming that has improved the quality of our produce and the yields. We thank the organization for supplying the magazines that enables us to utilize available resources correctly. The copies have reached every member of the group and they are happy for it is realistic and self-explanatory. From the copy of September/October issue, there was information about dairy goats. We would like through you, to get in touch with the farmers having them so that we can start it as a project. By now we have set project of dairy cattle and poultry that is successful. We hope that you will be sending to us the newspapers every month. I encourage mixed farming for one can easily utilize manure on the farm, which will be appropriate for soil fertility.

Phillipine Nyongesa, Inua Society, P.O Box 446, Kimilili

Send me past issues

I thank you for the advice given by your newspaper. I have only read No.10 from one of the farmers in our area. If possible please send me the previous newspapers so as to catch up with you.

Shaaban Hassan Saidi, P.O Box 1512-20300, Nyahururu, Tel.0720551105

We need information

We are happy to write to you with the above plea in our mind. We represent 35 squatter groups and one of the agenda discussed recently was to give the squatter groups with agricultural education so that they can boost farming and sustain themselves economically. With that in mind we resolved to write and kindly ask you to send the paper to us. After perusing one of the papers we found that it is of much help to our squatter groups.

Chairman, Trans-Nzoia Squatters Alliance, C/o CJPC Kitale Diocese P.O Box 4656, Kitale

Newspaper motivating

First and foremost I would like to congratulate you for your tireless efforts to make us knowledgeable in the use of organic material in farming. Fortunately I came across your issue No.8 and after reading it, I was motivated to try organic farming. Our members are organized small-scale farmers engaged in poultry, agro-forestry, tree nursery, bee keeping and horticulture. The group is registered by the department of social services and has 32 members. We will be grateful if you can send us monthly copies of the newspapers.

Rulas Mosoh Barango, Muungano Youth Group, P.O Box 319, Nyamira Tel. 0735 913319

Get grassroot support

I am very pleased to inform you I really enjoyed and shared ideas on TOF magazine with my neighbouring groups. For the newspaper to achieve its set goals, it should work closer with farmers from grass root level. This can be done if there was one contact person in every region who can give details to the TOF of what is exactly going on in the field. The magazine will motivate farmers' countrywide. I am working with almost 20 groups and need your assistance in everything within Longisa and Sigor divisions of Bomet district.

Peter Kipngeno Kilele, Lelaitich Primary School, P.O Box 57 Sigor

An eye opener

I would like to say that a lot has been done by your efforts on the publications on a monthly basis; this has been an eye opener to the farmers. It has helped many of them at local level. This should continue because it has assisted us community and development agents to quicken the trainings we offer to the farmers at the local level.

Peter Mwaura P.O Box 3128 Nakuru Tel. 0726-841863. slidekenya@yahoo.com

Prize winners!

When *The Organic Farmer* sent out the questionnaires in November last year, we also set a prize: We promised to invite 20 farmers who responded to our questions, to come to Nairobi to visit the International Centre of Insect Physiology and Ecology (ICIPE), the Biop Company and Su Kahumbu's vegetable farm. Now it is time to fulfill our promise! Our Secretary, Lucy Macharia, (blindfolded) picked out 20 of the nearly 400 questionnaires we got back from you. We congratulate the lucky farmers; they will be informed individually. Once more, we thank all those who responded to the questions. We assure them that the information they gave will go a long way in improving the quality of our newspaper in future.

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please send us (with sms) your contacts. We shall get back to you!

Tuma maoni yako! Asante.

farmers income...

continued from page 3

sibly. In other words, the farmer becomes a monitoring person.

The future is promising nevertheless. Kenya has many advantages in comparison to its neighbours. The country has a long experience in commercial agriculture, a well developed seed industry, and a booming consumer market. The demand is there, but, "We ruin the markets by not having standards", Kariuki warns. In the long run, organic farming with its approach of soil conservation is, for this expert, the only way forward, since the population will continue to grow further.

The Government of Kenya seeks to raise the annual growth in the agricultural sector to 3.1% per annum by 2007 and to 5% thereafter. Every single Kenyan farmer should be involved.

tips and bits

Problems with retained placenta

Retained placenta (when there is no automatic release of the placenta after delivery), is one of the common problems facing dairy farmers. Veterinary doctors give various reasons for this problem, such as lack of proper diet during pregnancy, a cow not having enough strength to push, or a disorder in hormone levels. Private veterinary doctors have been charging a lot of money for treating this disorder, ranging from Khs 800 to 2000. Many farmers have not been able to afford this amount. Due to the high fee charged for this service, most of the farmers have resulted to using herbal medicine. Two common herbal methods are:

1) A plant called wanjiru wa ruui (any common or botanical name so we can identify it). This plant is commonly found in central Kenya. It is prepared by boiling ½ kg of the plant in 1 litre of water for about 30 minutes. Give it to the cow as drench of ½ litre of this tea twice a day.
2) Mango seeds: Remove the inside part of the mango seed, crush about five seeds and give the cow in her feed. This traditional method should be given immediately after delivery, or 3 days after delivery in case of the retained placenta.

Compiled by: Elijah Koinange Ndaba, P.O. Box 1388, Kikuyu, 0721 658 199

Many other uses of African marigold

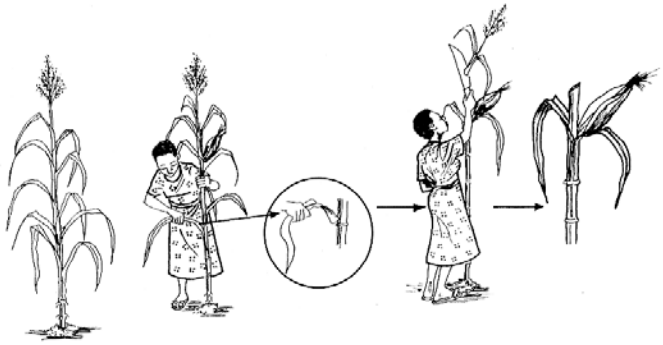
In our area, if not the whole of Kenya, we consider African marigold as a weed which uses up and weakens soil fertility. A garden full of the weed often results in poor crop yield. Early weeding is the only safe way we use in our gardens to curtail its spread. A dry marigold plant stump when cut or broken is poisonous if by bad luck it pricks a human being. A wound lasts a long time before it heals.

The marigold plant has an unpleasant smell that of course is not pleasing. Farmers use it to repel red safari ants (sisimizi) when they invade their homesteads or animal cages, stables or houses. We also use it as an inhalant for treating headache caused by cold and fever.

There is no special technical way of preparation or application when repelling safari ants. To drive away safari ants, you can pick three to five marigold plant stalks, then flop them directly over the heading-invading ants. The ants will eventually retreat and drift away from the scene. For headaches, pick a few green leaves of the marigold plant, and then compress them between your palms. Directly inhale for a few seconds then throw them away.

Elijah K. Kisiara, Kongasis Group, P.O Box 226-20203, Londiani

Extra fodder from maize



Start removing the lower leaves of the maize plant for feeding the cattle 3 weeks after the maize cob has produced silk. Remove one leaf per week, starting from the bottom going towards the top. Do not remove the leaf directly below the cob and the one above it. By doing this, it is possible to produce 450 to 600 kg of feed per acre of maize. After the maize grain reaches the soft dough stage, remove the part of the plant above the cob for feed (topping). This method produces better quality feed without affecting grain yield.

Source: More forage, more milk. Technical Handbook No. 33, published by World Agroforestry Centre, Nairobi

Market place

Service to farmers. Many farmers have been calling or writing to us asking for past issues of The Organic Farmer. We are no longer able to give you these back issues because the stock has run out. However we can still assist those of you who need these copies-we will photocopy them for you. But we cannot do this for free. Any farmer interested in getting the copies will have to buy stamps worth Ksh.350, put them in an envelope and send it to us. We will then send you the copies between April 2005 and April 2006. Please do not forget to give us your full address!

Market. Do you have any organic products for sale? A marketing group in Nairobi is looking for organic vegetables, fruits, maize, beans and related cereals and legumes. Farmers with these products should get in touch with the buyers through the following address: Michael Waweru, KOF & Group, P.O. Box 58440, 00200, Nairobi, Tel. 0724 634 492

Land for sale. 2.2 hectares, prime agricultural land situated at Meru farm next to Kitale Showground in Kitale Municipality. Interested buyers should get in touch with the owner. Contact Kihara Mwai, P.O.Box 24214,005200, Nairobi, 0722-575 816

Do you keep dairy goats? Many farmers want to buy dairy goats.We would therefore like to request all farmers rearing dairy goats in the country to give us their full addresses and telephone numbers. We will publish them in our August issue. This will help other farmers near you to contact you whenever they need the goats or information regarding them. The address list will help more farmers acquire the goats. Please SMS or call us through: Tel. 0721 541 590/ 0721 793 759/ 0733 713 105.

Seedlings. Are you interested in buying indigenous vegetable seedlings. The Rural Outreach Programme has many varieties. Contact: Thomas Mutuli, P.O.Box 29086, 00625 Nairobi, Tel. 0733 568 824

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 11 March, 2006

Farmers buying fake seed

Traders in maize growing areas are selling condemned seed instead of genuine seed to unsuspecting farmers.

The Organic Farmer

"Many farmers would get much more harvest if they planted the right seeds". This statement from a farmer's letter sent to us shows the importance of seeds in crop production. Although a majority of farmers already know that good seeds play an important role in increased production, they often ignore the advice and go for poor quality seed that is to blame for decreased crop yields in many farms today. Part of the reason farmers buy the counterfeit seeds from dishonest seed traders is to save money.

Producers sell rejected seeds

Indeed, the main culprits in this whole racket are the seed growers themselves; According to Simon Komen, the Kenya Plant Health Inspectorate Service (KEPHIS) regional manager in Kitale, the organization may condemn a farmer's seed maize after inspection. The farmer is then advised to sell the rejected seed as commercial maize. But the majority of the farmers do not do so. Instead they offer the rejected seed as genuine seed maize to unsuspecting farmers at a lower price. Some of the seed growers even offer the parent or basic seed maize (from which hybrid seed maize is propagated) as genuine seed to farmers. Komen says that parent seed maize cannot be used as seed because it is too weak to produce healthy maize.

Seed inspection, which is conducted regularly, is done to ensure farmers get the best seed. KEPHIS also ensures that unscrupulous traders out to make quick money do not exploit them. Every year, KEPHIS makes an inspection of all appointed maize seed stockists, who are then issued with certificates to show that the seed stock is certified. Farmers should request to see the licenses issued to any stockists before purchasing seed maize.

Farmers should buy certified seed. (TOF)

Expired maize seed

Sale of expired maize seed is another problem farmers have to contend with. Most of the stockists sell carry-over stocks of excess seed purchased the previous season to farmers. Unless stored in a cool and dry facility, maize seed exposed to sunlight for a long period of time becomes weak and cannot grow well. Farmers should ensure they buy their seed stock early enough to avoid the last minute rush that forces them to buy poor quality seed when the stocks run out. This is also another reason why farmers should insist on seeing the certificate of test from KEPHIS whenever they buy seed maize. A certified seed stockist will not sell poor quality seed (see page 3).

in this issue

Dear farmers,

Many parts of the country are still experiencing drought. The pastoralists in Northern Kenya lack pasture and water, which has led to both human and livestock deaths. Even farmers in higher potential agricultural areas in the country are experiencing severe food shortages. If what has happened in the past is anything to go by, this is not the last time Kenya will be encountering drought.

Climate scientists are already warning that parts of the African continent, including East Africa, the Horn and southern Africa will face even more severe drought conditions in the next decade. This is thought to be a result of global warming.

The scientists believe that the rising temperatures in the Indian Ocean are responsible for the current drought. Global warming will reduce the amount of rainfall we receive by more than 20 per cent. As most of you already know, of course, not all predictions from our weathermen come to pass. But what we have seen in the last 20 years should be a good lesson. The climatic patterns are changing for the worse, with many parts of the country receiving less rain. Drought spells are also more frequent than before.

In these circumstances, we would advise our farmers to be much more creative in order to cope with the changing climatic conditions. One way we can do this is to start growing more and more drought-resistant crops. Crops such as sorghum and millet require less water and are early maturing. It is difficult to tell why most of our farmers have abandoned these important crops that are crucial to our food security. Most farmers today prefer maize, which requires more rainfall and takes longer to mature.

We are still receiving the questionnaires, which we sent out to you last month. For us editors it is satisfying to realize that farmers appreciate our newspaper. This is what we can tell from a quick look at your answers: Kenyan farmers are hard working, they are proud to be farmers, and are eager to get more information about organic farming. This is exactly what we are trying to do. Thanks a lot!

MY OPINION

By Paul Kimani

I have been following with much interest, the looting of public funds by some of our leaders mentioned in the Anglo Leasing and Goldenberg scandals. It is not only the fact that they are stealing our money that makes me sick, but the mere fact that they do so shamelessly and without due consideration of the living conditions of millions of Kenyans. Can you imagine how many roads in rural areas in the country could be repaired with just a fraction of this money? Or even how many farmers could be trained on sustainable agriculture with only a small portion of the looted funds?

Paul Kimani, farmer, Kiambu

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

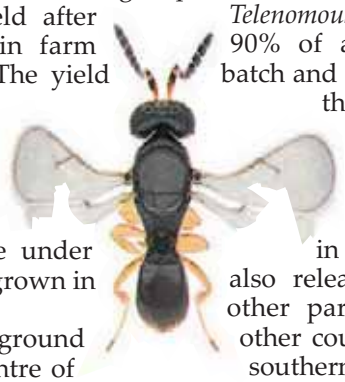
Tiny fly controls stemborer

Introduction of a new predator by ICIPE scientists will drastically improve maize yields.

~~Felix Mbitu~~ Murimi

~~Insect pests~~ such as the stemborers are very clever. They have always devised ways to overcome the pesticides that are used to control them. As a result, farmers today have to deal with pests that do not respond to the pesticides, which are available in the market.

These pests are more demoralizing because they reduce yield after farmers have invested in farm inputs and hard work. The yield loss to the pests was found to be 10-70%. The stemborer problem is particularly acute in the small-scale, resource-poor agriculture under which maize is typically grown in sub-Saharan Africa.



It is against this background that the International Centre of Insect Physiology and Ecology (ICIPE) started the project 'Biological control of stemborers in subsistence agriculture in Africa'. Its aim was to match the important stemborer species with their natural enemies indigenous to Africa through introducing natural enemies to regions where they do not exist. The need for use of indigenous parasitoids (enemies) arose from the successes of redistribution elsewhere in Africa. A successful example was the coffee mealybug pest that was affecting coffee production in Kenya. For 30 years, it was thought that it was accidentally introduced from Asia until scientists realized that it came from Uganda, where it was under control by indigenous natural enemies. Subsequently the natural enemy was introduced from Uganda into Kenya and permanently controlled the pest.

According to Dr. Fritz Schulthess, who is the head of the Plant Health Division at ICIPE, this biological control is identified as the only means for sustainable control of stemborers, since these pests are able to develop a pesticide resistance. It is also very difficult to control stemborers once they have entered maize stem because most chemicals act on contact. That is why biological control is the best method to eradicate these greedy pests. Biological control, once again, is a natural process whereby a pest is controlled by the use of a predator (a natural enemy). Different types of stemborers found in Africa require different types of predators.

Natural enemy

Telenomous isis is a tiny, small insect of 2 millimeter length. The parasite feeds on the eggs of the stem borer and is well known in West Africa but has never been found in East Africa. Anani Bruce who is an egg parasitoid specialist in the project says that *Telenomous isis* can destroy up to 90% of any stem borer egg batch and can drastically reduce the density of eastern African stemborer. ICIPE recently released *Telenomous isis* from West Africa in Taita hills and will also release the parasitoid in other parts of Kenya and in other countries in eastern and southern Africa.

According to a survey carried out in various parts of Kenya, the average seasonal stem borer infestation level is about 43% which led to an average 30% reduction in maize yield. Redistribution of parasitoid in all parts of Africa is expected to increase maize production by up to 20% in the next 10 years without any investment by farmers through reducing yield losses to stemborers. With about 24 million hectares under maize production in sub-Saharan Africa and average yield of 1.3 tons, the project is expected to lead to an increase in maize production by 6.2 million tons.

No chemical pesticides

The most important step in ensuring sustainability of biological control agents is the maintenance of favorable environment that allow the interaction of these natural enemies of the stemborer. This includes the conservation of natural enemies by providing refuge vegetations and non-use of poisonous chemicals. That means, sustainability of the biological process of pest control is only possible if the right environment for the survival of the predator is provided. Chemical pesticide use often kills the predator, interfering with this process.

Telenomous isis (Inset) enlarged 100 times. (Photo ICIPE)

Early planting increases crop yield

Many farmers plant when the rains have already started. This leads to poor seed germination, slow growth and reduced crop yield.

The Organic Farmer

Covering seed with crumbed soil prevents growth. *(Photo TOF)*

The planting season is a crucial period for the farmer. But it begins long before the burying of the seeds in the soil. The feeding of the soil during land preparation is the first step in planting. The soil is the most important component in farming. How we care for it, determines how much harvest we get at the end of the season. As we have mentioned in earlier issues of this newspaper, soils in Kenya and much of East Africa are poor; they do not contain most of the essential nutrients and organic matter that promotes plant growth. To enrich them, most farmers have resorted to the use of chemical fertilizers over the years.

Chemical fertilizers are harmful

No doubt, the use of chemical fertilizers can lead to an impressive increase in yields. Chemical fertilizers offer large amounts of nutrients to the plant in easily available form. But, they have their limits. According to research, repeated use of chemical fertilizers in most of the maize-growing areas of the country has led to an increase in acidity in the soils; this is largely to blame for the declining maize yields in the affected areas.

About half of the applied nitrogen fertilizer usually gets lost through runoff, leaching, and evaporation into the atmosphere. Under unfavourable conditions (too much rainfall, long dry periods or soils with a low level of organic matter), the efficiency of nitrogen fertilizers may even be lower. Use of chemical fertilizers also leads to oversupply of nitrogen, which causes the softening of the plant's tissues. Such plants are more vulnerable to diseases and pests. Inorganic fertilizers reduce the growth of a beneficial root fungus called mycorrhiza around the plant roots.

A sick person cannot get well just by taking only vitamin tablets. He/she needs healthy food as well. Farmers in the same way overlook important plant food in the organic materials that are readily available from the farm. These include crop residues, compost and farmyard manure. Organic matter is like well-balanced food: it contains essential nutrients such as nitrogen, phosphorus and potassium. It improves soil structure, water holding capacity and air circulation. Soil acidity is also regulated, creating the ideal conditions for plant growth. Organic fertilizers are currently available in the market for farmers who may be interested.

Important tips for planting

Most farmers have adequate knowledge on planting methods. Here we give you a few additional tips:

Timing: After tending the soil, it is at the planting stage that many farmers make a serious mistake; most farmers plant too late. To go round this problem, farmers should practise dry planting. In dry planting, the farmer plants before the rains, say in mid-March. What happens is that before the rains start, the soil temperatures are at the required level for proper seed germination.

Once the rains start, the soil temperatures tend to go down gradually. This means that seeds planted at this stage will not germinate well. The germination and growth rate for crops such as maize is greatly affected. According to research undertaken by the Kenya Agricultural Research Institute (KARI), a farmer loses two-and-a-half bags of maize in every acre of maize each week if he plants in the third week after the rains begin, or five bags per acre by planting two weeks late. Farmers therefore need to plant early if they are to cut down on the huge losses that occur as a result of late planting.

Spacing: Another common mistake made at planting time is spacing between plants. Many farmers wrongly believe that the closer the spacing, the higher the yields. This is wrong, because when crops such as maize are crowded, the plants compete for sunlight, water and nutrients. Since every plant does not get enough of these essential elements, they weaken and cannot produce the desired yield.

When planting maize, the correct spacing between one hole to the next should be 60 cm (2 ft), while spacing between the rows should be 75 cm (2 1/2 ft). The farmer should ensure that only two seeds are planted in each hole when using this spacing method. The farmer has also to apply two handfuls of compost in every planting hole in order to provide the young plants with enough nutrients for growth.

Erosion: Soil erosion is one of the most serious threats to soil fertility. It carries away the most fertile parts of the soil: the topsoil and the finer clay fractions, which are rich in humus and nutrients. It is therefore of vital importance for farmers to protect the soil from erosion. There are two general methods for preventing soil erosion:

- reducing the erosive power of the rain drops by keeping the soil covered (with mulch for instance);
- reducing the speed of the water flowing down the slopes. This can be done easily: plant the seeds along the contour, such that the plant rows run across the slope, rather than up and down.

Another good method is intercropping the maize with beans or legumes. Alternatively, you can plant the maize between rows of napier grass. In this way, the grass prevents erosion and loss of essential nutrients.

Farmer produces certified fruit seedlings

Benjamin Lugano has managed to meet the demand for certified fruit seedlings in Kenya and neighbouring countries.

Peter Kamau, Cherangani

Most farmers lack clean seedlings that are high yielding and disease-free. Poor quality fruit seedlings often can be seen offered by roadside vendors in most parts of the country. Government-run seedling nurseries in prison farms and the Ministry of Agriculture have collapsed. Fourteen years ago Benjamin Lugano identified this problem and decided to convert part of his 7-acre farm in Munyaka, Kaplamai division of Trans Nzoia district into a fruit nursery.

Today, the 42-year old father of six is the main supplier of fruit seedlings to many farmers in the country and across the border in Uganda and in Zanzibar and Pemba in Tanzania. If one looks at the areas where he supplies the seedlings, it is evident there are very few producers of certified fruit seedlings in the East Africa region.

"At first I started with passion fruit growing. This was after realising that the fruits were in great demand in the local and international markets. But I discovered that it was difficult to get clean planting material following the outbreak of diseases such as the fusarium wilt that affects passion fruits", he says.

Recognised for his efforts

At the same time, a viral disease outbreak had devastated the orange crop in Trans Nzoia district and most parts of the country. This forced farmers to stop production of oranges altogether. He had to obtain fruit seedlings from hot areas such as Sigor in West Pokot and Kerio Valley and Kisumu, which were not affected by the disease. The Government recognised his efforts and facilitated his training on seedling production. The Kenya Plant Health Inspection Services (KEPHIS) and the Horticultural Development Authority (HCDA) provided the training. He also acquired additional skills in this field from a Swedish Agro-forestry Project.

Seedlings from Israel

"From these courses I gained a lot of experience on seed selection, grafting, nursery care and management," he says.With the help of KEPHIS and HCDA, he now sources high quality

Benjamin Lugano tends passion fruit seedlings. Photo (TOF)

passion fruit seedlings from Israel, which he grafts with local varieties. Among the fruit varieties in production at the farm are Fuerte and Hass varieties of avocado. Others are Apple, Tommy and Harden varieties of mango fruit, and pawpaw and tree tomato seedlings.

Seed production needs care

Seedling production is a delicate and sensitive occupation. Lugano says he has to be careful to avoid any possibility of transmitting crop diseases by wrong selection, grafting handling or even transportation of the different cultivars (planting material) during the production process.

"You can imagine what would happen if I sold diseased seedlings to farmers in Uganda or Zanzibar. It could affect the whole horticulture industry in those countries, bringing a great loss to farmers," he says

The seeds are certified

To avoid diseases, the Kenya Agricultural Research Institute (KARI) staff assist him in selection of the root stock (the lower section of the grafted seedling). The root stock has to be obtained from known indigenous varieties which are strong and also resistant to diseases. He often travels to Butere and Mumias to get these seedlings.

The nurseries are regularly inspected by KEPHIS staff that take soil, water and plant samples to ensure they are not infected by diseases. Every year the farm is inspected and all the seedlings certified as disease-free by both KEPHIS and HCDA.

Lugano uses compost to enrich the soil used in the nurseries. He says this has helped to cut down costs from the use of chemical fertilizers. Another advantage is that the soils do not lose their fertility as fast. To serve farmers in other districts, he has established nurseries in the Agricultural Society of Kenya showgrounds in Eldoret and Kamarin in Keiyo. Farmers can also buy his seedlings at the Agriculture Centre in Kitale town which is run by the Ministry of Agriculture.

High demand for fruits

Apart from seedling production, farmer Lugano has put five acres of his land under passion, avocado, mangoes and tree tomato fruits which he supplies to local and international markets.

"Demand for passion fruits is very high, especially in major towns in East Africa including Nairobi and Kampala. I am surprised many farmers still grow tomatoes and Sukumawiki (kale), whose prices keep on fluctuating every day. They should try passion fruit production to increase their income", he advises.

Lugano has received orders to supply passion fruits and avocadoes to the European markets but he is unable to do so because he cannot meet the quantities needed. He has now brought together other farmers to form the Kaplamai Cooperative Society, through which they hope to produce enough fruits for export.

Farmers interested in certified fruit seed should get in contact with Lugano at this address: Lugano Horticultural Farm Enterprises, P.O. Box 323, Kitale 30200, Tel. 0733 99 05 7

Agroforestry

This article is the first in a series we intend to carry in the coming issues of *The Organic Farmer*. Planting of fruit and tree crops is one area that most farmers neglect. In the next issue we will look at the role of agroforestry in sustainable agriculture

Soil is the starting point for organic farmers

Life begins in the soil. It is important to know more about our soils and how to care for them.

Su Kahumbu

Our soils have been created over many millions of years, giving rise to all the forms of life we know today. How ironic that man, however, the supposed superior life form at the top of the food chain, has managed to cause the greatest changes to soil in the shortest period of time, backtracking our planet and sending it into a spiral of self destruction.

The massive use of chemical inputs in agriculture has affected not only our soils, but also the biodiversity that exists above the soils. Great stretches of land have been opened up for monocropping (planting a single crop) in conventional agriculture, resulting in the destruction of forests, reduced rainfall in catchment areas, declining soil fertility, poor crop quality, poor animal and human health due to introduction of foreign toxins in the food chain, and finally resulting in drought.

Production of manufactured chemical fertilizers, pesticides, fungicides, herbicides and other agricultural chemicals by large corporations is a multi-billion dollar industry. Organic agriculture is one way to reverse this spiral towards the destruction of our planet. The production of organic inputs, however, is not yet seen as profitable business and thus is of little interest to big business corporations or government policy makers.

Soil health and thus fertility is the most important starting point for an organic farmer in order to create a sustainable, healthy environment. Once this is achieved, nature takes care of the rest. We must therefore seek to have a greater understanding of this magical "earth food" we call "soil".

Soil, a living organism

As lifeless as it may seem, soil is actually an underground living environment, filled with life and having as much influence on plants as the environment above the ground. Soils are made up of organic matter, mineral particles from weathered rocks, living organisms (plants and animals and microorganisms), water and air. Different soil types are determined by the size and chemical composition of the particles of rocks from which they are formed. Sand, silt and clay are the three types of weathered rock particles that make up soil. All soils, apart from those formed from organic matter (for instance compost, peat) are rock-based and contain a mixture of the rock particles in varying proportions. If the proportions of these three elements are the same, the soil is called loam. A sandy loam is a soil with predominately sandy particles, a silt loam with more silt and a clay loam is one with more clay particles.

Clay soils: As clay particles are tiny, the soils are dense, heavy and sticky. These soils may be rich in nutrients, however plant roots may struggle to reach them. They can also become water-logged.

Sandy soils: Sand particles are quite large, resulting in a soil in which water runs through quickly, carrying away plant nutrients and drying very easily. These soils are easy to cultivate and warm up quickly, but are low in nutrients.

Silt soils: When wet, silt soils feel silky and soapy. They are nutrient-rich and have a good water-holding capacity, however as the particles are so fine, silt soils compact easily and are hard to cultivate.

Peat soils: Formed organic matter, peat does not decompose fully due to the wet and acid conditions. Rich in organic matter, peat may be acid and infertile, although it also can be fertile. This soil is very dark in colour. Although a good soil for seed beds, it is best for acid-loving plants.

Chalky soils: This soil type is Alkaline and free draining. Its parent rock is limestone. This soil requires a lot of food nutrientsand water

Soil structure

Good soil structure means plant roots can penetrate deeply, water drainage is good, the soil is easy to dig, there is no hard "pan" or compact layer in the top soil, the soil has many earthworms and thus worm channels (for ventilation) and the top layers are crumbly when both wet and dry.

Poor structure is when plants are shallowrooted; water sits in pools on the soil or drains immediately; the soil sticks into hard clumps, cracks and is very dry; there are few worms; there is a compacted layer in the top soil; and the surface layer dries out to a crust after rain.

Vital microorganisms

The majority of life forms in the soil as microscopic bacteria, fungi, earthworms, beetles, slugs and insect larvae, are responsible for the breakdown of organic matter into nutrients that are then available to plants. Life in the soil is made up of checks and balances. The soil living pests are balanced by the abundance of soil beneficials, just as we see above the soil. It is obvious then that the more diverse the community above and below the ground, the better balance all over for agriculture and the environment. Keeping this life alive in our soils is

continued on page 7

Organic soil: Six golden rules

1. Feed the oil

It is through good soil management that we will produce healthy crops. Poor quality crops and insect pest problems are signs of poor soil management.

2. Tread carefully

Compact soil contains little air and is difficut for plants to penetrate. It also is a poor environment for soil-living creatures.

3. Dig only when needed

Digging can destroy soil structure. It also brings a new batch of weed seed to the surface.

4. Keep soil surface covered

A live covering of green mulch or dry mulch protects the soil structure.

5. Do not over-fertilise

Over-fertilisation causes more problems than under-fertilisation. Let your crops be your guide.

6. Check pH before liming

Unnecessary liming can result in nutrients being locked-up chemically and less available for plants

In the next issue, look for organic soils improvers

Stop the fly before it lays eggs

"How do we control the pumpkin fly or 'dudu' that stings and lays it's eggs in courgette gem squash and butter nut squash?"

Mrs Rosalie Faull, Mugie Ranch Ltd P.O Box 30, 20321 Rumuruti

Rosalie, the bug is a Melon Fly. It can be destroyed with a pyrethrum spray, Flower Ds is allowed, and available from most agro outlets. Be careful however and make sure you spray selectively, so that you do not affect any beneficial insects that may be present. Once the eggs are in the fruit, bending of the fruit is inevitable. You must therefore try to kill the fly before it lays. It will also be useful to grow a wide diversity of crops on your farm to allow for a wide diversity of insects, birds etc. that will create an eco balance whereby you may not need to spray at all. We must learn to accept what we consider damage, in a few of our crops in order to allow for natures balance to take hold. You could also allow a few chickens around your farm as they will forage for insects and fertilise the ground as they do so. Be careful to keep them away from your seed beds though. Also, harvest the fruit as soon as you notice the tiny pin prick of damage and utilise the fruit immediately before there is internal damage or subsequent release of the insect. If for home use, just cut out the bad bits and submerse them in hot water before putting into your compost, or feed to chickens.

Packaging is important

I am an organic farmer, I grow vegetables. Su, how can we control the transportation of our products? And where can we get market to sell our products?

Esther Ndiku Sinai Organic Group P.O box 1591 Kangundo

Esther, you have a very good point. Organic Standards require organic produce to be packaged and transported in a very specific way so as to prevent substitution or contamination of the product and thus ensure full integrity of the same. Each consignment must be accompanied by appropriate documentation enabling the origin of the product to be traced. Some Organic Standards insist on separate vehicles or a cleaning program to be followed and recorded of vehicles that may carry conventional produce too. Knowing these requirements as producers we must try to bring our products to the market following the regulations. One way would be to link up with other organic producers when it comes to transporting. Finding markets for our products is a constant question being forwarded to *The Organic Farmer.* Retailers of organic produce need assurance of organic certification. To move into the commercial organic arena, we must learn the global use of the word "Organic". Organic Standards, (the documented requirements) must be understood and followed. To ensure full integrity, products sold as organic must show Certification. Consumers will then be willing to pay more for these products. Retailers will have to stock them.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Termites refine manure

"When I apply the manure on my vegetables, the termites invade the crop and cause damage. How can I control the termites?" asks Ann Wamuyu of Cherangany, Kitale.

Ann, your problem will be solved if you compost correctly. Termites cannot survive the temperatures of a proper compost pile. At the end of composting, microorganisms will have converted the fresh manure into nutrients available for plant uptake. The use of EM will speed up the composting time. And you will also find that by using a healthy compost, your crops will give better yields.

Any material with a high carbon content, and in this case water too, is a feast for termites at this time due to the drought. All creatures need water, the termites may be getting this from the plants and in so doing causing damage. However, their presence is due to the fresh non-composted manure.

My pumpkin does not bear fruits

John Mulwa of Box 323 Munyaka in Kitale has a healthy pumpkin vine in his kitchen garden. Every season the pumpkin flowers but the fruits only develop to thumb size and do not grow any further. He asks: "I have tried fertilizers, thinning the vine and tending it but there is no improvement. What can I do"?

John, it seems your pumpkin flowers are not getting pollinated. This could be due to the lack of insect that performs this miracle. Next time the plant is flowering, try hand pollinating the female flowers with pollen from the male flowers. The male flowers are those without evidence of the small fruit behind them and are generally on a longer stalk than the female flowers. You will not have solved the problem, which seems to be one of no-pollinators.

Try to encourage as much insect diversity on your farm by growing a wider range of plants, accepting a few pests and reducing your costs and time spent on spraying. We believe all insects are good and necessary, if we allow nature to create a balance on our farms. Our contribution is to ensure a good healthy soil, let nature take care of the rest.

Letters to the editor

Soil is the starting point...

continued from page 5

essential. Using chemical pesticides, fertilizers, herbicides and other chemicals, results in damage to these microorganisms, thus creating imbalances. It is unfortunate that the solutions to these imbalances result in worse imbalances. When land is totally destroyed and considered worthless it is abandoned. And then immediately slowly but surely nature starts to repair the damage.

Some of the microorganisms living in the soil include bacteria, which can take nitrogen from the air; these bacteria live in nodules on the roots of leguminous convert it into soluble forms that plants can use. Beneficial mycorrhizal fungi also are attached to the roots of plants. They help the plant absorb more water and nutrients and in return the plant provides food for the fungi. These fungi are very sensitive to fungicides and prefer soil that is high in organic content.

Plant nutrients

Plants require both macro and micronutrients. The common macronutrients are:

- Nitrogen (N) – fuels the growth of leaves and shoots
- Magnesium (Mg)- important in the production of chlorophyll
- Phosphorus (P)- important for root growth
- Potassium (K)- vital to flowering and fruiting, also hardens growth, increasing resistance to pests, diseases and frost.

Organic agriculture ensures a more or less healthy balanced diet for our crops. Therefore, the organic farmer generally does not need to be concerned about the precise levels of plant foods in their soils. Following nature's example, rather than feed plants directly, we aim to recycle the plant and animal wastes and feed these to the soils. Microorganisms in the soil then break down the organic material into nutrients that become available to plants. The soil structure is also improved through this process. Bulky organic feed containing a wide range of essential plant foods and trace elements is best for the soils. They may be incorporated directly into the soil, or composted or used as mulch (see *The Organic Farmer*, April and May 2005).

Keep up the good work

First and foremost I congratulate you for your continued effort to educate us on farming tips. I read *The Organic Farmer* the first time when I came across the Nr. 7 November 2005 issue. I went through the magazine and found it so enriching to us farmers. I read much on Napier cultivation and found it interesting and discovered the disease "napier stunt". I also learned much about soya beans, that soya is very nutritious, especially when mixed with sorghum, maize flour to make highly nutritious ugali and porridge. Please, we are an organized group of 30 members and would like to learn more about farming from *The Organic Farmer*. Give us more on crop rotation, dairy goat farming, organic fertilizers and generally on how to improve our farming methods. Again, keep up the good work!

Wilson Kamau, Kakimari Self Group, P.O Box 203, Rongai, Nakuru

ICIPE is helping farmers

I am grateful to ICIPE and *The Organic Farmer.* The two institutions are really working hard to support farmers countrywide. It should be well noted that we are facing so many problems in farming. Some of these are poor markets, expensive labour, sustaining production and use of chemicals. I would request the two bodies to hold regular workshops in our region inorder to educate farmers on modern methods of agriculture.

Joseph K. Kinyanjui, PO Box 125, South Kinangop

Useful for our field school

On behalf of "Life class" Nyasi farm, I request you to send us copies of *The Organic Farmer*. Beneficial discussions were witnessed in our last class when we received a copy of the newspaper from a friend; that day's attendance was fair because we had 22 farmers attending. Please assist this group by sending us the newsletter. Thank you.

John Sprite, Kiminini division, P.O Box 1781, Kitale

We face pest problems

We thank you for starting a newsletter for Kenyan farmers. We are a self-help farmers' group in Toito Location, Kuresoi Division of Nakuru District. We read a friend's copy and took much interest in it. This is because we grow cereal crops and horticulture. In our area, the common crops are potatoes, beans, and cabbages. We have many problems due to fungal and bacterial diseases and insect pests. We request you to send us monthly copies to assist us in our farming. Thank you.

Absolom Chebochola, Tegunot Farmers Group, P.O Box 356, Molo

Dear Farmers,

As part of our efforts to serve the organic farming community effectively, we would like to create a database of organic farmers in the country. We are interested in:

-Your names,
-Addresses, Location,
-Farm acreage,
-Are you an organic farmer?

To make it easy for you, we have a special telephone number: given above. All the farmers can provide these information through short messaging service (SMS). ***Come on Farmers, Tuma jibu. Asante.***

SMS ONLY

We need it for Library

I am a Kenyan citizen aged 46, apart from being a farmer at Stoo Mbili, Njoro, I am also the Adult education officer in charge of Lare Division of Nakuru District. One of the objectives of the Department of Adult education is to increase the levels of literacy in the division through the provision of basic reading skills and at the same time creating a reading culture among the rural farming communities by encouraging learning as a life long process. To achieve this we have instituted a small resource centre where farmers borrow reading materials. It is for this reason that we request form you reading materials for the center and especially *The Organic Farmer* newspaper, which addresses problems facing farmers in the division. We will appreciate. Thank you.

Stephen Mugi Wagathanga, Appointed Time 98, P.O Box 760, Njoro

Bird flu threatens poultry farmers

After bird flu outbreaks in Nigeria and Egypt Kenyan farmers are concerned about the disease. Here are some precautionary measures.

Dr. Anna N. Wambui

Bird flu or avian influenza is an infection caused by avian (bird) influenza (flu) viruses. These flu viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them. However, avian influenza is very contagious among birds and can kill domesticated birds, including chickens, ducks and turkeys.

There are 15 types of bird, or avian flu. The most contagious strains, which are usually fatal in birds are H5 and H7. The type currently causing concern is the deadly strain H5N1, which can kill people. Migratory wild fowl, notably wild ducks, are natural carriers of the viruses, but are unlikely to actually develop an infection. The risk is that they pass it on to domestic birds, which are much more susceptible to the virus.

How does it spread among birds?

Domestic birds can get the infection when they roam freely, share water with wild birds or take water that might be contaminated by infected droppings. Contaminated equipment, vehicles, feeds, cages, or clothing, especially shoes can carry the virus from farm to farm. Wet markets where live chickens and other birds are sold under crowded and sometimes unsanitary conditions help spread the bird flu infection.

What are the signs of bird flu in chickens?

Infection causes a wide spectrum of symptoms in birds, ranging from mild illness to a highly contagious and rapidly fatal disease resulting in severe epidemics. The normal signs are decrease in activity, drastic decline in egg production, facial swellings with swollen and bluish-violet colored combs and wattles. The birds gasp for breath, their muscles are weak and sometimes paralysed. They have diarrhoea and will all die within 48 hours.

Pre-cautionary measures

Farmers should stop use of chicken manure in feeding cattle. Most farmers feed the chicken manures to cows because chicken only digest 70 per cent of the feed; all commercial

Bird flu is killing millions of chickens and even people. (Photo Agencies)

birds should be kept in chicken houses. Do not let chickens roam freely.

In case of an outbreak, farmers should not sell live chicken as they do in open air markets. It is also important to avoid keeping chickens, ducks and pigs together in one area,cage or pen. Poultry keepers should practise proper hand washing and cleaning and use disinfection procedures in poultry houses. When infection occurs all healthy and infected birds in the affected area should be killed and burned to stop the disease from spreading to other farms. Dead birds can also be buried at least three metres deep and lime or soda applied on them to kill the virus.

Current Kenyan status

Kenyan farmers should be informed that Bird flu has not occurred here yet. However, preventive measures have been taken. A national task force has been formed to prepare for a rapid response in case an outbreak occurs. Farmers who notice any dead birds in their locality or see any of the symptoms mentioned above in their birds should not touch them; Children should not be allowed to play barefoot near the poultry shed. They should not touch any of the affected birds or even their eggs. They should immediately notify the task force through the bird flu hotline given below.

Bird flu can affect people

Although avian influenza in general does not affect people, the H5N1 subtype has a 50% mortality rate, it affects man. It is a severe respiratory illness accompanied by fever. The sickness can be confused with other respiratory illnesses.

The patient experiences increased body temperature, cough, sore throat, eye infection, pneumonia, acute respiratory syndrome, vomiting and diarrhoea. Doctors should enquire whether the patient had travelled to affected areas in the last ten days. Blood and body liquid samples can be used to test for the virus. The Kenya Medical Research Institute Laboratoriess are able to do this here in Kenya.

Can be treated if discovered early

Studies done in laboratories suggest that the prescription medicines approved for human influenza viruses should work in treating avian influenza infection in humans. So antibiotics, antipyretics, oxygen supply and respiratory support are supportive drugs. Although there is a vaccine to prevent the disease in poultry, it is not yet available in Kenya. So far there is no human vaccine for H5N1 control .

The most important step in the control of of the disease is prevention. That is the reason why farmers and emergency personnel are advised to wear masks, gowns, gloves and other protective clothing while working on farms with outbreaks.

Bird flu hotline

Farmers who come across dead birds or see any birds with symptoms similar to the ones mentioned above should immediately get in touch with the National Task Force on Bird Flu through the following hotline and wait for help:

Bird Flu Hotline Tel. 0722 726 682

The Organic Farmer

The newspaper for sustainable agriculture in Kenya Nr. 9 January 2006

Su Kahumbu's farm is certified as organic

All our readers know Su Kahumbu, the prominent organic farmer from Limuru, who also answers questions from you farmers. In mid-December last year she received the Certification of Registration from Musa Njoka, director of a Kenyan Certification Company, EnCert. This is a big step for the local organic farming community, which is struggling to market their organic produce, as you can read on pages 4 and 5. *(Photo TOF)*

Early land preparation important

Many farmers wait until it is too late to prepare their land for planting.

By *The Organic Farmer*

In the farmers' calendar, the month of January is important. This is because it is just after the harvest when most farmers prepare the land for the next crop. Proper land preparation at this stage determines the quality of harvest the farmer will get at the end of the next season.

At this time, farmers have plenty of organic material, mainly maize and bean residues that remained in the shambas after the harvest. What often happens is that farmers release their animals to graze in the farm fields for a short time. Then they burn these materials. The burning will be done so that the farms can be ploughed in readiness for the planting season.

What farmers might not know is that this material is in fact very essential organic manure that supports a lot of life in the soil, such as worms and microscopic bacteria, which help release food for the plants in a balanced way.

Early land preparation, however, has many advantages for the farmer. One advantage is that it loosens the soil, making it easy for the plants roots to penetrate. Early digging also helps the circulation of air in the soil, which is essential for plant germination and growth. (See page 2)

BIOVISION

In this issue

Dear farmers,

First of all, we would like to wish you and your families a happy and prosperous New Year, good health, excellent harvests and sufficient rains throughout the year.

Finally, the Kenyan economy is slowly recovering. Since agriculture is the backbone of the country's economy, farmers have all reasons to be proud of having contributed to this recovery. Let us redouble our efforts! We need to be more practical in taking up challenges that confront us in our day-to-day farming activities. This is the only way we can solve our problems. We need more action and less talk. That is the reason why we are pushing for the marketing of organic products in Kenya (see pages 4 and 5). Even though the organic farming sector is still very young, it has a bright future.

At this time, we are lacking clear information of the potential and the needs of the organic farming community. Therefore we would like to ask you for a favour:

•First, to get a reliable idea of the number of organic farmers in Kenya, please let us know whether you are an organic farmer. Simply send us an SMS (see details on page 7).

•Secondly, in order to do a good job, The Organic Farmer would like to know what you as farmers think about our newspaper. Are you satisfied with the topics we write about? Do you understand the articles? What kind of articles would you prefer or wish to read? Do you miss reading about any topic, technology for instance?

To help us improve our services to you, we have prepared some questions. The questionnaire has been sent to around 800 farmers in all parts of the country. We will be grateful if those of you who get the questionnaire would fill it as straightforwardly as possible and send it back to us soonest, at least before the end of January. You will not meet any costs because we provide an addressed and stamped envelope, in which you will put the questionnaire and post it.

We thank you all for your cooperation and are looking forward to your responses. Your proposals will help us to improve our newspaper, to become more involved in a direct dialogue with you and to cater even better for the growing needs of the organic farming community.

MY OPINION

By Isaac Maina Munyari

Have you ever planted crops in a former cowshed? And what did you discover? You got a very nice and healthy harvest. This is a good example for farmers. One can see, that farmyard manure is very important for soil fertility. A lot of farmers have a lot of such good experiences. But do we really share the knowledge with others? We should share information, especially when we are going organic. Up to now, we are a minority in the country. But things will change. It will change even faster if we work together.

I. Maina is a farmer in Subukia.

The Organic Farmer
Nr. 9, January 2006

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Secretariat
Lucy W. Macharia
Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com
Layout:
In-A-Vision Systems(k)

Soil care increases fertility

Proper soil cultivation methods can improve its quality and productivity

By *The Organic Farmer*

Good land preparation practice involves taking care of the soil to ensure it contributes to increased farm productivity. Working on the soil the right way can improve its capacity to retain water and allow the circulation of air. Water and warmth in the soil is also important for plant germination and growth. There are many ways a farmer can prepare their land for planting, but each depends on the type of crops they are planting and the type of soil they are working on.

For an organic farmer, it is important to add organic matter into the soil before preparation of the seedbed. Organic matter includes crop residues, green manure and farmyard manure. The organic matter should be dug into the top layer of the soil (to a depth of 15 to 20 cm).

Take care during cultivation

Soil cultivation has many advantages and disadvantages. One of the benefits is that it encourages the activity of soil organisms; it also helps to reduce evaporation and penetration of the water into the soil. Weeds and soil pests are controlled with good cultivation while soil hardening, caused by previous cultivation is repaired.

Soil fertility can be affected by cultivation methods used. Therefore farmers need to take care to ensure there is minimum disturbance of the soil life during cultivation. Working on the soil will always affect its structure in one way or another. In Africa for example, continuous cultivation speeds up the decaying of organic matter, which can lead to loss of essential nutrients needed for plant growth. Cultivation leaves the soil fragmented and exposed to erosion that is why manual cultivation is preferred to the use of machinery, as it does not disturb the soil. Other methods a farmer can use to improve the soil are outlined below:

Weed management

The aim of weed management should be to keep weeds under control rather than to eliminate them completely. Weeds help form a good mixed environment. There are several methods of weed control, including using a hoe or hands to remove weeds. Weeding immediately before planting is a useful technique when growing crops from seeds, which are slow to germinate, such as onions, and carrots. This is especially so where weeds are a problem. Make the seedbed and allow the first weeds to appear, use a hoe to remove them, then plant the seeds you want.

Benefits of mulching

Manure is best composted before use on the crops. Add bulky plant material such as straw if not already present. Fresh manure should not be used directly on the soil because the nitrogen in the ammonia it releases can be harmful to the plants. Fresh manure can also attract pests. Avoid manure from town sewage as it may contain disease causing agents such as parasites and harmful bacteria.

Mulch is any loose material such as straw, leaves or dry grass that is placed around the plant to protect the soil from over-drying and to control temperatures. Recommended mulches are crop residues, dry grass, dry leaves, dust, old compost and old manure. Green vegetation should not be used because it takes a long time to break down and does not allow water to penetrate the soil. It also attracts pests and fungal diseases.

Mulch in the proper amount is used after a seedbed is planted. Too much mulch prevents adequate airflow and encourages pests such as termites in dry areas, or fungal disease. Mulch only in the dry season and apply it two weeks after seedlings develop. Mulching has many advantages. It helps decrease water loss through evaporation. It results in increased water retention and keeps the soil cool and moist. Soil temperatures are maintained and erosion is minimised. There is increased presence of useful microorganisms in topsoil as a result of organic matter while weed growth is reduced.

If possible farmers should carry out soil tests to determine the level of acidity. If this is not possible, consistent use of organic matter can regulate the level of acidity in the soil.

"One can make money with indigenous chickens"

Rearing traditional chicken the modern way has increased earnings for a former chief.

By Peter Kamau, Rongo

It is a common practice among all Kenyan communities to rear indigenous chickens in the traditional way whereby they are allowed to scavenge for food around the homestead. It had been the same for 53 year-old retired Senior Chief Josiah Arende of central Kamagambo location, Rongo division in Migori district. Throughout his working life as the area chief, he did not take chicken-rearing as a serious business. He only concentrated on dairy farming in his 7-acre piece of land. With two wives and 10 children, Chief Arende was often forced to buy eggs from neighbours. His own stock of 11 chickens could not lay enough eggs or even meet the family's meat requirements.

All this changed when he attended a workshop on poverty reduction organised by the World Agroforestry Centre (ICRAF) and The Consortium for Scaling-up Small-Scale Farming in Kisumu two years ago.

" I came to learn that a farmer can make a lot of money from indigenous chickens if they are well fed and cared for like we do with exotic breeds. Many farmers do not realise the full potential of indigenous chicken because they neglect them", he says.

Armed with all this knowledge, Chief Arende went to work immediately. He selected four good layers and a cock from his flock and put them on nutritious feed made of maize flour and omena fish with adequate drinking water. He also built a modern chicken house for the project. By the end of 2004, he had 480 chickens ready for sale to individual buyers, market centres and hotels in Rongo, Migori and beyond. Each chicken goes for Ksh 200 at farm gate price. Demand is high for indigenous broilers, which are popular with many people in the region. His income has improved considerably and he now plans to expand the chicken house to accommodate 2000 chickens.

Chief Josiah Arende (Photo TOF)

False eggs encourage brooding

"A good poultry farmer also has to understand the egg laying behaviour of an indigenous hen. With proper feeding a hen can lay 15 to 18 eggs in each laying cycle; after this it will want to brood (sit on the eggs until they hatch into chicks)," he says. Chief Arende has therefore exploited the egg laying and brooding patterns to increase production. When the brooders hatch, the chicks are taken away on the seventh or eighth day and put on artificial brooders. Since the hens are still in a brooding mode, they are given false eggs made of Kisii soapstone to sit on until the other hens have laid enough eggs.

When the required number of eggs is attained, the hen is now given the genuine eggs and continues brooding until the eggs hatch. When the chicks are taken away, the hens start laying eggs after 15 to 16 days. Each egg laid is clearly marked to indicate the date when it was laid to avoid mixing and ensure all eggs given to a brooder hatch on the same day. He also maintains five good layers which supply eggs for hatching.

Chicks are isolated

When the chicks are taken away, they are kept in an artificial brooder and kept warm with heat from kerosene lamps. Here they are fed with chick mash mixed with glucose and clean water to promote fast growth. Temperatures are also monitored by use of a thermometer to ensure they are safe from excessive or low heat.

Fellow farmers from the area have learnt a lot from Chief Arende. Thirty-three of them have taken up poultry farming to supplement sugarcane growing, the main economic activity in the region. Together they have set up the Kamagambo Community Development Project with Chief Arende as their patron. Their mission is to popularise indigenous chicken-rearing among the farmers.

It is easy to manage indigenous chickens

Feeding: Indigenous chickens feed on maize, rice and remains of ugali. This should be properly dried and ground into fine pieces. Feeding should be on a clean and hygienic surface or from feeders specifically made for chickens.

Housing: Chickens, whether indigenous or exotic, need proper housing for shelter and protection. They require spacious and well-ventilated rooms. Perches should be erected, as birds prefer resting on them. The chicken house should be securely closed at night to keep away predators. It should be clean to reduce diseases such as coccidiosis. Sawdust or old clothing material should never be used on laying nests as they encourage mites and fleas. Use of sand is preferable.

Drinking water: Clean water should be provided. This should be checked regularly and refilled. Drinking containers should be kept clean at all times. Dirty water must never be given to birds.

Vaccinations: Vaccination of the flock is important to help keep infections and diseases in check. Common diseases include Newcastle, fowlpox and typhoid. Vaccination is usually done once every two months depending on any disease outbreaks in the region. A qualified livestock officer should provide advice on how and when to vaccinate.

Record keeping: A proper record of the flock should be maintained. Records should include type of feed, batch number, expiry date, daily feed intake, mortality and egg production. Weighing should be done the same day of every week. This will guide the farmers on when to market the chickens. Vaccination and medication records are also important. These should include the age of the flock, when they were vaccinated, drugs used, expiry dates, etc. These records guide the veterinarian.

This advice is given by Chief Josiah Arende

What is certification in organic farming?

To sell a product as organic, a farmer has to get a certificate from an inspection company.

By *The Organic Farmer*

Let us explain the procedure of certification in organic farming with an example: A farmer wants to buy a panga. At the shop he finds two pangas, one Ksh 90/=, while the other costs 180/=. Both are of the same size, and they look similar. But a closer look reveals that the more expensive panga is made of better material.

Now, a woman wants to buy organically grown vegetables, let's say cabbages. Because organic vegetables are healthier and therefore of higher value, she is willing to pay more. But, she cannot see the difference between organic and chemically produced cabbages. Since she does not know the farmer who produced the cabbage, there has to be a recognized mark to show the cabbage is really organic. In other words, somebody has to certify and put the mark to prove this.

This is why certification of organic farm produce is so important. Organic certification is done by reputable and recognised companies. These companies continuously inspect farmers to ensure they meet all the requirements of organic production. To be certified, a farmer has to undergo a conversion period, which varies depending on the crop and the previous use of the land. During this period they have to follow organic production guidelines.

A question of trust

On certification, the products are given the logo of the certifying company. The whole process of certification is a question of trust, seriousness and transparency. If, for example, a farmer is cheating by using chemicals or artificial fertilisers, they will lose the certification. The company that has certified them also loses their reputation. Both the farmer and the company therefore have to be very careful not to lose their credibility with their clients and the buyers of organic produce.

In many parts of the world, the system has worked very well for many years. In Kenya, several companies have been offering certification services mainly for the export market. These companies are the Soil Association, IMO, Africert and Ecocert. In July 2005, a local Kenyan company, EnCert, was officially registered to offer certification services to local farmers for selling to the local market. Its director, Musa Njoka, is a trainee of the Soil Association, a reputable UK-based Certification Company. He is their local representative.


Certificate of Registration

This is to certify that

Green Dreams Limited

P.O. Box 1403 Town LIMURU Post Office Code 00217

Licence Number: Fp001

Has been inspected and, having satisfied the requirements of EnCert Standards for Organic Production and Processing, is registered and licensed for the production of

ORGANIC

products listed in the Trading Schedule

Issue Date: 5th December 2005 Expiry Date: 10th December 2006

EnCert Limited

P.O.Box 74510, Nairobi 00200 Telephone: 0724910240

The good news for organic farmers in Kenya is that the Kenya Bureau of Standards (KEBS) has recognised the importance of organic farming in the country. They have therefore prepared the guidelines for organic farming (DKS 1928:2004) which will hopefully come into force this year. Musa Njoka was a member of the technical committee that prepared the guidelines.

All the principles, practices and requirements are defined in the EnCert Standards for Organic Production and Processing. These standards meet the International Federation of Organic Agriculture Movements (IFOAM) requirements, an of course those of the Kenya Bureau of Standards.

EnCert works like all the certification companies mentioned above. This means that the farmers have to pay for the certification. For individual applicants, the application and the annual licensing fees are based on the total area to be converted to organic farming. For self-help-groups, these fees are based on the number of group members. The inspection fee varies depending on the complexity of the operation. It is around Ksh 17,000/=. There is also a fee to cater for travel expenses.

Cost of Certification

Individual Applicants

Converted Area	Application Fees Ksh	Annual Fee Ksh
Up to 2 ha	10,000	15,000
2.1 to 5 ha		20,000
5.1 to 10 ha		30,000
10.1 to 20 ha		40,000
Over 20 ha		50,000

Group Applicants

No. of members	Application Fees Ksh	Annual Fee Ksh
Up to 15	10,000	15,000
Extra member	300	500

"Strict control"

Is it not too expensive for small-scale farmers?

"No", says Musa Njoka. "If a farmer is registering with a group, they are only required to pay Ksh 3000/= at the beginning. Every year after that, we charge Ksh 2000/=. But if they can sell their organic produce say, vegetables, at a higher price, these will offset the certification costs".

If you certify a farmers' group, how can you be sure that an individual farmer does not cheat?

"Oh, we should not worry about that, the farmers themselves inspect each other very strictly to ensure none of them cheats. Even the Soil Association does the same in Europe. IFOAM too allows group certification".

How do you expect farmers to pay for certification if there is no market for organic produce?

"In Kenya, the market is small at the moment, but it is growing. We have to raise awareness of the benefits of health foods. Take Europe for example: Many years ago, the market for organic products was negligible, however in the last few years, the demand has been growing at a rate of 25 % every year. I am sure that more and more Kenyans begin to realise the benefit of organic foods."

EnCert Ltd, PO Box 74510, 00200, Nairobi Tel: 0724 910 240.

The market for organic products will grow

Marketing of organically produced vegetables is a big problem for small-scale farmers, but the future for organic products looks bright.

By *The Organic Farmer*

There is a lot of confusion within the Kenyan organic farming community. Every week, farmers complain to our newspaper that they can neither get a market nor a higher price for their organically grown vegetables and fruits. A research study recently carried out by *The Organic Farmer* among greengrocers and supermarkets in Nairobi shows a baffling result. Some shopkeepers say: "We do not get enough organically produced food for our customers". Others claim: "There is no demand for organic food".

So, what is going on? Let us have a look at this problem from different points of view.

The question of the price

When it comes to price comparisons, many small-scale farmers in Kenya turn to Europe. Customers there pay much more for bio-products, as the organic food there is labeled. Organic agriculture or farming without using chemicals in Europe, is more expensive because more labour is needed than growing vegetables using chemicals. Labour in Europe is very expensive. This additional cost of labour plus the cost of certification and to some extent, the forces of demand and supply, has resulted in higher prices for organic products.

The situation in Kenya is different. Labour costs are comparatively cheap, at least in small-scale farms where activities are shared among family members. However, even if labour costs are not the main problem, farmers have to pay for certification *(see page 4)*. These costs must be passed on to the consumers.

The need for certification

One fact must be understood by farmers: The priority is to assure the consumer that the products are organically produced. The certification is an assurance for wholesaler and retailer and also results in bargaining power for better prices for the farmer. A "Certified Organic" product, where the certification body is recognised and respected in the marketplace, guarantees the consumer of the products integrity. In the end, the consumer is willing to pay a higher price for these certified products both for health and environmental reasons.

Products of Meru Herbs are certified by the UK-based Soil Association (TOF)

To avoid unethical labeling of organic products, most countries have developed standards at a national level which include clauses that *prohibit* the use of the words "organic, organically grown, organically produced etc." on any products unless they are certified by a recognised certification body. Some countries go to the extent of pressing charges on producers who break this code of ethics. As mentioned earlier, the Kenya Bureau of Standards (KEBS) has produced a set of documented Standards for the local organic industry. Once gazetted, it is hoped that fraudulent labeling will be a thing of the past. Knowledge of these Standards is absolutely necessary for certification.

A local certifier

In Kenya all certification of produce has been carried out by international certifiers until recently, at a very high cost and for the export markets only. Producers for the local market could not afford certification. But in July last year, a certifier for the local market was established with the aim of certification at an affordable cost. The certifying body is known as "EnCert" and is already operational *(see page 4)*. Products certified by EnCert are authorised to carry the label "EnCert Organic" on their packaging.

The Kenya Organic Agricultural Network (KOAN) is currently proposing a national label for organic products. This initiative by KOAN has caused some confusion, as the symbol is not backed by a certification body, and will be an additional cost to the farmer when labeling. From the KOAN proposal it appears as if a producer will be expected to carry three labels, a) the producer's trade mark, b) a certification label and c) the so called national symbol (the KOAN label). Some members of the organic movement fear that there would be a conflict of interest, because KOAN itself is not authorised to label products and cannot act as a certifier. KOAN is an NGO mandated to act as a mediator to network with the organic stakeholders, including certification bodies, farmers, training institutions as well as processors. What is needed is an independently working and officially acknowledged authority to do certification work. The way forward for KOAN could be to play a supportive role in the industry by strengthening the existing players like EnCert rather than competing.

Let us review the important issues about organic certification:

1. In order to be able to sell their products as organic, farmers must follow the documented Standards of Organic Production.

2. Farmers need to have their land certified as organic by a recognised certification body. Costs are greatly reduced when farmers get certification as a group. There are a number of NGOs that may be willing to help with initial certification costs. Farmers have to look at farming as a business; therefore certification of their products is an investment for the future.

3. Farmers don't take risks. International statistics show that the consumption of organic produce is increasing year-after-year due to better consumer awareness. Both local and export markets of Kenyan organic produce have yet to be tapped. Local consumption is set to rise due to the newly formed integrity system and certified labeling and the forthcoming massive consumer awareness campaign promised by KOAN in 2006. As Kenya has a reputation for being the largest exporter of naturally produced flowers into Europe, we

Continued on page 8

What can we do against aphids and cutworms?

Readers of *The Organic Farmer* in Subukia had two questions. The first one on the preparation of seedbeds was answered in the December issue. Let us look at the second question: What can we do against attacks by pests, especially aphids and cutworms?

The presence of aphids suggests imbalances within the system. This could be due to many factors, however generally, a healthy soil will promote healthy plants. The weakest are those that normally succumb to attack by aphids and other insect pests and diseases. If dealt with at an early stage, the damage can be controlled quite effectively. This can be done by spot spraying with a biopesticide such as pyrethrin or neem-based extracts.

However, this is merely dealing with the symptom and not the underlying problem. It is also detrimental to the good insects, those which act as natural enemies and pollinators, which we need in abundance.

A better long-term solution would be to provide havens on your farm in the form of untrimmed hedges, bushes and fallow areas, to harbour the natural enemies, such as ladybirds, lacewings and parasitic wasps.

As organic farmers, we must recognise that nature has all the answers to what we perceive as problems. We must strive to allow the balance of pests and natural enemies to prevail. This is only possible by creating diversity on our farms. By growing a variety of crops, we encourage a variety of natural enemies and predators that help us to manage our yields with as little intervention as possible. By farming in this manner, we automatically create a system of rotation which also helps us avoid the problems related to monocropping (growing only one kind of crop). We also have a wider variety of goods to sell, and most importantly, we have better health for ourselves due to a varied organic diet. This finally translates to a healthier nation and a safe environment for our families.

To see nature firsthand, take a close look at your aphid infestation. Hopefully you will notice some brown round eggs interspersed with the aphid population. These are aphid bodies that have been parasitised by a small parasitic wasp. The wasp lays its eggs in the aphid and the emerging larvae feed on the aphid, killing it. By spraying the aphids we also kill their natural enemies.

Chickens against cutworms

Cutworms normally damage crops at night. By digging the soil around the affected plants, you can usually dig out the cutworm. Damage by cutworms is not normally very severe. If it is, chickens can be useful. We are experimenting by allowing our chickens exclusive access to an area; we expect them to clean up this area and fertilise the soil at the same time.

Cutworm destroys a plant stalk (TOF)

We shall keep them in this area for six months and then we will plant a crop. If the situation is desperate, however, use pymac, the residue left from pyrethrum extraction. Pymac can be put into the holes with your seedlings and this can also deter the worms.

Su Kahumbu answers your questions

Write to:
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com

"Farming is like gambling"

Jacob Kamau from Bahati, P. O. Box 1128, Nakuru feels that, "after trying many farming methods the whole business appears to be like gambling". He has three questions:

1. How do I get a fertile and organically self-sustaining soil for crop production?

Unfortunately the only self-sustaining fertile organic soil is that which is formed beneath our natural indigenous forests. We can produce fertile organic soil, however it cannot be self-sustaining for as long. As we take crops away from an area, we must replenish the area with more nutrients if we expect to reap another harvest from that same area. Therefore we must sustain the soil by using organic inputs so as to create an enabling environment for all of the microorganisms, fungi, bacteria, etc. that we need for optimum fertility. To do this we need to continually add organic material, compost, farmyard manure, and green manure, as well as to grow fertility-building crops such as beans, peas and other legumes.

Our aim is to understand our crop requirements and in so doing, we try to make the nutrients and conditions optimum for the crop we grow. As organic farmers we must learn to read our fields, notice the differences in the crop quality and learn from the lessons nature teaches us.

2. How do I plan farming activities on a small piece of land to realise maximum yields?

A first start here is to concentrate on building soil fertility. This will depend on your available inputs such as manure, composting materials, etc. If you have quite a large area and not much in the way of inputs and are not prepared to purchase any, concentrate on the little you can do, and do it well. Spreading fertility-building material thinly over a wide area will not result in good quality crops, only in a lot of hard work. You can concentrate on cultivating a small area as you grow fertility-building crops like legumes in another area to be used in the future. At the same time, another area can be left fallow or used to grow animal feed.

Weed can be used for compost

Land laid bare will soon dry out, so let some areas go to weed and bush; the soil beneath them is healthier than that of bare land. The bush/weed materials, even though of no commercial value, can be collected for bedding for animals and eventually used in compost. All of this will then enlarge your bank of organic material to put back into your land.

Letters to the editor

Good for training

We wish to thank you most sincerely for sending us *The Organic Farmer* magazines. These magazines proved an asset in the group as they arrived by the time the group was under going Farmer Field School (FFS) lessons on fodder establishment and agro-forestry project. The group since its inception in 1996 to date has great interest on organic farming, that is why the magazine proved indispensable and of greater help to them. May I request that you continue sending us more issues if possible.

Alice Kemunto Nyakundi
Nsicha Nyabomo Group
P.O Box 33, Nyamira

Goat story was informative

The demand for *The Organic Farmer* magazine among the farmers here is putting me in as awkward situation. A topic 'dairy goat farming is easy' in Nr 6 September/October attracted a larger number of readers than the five copies you send us. A sub-topic and a design on how to build a goat shed helped many farmers erecting goat structures in their homesteads. This is testimony and a very encouraging gesture that the paper is informative, educative and an eye opener. In your next issue, a detailed subject on fish farming for human food and commercial purposes would equally help us. Keep up with the good work.

John Njoroge, P.O Box 82, Sabasaba

Dear Farmers,

As part of our efforts to serve the organic farming community effectively, we would like to create a database of organic farmers in the country. We are interested in:

-Your names,
-Addresses, Location,
-Farm acreage,
-Are you an organic farmer?

We make it easy for you. We have a special telephone number: given below. All the farmers can provide these information through short messaging service (SMS). ***Come on Farmers, Tuma jibu. Asante.***

0721 541 590

Su's answers

continued from page 6

Your choice of crops will depend on many factors: Will you grow commercial crops, subsistence crops, animal fodder or compost making material? Note that many of these can be intercropped with each other and will in fact benefit overall soil fertility and quality of your crop. Diversity is extremely important. If we think diversity, we automatically start to think rotation, we also create better chances for biodiversity to balance our growing systems. This should answer the final question:

3. How do I curb pests and diseases without using chemicals?

Ideally we strive to create a natural balance without using toxins of any kind, either synthetic chemicals or of biological origin. However, organic systems do not produce ideal solutions immediately. Infact, we have to work very hard to achieve the balances we want. Financial losses can be averted with the use of biopesticides but more often than not, the underlying problems are just encouraged. We can manage pest problems meanwhile using natural pyrethrum products, neem, and other natural extracts. Some of these have been covered in past issues of *The Organic Farmer*. Diseases of a fungal nature can be treated with milk diluted 1:10 and sprayed on the affected area. Sulphur products can also be used for fungi and can be purchased as a product called Thiovit. Organic farming requires absolute integrity and respect. Only by respecting our planet can we attempt to respect ourselves.

We are making photocopies of the newspaper

We are a group of farmers who meet regularly in our church in Gikingi Nyandarua. As a group we are interested in improving our farming skills and knowledge to the betterment of our small society that generally is very poor. When we received 10 copies of your newspaper Nr. 7 we were excited. We have distributed the copies to 10 farmers who we believe will make good use of it and who have promised to pass the newspaper to other farmers. We have also downloaded from your website the issue Nr. 6 as the topics in that paper are of particular interest to farmers up here in the highlands of Kenya. Especially the goats, control of potato bacterial wilt, we made photocopies of the newspapers and distributed them. However this is a bit expensive and we are therefore grateful if we can in future receive your newspaper free.

We will also formulate some questions and send them to you as we have any problems. We thank you for the newspapers.

Rachael Nduriri, Gikingi Church Group, P.O Box 1334, Nyahururu,0720 616435

Dear Mrs Nduriri,
That is a great effort on your part. We will make an effort to send you more copies. However our resources are limited. Due to the small budget, we can only print 12,000. Many other farmers have made the same request.

Increase our allocation

I take this opportunity to heartfully thank the editors of *The Organic Farmer* newspaper for the prompt response to our request for the newspaper. So far we have received two times from your organization a total of 12 newspapers. In October we received 7 copies of different issues as per our request just to catch up with the system and in the month of November we received 5 copies of the same issues. This newspaper has rejuvenated our memory on organic farming and we are supplying them to our motivators in the field to read and spread the ideas to the farmers. We are also making a follow up to verify and add value to the impact of the magazine. In the field we have seven motivators who covers an area with a population of about 50 000 farmers and according to your provision of 5 newspapers, there is slight requirement of adjustment if possible may be to at least 10 copies. Other wise we appreciate very much your support and in case of any requirement that may improve areas of more supply, please never hesitate to inform us. I promise that soon you will be getting practical feedback of our input in the newspaper. Thanks.

Peter O. Okwany, Agriculture Sector Head, Ortum

Send us copies

Your newspaper is interesting. We are an organized small-scale farmers and the group is registered by the Department of social services. I request you to send us 20 copies.

Chairman, Jambo Yetu Jisaidie Group
P.O Box 55,Londiani

Marketing

.....continued from page 5

must realise that our foot is already in the door. The potential is out there!

Awareness campaign

Kenya urgently needs an awareness campaign which highlights the advantages of organically produced vegetables. There is limited knowledge of the benefits of organic products among local consumers in Kenya. Nearly all buyers of organic foods live in urban areas and a large percentage are expatriates. " There is need for a serious awareness campaign for local consumers through the Kenyan media", says Su Kahumbu, the organic farmer from Limuru who answers questions from our readers. "We have to lobby much more for organic food", declares John Njoroge, Director of the Kenya Institute of Organic Farming (KIOF). "There is a need for stronger links between the producers and the consumers. KIOF is already working towards this end, and this lobbying should be done by KOAN."

Andrew Botta has the same opinion. He is the co-ordinator of Meru Herbs, a company producing organic products which is certified by the British Certification Authority Soil Association (*see label on page 5*). "Once more, consumers demand certified organic vegetables; the pressure mounts on the shopkeepers to offer such food", Botta says.

Cooperation needed

The situation at present is unclear. Many traders take advantage of the lack of certification. They are selling products from anywhere as organic and are therefore cheating consumers. This attitude will soon change due to demand caused by informed consumers. This will finally allow the farmers to get the due respect and prices for their efforts.

To get there, farmers, traders and all organisations supporting organic farming need to work together. Sometimes it appears as if these organisations jealously try to defend their positions against each other and miss out the overall interest of the thousands of small-scale farmers they claim to support. Our paper, *The Organic Farmer*, will continue to provide as much information on these problems and act as a forum for exchange of ideas. We are able and willing to work with all the relevant interested bodies to achieve this objective.

Marigold

This very useful plant is well known all over in Kenya. The common name is Tagetes minuta, because of the smell it is also named "stinky weed"

Plant parts used: Flowers, leaves, and roots

Mode of action: Insecticidal, repellent, fungicidal, nematocidal

Although there are no known bad effects on human beings, clean poperly the untensils before and after preparation and applying, wash your hands and do not have a direct contact with the crude extract.

Materials	Preparation	How to use	Plant pests
Fermented marigold extract Whole flowering plant Soap, Water, Strainer,Drum	Fill-in drum with 1/2-3/4 full of flowering plants. Leave to stand for 5-10 days. Stir occasionally. Strain before use.	Dilute the filtrate with water at a ratio of 1:2. Add 1 tsp soap in every liter of the extract	Coffee berry disease. Rice blast.Tomato blight. Root knot nematodes
Marigold water extract Mexican marigold leaves, Soap. Hot water Mortar and pestle Strainer,Pail	Pound the leaves. Soak the pounded leaves in hot water. Leave to stand for 24 hours. Strain.	Dilute the filtrate with water at a ratio of 1:2 Add 1 tsp soap in every liter of the extract	Ant Aphid Grasshopper
Marigold/ tomato extract 1 kg of marigold leaves 1 kg of tomato leaves 20 lt of water. Grinder, Soap, Strainer	Grind the leaves. Add enough water. Strain.	Add 20 liters of water to the filtrate. Add 1 tsp soap in every liter of the extract. Spray on the target pests.	Aphid Bean pod borer Leaf beetle
Marigold and chili extract 500 g of whole plant. 10 hot chili pods. 15 liters of water. Knife, Soap, Strainer,Pail	Finely chop the plant and the chilies. Soak them in water overnight. Strain.	Dilute the filtrate with water at a ratio of 1:2 Add 1 tsp soap in every liter of the extract.	Most agricultural pests
Marigold, chili, garlic, onion spray 2 handfuls of marigold leaves, 2 pieces of chili, 3 garlic cloves, 2 large onions, Cooking pan, Pail, Strainer	Chop 2 handfuls of marigold leaves, 2 pieces of chilies, 3 gloves, garlic, and 2 large onions. Place in a pan of water and bring to boil. Let it cool. Strain.	Add four times amount of water to the extract. Spray or sprinkle on affected plant parts.	Most insect pests

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 19 December 2006

Good pasture, more milk

Poor pasture is to blame for low milk production and reduced income for many farmers.

The Organic Farmer

The type and quantity of feed dairy cows eat determines the amount of milk they produce. Even a high-yielding dairy cow will not produce the optimum milk yield if it is not well fed. A good mixture of forage that contains energy, protein, fibre, minerals and vitamins helps the animals to maintain their normal body functions and stay healthy. Also important is the supply of water. If a cow does not get enough water, it will produce less milk. A milking cow drinks about 5 litres of water for every litre of milk it produces.

Many small-scale farmers feed their dairy cows with inadequate and low quality fodder, resulting in low milk production (and, of course, low income for the farmer). Before buying dairy cows, a farmer should know their pasture requirements according to the size of the shamba. Even for those who have planted pasture, it is very often of poor quality that cannot sustain the animals. Pasture is like any other crop on the farm: it should be well managed. Farmyard manure should be applied to maintain soil fertility and ensure faster regeneration.

Dairy cows are more comfortable if they are given enough space for free movement. All animals should have access to pasture and an open-air exercise area or run. In organic farming, landless zero grazing is not allowed.

Hay is important

We are now approaching the dry season. Scarcity of pasture forces farmers to work extra hard to feed their animals. Farmers should make provisions for the dry season. How can they store feed so that the cows do not suffer and reduce milk production during the dry season? See pages 4 and 5 for some answers. ■

in this issue

Recordkeeping is the way to success

Farmers, can you answer the following questions: How many bags of maize did you sell after the last harvest? How many litres of milk does your cow produce per month? Do you actually know the exact size of your land?

You are not sure? Then you don't keep your records properly! Keeping farm records is neither a waste of time nor a boring job done only by people in offices. On the contrary,

it gives you an exact picture of the expenses and earnings of your farm. It is the only way to find out whether you are making a profit with your farm and its produce or whether you are losing money. Read page 2 on how to keep farm records.

Dear farmers,

First off, we would like to thank you for all the letters, telephone calls and SMS messages we have received this year. It is a good feeling to be in direct contact with farmers. Every week, at least four new farmers' groups join our mailing list. This is a very good indicator that farmers value the information we give and are ready to put new ideas into practice. We may not be able to meet all the demand for the newspaper, but we have addressed the problem partly by increasing the number of copies from 12,000 to 14,000 copies. We will try and distribute these fairly to ensure as many farmers as possible are able to access the information.

Going through your letters and reactions, one is really impressed by the direction agriculture is taking in the country. Farmers are becoming more and more self-confident. They are willing to learn new farming methods. To them, farming is no longer an occupation for those who have nothing else to do. It is an honourable and profitable occupation like any other. Many farmers now realise that farming is not just about producing food for consumption, but is like any business enterprise.

A farmer needs to be a planner and a manager. A well organised farmer knows that the dry season is a time of great hardship, as pasture and water resources reduce. He/she has to ensure there is enough fodder to feed their animals during this period (see page 4 and 5). A farmer has also to be an accountant: He/she has to keep a record of all the farming activities during the year to determine how much money the farm has made and how it has been used, and whether they have made any profit or loss during the year. One has to be a marketing specialist too. You should know when to grow and sell to get a maximum return on your investment (see pages 2 and 3).

Farmers have to be self-reliant, but they should not underestimate the advantages of working as a group. Farming has a great future if it is done in the right way. Finally, in this last issue of 2006, we would like to wish you all the best for the holiday season and the coming year. May you enjoy the fruits of your hard labour, a good harvest and good health, as we all work together for the prosperity and peace of our country.

The Editors

MY OPINION

When I was young, we could accurately predict the seasons, grow crops at the right time and get good harvests. But climate change now threatens food production. The current rains for example, have intensified in November which is supposed to be the beginning of the dry season. Africans does not have many cars or big factories that produce dangerous gases. The US, Europe China and other industrialized countries are to blame for global warming and the changing weather patterns. But I do believe that if all farmers adopted sustainable agriculture, planted trees and stopped use of dangerous chemicals that pollute our environment, we will play our part in saving this planet.

Simon Githinji, a farmer in Thika

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

icipe

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch BIOVISION

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

Do you keep farm records?

Farmers should keep proper records about the activities on their farm. To be certifed as an organic farmer, recordkeeping is a must.

Anja Bengelstorff

Recordkeeping tells you how the various activities on your farm perform. For example, how much profit did you make from milk production, or how much from maize farming? Which of the enterprises is most profitable, which causes you losses? You might need this information in case you want to change the crop you are planting or if you have to decide whether or not to purchase another cow. Also, if you want to apply for a loan from a bank or another lending institution, you will need to present farm records to show how your farm performs. It is almost impossible to get a loan without evidence of records.

Start an inventory

At the beginning, an accurate inventory of the farm should be done so as to know what you, the farmer can work with: buildings and their size, use, and capacity; livestock, tools and machinery; and other available assets. All need to be listed. What is the cash value of all this? To plan future steps, draw a map of the homestead which shows the important features and field arrangements. How many acres/hectares is the farm? Determine how much is under crops and pasture, or used for housing, and what is wasteland.

It is also important to look into the following factors:

Water supply: How do you access water for irrigation? Do you have a stream next to your homestead, or do you have to carry water from far? Supplying the farm with water from a distant place involves additional labour and time and determines whether you can develop an irrigation system.

Climatic conditions: Record the rainfall patterns in your area. How many days of rainfall do you experience per year? Does it change over the years, and if yes, how? The amount of rain will determine which crops a farmer can plant since there should be enough water for irrigation. Do you enjoy two or only one growing period per year? Describe the soil type(s) and the general vegetation in your area; changes over a longer period might force you to change farming activities.

Proceed with activities

Every single activity must be recorded. As a rule, note the price, date and place of each purchase and expenditure.

Crop production records: Note exactly how much of seed or seedlings you plant and on how many beds and what size and on which day? Put a sign on each bed, naming the plant grown there. Record the time in days you needed to cultivate your crop. Record how much manure or fertilizer you used. If you prepared it yourself, which components you mixed and at what cost. Note how many bags/ kilos of each of your crops you harvest. Write down exactly how much you consume yourself and how much you sell, and at what time and price and place.

Livestock production records: Count your cattle/ goats/ poultry, etc. Document new births and their birth weights and their parents. Record how much money you spend on fodder, water, shelter, veterinary services, etc. during an animal's lifetime. Record how much milk/ eggs/ meat, etc. you consume yourself and how much you sell and at what price and place.

Storage records: How much space do you have? What were the costs of setting up the storage facilities?

Labour records: Record how many people worked on which farming activity and for how many hours or days? Note if and how much you paid them. This should als include family members.

At the end of each month, calculate the output (yields and their cash value, sale of livestock, etc.) of each farming activity. Deduct the money spent on input (costs of seeds, labour, medicines, fertilizers, etc.) from the output – this is your profit. ■

The best way to market your maize

Most of our Kenyan farmers grow maize. However poor marketing continues to reduce their profits.

Anja Bengelstorff

Considering farming as a business is necessary to improve livelihoods, as we pointed out in the July issue. Part of the farming business is marketing of crops in order to get the highest profit possible. Maize is the most important food crop in Kenya. The majority of farmers plant it for home consumption and hope to sell a surplus to earn some cash. Every Kenyan eats on average 98 kg of maize every year.

A farmer who wants to produce maize for sale needs to consider several important factors when entering into maize production, and also when deciding when and how to sell the maize – the marketing.

First, a farmer defines how much land will be available to put into maize. The farmer then needs to calculate how much maize the family will need between the planting seasons. Will the output only feed the family, or can you get more to sell at the market? Once you have come up with a figure, you should plan how much maize you want to sell and where. The maize can be sold directly from the farm to individual buyers or to middlemen, or it can be taken to the (nearest) market by the farmers themselves or by farmers organized in a group. It can also be taken to a buying agency such as the National Cereals and Produce Board (NCPB).

A farmer can also consider other possibilities such as contract farming: The farmer signs a contract with a buyer or an agency and agrees on the price per bag and how many bags are to be delivered before the production even starts. This way of marketing is not very common in Kenya as yet, but has the advantage that the price is fixed, regardless of how good or bad the harvest will be.

The price per bag needs to be calculated, too. Here the farmer should know the prices of previous seasons as a starting point. Currently, a bag of maize in Kenya goes for around KShs 1,300.

Production and other costs

Another important, if not the *most* important consideration is how much do you have to invest to get one bag of maize? These costs include labour,

the money needed to buy seeds and to prepare manure, the cost of pest control, among others. How fertile is your soil, and how much care does it need to get a high yield? Once the production costs are established, they are used as a basis to determine the selling price. Farmers should recover their production costs, getting at least the same amount of money for their maize as was put into its production. A good profit would start with anything above 10% of the production costs, sugggests Dr. Festus Murithi from the Kenya Agricultural Research Institute (KARI).

Storage also requires some investment. Other costs which must be taken into account include transporting the maize to the market or the buyer. Also, if the farmer needs someone to sell the produce at the market, this person might need to be paid.

To establish the true production costs, it is necessary for every business-oriented farmer to keep the records properly.

The maize is harvested – what's next?

If all the maize is not to be sold immediately after harvesting, a farmer needs to store the excess properly. The storage facility is supposed to contain all the maize and keep away pests and rodents such as insect pests and rats.

Prices are usually low at harvest because everyone is selling, and improve once the harvest time is over. Every farmer needs to know the highest prices of previous seasons and the current price to decide how long to store the maize and when to sell. If not sold at the right time, prices could fall, pests could destroy the produce, or there could be no buyers at all.

If the maize is to be sold green for roasting or boiling, higher prices are likely to be gained near towns where many people might buy maize cobs while passing by.

As a rule, the price will depend on how much maize is in the market and how much maize is needed by buyers, as well as the costs of storage if one wants to wait for better prices. The general performance of the maize crop within the neighbouring farms, areas and the whole country must not be forgotten either: If the season is good for all farmers, a farmer may want to wait before selling or sell immediately if the prices are good.

Marketing as a group

However, there are times when cash is needed immediately: to pay school fees three times a year, to buy seeds to start the new season, or to meet other urgent needs which cannot be postponed. At such times, if saving money from previous harvests was not possible, the farmer is forced to sell at whatever price is available.

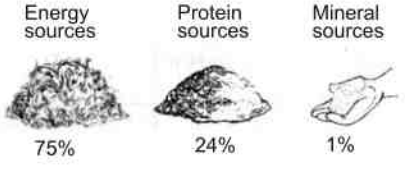
As Dr. Murithi from KARI points out, farmers in a given area could benefit from better prices if they form marketing groups to sell their maize as a group. This will improve their bargaining power with traders. In such a group, all members put in some money for the benefit of all, and since acting as a group reduces costs, the farmers could construct or hire storage facilities and transport their maize together at lower prices. Also, they could assign someone to get information on prices and demand in other parts of the country. This would enable the group to transport their crop to places where there are favourable higher prices. ■

Dairy cows need a balanced diet

How can farmers improve the quality of the pasture to meet the feed requirements of their cows?

The Organic Farmer

A good cow will bear one calf a year and produce milk for more than 284 days during the same year. To sustain this production level, proper feeding is required to meet the nutrient needs of the cow. Just like human beings, livestock require a balanced diet. Cows have a large stomach which should always be full (maize stalks and banana stems are good fillers). Mature cattle need 80 kg per day of fodder including fresh foods with a high vitamin content. A variety of food makes the cows healthier and more productive (see two diets for dairy animals in the table on the right). Good and balanced feed for cows must have at least equal parts from each of the following three sources: protein, energy and minerals; they should be distributed as explained below:



Energy

Cows obtain most of their energy from roughage (plant feed materials). They require energy for body maintenance, milk production, growth, weight gain and reproduction. Most of the milk is produced during the first 3 to 4 months of the lactation period. Therefore the cow needs more energy at the beginning of lactation. Also, the young animals need extra energy for growth and weight gain.

Ordinary energy sources: All grasses and maize stalks are very good sources of energy for ruminants (cud-chewing animals). The most popular fodder grasses include Napier (elephant) grass, Guatemala grass, Giant setaria, Guinea grass, Makarikari grass, Rhodes grass, Kikuyu grass, Nandi setaria. If farmers use the *tumbukiza* method for Napier grass (*see page 5*), they should remember that each dairy cow needs grass from three holes to meet its daily forage requirements. Napier grass can only be fed to animals at 6 or 8 weeks after planting as young Napier grass contains a lot of water and very little dry matter and so will not sustain the animals.

Extra energy sources: Molasses, maize germ, wheat germ.

Protein

Protein is required to help micro-organisms in the rumen (stomach) to break down the roughage (plant feed materials) into nutrients that the animal can use. When protein is lacking in the diet, the results are poor growth, reduced milk production, loss of weight and late maturity. The available amount of protein depends on the plants: Legumes have a higher protein content than grass; younger and fresh plants have a higher protein content than older plants. Young green pasture or fodder also has plenty of vitamins.

Protein sources: Leguminous fodder is a good protein source for all livestock. Examples are desmodium, lucerne, white clover and bean straw. Good protein sources are the fodder trees like calliandra, sesbania, leucaena, mulberry, trichandra (*see on page 8 the protein content of plants*). Note: Do not feed fresh calliandra as it causes the milk to smell. Farmers should let it dry before feeding the animals. Other protein sources are sweet potato vines, sunflower and *omena*.

continued on page 5

Daily rations for a dairy cow

Ration 1

Ingredients	Quantity
Chopped maize stalks	2 debes, tight
Chopped sweet potato vine	2 debes
Chopped Napier	2 debes
Maize germ or Maozo (reject maize)	3 gorogoros
Cotton seed cake	1½ gorogoros water
Dairy lick	2 tablespoons

Expected production: 13 bottles of milk per day.

Be careful with reject maize (maozo); rotten maize may contain aflatoxin.

Ration 2

Ingredients	Quantity
Chopped maize stalks	2 debes, tight
Chopped sweet potato vine	2 debes
Chopped Napier	2 debes
Dairy lick	2 tablespoons
Dairy meal	5 gorogoros

Expected production: 13 bottles of milk per day

Poultry waste ... Not allowed!

In conventional agriculture, farmers are advised to give the cows poultry waste, also referred to as poultry litter or poultry manure. Poultry litter consists of bedding, spilled feed, feathers and chicken droppings collected from where chickens live.

No doubt, chemical analysis shows that the protein content in poultry waste is very high, and the nitrogen in this manure can be utilised up to 10 times more efficiently when recycled through animals as a feed. Microorganisms in the stomach have the unique ability of utilising protein and nitrogen in the waste to make their own cell protein, which is subsequently digested in the lower gut for use by the host animal.

But there are a lot of problems associated with the use of poultry waste as feed. The material, if it is not properly treated, is a potential source of harmful agents including pathogenic bacteria, for instance *Salmonella*, moulds and yeasts. In addition, some forms of poultry waste (e.g. caged-layer waste) have a particularly offensive odour and are rather messy to handle.

Bird flu is another potential worry, although it is not present in Kenya at this time. Another reason why the US, Canada and many other western countries have banned chicken waste from livestock feed is that they fear the transmission of BSE (mad cow disease).

In organic farming, the use of poultry waste is not allowed. According to the International Standards for Organic Farming, the following substances are prohibited in the diet for livestock:

- Farm animals by-products (e.g. abattoir waste).
- All types of excrement, including droppings, dung or other manure.

Farmers can overcome the dry season

In order to keep their animals productive during the dry season, farmers need to plan ahead through conservation of pasture.

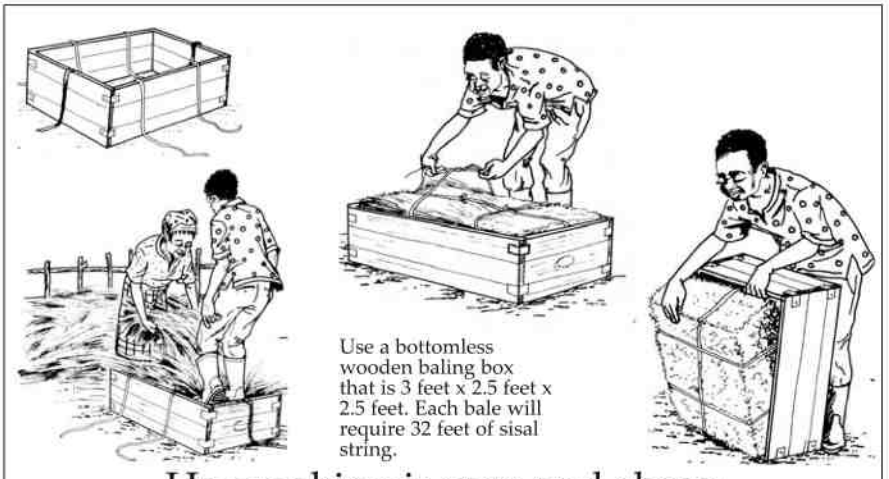
The Organic Farmer

Agriculture has a lot to do with planning, as you can read on page 2. Farmers should know when the dry season is coming and plan their pasture requirements early on. The limited growth of pasture or fodder during this period leads to reduction in milk yield and loss of body condition – and income too! To avoid this, farmers should make provisions during the rainy season, during which a surplus of forage beyond what the animals can eat is often produced. To overcome dry season feed shortages, farmers should grow grasses and deep-rooted legumes that provide high quality feed for a longer period. It is important to conserve all surplus feed while it is still nutritious for use later as hay or silage in the dry season.

The most common methods used to provide quality feeds throughout the year include hay and silage making. In this issue of *The Organic Farmer* we introduce to you methods of making hay (*see box on the right*). In the January 2007 issue, we will feature silage production.

Tumbukiza and fodder shrubs

Well-prepared farmers plant Napier grass using the *tumbukiza* method, or trenches. Even during the dry season, they will have forage for their cows since the water remains longer in the holes and the trenches. One bucket of water per week for each hole will keep the Napier grass growing. ■



Use a bottomless wooden baling box that is 3 feet x 2.5 feet x 2.5 feet. Each bale will require 32 feet of sisal string.

Hay making is easy and cheap

Material for hay

Harvest forage when the feeding value is high (pasture for conservation should be cut after 4 to 6 weeks of regrowth), then dry and store it. Cut the pasture when half of the plants have flowered. Morning is the best time to cut forages for hay because more nutrients are conserved. A mixture of grasses and legumes with a lot of leaves is ideal. The legumes increase digestibility and intake of the conserved forage. Grasses such as Rhodes grass, Congo signal grass, Guinea grass and Kikuyu grass are good for hay production.

Making hay

Dry the cut pasture as quickly as possible. Use a rake to turn the forage several times; this allows quicker wilting. Drying for 2 to 3 days should be sufficient, depending on moisture content of the plant. Over-drying gives poor quality hay. Once dry, the hay can be stored loose or in bale-stacks in the field or in the barn. In the field, it should be stored on a raised mice-proof platform to avoid damage by rodents and termites. It should be covered to avoid damage by rain and sunlight. One old farmer saying is, "Make hay when the sun shines".

Feeding hay

Good quality grass hay is able to sustain milk production during the dry season. An average-sized cow will require one bale of hay per day if no other feed is available. Remember that when feeding dry matter, a constant supply of water is essential!

Fodder trees and shrubs are very helpful. They contain not only protein, but are much more drought-tolerant and produce high quality fodder (*see box on page 8*).

Reference books

Below are some very useful books, booklets and leaflets about forage from which we used the information and illustrations on these two pages:

- *More Forage, More Milk*. Technical Handbook No. 33, RELMA/World Agroforestry Centre (ICRAF), P.O.Box 30677, 00100 Nairobi
- *Field Notes on Organic Farming*, by John Njoroge, Kenya Institute of Organic Farmig, P.O.Box 34972, 00100 Nairobi
- *Coping with Feed Shortages During the Dry Season*. Published by KARI Kitale, P.O.Box 450, Kitale
- *How to Get More Milk in the Dry Season*. Leaflet published by KARI Kitale, P.O.Box 450, Kitale
- *Plant Fodder Shrubs for More Milk and Cash*. Published by World Agroforestry Centre (ICRAF) and KARI, Nairobi.

... balanced diet ...

continued from page 4

Minerals

Salts provide essential minerals such as calcium (Ca) and phosphorus (P)which are vital for livestock. During pregnancy, a cow requires extra minerals to help the bones and other tissues of the unborn calf develop. A balanced mineral supplement, either as powder or block licks, should be provided freely at all times. Attention! Ordinary table salt used in the kitchen is *not* appropriate for livestock as it does not have the types of minerals that are much needed by animals.

Dairy meal: Dairy meal or concentrates (feeds high in nutrient concentration) are not only expensive, and must be used in the most beneficial way possible, but they are also dangerous if a farmer is feeding high levels of concentrate and cutting back on low-cost forage. Forages such as grass or hay must always remain the main feed for all animals. Experienced farmers plant fodder trees and shrubs for more milk and cash: 3 kg of tree fodder and other legumes such as desmodium, or even sweet potato vines, gives roughly the same milk yield as 1 kg dairy meal! Therefore farmers can save money by having to buy only small amounts of the expensive commercial protein supplements.

Can you set up a demo plot?

Justus Ikiungu P.P Box 134 of Maua, Meru North says that many farmers in his region consider miraa the only agricultural crop that can bring them income. "I am at present teaching and applying E.M. What advice can you offer so that I may increase my effectiveness in teaching these farmers other agricultural alternatives? Our soils are very rich and in the lower parts we have water. Can you please consider starting an organic farming demonstration plot in this area so that farmers can learn practically?"

Justus, well done with your teaching on the uses of E.M. We can assist you by sending you copies of *The Organic Farmer* monthly, that you may distribute to the farmers in your area. The detailed information in the magazine will help the farmers make a choice on what they are willing and able to do that may be different from their current practices. At this point we are unable to set up a demonstration plot in your area, however, we do try to make the magazine as informative as possible and would be very happy to hear that you are able to start a demo site in the area yourself. We look forward to hearing from farmers who have taken the initiative to start such sites and encourage more to do so. We would be very happy to publish photographs, contributed by farmers and farmers groups so that we may share your experiences with the other organic farmers in the country.

Prepare plant extracts in the right way

Mburu (Tel: 0720 244 522) says, "I am wondering if there is any pre-harvest interval to be observed when you use FPE, especially marigold spray".

This question is asked time and again and is very important. Plant extracts can be very toxic, although we may feel they are safe because they are 'natural'. Keeping in mind that even deadly cyanide can be found in a natural state, we must be cautious with the ingestion of anything we use as a pesticide, fungicide, foliar feed et cetera. It is advisable to give at least a week's interval before consumption of products that have been exposed to bio-solutions, less time if it is during the rainy weather.

Wash the vegetables

Added to this, most of the plant extracts have strong smells and sometimes contain natural oils. These can adhere to our crops once harvested and may affect the taste of the crop. It is advisable always to wash your vegetables and fruit in clean drinkable water before preparation and consumption.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

I want to start organic poultry keeping

I am a small scale-farmer engaged in horticulture and rearing of exotic poultry. I am interested in rearing exotic poultry the organic way. How can I do it?

When we use the word exotic poultry, we could be referring to rearing of any of the following: guinea fowl, quail, ostrich, wild ducks, wild geese, etc. Please elaborate on the particular exotic breed you have in mind, then we can better investigate and answer the question to your satisfaction. I

would like to mention a few words on guinea fowl. This bird is a delicacy in Europe and has been domesticated and reared for many year, especially in France. I do not know of any local guinea fowl breeders and understand one may require a license from KWS in order to commercially rear them. I do believe there is an opportunity and would be willing to research the means and ways of commercially rearing them for the Nairobi market if anyone is interested in doing so. One thing I do know is they are useless brooders and abandon their eggs where they lay. A good *kienyeji* mother hen is the simple brooding solution!

Properly made compost...

... is very good fertilizer *(Photo TOF)*

How do we get organic fertilizers?

We, the Akombori Self Help Group (Tel 0720 708 574), have a shamba and we would like to grow crops with organic fertilizers. We want your advice on how to go about it.

Organic fertilizers are simply products that will increase the soil fertility that are not of synthetic (chemical) origin. We have animal manures, green manures (e.g mustards, rape, alfalfa, legumes etc.) rock residues, ashes, bonemeal. For best results these products should be composted. This encourages pasteurisation, thus elimination of pathogens, disease and weed seed. It also helps to improve the structure of the soil and acts as a nutritious feed for the soil organisms and plants. Look around you: the leaves, weeds, animal bedding, animal manure…..these are all natural fertilizers waiting to be used! When planting your crops, instead of using chemical fertilizers, use these natural composted fertilizers by digging them into your planting beds at the time of planting. As plants mature, you can take the same compost and make a compost tea by soaking 5 kg of compost in a 20 litre drum of water. This tea can then be used as a foliar feed for plants in need of regular feeding. Good luck, we would like to hear how your group get along.

I have changed to organic farming

I am happy and thankful for your research in organic farming. Thank you also for the information you are passing on to young organic farmers across the country. I am now practicing organic farming since I read the information on how to make and prepare organic manure from your newspaper. On my farm, I use the organic manures to plant and top dress crops. Please consider me and send me one magazine on how to prepare and continue using this organic manures. More so, I want to get the experience of other organic farmers who have successfully used natural methods to control pests and diseases on their crops. I would like to assure you that, I will go ahead to form a Bingwa organic farmers association for the young generation.

David Kamotho Rotich, P.O Box Makimeny, Via Sotik

I need information

Recently I came across a copy of March 2006, from a friend who attended a seminar organized by ICIPE on malaria control in the community of Nyamondo. I am not an organic farmer but I am very much interested to become one. Therefore if you have past magazines send me copies to help increase my knowledge on the following subjects:

1. A step by step guide on how to prepare compost.
2. How to control mole rats in the farm.
3. Conserving Napier grass for future use. Thank you

William Makori Omaiyo, P.O Box 4115, Kisii

Our group wants organic poultry production

I would like to thank you for *The Organic Farmer* magazine that is very educative to farmers. On behalf of Kwinyinyia Farmers Field School members, I request you to send more copies to our group. We are 20 in number. We specialise in Kenbro chicken breed and we intend to go into organic poultry farming. We usually meet on Thursday every week. Thanking you in advance.

Beatrice Nyaga, P.O Box 69, Siakago.

How do I get past issues?

I thank you for the advice given in your news magazine. I have only read *TOF* No.15 of July 2006 given to me by a friend. I wish to request for past issues of *The Organic Farmer* so as to catch up with you. You have advised that any interested farmer will need to buy stamps worth Ksh.350 and send them to you for the same, that was between April 2005 and April 2006. I am willing to pay for all the past issues. Once again thanks for the information contained in your newspaper and please keep it up. Let me request the following: I need additional information on dairy goat rearing so that our group can start such a project. We wish to be supplied with future copies of the newspaper. We also request a visit to our area by one of your officials for grass root contact. I am willing to coordinate the visit as I am involved in many self-help groups in the Timboroa location of Uasin Gishu district. Thanking you in advance.

Evanson N Karanja, Chagaiya Settlement Scheme, P.O Box 115, Timboroa, Tel: 0724 415145

Dear Mr Karanja,

To get past issues as we explained earlier, all a farmer needs to do is to buy stamps worth Ksh.350, put them in an envelope and send them to us. We use the stamps to send newspapers to other farmers and also defray the cost of photocopying the newspapers for you.

I want to do organic research

I am interested in organic agriculture research; please advice me on where I can get literature in Kenya.

Jennifer, Kenyatta University Tel. 0722 759401

Dear Jennifer,

Thank you for your interest in organic agriculture. We will send you more information on this subject later.

Is *TOF* for sale?

I would like to subscribe to *The Organic Farmer*. Please let me know how. Is it free, do I have to pay a fee and if so, how much? Where can I get back copies of the newspaper? Many thanks, Felix Kaloki , P.O. Box 63453-00619, Tel 0722 780 086, Nairobi.

Dear Mr. Kaloki,

The newspaper is available free of charge to all interested farmers and groups. It is possible to receive the newspaper if farmers provide us with their full address including telephone numbers if possible for ease of contact. We especially prefer mailing to 5 or more farmers sharing one address to reduce cost. Please provide us with the names of other farmers with whom you wish to share the newspaper.

Give us more

I am a Kenyan citizen who is practicing organic farming. One day I came across *The Organic Farmer* and I was very happy with what the paper contained. I liked the articles so much that I would like you send to me any editions containing more about poultry, bee keeping, and dairy keeping. I will be very happy if you address my problem. Lastly I would like to ask if it is possible for your experts to visit our farms.

George O Atolo, P.O Box 128 40107, Muhoroni Tel 0735 331682.

I need the newspaper

I am a farmer in Kiminini division of Trans-Nzoia district. My farm is situated about 15 km from Kitale town. I grow maize, beans, and vegetables and also keep cattle. My neighbour who is also a farmer recently passed to me some past copies of *The Organic Farmer* which I find very interesting and educative especially to a small-scale farmer like myself. I will be grateful if you could include me in your mailing list.

Joseph L Mudhay P.O Box 2642, Kitale

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

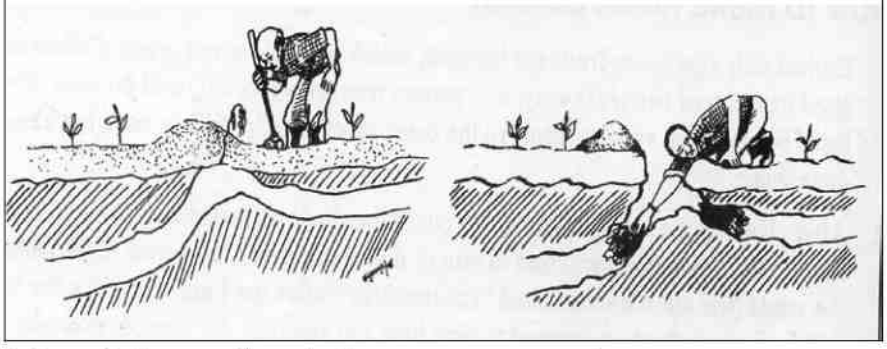
from farmers for farmers

Controlling moles with stinging nettles

Moles are a serious pest to farmers in many parts of the country, particularly in areas with high rainfall. In the past issues of *The Organic Farmer*, we have shown you how to control them using the castor oil plant (the one with red stems), which are cut into small pieces and put into the tunnels and in the process driving away the moles. A farmer in Kenya has found another way to control them using the leaves of the stinging nettle (known as *hila hila* or *Thabai* in Kikuyu language). Moles do not like the nettles because the nettle irritates their sensitive skin. So they move away. All a farmer needs to do is dig the mole hill until you reach the tunnels leading to it on both sides (see sketch). Push the leaves of the stinging nettles as far as you can into the tunnels, and then cover the tunnels with soil. Repeat this in all the molehills you can find. The moles will move elsewhere or they will be eaten by predators.

Note: Please farmers if you have other methods of controlling moles, write to us.We will share it with other farmers.

Source: *Sustainable Agriculture Extension Manual for East and Southern Africa – Published by International Institute for Rural Reconstruction (IIRR) P.O. Box 66873 Nairobi.* ■



Nutritious feed for your poultry

Option 1: Maize 8kg, Croton (*Mukinduri*) seeds 1kg, beans 1kg, Omena ½kg
Option 2 - Maize 8kg, Sorghum 1kg, *Omena* 1kg,
Option 3 - maize 8kg, Groundnut dust 1kg, Cassava 1kg
If farmers prepare any of the above three recipes, their chickens will get a balanced diet. The feed is taken by all ages of poultry.
William K Cheruiyot, Aruba farmers group, P.O Box 596, Kitale

Protein content of various forages

Legumes, etc. (high protein)	Grasses (medium protein)	Crop residue (low protein)
Lablab, Lucerne	Napier grass	Maize stalks
Greenleaf desmodium	Guatemala grass	Stripped maize leaves
Silverleaf desmodium	Giant setaria	Sorghum stover
Centro, Siratro	Guinea grass	Banana stems
Calliandra, Leucaena	Makarikari grass	Barley straw
Mulberry	Rhodes grass	Wheat straw
Star grass	Kikuyu grass	Rice straw
Sesbania, Glycine	Congo signal grass	
Sweet potato vines	Sudan grass, Kow kandy	

see page 4 and 5

Market Place

Beekeeping. Thomas Carrol from Baraka Agricultural College in Molo is looking for information on organic honey production. Tom Kariuki from Nairobi tells him: "Look in the book from John Njoroge, Field Notes on Organic Farming, Kenya Institute of Organic Farming, P.O.Box 34972, 00100 Nairobi. The book contains quite some useful tips".

New magazine. The Kenya Organic Agriculture Network (KOAN) has released a new magazine "KILIMO HAI" The newsletter will be published 4 times a year. It will update farmers and other stakeholders with information on developments in the organic sector both locally and internationally. Farmers interested in getting the newsletter can write to the organisation through the address: KOAN Secretariat, Environmental liason Centre International (ELCI), P.O. Box 72461, 00200, Nairobi. Tel. 020 387 61 19/54 Fax: 020 387 61 25.

Dairy goats. Farming Systems of Kenya (FSK), a non-governmental organisation working with farmers in Nakuru, has a number of farmers groups with male and female goats for sale to interested farmers. Interested? Please get in touch with the organisation: Farming Systems Kenya, P.O.Box 2816, 20100 Nakuru, Tel. 051 221 11 77, 0722 588 143 or 0722 457 260. Ask for David Gicharu or Joseph Muraya.

Export. A German- based company would like to buy organically certified fruits from Kenyan farmers. They prefer mangoes, avocadoes, pawpaws, and pineapples (Victoria and Baby varieties). Farmers groups or individuals should be able to supply a minimum of one tonne per week. They should indicate the season when they can deliver supplies. Contact Wachira Waikwa, e-mail: nefshi@yahoo.com

Organic fertilizer. Some farmers have complained that they cannot find Mijingu rock phosphate organic fertilizer in Agrovet shops. They can contact the local agent for their supplies at the following address: MIPCO Regional Representative, P.O. B0X 53822, 00200, Nairobi. Tel. 020 386 91 65, 386 96 97 Fax 387 42 16, 0720 817 072 or 0734 911 910

For 1 acre of land 1kg of desmodium seed is needed.

5. Prepare the soil carefully so that it is as fine and clean as possible.
6. Using a strong pointed stick, make a furrow in the middle of the rows where maize will be planted.
7. Mix the desmodium seed with super phosphate fertilizer (about one handful of seed and two handfuls of fertilizer).
8. If you cannot afford fertilizer, then mix seed with fine soil. Sow it into the furrows you made and cover with soil.
9. Plant desmodium with the rains for maximum germination.
10. Plant your maize in the field surrounded by Napier grass.
11. After 3 and 6 weeks, trim the desmodium so that it does not overgrow in between the maize plants.
12. Keep the field weed free so that the Napier has a start on the maize. The moths will like the larger Napier even more than the maize.

A well-planted field should look like this:

For more details on planting methods, please read the following ICIPE brochure:
"Grow more maize and Napier grass: make more money"
"Grow desmodium and stop striga"

Advantages of adopting the 'push-pull' method

When you adopt the 'push-pull' strategy you will get:

- **Increased maize yield**
- **Continuous supply of cattle feed from the Napier grass and the desmodium**
- **Nitrogen fixed into your farm by desmodium legume, so you save on fertilizer costs**
- **Soil protected from erosion as desmodium acts as a cover crop**
- **Soil retaining water as desmodium acts as a mulch**
- **Money from sale of desmodium seed at a good price**
- **Money from selling more milk from your cattle**
- **Saving on farm labour as you do not have to pull striga**
- **Maize protected from strong winds when surrounded by Napier grass**

A farmer feeding their cow on Napier grass and desmodium harvested from 'push-pull' fields.

For any questions, write to Director General, ICIPE, PO Box 30772-00100, Nairobi, Kenya.
Tel: +254 (20) 861680-4, E-mail: icipe@icipe.org

icipe

Use "Push-Pull" Strategy

and produce more maize by controlling stemborers and striga weed

Plant Napier grass on border and desmodium in between the rows of maize to control stemborers and striga weed

International Centre of Insect Physiology and Ecology (ICIPE), with Rothamsted-Research, UK, KARI and MOA, Kenya
Donor: Gatsby Charitable Foundation, UK
Visit website: www.push-pull.net

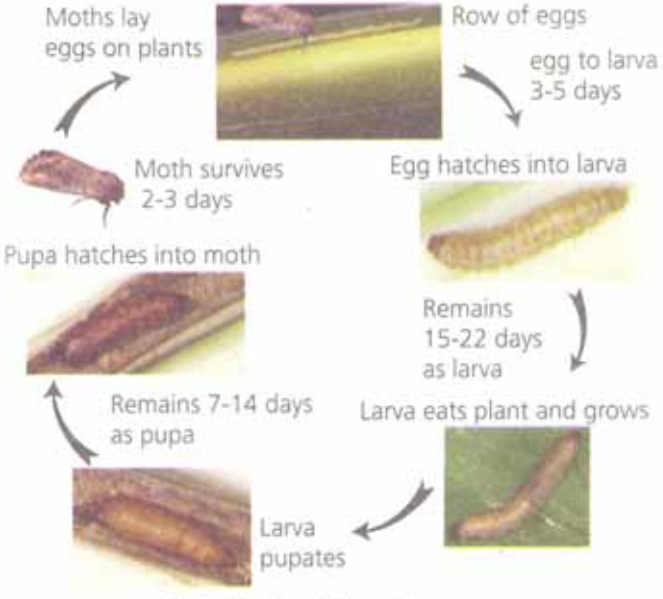
Have you seen stemborer, and striga weed damage on your maize crop?

If you were to harvest 10 bags of maize, stemborer and striga cause a loss of 8 bags!

How do stemborers get into your maize crop?

Moths lay on maize plant. Eggs hatch into larvae that eat maize leaves and burrow into the stem as it grows

The stemborer hence eats the food the maize would use to fill the grains



Life Cycle of Stemborers

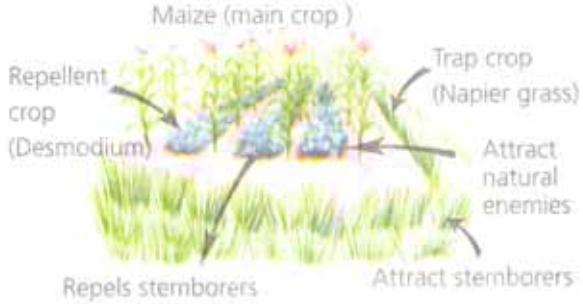
How does the striga weed affect your maize?

Striga weed puts its roots into the roots of maize plant. Striga weed takes the food the maize crop is trying to get from the soil before the maize uses it.

What is "Push-Pull" Strategy?

It is a cropping strategy to control both stemborers and striga weed. The farmers use Napier grass and desmodium legume for management of these pests in their maize fields. Desmodium is planted in between the rows of maize.

"PUSH-PULL" SYSTEM



It produces a smell that stemborer moths don't like. The smell "pushes" away the stemborer moths from the maize crop.

Desmodium also covers the surface of the ground between the rows of maize. It puts a chemical into the ground that stops striga weed from growing on maize.

Napier grass is planted around the maize crop as a trap plant. It is more attractive to stemborer moths and it "pulls" the moths to lay their eggs on it. But Napier grass does not allow stemborer larvae to develop on it. When the eggs hatch and the larvae bore into Napier grass, the plant produces sticky glue, which traps them in, and they die. So very few stemborer larvae survive, no striga grows and maize is saved in the 'push-pull' strategy!

How to plant a "Push-Pull" field?

1. Plant Napier grass (Bana variety is the best) in a border around the maize plot.
2. Plant at least three rows of Napier all around the maize field.
3. In the first year, plant Napier grass before the rains so that it has a start on the maize. The stemborer moths will like the larger Napier grass even more than the maize.
4. Get desmodium seeds from seed companies (Western Seed Co. or Kenya Seed Co) or your neighbour who has started growing it.

Management Matters in the War against Stemborers and Striga

MARSHALLING PLANT DEFENSES IN BATTLE FOR SURVIVAL

By Zeyaur R. Khan and Annalee N. Mengech

Nature has provided plants with an array of defense mechanisms to help them compete in the never-ending conflict for one's own turf or biological niche in this world and the right to grow and multiply. The Nairobi-based International Centre of Insect Physiology and Ecology (ICIPE) is putting the tug-of-war between cereal crops and their enemies (plant pests) to good use to control stemborers, the major pests of maize in eastern and southern Africa. Losses to stemborers can reach as high as 80% in some areas, and average about 15-40%. Spraying with pesticides is not only expensive and harmful to the environment, but is usually ineffective, as the chemicals cannot reach the pests deep inside the stem. Preventing crop losses from stemborers could increase maize harvests enough to feed an additional 27 million people in the region.

Called the 'push-pull' strategy, ICIPE's approach makes use of the resilience of nature and the built-in checks and balances to operate in man-made environments such as maize fields by manipulating the agro-ecohabitat. The approach relies on a carefully selected combination of companion crops to be planted around and among the maize plants (see photo, facing page).

Dr Zeyaur Khan, the leader of the Habitat Management Programme at ICIPE, says that both domestic and wild grasses, often ploughed under in modern monocropping (maize-only) practice, can help protect the maize by attracting and trapping the stemborers. The grasses are planted in a border around the maize fields, where invading adult moths become attracted to chemicals emitted by the grasses themselves. Instead of landing on the maize plants, the insects head for what appears to be a tastier meal. These grasses provide the 'pull' in the 'push-pull' strategy. They also serve as a haven for the borers' natural enemies. Good trap crops include the well-known Napier grass (*Pennisetum purpureum*) and Sudan grass (*Sorghum vulgare sudanese*), a type of wild sorghum. Napier grass has a particularly clever way of defending itself against the pest onslaught: once attacked by a borer larva, it secretes a sticky substance that physically traps the pest and effectively limits its damage. The natural enemies lurking among the grasses go into action and dispatch the borers in both maize and grass host plants. (A complementary ICIPE project is introducing natural enemies to boost the allied forces to fight the borers.)

Stemborers are the worm-like larval forms of certain species of moths, which attack not only cereal crops (maize, sorghum, rice) but also other plants in the grass family such as sugarcane and wild grasses. *Left: Adult moth of the spotted stemborer,* Chilo partellus, *a major pest of cereal crops in East and southern Africa. Right: The worm-like larval form is the stage that causes the damage as the larvae eat their way through the stem.*

The 'push' in the intercropping scheme is provided by plants that emit chemicals (kairomones) that repel the borers and drive them away from the maize main crop. The best candidates discovered so far for their borer-repelling properties are members of a leguminous genus *Desmodium spp.* Desmodium is planted in between the rows of maize. Being a low-growing plant (*see photos next page*), it does not interfere with maize growth, and furthermore has the advantage of maintaining soil stability and improving soil fertility through its nitrogen-fixing action. Desmodium is easy to harvest and serves as a highly nutritious animal feed. Another plant showing very good repellent properties is molasses grass or *Melinis minutiflora.* This is a 'jack-of-all-trades' grass, as it is also a nutritious animal feed and repels ticks to boot!

A further bonus is in store for the farmer who uses push-pull for pest control: Not only can she/he harvest 3 crops (maize, desmodium, *Melinus* forage and Napier grass forage), but another widespread maize pest can be controlled: the witchweed, or *Striga hermonthica*. A ground cover of desmodium interplanted among the maize reduces striga growth by a factor of 40.

Mrs Respa Ouso, a farmer in the semi-arid Suba District practising 'push-pull' technology, has observed an increase in her overall maize yields by up to 100 percent by controlling both stemborers and striga weed. Now that she is producing fodder, she has been able to keep grade cows and can thus provide her family with milk. She and her friends are also becoming members of the cash economy by selling desmodium seeds to other farmers. Maize production on 150 farms practising 'push-pull' in Kenya is up by 25-30% and milk production has increased by an average of 50-60% in Suba District among participating farmers, with the benefit-to-cost ratio estimated at 2.25 among farmers using the push-pull approach. (This means that for every Kshs 1,000 invested, a return of Kshs 2,250 will be earned.) The habitat management approach to pest control, started in 1997 with continuing support from the Gatsby Charitable Foundation (UK), is being demonstrated on more than 1,500 farms in ten districts of Kenya including Trans Nzoia in the breadbasket of Kenya and in the less productive semi-arid regions around Lake Victoria. The other districts in Kenya where the technology is being demonstrated are Kisii, Bungoma, Busia, Siaya, Migori, Homa Bay and Rachuonyo. More than 100 farmers are testing the push-pull technology in Uganda.

How does push-pull really work? The underlying chemical ecology of plant defense mechanisms are also being studied by the project. For instance, molasses grass releases volatile chemicals that discourage stemborer adults from laying eggs, thus protecting nearby maize. Molasses grass also attracts natural enemies of stemborers which help in the defense. Current studies are focusing on the identity of chemicals produced by the roots of desmodium that are responsible for suppressing the striga weed. Whatever the strategy, stemborers are now on the defensive when push-pull is at the battlefront.

This work is undertaken in collaboration with
- Kenya Agricultural Research Institute
- Ministry of Agriculture and Rural Development (Kenya)
- IACR-Rothamsted, UK
- National Agricultural Research Organization (Uganda)

Mrs Respa Ouso surveys her maize field with heavy infestation of the parasitic striga weed and stemborer damage.

Using the push-pull management approach, Mrs Ouso stands in her maize field planted with desmodium between the rows of maize to repel the borers, and Napier grass as the trap crop.

In this field, Napier grass has been planted as the trap crop, and desmodium in between the maize plants to repel the borers. If using Napier grass (the Bana variety is best), then 3 rows of Napier need to be planted as a border all around the maize field. Inset: Both Napier and desmodium are highly nutritious forage feeds.

For more information about ICIPE and its activities, contact:

The Director General
International Centre of Insect Physiology and Ecology
P.O. Box 30772-00100, Nairobi, Kenya
Tel: +254 (20) 861680-4, 802501
Fax: +254 (20) 860110, 803360
E-mail: icipe@icipe.org: Website: http://www.icipe.org

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 20 January 2007

Don't neglect to feed the soil

As you have read many times before in this newspaper, the soil is the most important resource for every farmer, and especially so for organic farmers. Maintaining a fertile and healthy soil must be the first priority at all times. To feed the soil means to feed the plant, hence giving a successful yield. Apart from light and water, soil requires nutrients (minerals).

Legumes are beneficial organic fixers of nutrients which conserve and improve the soil in many ways. They also provide a valuable addition to a family's diet or serve animals as fodder. On page 2, we explain these aspects of the value of legumes, and introduce the most common legumes in Kenya on page 3.

We need to fight soil degradation

Unless we improve land management practices, Kenya will in future face big problem in food production.

The Organic Farmer

Food production has declined in Kenya — largely as a result of rapid land degradation and high population growth. This suggests that food insecurity will persist in Kenya if the natural resource base for agriculture continues to be depleted. About 90 percent of the poorest people in sub-Saharan Africa live in rural areas. Because of population growth, land has been sub-divided and it is therefore in smaller parcels than that our parents had for farming.

Although there is increased cultivation of small land holdings in Kenya and other countries in Africa, farmers have failed to restore the soil nutrients through planting of nitrogen-fixing crops such as legumes and addition of organic manures and mineral fertilizers to replace nutrients taken out of the soil. The result has been widespread soil degradation through processes such as mining of soil nutrients, depletion of fertility, soil erosion, acidity, accumulation of salts (salinity) and desertification.

Studies show that much of the land degradation in the Kenyan highlands is due to poor land management practices. Unlike the relatively wealthy farmers of central Kenya, poor farmers invest little in soil management. Poor farmers also have fewer opportunities to obtain information and learn about appropriate technologies. ■

in this issue

Dear farmers,

Whenever we visit farmers' groups across the country, the most common problem we have noticed are leadership squabbles. Sometimes members complain that money meant for the groups has been misused in one way or the other. It is such a serious problem that defeats the whole idea of the benefits that farmers stand to gain from working together.

Farmers' groups help members overcome the disadvantages of working as individuals. From last year we have emphasized the need for farmers to form groups in order to share ideas, solve their day to day problem, pool their resources and at least have some bargaining power. This enables them to get quality services. But these objectives cannot be achieved in an atmosphere of mistrust and suspicion. It is sad that wherever there is an external donor willing to give financial assistance to a group, members immediately start fighting over leadership positions; sometimes this has resulted in donors withdrawing support altogether. Often the allegations leveled against group leaders do not hold water; some members simply want to take over leadership, not to improve the welfare of the group, but for their own gain.

Group leaders need to show a high degree of integrity, they have to be open to all members at all times in order to create confidence and remove any suspicion. Members should be able to scutinise the account books and raise any queries regarding the management of group funds. Kenyans have witnessed widespread corruption in the past and will question any dealings that do not appear to be above board. Group leaders that do not meet these expectations will always have problems with their members. Elections should also be held regularly to allow members to change leadership whenever the need arises. Meetings should also be held on a monthly basis and members allowed to air their views freely. This is democracy at work and leaders should accept it.

How can we demand for accountability and transparency in the government if the farmers' groups themselves are unable to deal with each other in an open and democratic way?

We wish all of you a prosperous new year 2007. *The Editors.*

MY OPINION

How many farmers have utilized the current rains to grow some food? If you asked this question, very few farmers will have anything to say. This is because none of them have planted anything during the short rains. Indeed many of us gave up when the short rains delayed in September and the better part of October. In September weather forecasts broadcast over the radio and the newspapers indicated that the rains would start late and extend into December. I took this information seriously. Now I have a healthy crop of maize beans and vegetables growing and which I hope to harvest.Weather forecasts maybe unreliable but at times it is good to try.

John Mutua, Farmer in Machakos

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

Legumes improve soil fertility

The soil needs nutrients, especially nitrogen. Planting legumes is the cheapest way to feed the soil.

Anja Bengelstorff

All plants need nitrogen to grow. They get it from the soil and store it in their leaves, stems and roots. Some types of plants are good at getting nitrogen either from the soil or from the air, while others, like maize are less able to do so.

Legumes can fix their own nitrogen from the air. They are very valuable organic material or intercrops, as they actually increase the amount of nitrogen in the soil as well as storing it in the stems and leaves. Furthermore, legumes like green grams or cowpeas are important for human nutrition, while others like desmodium and lucerne are nutritious fodder for animals.

In general, the colour of a plant's leaves can tell whether it contains a lot of nitrogen or not. If it has dark green leaves, it probably contains plenty of nitrogen, which makes the plant good organic fertilizer. If the leaves are yellowish, nitrogen is lacking and the leaves are less useful as manure.

Intercropping with legumes

Intercropping with legumes can be a solution to help provide the less able plants with sufficient nitrogen. Intercropping means growing two or three different crops in rows next to each other. It is a method used by farmers all over Africa and helps both crops to grow better. Maize, for example, as the staple crop in Kenya, grows well together with cowpeas and groundnuts. Apart from the fact that the legumes fix enough nitrogen in the soil to feed both the maize plants and themselves, intercropping also helps by denying weeds the space to grow. It also means that the farmers will always harvest one crop even if the other one does badly. Finally, harvesting is done at different times for each crop, so there is not so much work required at the same time.

To be successful intercropping needs to meet the needs of all the crops planted together. Sometimes, it is best to plant different crops at the same time, so they don't compete too much. Make sure the plant population density does not get too high in areas where there is not a lot of rain. The planting for intercropping can be done by mixing the seeds together before planting, or if you plant directly into rows, the maize for example is planted in one row, the legume in the next, and so on. Runner beans could also be planted in the same row with maize because they can climb up the maize plants.

Legumes in crop rotation

Farmers who have enough land available can use legumes as part of a crop rotation process. While the legumes in one season are planted as sole crops to improve soil fertility on degraded land, they are later rotated with a cereal crop. The benefits in increased yields can be surprising.

Legumes as green manure …

Legumes are fast-growing plants that can also be planted on a piece of land to improve soil fertility and protect the soil from erosion. In this way, they work as green manure. They are usually low, spreading plants that cover the soil surface quickly after planting. During or after the growing season, the green-manure plants are slashed and incorporated into the soil where they decompose, releasing nutrients and improving the soil structure.

Legumes such as soybeans, green grams, groundnuts and pigeon peas take nitrogen from the air and fix it in a form they can use. This nitrogen-fixing is done by tiny microorganisms called bacteria which live in the lumps (called nodules) on the roots of the legumes. The roots of other plants (such as maize) growing close by can also absorb some of the nitrogen. When the legume dies and rots, the nitrogen in its leaves, stem and roots is released into the soil, where other plants can absorb it. The rotting plants also increase the amount of organic matter in the soil.

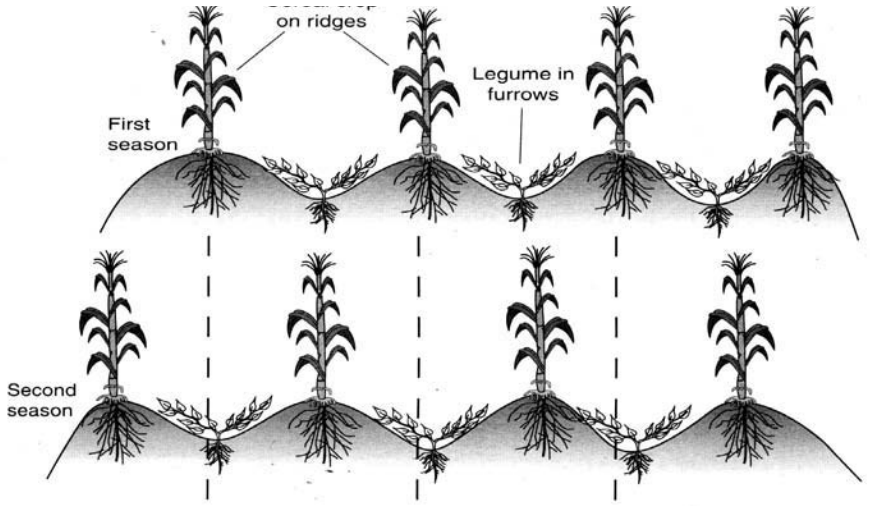
… and cover against heavy rains

Legumes prevent the soil from being washed away by rainwater. The legumes act as a cover crop: They break the fall of raindrops, so preventing hardening of the soil and helping the water seep in rather than running off. Their roots bind the soil and stop running water from eroding it. Finally, legumes protect the soil from the direct heat of the sun, helping it retain moisture. They break the wind and stop soil particles from being blown away. Green manuring can be used in various types of soils. Its benefits, however, are to be expected in the long run rather than immediately.

There are many legume varieties

Since we have described the value and the use of legumes for improving soil fertility, let's now have a closer look at some of the most common legumes in Kenya; there are also others, very well known are the nyayo beans. See also the information about Lablab or Njahi on page 6.

Anja Bengelstorff, Peter Kamau



Rose Coco: Rich in protein, this variety can do well in areas with an annual rainfall of over 1000 mm which should be well distributed. It is popular with many consumers in the country. A 90-kg bag costs Ksh 2800.

Soybean (*Glycine max*): One of the most nutritious foods, mostly processed as oil; needs as much rain as maize, grows in a wide range of soils, but does not do well in acid soils; has both creeping and erect types; very rich in protein. Seeds: Ksh 450/kg.

Cowpea (*Vigna unguiculata*), indigenous to Kenya; leaves and seeds widely used as food, but also good animal fodder; grows in semi-arid and sub-humid climate and low to medium altitude, in sandy to clayey soil; long-maturing varieties best for intercropping with cereals; seeds: 75 KShs/kg.

Lucerne (*Medicago sativa*): Used as fodder; grows in semi-arid to sub-humid climates and low to medium altitude as well as in a wide range of soils, but not too much rain; erect legume. Seeds: Ksh 700/kg.

Green grams (*Vigna radiata*): Most commonly grown in Kenya; used as food and fodder; grows in sub-humid to humid climates and low to medium altitude as well as in a wide range of soils; drought-tolerant; edible beans and leaves. Seeds: Ksh 75/kg.

Desmodium (*Desmodium intortum*): Used as fodder; grows in sub-humid to humid climates and medium to high altitude as well as in a wide range of soils; trailing and climbing legume; rich in protein; suppresses growth of striga weed. Seeds: Ksh 1,200-1,500/kg.

Pigeonpea (*Cajanus cajan, mbaazi/Kiswahili, njugu cia gikuyu/Kikuyu*): Used as food (peas), fodder (dry leaves and pods) and firewood (stalks); grows in semi-arid to humid climate (depending on variety) and low to high altitude, in sandy to clayey soil, erect legume, good at recycling phosphorus, rich in protein. Seeds: 520Ksh/kg

Red Haricot (*Wairimu- Kikuyu*): Rich in protein, it is grown in medium and high potential agricultural areas of the country. It is the most popular bean variety among Kenyan farmers and consumers. Grows well in areas with well distributed rainfall (750-1000 mm annually). Currently a 90-kg bag is going for Ksh 2300.

Chickpea (*Cicer arietinum*), used as food since rich in protein, carbohydrates and minerals; drought tolerant because of deep tap root system; needs fertile sandy, loam soils with good internal drainage, but not too much rain; grows short and rather flat; sensible seeds

Groundnut (*Arachis hypogaea*), used as food, residue from oil processing used as animal feed; grows in semi-arid to sub-humid climate and low to medium altitude, prefers sandy but fertile soils; requires moist conditions during growth and dry conditions at harvest time; rich in protein.

Water harvesting saves a community

Farmers in Lare now have enough water for domestic use, livestock and even crop production and agroforestry.

Peter Kamau, Njoro

The Naishi dam (above). Farmer Elishiba Wanjiku (below) draws water from her home dam.

It is six kilometres from Naishi to Stoo Mbili in Lare Division of Nakuru district, yet this is the distance Elishiba Wanjiku, a mother of three, had to cover every three days to collect water for her family. For her three cows, she had to buy the commodity from vendors at Ksh. 20 for a 20-litre jerrycan. "Sometimes I would go without water for up to three days. For us women it was a nightmare," she says. Her problem mirrors that of hundreds of families in this unlucky area, which has very little rainfall and underground water sources. Prolonged drought and conflict over water and pasture between communities had made the situation worse.

Area has inadequate rainfall

Lare division is one of the driest in Nakuru district. Located on the lee ward side of the Mau escarpment, the region receives an average of 600 mm of rainfall that is very erratic and unpredictable. To make it worse, the rock structure has poor water retention capacity. The high fluoride content in a few areas with water makes it unsafe for use.

Determined to overcome the water problem, the community decided to come together and look for ways to harness the available water resources. The first step they took was to rehabilitate abandoned surface dams used by colonial settler farmers to water their livestock. The Department of Agricultural Engineering at the Egerton University together with The Kenya Agricultural Research Institute (KARI) and the Ministry of Agriculture also chipped in and offered training on water harvesting and storage.

"We developed a comprehensive training programme for water harvesting in the community. The main problem was to make them understand that a lot of runoff water was going to waste during the rains. If the water was guided through channels into the field to grow crops and the storage capacity for domestic use increased, then the problem would be solved," says Prof. Mathew Chemelil of Egerton University.

A dam for every homestead

The Professor says the aim of the project was to enable each of the households to construct dams which could harvest at least 60 cubic metres of water for both domestic and livestock use and at the same time save enough runoff water for crop production, an objective the project has now achieved.

"The Rain Water Harvesting for Crop and Livestock Production" project has changed the life of the community in Lare for the better. Today nearly every homestead in the area has a surface dam where runoff water from the roadside is channeled and stored for use during the dry season. Also almost all the homesteads have harnessed roof water for domestic use.

Increased water and income

Elishiba Wanjiku is a member of Mugumo Self Help Group. Wanjiku uses her household dam until it dries up in December or January every year; she then has to rely on the community dam for her water supply. To reduce evaporation from the dam and prolong its water-holding capacity, she has planted a local weed that spreads on its surface. All the water from the road near her homestead is channeled into her 1 hectare farm where it helps to grow maize, beans, cabbages and even trees.

Her neighbour Esther Wanja has gutters in every building in her compound and the water goes into a ferro-cement tank. She says that the water can sustain her family until the next rains. Bananas, pawpaws, pomegranates and other fruit trees dot her kitchen garden which is supplied with runoff water and a surface dam in the compound.

Dam is well managed

With assistance from the Rain Water Harvesting for Crop and Livestock Production project, the 50-member group rehabilitated the Naishi dam 15 years ago. The dam has produced a rich biodiversity of wildlife, birds and plants which have changed the local climate and vegetation.

Today the dam is a showcase of how the proper management of a water resource can help a community. Runoff water is allowed to seep into the dam to filter out any impurities during the rainy season. Trees are planted around it to reduce evaporation. The group has started several income-generating activities from the dam, including beekeeping, fishing and tree nurseries. Income from these activities is shared among the members. There is a management committee which has employed a caretaker to stop misuse and pollution of the water. The committee has also set rules for water usage. The rules forbid watering animals directly from the dam, washing clothes and bathing in or near the dam.

Members must also pay Ksh10 every month to help pay the caretaker and for general maintenance. They are then issued with a ticket, which they must produce to be allowed to draw the water. Non-members pay Ksh 10 for every 20-litre jerrican of water they get from the dam.

Silage is good fodder for the dry season

Although it is a good method for preserving fodder, many farmers do not make silage.

Philomena Nyagilo

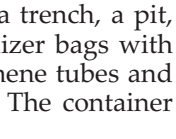
Silage is the technique of preservation of green forage material by controlled fermentation under anaerobic (no air) conditions. The ensiling (silage making) process results in preserving the grass under naturally produced acidic conditions, which effectively keeps the crop from decomposing. Of course, it needs labour and material just as hay-making does, which we featured in the December issue.

The common materials for making silage are Napier grass, maize, sorghum and sugarcane tops. To make good silage, you should use fresh, high-quality fodder crops. Harvest grasses at or just before flowering; harvest maize or sorghum during the "milk-stage", when the grains are soft and milky inside. The container used to make silage can be a trench, a pit, a drum or empty fertilizer bags with polythene lining, poythene tubes and plastic shopping bags. The container is called a silo.

Below are steps in silage making in a pit. It is a simple form of a silo in which excellent silage can be made.

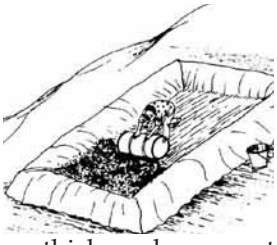
Step 1: Build the silo before the end of the green season, when there is still plenty of green fodder available. The pit silo should be located on high ground so that no water will run into it when it rains. The pit should be smaller at the bottom than at the top, so taper in the sides a little. This will make the structure stronger.

Step 2: Cut the crop just before flowering, as the protein content of the crop is high just before flowering. Leave the freshly cut fodder to dry in the sun for 2 to 3 hours, then chop the green fodder into small pieces about 1 to 2 cm in size. Remember, when harvesting, you should plan for dry days, as 2 inches of rainfall can reduce quality. Forages that are too high or too low in dry matter may not make good quality silage. You can try yourself by making a fodder ball. If the fodder ball falls apart quickly, it means it is too dry and you must add a bit of water to the fodder before putting it in the pit. If the ball falls apart slowly and there is no water left in your hand, then it is ready to put in the silo.



Step 3: Place plastic sheeting on the bottom and on the sides. The important thing is to prevent the fodder from touching the soil. Seal the pit to prevent air and water from getting in.

Step 4: Place the chopped material into the plastic-lined pit. Spread uniformly into layers of 30 cm thick and compact each time by using a suitable weight to expel air. You can use a drum full of water; press down also with the feet and trample the material to expel the air. It is important to have as little air in the pit as possible. This reduces the chance of mould and yeast growing and helps stop the silage from spoiling. Repeat this until the pit is filled to a dome shape, and fill the pit as quickly as possible. Over the top of each layer you should spread evenly a handful of salt and some molasses (for 1000 kg of green material you need 15-20 kg molasses). Molasses is a thick syrup produced as a by-product in sugar making. Molasses provides readily available energy and minerals (with the exception of phosphorus) and helps speed up the preservation process and gives higher quality silage. Dilute the molasses by mixing with water in the ratio of 1:3 and sprinkle this mixture over each layer of chopped forage. Use a watering can for a uniform distribution of the solution.

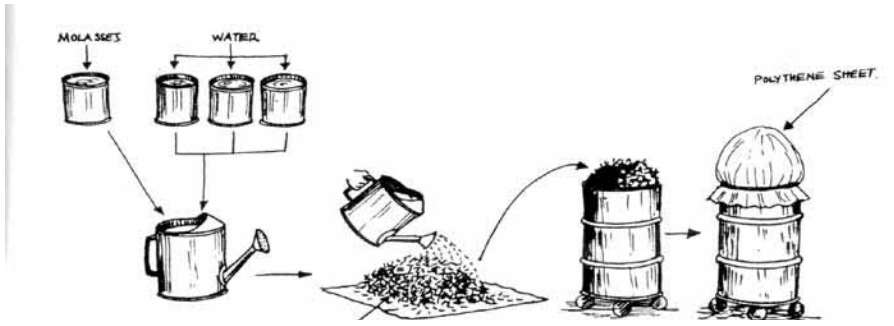


Step 5: When the pit is full, add some paddy straw and cover it with a plastic sheet or some gunny sacks. Finally, you should cover the whole pile with a thick layer of mud to prevent air and water from getting in. The material is ready for use in about 3 weeks.

The silage, if properly made, should be ready for use in 90 days. Good silage smells fresh and fruity and is light yellow brown or green. If the silage smells rotten and is black and slimy, then it is not good for your cow's consumption. If this happens then something went wrong and the silage should not be fed to the animals. After the pit has been opened, keep it covered with the gunnysacks or a plastic sheet to keep the silage in good condition.

How big should the silo be?

If you will feed 2 cows for 90 days, you have to count as follows: 1 cow eats 40 kg per day, 2 cows 80 kg. That means that for 90 days they will eat 7.2 tons (7200 kg) of silage. A 500-kg weight of silage is equivalent to 1 cubic metre. If you make the silo 2 m wide and 1 m deep, the length of the silo has to be around 8 m. This will hold around 8 tonnes of material, which can be produced on 2 acres (about 1 ha) of land. Instead of one long silo, it is more advisable to have several short ones. It is easier to get the right slope, to fit the size of the plastic, to compact the silage properly in a smalle pit. Silage that is not required for feeding can be kept undisturbed.



Steps in making silage in drums, empty nylon bags with polythene lining, polythene tube and plastic shopping bag silos. *(Illustration courtesy: Coping witn feed shortages/KARI)*

Feeding silage to dairy animals:

- Feed a little silage at a time until the animals are used to the feed.
- To avoid silage smell in the milk, don't feed silage to milking animals right before milking, but wait until immediately after milking.
- To avoid losses after opening the silo to collect feed, cover the silo immediately after you remove enough silage for the day.

You can make money with *Njahi*

"How many bags of Njahi does 1 acre produce?" aks a farmer with mobile number 0735 283 645. " What is the average price in the market? I am asking this because I would like to start planting njahi".

"Njahi" is the Kikuyu name for dolichos or lablab, a popular legume of the bean family which produces grains and leaves that are delicious and nutritious. The plant makes the soil fertile by adding nitrogen. The leaves can also be ploughed into the soil to serve as fertilizer for the following crop (see also pages 2 and 3). Njahi plants produce many leaves that cover the soil and prevent soil erosion. The leaves of lablab are also a rich source of protein for livestock. Dolichos are mainly grown in central Kenya, but farmers in the North Rift region have started growing it as it fetches better prices than maize (a 90-kg bag is currently selling at Ksh 3,600 in Nairobi). Farmers in the North Rift prefer the black variety.

To grow njahi, land should be well prepared. Planting is done at the beginning of the rains. When it is intercropped with maize, the spacing for maize should be 75 x 30 cm. Dolichos are then planted in between maize rows at a spacing of 60 cm from hole-to-hole at two seeds per hole. Fertilizer application is not necessary if it is already used for the maize. When planted alone, a spacing of 45 cm from line-to-line and 20 cm from plant-to-plant is recommended. While planting, apply well prepared organic manure if the soil is poor. Weed twice whenever weeds appear. Dolichos mature after about five months. Farmers should harvest the pods as they mature and dry. Thresh, clean and dry the beans. Harvesting continues for about 6 months. After harvesting, cut the dolichos and leave them on the ground. The residue can be incorporated into the soil during land preparation in readiness for the next crop. The fertilizer from dolichos can increase the yield of any crop planted in the following season.

The yield per acre is about 4.5 bags. Research shows that a farmer can make Ksh. 36,000 per acre of dolichos compared to Ksh 20,000 from maize in one season on the same size of land. Dolichos can do well in poor, acidic or alkaline soils. They can withstand drought once established.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Rabbits are a good source of protein

Bernard Gitau Gikonyo (0720 566 049) says: "I am a farmer from Makuyu-Maragwa. I was told by a friend that there are rabbits of 7-9 kgs. Where can I get the best type?"

There are some large breeds of rabbits, the Californian and New Zealand White. We purchased our breeding stock from the government breeding veterinary station in Ngong. Rabbits breed very quickly and are said to be the most efficient and cost effective converters of vegetation to protein. That is, they require very little food to produce one kilogramme of meat compared with any of our other meat animals such as pigs, chickens, goats, cattle, etc. cows etc. Culturally, some Kenyans believe they are only to be eaten by women and children! This really should not be the way of thinking in today's age. Rabbits are easily managed, quick to reproduce and are tasty too!

After researching further, a study done in Kenya (1981 Owiro) showed that rabbits produce a sale weight of approximately 2.3 kg at 7 months of age. They reproduce on average four times a year, with an average of 7 young ones. In a future issue we will have an article on rabbits.

Comfrey is good for compost

"How I can get comfrey seeds or plants?" asks Daniel Kiteme, Box 70, Ngwata.

Comfrey goes by the local name of mabaki (Kikuyu) and is surprisingly, found in many shambas around the country. It can be propagated from 2.5 cm (1 in.) root cuttings. When choosing a site for planting comfrey, make sure it is a permanent site, as once established, it is very hard to relocate. This is because the plant has roots that are able to penetrate 3 metres into the ground, which remain viable for months after the plant parts above the ground are removed. Given the right conditions such as rain, these roots are still able to send a shoot from such depths and continue to flourish. Plant root cuttings at a depth of 5 cm (2 in.) in good rich soil. Keep the soil moist and within 2 weeks or sooner, you will see the root will have sent up two or more leaves. Try to keep the comfrey growing in an area that is shaded part of the day. The plant does not like severe direct sunlight. It is also very important to keep the ground slightly moist and once in a while feed the plants with some nutritious compost.

We have many beds of comfrey located around the farm, allowing us a continuous supply. We use the leaves in our compost, to make liquid teas, to make a liquid concentrate, directly in the planting beds, and also as an animal feed.

We have noticed comfrey is available on many rural farms and suggest you ask around your community first. If you are unlucky, however, contact The Organic Shop in Nairobi (Tel. 467 4086) where they are readily available on order.

A comfrey flower

Muriithi Simba says: Copper is allowed

Su Kahumbu's advisory role to the readers of The Organic Farmer is commendable. She appears authoritative in her replies to various problems encountered by the aspiring organic farmers.

I ensure I go through her column with keen interest, to acquire additional information on solutions to issues raised by farmers. However, her reply to Sylvester on tomato growing in The Organic Farmer Nr. 18 could have had extra information on research conducted on milk by KARI and CABI-ARC as facilitators (refer CABI in Africa-2001). In this case, participatory action research by Thayu Farmers' Field School at Githunguri confirmed the effectiveness of milk in delaying the first appearance of tomato blight but they also claim it did not stop the disease progression once it had started. It is possible that further research could have revealed the right timing of milk application to enhance a higher degree of disease inhibition on tomatoes.

Sylvester could have been advised on other acceptable and effective fungal disease control measures on tomatoes, such as the use of Bordeaux mixture, copper sulphate, copper oxychloride and sulphur. These are permitted by the Soil Association of UK, a recognized certifying body. It is most likely that Su Kahumbu's certifying body (EnCert) has no objection to their use and these copper solutions could be recommended for use with the necessary precautions.

Yours sincerely
J.T Muriithi Simba

Su Kahumbu answers: Copper is restricted

Thank you, J.T. Muriithi Simba, for your much appreciated comments, highlighting some areas I had omitted in my response to Sylvester. Sulphur is indeed allowed by most, if not all, certification bodies. Our cheapest, most natural, and in most cases available way of using sulphur is to make a foliar spray using nettle (thabai) for this purpose. This information has been mentioned in several editions of The Organic Farmer.

Standards are different

The use of copper Sulphate and copper oxychloride according to the Soil Association Standards is 'Restricted' and requires approval from the Certification Department before use. The East African Standards, soon to be enforced, have conditions of no more than 8 kg/ha per year for any copper salts. EnCert states the following: "Copper salts are also restricted and may be used only in the case of immediate threat to the crops". EnCert further states that coppers salts may be used under the following conditions "From January 2006 up to 6 kg per hectare per year".

As you can see, different standards allow for different applications. Most standards also recommend that pests and diseases shall be controlled primarily by a combination of

a) an appropriate choice of species and varieties;
b) a balanced rotational cropping to break the pest and disease cycles;
c) proper attention to hygiene within the holding to minimize the spread of pests and diseases.

Our safest recourse if we choose to use any restricted substance is to ensure that we use adequate record-keeping to prove the application rates, dilutions, etc.

Personally, I have never used any copper salts and chose to grow cherry tomato types that are more resistance to blight. However, I do have a farmer in Wangige who is currently producing tomatoes successfully using copper oxychloride, and I shall be relying on his records which shall be inspected by EnCert to assure me and any other organic trader or consumer that he is within the recommended limits.

Milk is not always useful

Thank you for the information on the study that was carried on milk. I too have used milk and realize it is not effective when the disease is in a progressive stage. I shall do a little research and see whether further statistics from the same study were found. I also wonder if different dilution rates of the milk make a difference in the spread of the disease, and again would like to ask any successful organic tomato farmers to share their findings with our readers.

I have changed to organic farming

I am happy and thankful for your research in organic farming. Thank you also for the information you are passing to young organic farmers across the country. I am now practicing organic farming since I read the information on how to make and prepare organic manure from your newspaper. On my farm, I use the organic manures to plant and top dress crops. Please consider me and send me one magazine on how to prepare and continue using this organic manures. More so, I want to get the experience of other organic farmers who have successfully used natural methods to control pests and diseases on their crops. I would like to assure you that, I will go ahead to form a Bingwa organic farmers association for the young generation.

David Kamotho Rotich, P.O Box Makimeny, Via Sotik

We need more on plant extracts

I am the chairman of the Kaponpon Youth Group for Sustainable Development. We were happy to read last month's newspaper which was the first for our group. The paper has actually attracted our attentions very much. Farmers do respond positively to the ideas in this newspaper. Therefore, keep on sending us more copies and if possible increase the number in order to reach more members. If possible give us more information on important tropical diseases and how to treat them with plant extracts because we want to become organic farmers. Even we, the Pokot people have some herbs that we use to control a variety of diseases. We also need more information on dairy goats.

Samson Kuyo, P.O Box 211, Kapenguria

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Farmer invents tree watering method

In 1998, Elijah Kimani, a resident of Pwani area in Lare division of Nakuru District, decided to plant trees. But he was in a dilemma: How would he sustain the trees in an area that has very little water? The few water from the roof of his house would not be enough for his family and 4 head of cattle including sheep and goats. Then he had 3500 seedlings in his tree nursery.

"I knew using a normal bucket was going to be a real headache, as I could not manage to water all the trees", he says. This was the moment that the idea of making a watering device struck him. He would try to make a simple drench pipe that would use the ordinary knapsack sprayer to inject water into the soil. When he tried it, it was an instant success, as he could manage to water up to 200 trees in a day. Although there was drought the following year, all his trees managed to grow and now he has a forest.

The drench pipe, which is ½ wide and 1 metre long and has threads

Elijah Kimani and his invention (TOF)

like a normal GI pipe, is attached to the ordinary knapsack sprayer. The lower end has 14 holes through which the water flows. A foot peddle at the lower is used to drive the pipe into the soil near the plant. All the operator needs to do is to pump 4 times and the pipe will release 4 glasses of water into the soil, which is enough to sustain the plant for a week.

Farmers in need of additional information on this invention can get in touch with Kimani at the following address: ElijahWarui Kimani P.O. Box 236, 20107 Njoro, Tel. 0721 703 406.

Market Place

Organic Market. A German- based company seeks organic products from Africa. The company is in search of fair trade and organic products, particularly cacao, coffee, fruits, vanilla and all sorts of spices. Their contact information has been included below. They speak English, French and German.
Franz Joseph Witte, Rohstoffagentur Witte & Partner
Uppenbergstrasse, 948149 Münster, Tel + 49 251 1627837, Fax + 49 251 2007685
info@rohstoffagentur.de,
www.rohstoffagentur.de,
DE-001-Öko-Kontrollstelle
D-NW-1-9567-D.

Export. A German- based company would like to buy organically certified fruits from Kenyan farmers. They prefer mangoes, avocadoes, paw paws, and pineapples (Victoria and Baby varieties). Farmers groups or individuals should be able to supply a minimum of one tonne per week. They should indicate the season when they can deliver supplies. Contact Wachira Waikwa, e-mail: nefshi@yahoo.com

Tissue culture bananas. Do you need organically grown tissue culture bananas as from January 2007?
Contact J G Njoroge 3N-Harvest, P.O. Box 82 Saba SabaTel.0721638034.

Dairy goats. Miti Mingi dairy goat breeders have four mature pedigree bucks (Male goats) for sale call
Samwel Njoroge Tel. 0723 793414

Lichens do not do any harm!

While visiting South Kinangop, a farmer asked if the lichens on his apple trees were harmful. A visitor from Switzerland answers:
"I was very happy to find something which is quite familiar to me, as we have exactly the same "stuff" on our trees in Switzerland. These organisms are called lichens.

I can assure you the lichens on your trees do not affect either the trees or the fruit in any way, because they don't need anything else but sunlight, air, and moisture for their existence. They indicate a relatively moist environment and clean air. There is definitely no need to fight them! As they grow very slowly, I assume your trees are rather old trees. You will

not find lichens on very young trees or on young parts of older trees, not because these are healthier, but simply because lichens have not had enough time to develop.

In Switzerland, we replant trees for commercial production every 10 to 15 years, because usually their yields start to decline after this period. This means that there must be other reasons for the problems you encounter when your apples are falling down before they are ripe. In order to tell you more, I would need more information, and maybe a close look at your trees and apples. Are the trees well nourished? Is there enough moisture in the soil during the growth and ripening period of the fruits? Are there any symptoms of disease or pests on the tree foliage (leaves) and on the apples? If yes, I would need some good photos. And what about pruning for rejuvenation, or thinning of the fruit in case the apples are too abundant? Do you practise this good fruit tree husbandry?
Feel free to ask for further deatails."

Theresa Székely
Theresa Székely is Agronomical Engineer and works at the Research Station for fruit-growing and wine-growing in Wädenswil, Switzerland.

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 21 February 2007

Keep an eye on bean flies!

Bean flies are very small, but they cause a lot of damage if the farmer does not take action.

Su Kahumbu

Have you ever had the problem where some of your beans do not do as well as others? Where all of a sudden you notice stunted growth, yellowing of leaves and collapse and drying of the entire plant? One may even give up on the idea of being able to save the weak plants, resulting in loss of yield and waste of planting time, as well as loss of income. One might feel this is due to nematodes, poor seed quality or poor soil fertility. But more often than not, the culprit is the Bean Fly or Bean Stem Maggot.

Bean flies are especially active following the rainy season. They usually do not occur during the rainy season and during prolonged dry spells. They can occur more frequently when using drip irrigation. This insect can cause up to 100% seedling mortality in a susceptible variety when infestations are high.

Black bean larvae on the root of a bean plant

Small flies …

Make a simple experiment. Select a poorly looking bean plant. Simply lift an entire plant from the soil and where the soil meets the stem you will notice browning scar tissue, which is sometimes swollen and flaky, around the stem. Peel a little of this crusty scar tissue back and you will notice small shiny black cylindrical larvae or pupae!

Bean flies are among the major pests of beans and related crops, including cowpea, soybean and mung bean. The adult fly is about 2 mm long with clear wings that reflect a metallic blue colour in sunlight. The wings do not fold over but form a 'v-shape' when the fly is resting.

… big damage

The eggs are deposited directly into the stem, leaf or emerging bean. Incubation lasts 2-4 days, after which the larva, a small white maggot, eats its way to the root zone where pupation takes place. Some types travel through the leaf and stem tissue to pupate near the root collar. During this travelling, the larvae feed extensively in the stem tissue. The duration of the larval and pupal periods is about 10 days each. *continued on page 6*

in this issue

Compost, the best feed for plants

Compost plays a central role in organic farming. *The Organic Farmer* carried an article on compost nearly two years ago, in our first issue! But: Nearly every week farmers are sending us questions on compost. We have therefore decided to provide farmers once again with additional information on the correct way of compost making. *Pages 4 and 5*

Choose maize varieties very carefully

Whenever trying out a new seed variety it is advisable to test the seed on a small portion of land before large scale production. *Page 3*

Dear farmers,

In the past 20 issues of The Organic Farmer, *which we have so far produced, we have given you plenty of information, new ideas, tips and advice on ways to improve your farming practices in a way that makes farming a rewarding and profitable venture. Organic farmer Su Kahumbu has always answered your questions in a brilliant way. There is no doubt that you have at your fingertips some of the most up-to-date information any farmer needs to improve production. But our major worry has always been, "Do the farmers really utilize the information we give them every month"?*

We are asking this because one of the major complaints we get from technical personnel and research scientists who have interacted with many of you out there, is that many farmers hardly follow the advice given by our experts. Many researchers who have put up demonstration plots among the farmers in various parts of the country, are really disappointed. When they go back, they find that the farmers have gone back to their old ways of doing things.

Every year, scientists all over the world spend billions of dollars in research funds to investigate ways to control diseases, fight new pests, propagate new varieties of crops, or devise new ways to improve soil fertility. These research findings have helped revolutionalise agriculture and even tripled food production for farmers in developed countries.

In Africa and here in Kenya, in particular, we have premier agricultural research institutions which are internationally recognized, such as ICIPE or the Kenya Agricultural Research Institute (KARI). It is sad that even farmers living next to such institutions do not use them to improve their methods of agricultural production.

Of course farmers may be cautious about trying new ideas for fear of not getting the expected results. But this is not an excuse for not trying. One can even set aside a small portion of land and try a new method or crop variety being introduced. Many of these ideas and techniques have been tried elsewhere with great success. There is no reason why they cannot work here in Kenya. Our farmers should accept change and embrace innovative methods of farming in order to increase their yields and income.

OUR OPINION

The Organic Farmer would like to welcome Dr. Joseph Mureithi to the Advisory Board of our newspaper. He is the Deputy Director of the Kenya Agriculture Research Institute (KARI) and in charge of Research and Technology. Joseph Mureithi brings not only a wealth of experience, he is also a respected and commited scientist. Anyone dealing with the needs of small-scale farmers, with the improvement of soil quality, or with research for better yields, will find the name of Dr. Mureithi. Karibu!

The Editors

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, 00100 Nairobi
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer Wangige
Joseph Muriithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, 00800 Nairobi
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Blight-resistant tomato developed

The new variety will make growing of organic tomatoes much easier.

Markus Knapp*

Late blight, a disease caused by the fungus *Phytophthora infestans*, is a major disease of tomatoes in Kenya, mainly in the cool-wet season. It makes tomato growing in the rainy season very difficult and farmers have to spray fungicides regularly to control the disease. The only option for organic farmers is spraying with copper oxychloride (see *The Organic Farmer* Nr. 7, November 2005). Resistance to pests and diseases is an important part of integrated pest management (IPM) and organic farming and an ideal solution for small-scale farmers. Resistance is built into the seed and no additional inputs are necessary to make it work.
Researchers at the World Vegetable Center (AVRDC) in Taiwan and its Regional Center for Africa in Arusha have developed tomato lines that are resistant to late blight. These lines were obtained by crossing tomato varieties with wild tomato species that are resistant to the disease.

They require chemical spraying

The yields of these lines and the quality of the tomatoes are as good or better than varieties commonly grown in Kenya such as the Money Maker or Marglobe. Some lines also show resistance to Tomato Mosaic Virus and Tomato Leaf Curl Virus, two other diseases of tomatoes that are very difficult to control. The resistant tomato lines are currently being tested by AVRDC and the Horticultural Research Institute Tengeru in Tanzania and are also used by ICIPE in a farmers' training project on vegetable IPM in Taita Hills and the Usambara Mountains in Tanzania. The resistant tomatoes do not require any fungicide treatments against late blight and will therefore save a lot of cost and labour for the farmers. They will also make growing of organic tomatoes much more easy.

Tomato affected by blight (Photo ICIPE)

ICIPE to start biological pest control

Before they can be distributed to farmers, these new tomato lines have to be tested according to national regulations and registered as varieties. This process has already started in Tanzania. ICIPE will also start experimental releases of a predator of the red spider mite, a major pest of tomatoes in the region. The natural enemy (imported from Brazil) will be tested in Kirinyaga district soon (see *The Organic Farmer* No. 6, September/October 2005). The Kenya Standing Committee for Import and Exports (KSTCIE) has granted approval for these releases in December 2006.

If the biological control proves to be successful, the release of the predatory mites can be combined with the use of tomato varieties that are resistant to late blight to solve two major problems in tomato production without using pesticides.

** Dr.Markus Knapp is a research scientist at ICIPE* ■

Crop rotation important

Tomatoes are tasty and nutritious, they are easy to grow and contain vitamins A and C – especially when eaten raw. However they are not easy to grow if a farmer cannot control diseases and pests. If properly taken care of, a farmer can get 4 to 5 kilogrammes of tomatoes per plant.

Watering: Water once a week; at least one bucket of water every week is enough. Try not to water the leaves or even splash the water onto the plants as this can bring diseases. The best way to prevent some of the common tomato diseases is through crop rotation. It is important to remove and burn all diseased plants. Mulch heavily in order to retain moisture in the soil. If affected by bacterial wilt, do not plant tomatoes, potatoes or pepper in the same plot for at least five years. (*TOF*)

Know the right seed for your area

Although poor seed selection can affect your maize harvest, farmers still get poor yields because of poor crop management.

Peter Kamau

Selection of the right seed maize variety is still a problem for many farmers, yet this is a very important decision that determines the amount of harvest at the end of the season. Seed varieties are developed to perform best under different conditions. This depends on the altitude, rainfall, type of soil and temperature. Take the example of H614 maize variety, which is grown in most high altitude areas in Kenya. The main reason farmers prefer this variety is due to its ability to do well even under poor management. The variety is consistent and can withstand sudden climatic changes. The problem is that many farmers are ignoring advice given by seed companies when buying seeds. The result of this is that they end up planting varieties that are not suitable for their area and in this way get poor yields. Before buying seeds, a farmer has to know all the characteristics of the seed variety they intend to buy and if it is suitable to the climatic conditions in their farming area.

Dr. Jenniffer Chumo, a maize breeder at the Kenya Seed Company advises farmers not to abandon seed varieties they have been growing in favour of new ones, without testing the suitability of the new varieties on their farms. "We often advise farmers not to abandon seed varieties they are used to in favour of new varieties whose qualities they do not know", she says.

Test on a small place in the shamba

Whenever a new variety is released, farmers are advised to isolate a portion of their land, plant and observe all its characteristics. Once they are sure the variety can do well, then they can adopt it.

Although poor seed variety selection is partly to blame for decreased yields in some areas, farmers are also to blame because of the way they manage their crop. According to the chief scientist at the KARI station in Kitale, Dr. George Ombakho, a maize variety may yield 6 to 8 tonnes per hectare ((1 hectare is about 2.5 acres) while under research trials at the station, but when it is released to farmers, the yields goes down to around 2 tonnes per hectare. He says farmers face many problems such as low soil fertility, late land preparation and planting, lack of weeding, and even wrong seed application methods.

"The main reason for low maize yields is general neglect by farmers", he says.

He advises farmers to buy only the maize seed varieties recommended for their areas. Below are some of the newly released maize seed varieties, their characteristics and the recommended areas for growing:

Highland varieties

H6213:

This is currently the most popular hybrid variety among farmers in highland areas. A late–maturing variety, it was released by the Kenya Seed Company in 2002. With an average yield of 52 bags per acre, it prod-uces more than any other variety in this category. The variety does well in areas at an altitude of 1700-2100 metres above sea level and which receive an annual rainfall of between 1000-2000 mm. It has good standability (does not fall due its strong roots and stalks). It is also resistant to ear (cob) rot, rust, Grey Leaf Spot disease, stem and leaf blight. It can do well in Trans-Nzoia, Uasin Gishu, and tea growing zones of Kiambu, Nyeri, Meru, and Nyandarua districts.

H6210:

Released by the Kenya Seed Company in 2001, It can produce up to 50 bags per acre and has good standability; the variety is resistant to ear (cob) rot, rust, Grey Leaf Spot, stem and leaf blight. It does well in areas with an altitude of 1700-2100 metres above sea level and an annual rainfall of 1000-2000 mm.

H6213 maize variety *(Kenya Seed)*

KH600-14E:

The variety was released by KARI in 2004. It has an average yield of 34-48 bags an acre (about 88- 188 bags per ha)and does well in areas with an altitude of 1800-2500 metres above sea level and an annual rainfall of 1000-2000 mm. The variety has good rust and blight resistance, It can also withstand Grey Leaf Spot disease and has good standability and does not rot. It takes 150 – 165 days to mature. Areas where it can be grown include the slopes of Mount Elgon, Trans-Nzoia, West Pokot, Uasin Gishu, Nandi, greater Kericho, Nyeri, Laikipia and lower Nyandarua.

KH 600-15A:

The variety was released by KARI in 2001. It produces 35-47 bags an acre. It can be grown in areas with an altitude of 1800-2000 m above sea level and an annual rainfall of 1000 to 2000 mm. The variety has a fairly good husk cover and standability. It can be grown in Bungoma, Trans-Nzoia, West Pokot, Uasin Gishu, Nandi, Kericho, Taita, upper Nyeri, Laikipia, Lower Nyandarua, and upper Kiambu.

Medium–Altitude varieties

H516:

This is a new high–yielding variety for the medium altitude. It yields 28 bags an acre (70 bags per ha) and does well in hot, low-rainfall areas and matures in 3 to 4 months. It is resistant to foliar diseases and pests, has a good husk cover and good standability, and can withstand ear rot, rust, GLS, stem and leaf blight.

Other varieties under this category include H515, H513, and H511. The most suitable areas for these varieties are Busia, Kisumu, Siaya, Embu, Muranga, Nyeri, Nakuru and lower parts of Kisii.

Dryland, Low–altitude varieties

These include the Pwani (PH4 and and PH1) which are meant for coastal areas. Dryland hybrid DH01 does well in all areas where Katumani variety is grown. These include Kitui, Makueni and Baringo areas. ■

I finally made my own compost

To me compost was compost and it did not matter how I prepared it so long as it decomposed well enough for use in the shamba.

By Peter Kamau

Over the years, the idea of compost making seemed to be a very simple affair to me. At our farm in Cherangani, Kitale, I would collect farmyard manure from the cattle boma and sheep pen and pile it in one big heap in the banana plantation behind the homestead. Here I would leave it to "burn" until it was ready for application on the bananas and maize field as an additional fertilizer, after the usual application of DAP fertilizer. We had to be patient because the decomposition period for this manure would take something like one or even two years before we could use it.

Most of the time, however, we could not wait for this long because we wanted to use it whenever we planted fruit trees such as oranges and avocadoes. In such circumstances, we had no option but to mix the fresh farmyard manure with the topsoil and put it into the planting holes! How some of the plants survived is a miracle which I cannot explain even now, but one thing I observed is that it took a very long time before the plants started showing any sign of proper and healthy growth, while others simply wilted and died.

I ignored instructions

My first opportunity to learn compost making came during a field day I attended at the Kenya Agricultural Research Institute (KARI) station in Kitale back in 1981. But I did not take much interest in the whole affair. To me, compost was compost, and it did not matter how I prepared it so long as it had decomposed well enough for use in the shamba.

I held this position regarding compost until last year when we launched *The Organic Farmer* newspaper. I came to learn the value of compost, especially in addressing the problem of declining soil fertility and crop yields. In the late 1960s, we could harvest as much as 30 bags of maize per acre; now we can hardly get 15 bags even after using the same amount of chemical fertilizer. The damage caused by these fertilizers was very clear to me. Last September I decided to make my own compost and reduce the use of synthetic fertilizers.

Compost material carefully selected

The first task was to ensure I had all the material needed to make quality compost. To do this, I had to use four farm workers to provide the labour. We collected all the necessary material and brought it to the compost site. The plant material is carefully selected to ensure only plants rich in minerals and various plant nutrients or medicinal properties are used in order to enrich the compost. Composting needs to be done when there is plenty of plants to choose from.

One of the best plants for composting is tithonia, as it is rich in nutrients. As we did not have enough of it, we had to get it from neighbours. We got other plant materials such as maize stalks, and branches from various trees on the farm and cut all these into small pieces that would decompose easily. We also cut stacks of comfrey plant, which is also rich in nutrients and activates the decomposition process. Finally, we used 20 wheelbarrows of fresh farmyard manure.

I followed all the instructions we had given to farmers in the past editions of *The Organic Farmer*. After making each layer of compost with the required material, we would sprinkle 2 kg of rock phosphate and spray with a diluted solution of Effective Microorganisms (EM2) mixed with molasses. The addition of rock phosphate is important because most organic material has only small quantities of phosphates. The EM solution has many beneficial microorganisms that help break down the compost faster (ordinary compost can take up to 6 months to decompose while EM can help reduce this period by up to 3 months). Within a period of three months, we had managed to bring the compost to the required standard.

Material ready for composting (foreground), a compost heap (background). (TOF)

Cover the compost

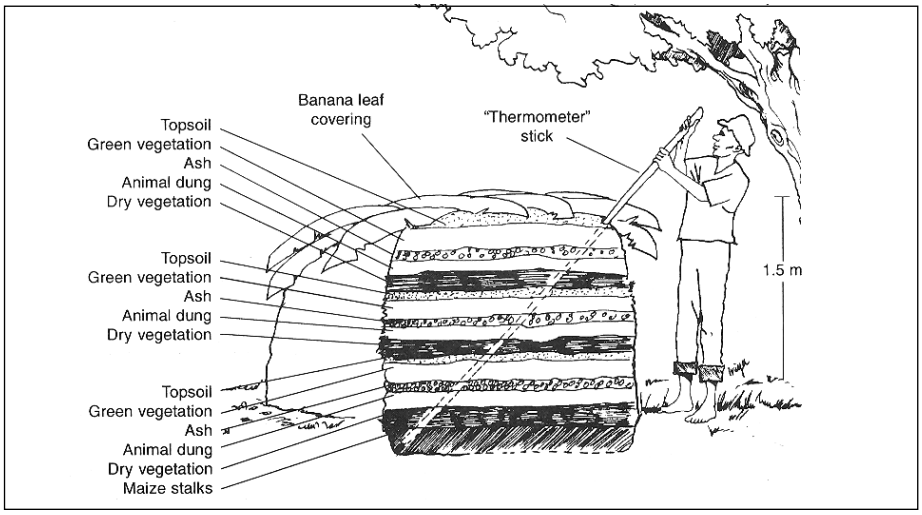
As I write this article, the compost is ready for use in the next planting season. Many farmers do not seem to follow the instructions on compost making. It is very common to see heaps of farmyard manure in many farms today. The manure is not mixed with grasses and other material which could produce quality compost. Lack of proper cover leads to nitrogen loss and even the loss of other essential nutrients when it rains. Since I made the compost many of my neighbouring farmers have made visits to my farm to see how it is done. It they did it correctly, I am sure they would reduce their dependency on expensive chemical fertilizers which only damage their soils. ■

Adding rock phosphate supplements nutrient levels in compost (Photo TOF)

It pays to make good compost

Making a compost heap requires labour, material and knowledge. Follow the steps outlined below and your soils will be better.

Felix Mbitu Murimi



Farmers who need to improve their soil quality and fertility can save a lot of money. Instead of buying fertilizer, they can make compost. Of course, this needs a lot of labour to prepare and spread it over the farm, but compost is like gold for the soil. Well–made compost is an organic fertilizer that is balanced in plant nutrients. This organic fertilizer, known as humus, improves the soil fertility; it helps retain the soil moisture and mixes the soil with air (soil aeration). When properly made, compost becomes immediately available as plant food without the need to be first broken down by soil micro-organisms.

What materials do we need?

The requirement for composting is organic material such as animal manure, crop remains, kitchen and household waste and hedge cuttings, but not seeding weeds. It is useful to include some plants with a lot of nutrients. All kind of legumes leaves (for example crotolaria, desmodium, soybean, lablab etc.) add lots of nitrogen to the compost. Coffee husks, banana stalks, sweet potato vines, etc. are important as sources of potassium. Excellent for compost are the leaves of tithonia and comfrey, since they add not only nitrogen and potassium but also help speed up the process of breaking down organic materials of plant and animal origin to produce humus.

How to prepare compost

1. Select a place which is sheltered from the wind, rain, sun and especially runoff. If animal manure is available, make the compost near the cattle boma (because of the manure-transport). Make a rectangular pit 4 feet by 5 feet; don't make it too large as you must be able to work on it without stepping on the pile. Take care that you have enough space around the compost heap.
2. Dig a shallow pit (1 foot deep), put the soil on one side; you will need it.
3. Put at the bottom of the pit a layer of rough materials such as maize stalks and hedge cuttings. This improves the air circulation in the pit. The maize stalks should be chopped into small pieces to accelerate decomposition.

Sprinkle some water on this layer.

4. Add a 1 foot layer of green material (preferably legume cover crop materials or kitchen waste which are rich in nitrogen) and water carefully. This layer forms organic composting material.
5. Add a 2 inch layer of topsoil or old manure or old compost to ensure the presence of microorganisms; they are vital for decomposition.
6. Add a thin layer of wood ash and water adequately. The ashes contain valuable minerals including potassium, phosphorus, calcium and magnesium. The ashes also neutralize the acids produced during decomposition, especially by the animal manure.
7. The next layer should be of green materials (1/2 foot thick). Use green leaves from high-protein leguminous trees like calliandra, leucaena and sesbania. Very good are also hedge cuttings of plants like tithonia as well as comfrey.
8. Sprinkle a little topsoil or old compost which are useful for decomposition.
9. Add more layers in turn, starting with dry vegetative materials, then animal manure, followed by wood ash, green vegetation and topsoil. Remember to sprinkle water on every layer. Build the pile up to 1.5 m (5 feet). A well-made pile has almost vertical sides and a flat top.
10. To complete the pile, cover it all over with a layer of topsoil about 10 cm thick. This layer prevents plant nutrients from escaping from the compost pile. Lastly, cover the whole pile with dry vegetation such as banana leaves to reduce the moisture loss through evaporation.
11. Take a long, sharp, pointed stick and drive it in at an angle so that it passes through the pile from top to bottom. This stick is your "thermometer". After three days, decomposition will have started in the pile, and the stick will be warm when you pull it out.
12. Pull the "thermometer" out from time to time to check the progress of the pile. The "thermometer" tells you also how dry or wet the pile is: it should be moist but not wet.
13. Sprinkle water on the pile occasionally, about every three days, depending on the weather. If it has been raining, there is no need to water.
14. After three weeks, turn the pile over. Do not add fresh materials except water. The "thermometer" tells you when you must turn the pile: When the stick is cold, then the pile is too wet, the bacterial activity is suppressed through lack of oxygen (air). If the stick shows a white substance (a white fungal cover), the compost heap is too dry. Water the pile if necessary. Turning the pile is important: It mixes the different layers and makes the decomposition faster and more complete.
15. The compost should be ready after 4 weeks. Check the temperature: If the stick feels warm, the pile is still decomposing, and the compost is not yet ready. Properly decomposed compost should have a fresh, earthy smell and contain no grass, leaves or animal manure.

Note: If you have access to EM (effective micro-organisms), there is no need to add soil, a pile can be started on a flat surface. (see page 4) ■

Be careful with *Datura stramonium*

What medicine/pesticides can be obtained from *Datura stramonium*? Caroline Nkatha Kithinji P.O Box 38, Igoji

Datura stramonium, also called Thorn Apple or Jimson Weed, is a tall annual weed with angular leaves. This plant is very poisonous and must not be ingested, as the other names indicate: Angel's Trumpet, and Zombie's Cucumber. Datura is occasionally used as an available alternative to illegal drugs. Typically it is not illegal, although some states in the USA do have laws regulating its consumption.

It can be used as a fungicide, insecticide, and a nematicide, but must be used with absolute caution. It is helpful against cutworms, nematodes and some fungal diseases. Due to it's poisonous nature, it is better used as a pour–on into the soil rather than a spray. If it is to be used as a spray, it is better used on plant parts that are not eaten. If it is applied against fungus on courgettes, tomatoes etc., then do this only before the fruiting stage.

All parts of the plant can be used. They may be dried in the sun and used as a powder, or one could crush a few leaves and add to 1 litre of water for use as a spray (one could add a little soap in the spray mixture to act as a sticker).

Scientists in Spain studied the relationship between maize and datura over 4 years in a flood–irrigated field. Results: Maize yield was decreased by 14-63% when competing with the weed. Yield was worse as the time between crop and weed emergence decreased. ■

...controlling bean fly damage

continued from page 1

This feeding activity destroys stem tissue and reduces lateral (sideways) root formation. Some plants try to compensate by forming new roots above the damaged areas. Young seedlings and infested plants under stress wilt and die within a short time. Older and more vigourous plants may tolerate the damage, but growth and yield will be affected.

Prevention and cure

- If infestation is high, spray young bean plants with a biopesticide (neem, pyrethrum, sodom apple, etc.) at weekly intervals up until the flowering stage.
- Earth up around already-affected stems, allowing the bean to send out more roots.
- Do not over-water beans when using irrigation, especially drip irrigation.
- Add neem cake or pymac (pyrethrum cake) to planting holes and later also around bean stems.
- Mulch young beans.
- Be vigilant, deal with the problem before it becomes a disaster. ■

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Are mushroom and honey organic?

Q.I have always wanted to start mushroom farming but I would like to know whether it has to go through the certifying procedures or is it already a known fact that its organically accepted? And how about beekeeping? Can we also say it is naturally organic (honey production)? Wilson K Barchiba, Kibasiso Libraries, P.O Box 376 Eldama Ravine. Tel. 0725 556 292.

A. The question of whether honey is organic by default is commonly asked. The answer is very clear from all certification bodies. Honey may only be called organic when certain requirements stipulated in the Organic Standards have been met. Firstly, the forage area of the bees (which is up to a radius of 2-4 km) must be free of any toxic contaminants. A beekeeper neighbouring a conventional flower farm may not be able to achieve certification if the certifier feels his bees forage in a high risk zone.

Beekeeping, like animal husbandry in general, must be carried out with full respect for the hive, the queen and the growing brood. Harvesting of honey therefore must be done with consideration given to minimal destruction of the complex hive structure and setting. Devastation of a hive is prohibited, queen bee mutilation (wing clipping) is prohibited, the use of some sanitizers and antibiotics are prohibited for hive sanitation, the feeding of bees with sugar water is restricted unless under emergency conditions. Extraction of honey from a hive cannot be complete as a percentage must be left behind for the growing brood. Beehives are also subject to a conversion period of one year. These are just some of the conditions an organic bee producer must consider. Again, to prove compliance of the organic conditions, a beekeeper must keep comprehensive records.

Organic standards for mushrooms

With regards to organic mushrooms the culture medium for mushrooms shall contain ingredients such as organic grain and straw when applicable. Other ingredients in the culture medium and the inputs used in the mushroom production shall be in compliance with the organic standards for crop production.Thus if the straw, maize stalks, etc. upon which the mushrooms feed and grow is of conventional origin, the mushrooms may not be sold as organic mushrooms. ■

Paper changing agriculture in Kenya

We are among the beneficiary organizations that receive *The Organic Farmer* magazine regularly here in Kitale. Information on sustainable agriculture gained from the newspaper is now at the fingertips of our staff. Besides training local communities, we have also devised a way through which all partner farmers' groups get access to the vital information through the magazine. We now have a library where we stock the magazine; we lend the farmers' groups each of the monthly issues. After reading, they return it back to us and we give them some more copies. Our librarian ensures that all new copies have been circulated to all our farmers' groups.

To guarantee excellent utilization of the newspapers, our staff usually make follow-ups to check if the farmers are following the advice as stipulated in your magazine. I am glad to inform you that the influence of this resourceful magazine is great and the impact is overwhelming. It has improved not only the knowledge and skills of our staff but also the production capacity of the farmers. Farmers now are able to formulate their own botanical pesticides with less supervision from our staff in controlling different types of pests and diseases. This has reduced expenses and increased the profit margin, especially for small–scale farmers who for decades have not been able to meet the cost of chemical pesticides.

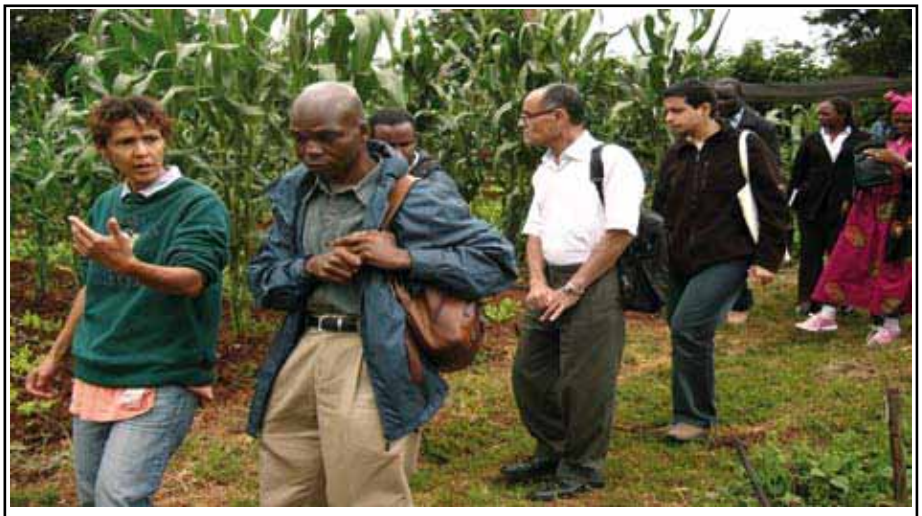
On behalf of the YRREC and the entire community, I give a lot of credit to the farmer's magazine, the editor, sponsors and all other contributors whose effort has enabled the newspaper to be an important tool in transforming agriculture in the country. Keep sending us copies.

Moses K. Tenai, Coordinator, Youth for Rural Reconstruction and Environmental Conservation, P.O. Box 4541 Kitale Tel. 0724 523 676

We want organic poultry production

I would like to thank you for *The Organic Farmer* magazine that is very educative to farmers. On behalf of Kwinyinyia Farmers Field School members, I request you to send more copies of the newspaper to our group. We are 20 in number. We hope you will assist us. Thanking you in advance.

Beatrice Nyaga, P.O Box 69, Siakago.



Participants attending a training programme on Organic Agriculture Development visit Su Kahumbu's farm in Tigoni. They were drawn from 14 African countries (Photo TOF)

I need back issues for our field school

My group is Midzimitsano Farmers' Field School. I have read the May 2006 issue of *The Organic Farmer* from a friend; I am very much interested in getting copies right from the first publication. I hope that my request will receive your consideration.

Francis Ngonyo Hinzano, P.O Box 285, Kilifi

Farmers in Paraguay ask for help

Receive greetings from the district of San Pedro del Parana Paraguay, South America! I'm a Kenyan missionary working in Paraguay. I work with the Pastoral Social promoting organic sustanable rural farming. We train our members on how to control pests and weeds without using chemical herbicides and pestides. When I was recently in Kenya for holidays, a friend of mine passed me some past issues of "*The Organic Farmer*". I enjoyed all the topics you write on.

Some four months ago, the field agricultural technicians came across the problem of stemborer which affects sugarcane and maize. I was so delighted on reading about its control using the predator *Telenomous isis*! How can we get it here in Paraguay taking into account restrictions of international movements of species of plants and animal products? Is it posible for ICIPE scientists to establish a center of field research here in san Pedro del Parana?

We can discuss practical details of such a venture. Congratulations for the nice work you are doing.
Our telephone numbers for contact are: +595 742 20151 / +595 975 659202

Fr Pascal Kinoti, svd, Coordinator
Pastoral Social- San Pedro del Parana
Itapua, Paraguay

Dear Father Kinoti,
We will forward your request to ICIPE.
Editors

Request for newspaper

We hereby request you for the above mentioned newspaper. We are a group of six farmers from Nyambaria sub-location, North Kitutu location Manga Division Nyamira District who want to know more about organic farming. We came across the September/ October 2005 issue from a friend. We hope you will be sending us the newspaper on a monthly basis.
Nyauncho Nyangena, P.O Box 1165 Kisii

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

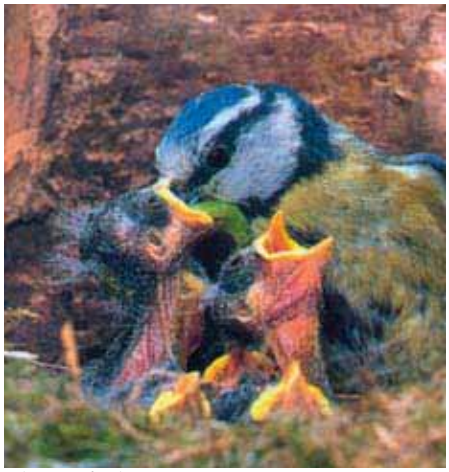
tips and bits

from farmers for farmers

Birds are useful in organic farming

About three years ago, I had to visit a friend in Nairobi. Since it was too early, I decided to while away the time in a local bookshop – the first time in my life! Of course, on the shelf were books about agriculture, flowers and vegetables. I opened a book and found something very interesting. I read that a pair of blue tits (a type of bird) will collect up to 15,000 caterpillars to raise a brood (raise their young ones). I also read that birds need a place to stay and to build their nests, and that the ideal habitat (living place) for birds is hedges.

Traveling home, I thought about birds and hedges. Some days later, I made some cuttings from a tithonia bush somewhere in the corner of my shamba. I planted them, and now, around two years later, I have a very nice hedge of tithonia, making boundaries between different parts of my shamba. They produce wonderful flowers, and a lot of birds are going in and out. Since I read in *The Organic Farmer* about the benefits of tithonia for composting, I regularly cut the leaves and throw them into the compost.



Blue tit feeding its young
Source: Organic Gardening

In January, your newspaper brought a series about agroforestry. You wrote about the benefit of fodder shrubs like calliandra, so I planted some of theses bushes. Now they have grown into a thick hedge. The leaves I feed to my four cows. They just love the leaves of the calliandra, and the birds like these bushes. It is such a nice experience to listen to the birds sing early in the morning.

Phillipp Maina, Karatina ■

Market Place

Tissue culture bananas. Do you need organically grown tissue culture bananas as from January 2007? Contact J G Njoroge 3N-Harvest, P.O. Box 82 Saba Saba Tel. 0721638034.

Organic Vegetables: I have organically grown capsicums, butternut, carrots, and courgettes. Interested buyers can get in touch with me at the following address: Joseph Njoroge, P.O. Box 52542, 00100, Nairobi, Tel.0721 647 618

Conventionally certified seed: Benjamin Lugano, the certified seedling grower from Kitale, will be operating a stand at this year's Eldoret Agricultural Show which opens on February 27. He will sell the following fruit seedling varieties to interested farmers: Hass and Fuerte varieties of avocado, passion; Kent, Harden and Tommy varieties of mangoes, tree tomatoes, oranges- Washington variety, paw paw, apples- ann variety. For details farmers can get in touch with him at: Lugano Horticultural Farm Enterprises, P.O. Box P.O. Box 323, 30200 Kitale Tel. 0733 990 574.

Articles wanted. Do you have something interesting you would like to share with other farmers? From now on, *The Organic Farmer* will award gift items for every article published. Karibuni.

Use of legumes doubles maize yield

In the January issue of *The Organic Farmer* you featured at length the benefits of growing legumes. By chance I came across the same information in a scientific report conducted by scientists from KARI among farmers in Matunda area on the slopes of Mt Elgon, which I wish to share with other farmers.

The soils in Matunda (Mt Elgon region) were very poor. The objective of the study was to determine the effect of several green manure varieties on the yield of maize and beans as a way of helping farmers to practise sustainable methods of production to increase their yields and income. Several trials were conducted in which different varieties of green manures such as mucuna, soya beans, dolichos, crotolaria and purple vetch were planted using compost in combination with chemical (inorganic) fertilizers. Each of the green manure crops was planted between the rows of maize and beans alternatively over a period of three years. From the findings mucuna had the highest ground cover followed by crotolaria, dolichos, soya beans and purple vetch in that order. Although there were no significant difference in the yield of maize and beans planted between the various green manures, they all gave higher maize yields than what farmers had harvested before the experiment. Green manures in combination with chemical fertilizers gave higher maize yields than green manures on their own, (the organic matter from green manure helped to make efficient use of the applied inorganic fertilizer). It was also observed that the maize yield obtained from use of green manure was the same as the yield from half the recommended rate of both compost and chemical fertilizers.

mucuna

Benefits for farmers

The result of the trials show that the use of green manures on their own doubled the farmers' yields, but when used in combination with chemical fertilizers, the yields were three times higher. Since most of the farmers were resource-poor and could not afford the cost of chemical fertilizers, the research concluded that the use of green manures on their own was not only cost effective, but improved the soils in the long term while suppressing weeds and adding nitrogen.

Benson Wafula, Nairobi

Source: Proceeding of the 18th conference and End of the Millenium Celebrations- 4th to 8th December 2000-Published by the Soil Science of East Africa, National Agricultural Laboratories P.O.Box14733, Nairobi. ■

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 22 March 2007

Well–bred cows are healthier and produce more milk. *(Photo TOF)*

Inbreeding is a big problem

Most Kenyan dairy farmers and artificial insemination service providers do not practise artificial insemination (AI) services in the right way. This is to blame for the increasing cases of inbreeding. The result is deterioration of the quality of dairy cattle and low milk production in the country.

Inbreeding occurs when animals sharing great grandparents, grandparents or parents are mated. The practice among a section of small–scale farmers is to use a home-bred bull to serve their animals whenever they come on heat. One reason why most farmers use such bulls is to avoid the high cost of artificial insemination (it costs Ksh. 600 to serve one cow). This is regardless of whether or not the bull and the animal are related. Use of village bulls can also spread venereal diseases from one cow to another, leading to abortions and related complications.

What most farmers may not know is that the semen used in AI services comes from the same bulls based at the Central Artificial Insemination Service (CAIS) station in Nairobi. Each of the bulls at the station has a name and number. For example, unless a farmer has kept records giving details on the bull that served a particular cow on the farm, there is a high probability that later on the artificial inseminator will end up serving the daughter of that particular cow with semen from the same bull - its father! (*TOF*)

See pages 4 and 5

in this issue

Good market for asparagus

Benson Chege, a Member of Kigogo Farmers' Group from Gilgil, delivers organic asparagus to The Organic Shop in Gigiri Nairobi. The farmers' group is one of the beneficiaries of The Organic Farmer Support Programme, launched in April 2006. Demand for asparagus from the group has gone up since they started growing it organically. *See page 8*

Helpful earthworms

Read more about this friend of the farmer on page 6.

Dear farmers,

The month of March is an important period in the farmer's calendar. It is time for preparing the land in readiness for planting. However, it is also a difficult time for the majority of the farmers in the country: Having harvested and sold their maize, many farmers have various financial commitments, the most urgent being the payment of school fees. As a result they may not be able to prepare the land in time, or even buy fertilizer and seeds in readiness for the planting season.

Although the Government has made considerable progress in restructuring the agricultural sector in the last four years, one area in which it has performed dismally is in the provision of credit to small-scale farmers.

Whenever the farmers complain about lack of credit facilities, the Government is always quick to point out that it has allocated billions of shillings to the Agricultural Finance Corporation (AFC) for lending to farmers. But the AFC Act is clear that only farmers with 5 acres and above can qualify for the loans. Applicants must also possess a title deed as security for the loans. Due to the increasing population, land subdivision has increased in most of the high potential areas in the country; this means that more than 80 percent of farmers have less than 5 acres (less than 2 hectares) of land. Therefore a large proportion of our farmers have no access to credit.

In the past, the Government operated the Seasonal Credit Scheme for this category of farmers, but it was discontinued. Clearly there is something seriously wrong. Otherwise one cannot understand how a Government can deny such a big section of its farming population any form of credit, yet they play such an important role in the country's food security. If farmers are such a risky group to lend to, then the Government should look for other options that would allow them access to credit. One of these would be to channel the loans through SACCOs, which have few cases of defaulting. A number of local banks have also launched lending schemes for farmers. We encourage farmers to look around and find the best lender. They should not wait for other people to solve their problems.

MY OPINION

In sub-Saharan Africa, agriculture is the lifeline of the economy. Women are key farmers, food producers and natural resource managers. In the region, women produce 60-80 percent of domestically produced food and provide nearly half the farm labour. Women work almost twice as many hours as men. In Kenya, women form the core of the smallholder farm labour force. Nearly all rural women (96 percent) work on family farms, providing 75 percent of the farm labour and 60 percent of farm-derived income.

Sustainable agriculture extension manual for Africa (1998).

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, 00100 Nairobi
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, 00800 Nairobi
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Preparing seeds for germination

Different types of seeds germinate under different temperature conditions. Care should be taken while doing pre-treatment.

Jane Kigo

Seeds become dormant during the period of storage, and many woody species have hard seed-coats that do not enable the seed to take in water. Water is crucial for germination of plants and if the seed cannot absorb water then it needs pre-treatment (making alternations in the seed coat to enable the seed to absorb water) before satisfactory germination can be occur. Different methods of pre-treatment are recommended for several types of dormant seed to help ensure the rapid germination of the maximum number of seed sown in the improved nursery. Different types of seeds germinate under different temperature conditions, hence care should be taken during the use of either cold or hot water methods. For example, spinach seeds do not germinate well under warm conditions and thus soaking them in cold water for 24 hrs immediately before sowing induces quicker and better germination. Soaking in hot water will mean destroying or killing this kind of seed.

Cold water method

This is recommended for pre-treating most types of seeds, whether dormant or not, since cold water aids in accelerating germination. Soak the seeds in cold water for 24 hrs. The empty seeds will float and can be discarded. The healthy seeds absorb water, swell, and fall to the bottom of the pot and are removed and sown immediately. This method is commonly used to pre-treat maize. It also works well with beetroot, which is very slow to germinate and is soaked in cold water for 24 hrs, after which it is sown.

Hot water method

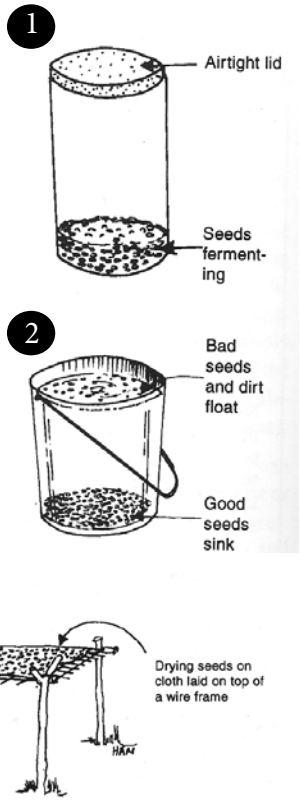
Steeping the seed in hot water softens the seed-coat, hence making it permeable to water. Heat the water but do not let it boil. Pour this water into the container with seeds and leave them for some hours. Remember not to boil the seeds because this will kill them. After a while the seed will absorb water, swell and sink to the bottom; then it is ready for sowing. Seeds which do not become swollen within 24 hrs should be discarded because they are most likely to be unviable. This method is used to pre-treat seeds such as asparagus, artichoke, parsley and many more.

Burning

Burning is used for very tough seed-coats of woody species such as acacia and it serves the same purpose as hot water pre-treatment. Place a patch of soil on top of the seed, pile trash on top of the soil, and burn it. When the fire has burned out, the seed can be retrieved and is ready for sowing. The seeds of some species appear to be dormant, even though the fruit is ripe. However, if seed from multiple fruits are planted fresh, the germination rate is usually high. It is therefore recommended that such seed should be sown as soon as possible after removal from the fruit.

How to process fleshy fruits and wet seeds:

1. Put healthy seeds in a container and close it. Leave it for 4 to 7 days; the mixture will ferment.
2. Close the lid tightly, then shake the fermented juice gently; pour it into a bucket and add clean water. The good seeds will sink to the bottom and the bad ones will float.
3. Pour off the water with the bad seeds. Put the good seeds in a sack and let them dry for 2 to 4 days. (This method is suitable for eggplant, cucumber, gourds, squash, etc.)



References- Agricultural Review 1997-1999
Gardening in East Africa.
By Gabu Remnant

Are you ready for the planting season?

Lack of proper planning and use of the wrong inputs is to blame for poor crop yields and poor earnings by most farmers.

The Organic Farmer

As we have mentioned in previous issues of *The Organic Farmer*, the planting season is one of the most important in the farmer's calendar. Planting means planning; a clever farmer writes down all the inputs they will need, including the cost. Proper planning will enable you to get the desired results, because at the end a farmer can find out if they have made a profit or loss. This involves making decisions on which crops to grow, and the amount of compost fertilizer or seeds required. An organized farmer will know the right quantity of compost they will need, for example to plant 2 acres of land. If you planted maize last year or the last few years on the same parcel of land, it is also important to practise a bit of crop rotation or intercropping.

Careful preparation will enable farmers to utilize the first rains, which often start in mid-March or April. Many farmers end up planting late due to lack of early preparation, which reduces their yields considerably. It is important that farmers keep to the following guidelines to ensure they get maximum yields from their farms:

Land preparation

Land preparation should be done early enough before the rains, preferably when the soil is still moist. Early preparation allows time for large lumps of soil to break up and also for the uprooted weeds to die on the surface under dry conditions. If it is a large-scale farm, it is important to use a tractor. If the land size is small, farmers are always advised to use hand digging, which has been found to be more appropriate because use of tractors on a small piece of land tends to compact the soil, making it harder for air circulation and survival of soil organisms.

Seeds

There are three types of maize seeds-local, hybrid and composite. Local seeds are traditional varieties that are low-yielding (sometimes local people prefer them due to their taste). Hybrid seeds are high-yielding, but they require more fertilizer than local seeds. Hybrid seeds cannot be planted

Land preparation *(Photo Pelu)*

again and the farmer has to buy new seeds every year. Composite seeds are stabilized during propagation and the farmer can replant the same seeds each year without affecting the yield. (Examples of composites are Katumani, Coast composite and DLCI). As we said in the last issue, farmers should always plant the right seeds for their own areas. It is important to buy seeds from certified stockists appointed by seed companies who can also give advice.

Planting

Proper timing of planting has its own benefits. Many farmers tend to wait until the rains have started before planting. Seeds germinate well when the soil temperature is still high. When it rains, the soil temperatures tend to go down, affecting germination of the seeds. Research shows that a farmer loses up to 2 ½ bags of maize per week if they plant after the rains have started. Maize planted early also benefits from nitrogen flash.This is a process where nitrogen in the soil is readily available for uptake by the newly planted seeds before it is lost through leaching when the rains come. Maize should be planted at a depth that will protect the seed from rodents and birds. This will also facilitate contact with warm moist soil for good germination. A planting depth of between 2.5 cm to 5 cm is acceptable. In case of dry planting, a depth of 5 cm is preferable to avoid germination promoted by false rains.

Spacing

The common practice of many farmers is to plant closely in the belief that the yield will be higher. When the plants are crowded, growth is poor because the seedlings compete for sunlight, water and nutrients, becoming weak and reducing the yield. The correct spacing should be 60 cm (2 ft) between one hole and the next. Spacing between rows should be 75 cm (2 ½ ft). Ensure only two seeds are planted in each hole. Maize can be intercropped with a second or more crops that do not compete for nutrients with it. Beans are the most common intercrop in Kenya.

Fertilizer application

When using manure, farmers are advised to ensure they use only well decomposed manure, at the recommended rate of 10 tonnes per hectare (about 5 tonnes per acre). For areas with low rainfall, 8 tonnes per hectare (about 4 tonnes per acre) are recommended. The farmer can apply two handfuls of well prepared compost per hole at planting time.

Thinning

If at planting more than two seeds were used per hole, then thinning should be done early, preferably within 14 days after emergence. Timely thinning minimizes the use of soil nutrients and moisture by the extra plants. For easy pulling of the extra plants, thinning should be done when the soil is moist.

Weed Control

Weeds compete with maize for nutrients, moisture and light, so it is important to control them early. Within the first month after germination, the maize crop is most vulnerable to stress, because that is the time when all the ears and leaves start to form. It is important that weeds are controlled within this period to minimize stress. The field can be kept weed-free by hand weeding. The first weeding needs to be done within 3 weeks after seedling emergence. In high rainfall areas, weeding three times may be required. ■

Advice from top cattle breeder

Recordkeeping is a most important exercise for a dairy farmer. Lack of proper records is responsible for inbreeding.

Peter Kamau, Njoro

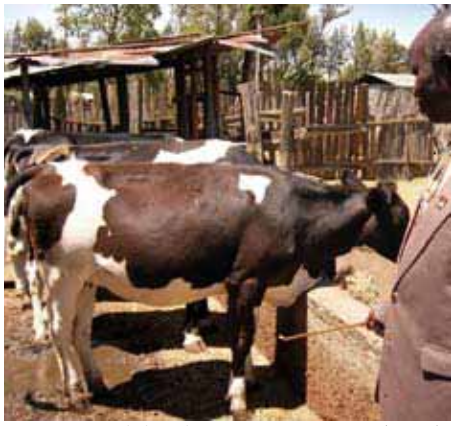
Going around James Karanja's 18-acre Pokea Farm in Njoro, one can easily mistake it for any other farm. But a closer look at the Holstein Friesian herd of dairy cattle reveals they are no ordinary dairy cows. Their bigger body frame, good udders and general health clearly distinguishes them from other cattle. This is by no means a coincidence, because James Karanja is a renowned Friesian cattle breeder in the country. Over the years, he has managed to produce prize winning bulls and cows. Some of his bulls are being used by the Central Artificial Insemination Service (CAIS) to provide farmers with quality breeds in the country. Animal breeding is a process whereby a farmer produces high quality cattle for milk or beef through upgrading with semen from top bulls whose characteristics and potential are well known.

High-yielding cows

Karanja's passion for cattle breeding started back in 1980 when an inspector identified a bull he was rearing then as a pure breed (pedigree quality). Soon after, a senior provincial administrator bought the bull for Ksh 25,000. "After selling the bull I immediately decided that breeding was my line of business in farming", Karanja says. Learning how to produce high quality animals from other breeders in the area, the farmer perfected his skills and has never looked back since.

Today he has seven high-yielding dairy cows. Due to his reliance on animals produced by the best breeders in the world, some of his Holstein Friesian cows give between 50 to 60 kg of milk per day. Many local livestock breeds in contrast, give an average of 15 kg a day. The main reason for this low milk production among local farmers, he says, is lack of knowledge on modern breeding technology.

"Until the white settlers left the country, local people were not allowed to own livestock. After independence, African farmers started livestock keeping without any knowledge of breeding. The few breeders who have acquired the knowledge have to struggle on their own, since there is little support from the Government", Karanja says. Although parastatals such as the Kenya Dairy Board were supposed to play an important role in farmer education or even support the Kenya Livestock Breeders Organisation (KLBO), they did not. This is to blame for the deterioration in the quality of animals that many farmers keep today.



Karanja with his dairy cows (TOF)

Inbreeding and poor management

It is out of this situation that Karanja has embarked on an education programme to sensitise farmers on the need to upgrade their dairy herds through proper use of artificial insemination (AI) services to stop inbreeding, which is mainly to blame for low milk production and even livestock diseases. Improved breeds, on the other hand, give more milk and income to the farmer.

Poor management is also to blame for low milk production, Karanja says. "Recordkeeping is the first and most important part in any serious farming enterprise. Many farmers do not keep any records on their animals. The most basic records that a farmer must have are names of the cow, dates of birth, age at service, number of services, and the breed and name of bull from the CAIS which sired (whose semen was used to serve the mother cow) to avoid inbreeding", Karanja says.

These details are important

For breeders, all the animals must be registered with the Kenya Stud Book (KSB). This is a secretariat that maintains records of all breeders who are members of the Kenya Livestock Breeders Organisation (KLBO). They must also maintain a milk record book where daily milk production records for each dairy cow are entered and sent to the Dairy Recording Services of Kenya (DRSK) on a monthly basis. The records should also indicate the cow's details, calving intervals, number of services, and health records such as treatments, vaccinations and deworming. ■

How to upgrade your dairy cows

James Karanja says that selection of a cow for breeding purposes has to be done carefully with the help of an inspector. Once the inspector identifies the cow, also called 'the foundation', the farmer has to look for a pedigree bull with certain characteristics, for example one that sires cows with high milk productivity, good udder position, a good pregnancy rate and has no complications while giving birth. The cow is then registered with the KSB as a foundation. When it comes on heat, it is served with semen from the selected pedigree bull.

The daughter of this cow should also be registered as soon as she is born as 'intermediate stock'. When the daughter comes on heat, she is served with semen from a different pedigree bull of the same breed. Farmers should always take care not to use semen from the first bull which served the mother as this will amount to inbreeding. The granddaughter, known as 'the appendix' is also registered with the KSB and served with semen from a high grade pedigree bull of the same breed. Finally, the great–granddaughter is now 'the pedigree'. He says the breeder can maintain the pedigree line by continued use of semen from high quality bulls from CAIS or other artificial insemination (AI) providers.

This is how to keep records (Photos TOF)

Farmers' groups or individuals interested in acquiring skills on breeding can contact the expert farmer at the address given below:

James N. Karanja, Pokea Dairy Farm, P.O. Box 157, Njoro, 20107, Tel. 0733 555 621.

Dairy industry threatened by inbreeding

The majority of dairy farmers do not understand the problems caused by mating cows with the same bloodline.

By Peter Kamau

Lack of information on animal breeding is one of the major obstacles facing the development of the dairy industry in the country. Although the majority of those involved in milk production are small- scale farmers, most of them do not possess even the most basic skills in utilization of artificial insemination services. Figures available at the Central Artificial Insemination Service show that more than 90 percent of the 3.3 million dairy cattle in the country are served with CAIS semen. Unfortunately, most farmers do not keep any records of their animals. This has contributed to increased cases of inbreeding. Inbreeding is the practice of mating closely related animals.

Inbred cows have many problems

Research findings undertaken by the Kenya Dairy Development Project (KDDP) showed that of the 3.3 million dairy cattle in the country, only 5 percent of the cattle had breeding records. This means that a large percentage of farmers are yet to adopt practices that help upgrade their livestock and prevent inbreeding. More than 75 percent of the dairy cattle in the country (mainly owned by small - scale farmers) are exposed to inbreeding because the farmers do not worry about mating cows with the same bloodline.

Dr. Dan Omollo, a vet, inseminates a cow in Kiambu *(TOF)*

To understand the problems associated with inbreeding, let us look at the relationship between animals and how it affects their health and productivity. All animals carry genes that determine certain characteristics such as size, height, colour, shape, milk yields and fertility. Although all cattle carry good genes, some have bad genes that usually remain hidden if their young ones are born of parents who are not related. Animals from the same parents have many similar genes or traits, including bad ones, and when they are mated, the young ones will get these bad traits from both parents. Animals born of related parents have many problems such as giving birth to dead calves, small calves, poor fertility, frequent diseases and even deformities. In order to avoid the occurrence of these poor offspring, scientists recommend that animals sharing great grandparents, grand parents or parents should not be mated. This means that family records of the bulls and cows should be checked before any mating is done so as to make the correct choices of bulls and cows.

Privatisation of AI services to blame

Before the privatisation of veterinary services back in 1992, the Government, under the Kenya National Insemination Services, could control the problem of inbreeding through a number of measures. One of these was the rotation of bull semen between regions after 2 years of use. Farmers using the artificial insemination service were issued with a red file with cow index cards; each cow's identification was made by ear notching to give each cow a unique identity. The inseminator had to carry a minimum of two bulls' semen of each breed, and was expected to check on the breeding information in the file before carrying out an insemination to avoid inbreeding. Artificial insemination officers in charge maintained farm record cards with details of each farmer and each cow inseminated for supervision and follow-ups. A team of veterinary officers from the veterinary headquarters would make follow-up visits on selected farms to ensure the system was observed. Since the privatization of the AI services, however farmers do not maintain any of these records any more.

According to a survey of 80 small-scale farms, it was observed that the majority of the farmers did not keep any farm records. They had only mental records of milk production and cow-offspring relationships. Persons who had records did not have any entries in them, while others could not produce even the most recent insemination records as they could not remember where they kept them. ■

Farmers can avoid inbreeding

Farmers can take several measures to upgrade their animals, improve milk productivity and reduce the dangers of inbreeding by observing a few simple rules:

- Always maintain records of each animal, e.g. date of birth, AI records such as name of bull that sired it, date and age at service, number of services, calving, interval etc.
- Avoid using village bulls to stop transmission of venereal diseases. Separate the bull from the cows at all times to avoid inbreeding.
- Try and register your graded animals with the Kenya Stud Book. An animal whose records are registered with KSB fetches a higher price in the market than one which is not registered.
- Do not throw away the semen straw when your animal is served through artificial insemination for future reference. All straws are labelled with the name and code of the bull, to avoid serving the daughter with the same bull, which will cause inbreeding.
- Always use semen from high quality bulls whose potential is already known. Using semen from known service providers such as CAIS will upgrade your cows, improve their milk production, health and accelerate their growth rate.

Additional information obtained from a report by Dr. Lucy Muthui, Senior Assistant director of Veterinary Services- Artificial Insemination Service.

Earthworms, small fertilizer factories

Many farmers send us questions concerning earthworms. These worms are very helpful, by increasing the nutrients in the soil significantly. The earthworm is a farmers best friend, however most farmers' are unaware that the presence of earthworms is a sign of fertile soils. Generally, we can see the effects of earthworms on the environment in various ways.

Earthworms enrich the soil

They accelerate decomposition of organic matter. During digestion, they mix organic and mineral soil particles and build stable crumbs of soil which help in maintaining the soil's structure. Their excrement (casts) contains 5 times more nitrogen, 7 times more phosphate, 11 times more potash and 2 times more magnesium and calcium than normal soil. They are, then, the smallest fertilizer factories which keep working at no cost to the farmer. The work is done on the spot

without fossil fuels and no transportation is involved. The earthworm also works as a "fine drainage maker", as their tunnels promote infiltration and water drainage, and thus prevent soil erosion and water logging.

In its travels through the soil, the earthworm's digging stirs and loosens the soil and aerates it, allowing water and air to enter. The earthworm improves and enriches the soil, making it easier for plant roots to get nutrients, thus making the plants healthier. For example, it has been shown that in orchards with a high population of earthworms, the trees have up to 40% larger root systems. Often roots follow the burrows and feed on the more available nutrients in the immediate vicinity. An amazing fact is that roots often seek out the earthworm waste. This happens even if the roots have to grow upward! The reason for this is that the earthworms (or the tiny organisms present in their gut) have concentrated high amounts of growth factors and vitamins in the casts.

Earthworms need good soil …

As with all life phenomena in the soil, earthworms are susceptible creatures and will not survive the application of poisons and aggressive chemical fertilizer. An earthworm cannot live in poor soil, it will starve and die. Water is another major necessity of earthworms, as they contain about 80% water by weight, and lose about 15% of their body weight per day. If moisture is not available, they will dig deep into the soil to find it. The rate of water uptake is related to the surrounding temperature.

… and are hardworking

Earthworm manure, or castings, are far richer in minerals than the soil which the earthworm feed on, and it is said that on average an earthworm will produce its weight in castings every 24 hours. The earthworm burrows down as deep as 6 feet into the ground, aerating it and making holes for the rain to penetrate. The burrowing of earthworms helps bring up minerals from the lower layers of soil to the upper layers. At the same time the lower horizons get enriched with the organic matter from the upper A and O horizons. This intermixing plus the increase of oxygen and water penetration to the lower layers of the soil increases the depth of the topsoil. As much as a 2-cm (1-inch) thick layer of subsoil may be brought to the surface each year by the burrowing of earthworms.

Pest control by earthworms

Earthworms generally feed on organic matter that has started to decompose, including mammalian dung. The deep burrowing species (geophanous species) feed on soil, and some even feed on nematodes. It has been found that nematode population may decrease by as much as 60% when earthworms are added to soil. Soil organisms also play an important part of the earthworm diet, and earthworms actually prefer organic matter with high concentrations of soil organisms.

Interesting worms

An earthworm is a segmented worm; its body is divided into segments, and the animal has well developed organs and systems. A single worm has both male and female parts. Pairs come together and exchange sperm. Eggs are laid by depositing egg cases full of sperm into the soil. The eggs hatch, and the little white thread-like worms are now on their own. Each egg case contains several tiny worms about 16 mm long. Earthworms are found everywhere on the earth's surface except in extremely cold northern and southern latitudes. ■

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Dung Beetles – nature's composters

There are around 30,000 species of dung beetle, and here in Kenya, there are three types of these wonderful beetles. They all have one thing in common: they survive on fresh cow dung! Beetles of the first type roll manure into small balls. They either feed on the animal droppings or deposit their eggs in them. The second group can be characterised as a dung-burying beetle. They take the manure to underground chambers where a ball is constructed to house an egg. The ball is plastered over with clay or packed for feeding or egg incubation. While performing this task, the cow dung pile may disappear in a day or less. The third group feeds on the dung and completes their life cycle in the cow dung itself.

Nature has produced solutions to all of its challenges with the ultimate intention of sustainability. These natural biodegraders automatically start to process the bovine dung, and in so doing, bury the rich, ripe materials in underground burrows.

Letters to the editor

Newspaper has improved our farming

First and foremost I would like to congratulate you for your effort in making us gain knowledge in organic farming. As a group we have received several articles and our group has improved very much in farming through reading your educative magazine. Mavuno Self Help Group has 20 members who are strong farmers. Working together as a group, we have 10 bee hives in the project where we harvest at least 20 litres of honey every three months. We have 200 chicken layers and fish faming. We also practise horticultural farming, growing vegetables like kale and different types of seeds such as passion fruit, bean seeds, soya beans and pumpkins. We have encouraged every member of the group to plant more bananas.

The group has improved most in fish farming. Through information we got from the Fisheries Department, we have adopted new fish farming methods. More advice from your magazine will help us improve. Through the newspaper, we have known many types of seeds. We have tried some and they have given us positive results. The group has learnt a lot especially on marketing of our produce without incurring much loss. Please, if you know of a good market where we can sell our bananas we will supply them. Lastly, we thank you for being educative and available to us.

Jared Namanga, Mavuno Organic Group, P.O Box 3, Nyamira

Impressed with newspaper

I am pleased to inform you that I really enjoyed *The Organic Farmer* issue No 15. I read with my group and we were motivated to try organic farming. This group is registered with the Department of Social Services and has 30 members. We undertake several projects like maize farming, horticulture, poultry, beekeeping and intend to start a mushroom project, although we have scanty information. Please send us at least 10 copies which we will use to educate other members. Thank you in advance for your motivating information.

Bright Wamela, Kwa U Youth Group, P.O Box 947, Kitale

Send plant extracts issue

There are about 10 additional farmers groups who have been requesting me for copies of the newspaper. I would appreciate if you could increase my allocation from 20 to 30 to cater for the request of those 10 groups. If possible include or post separately a copy of reprint in English of plant extracts which appeared in September/October 2006 issue.

J T Muriithi Simba, SOHGRO, P.O Box 12, Sagana

Visit us

I take this opportunity to thank you most sincerely for the newspapers. We received the five copies. It's the wish of the farmers to request for the addition of the newspaper to 10 copies. The group wishes to invite Su Kahumbu to visit the group and give a word of advice on the various activities of the group. Thank you in advance for the immediate action pertaining to the above matter.

Jacob Rware, P.O Box 453, Embu

We need training

First and foremost I would like to congratulate you for your tireless efforts in educating us on organic farming. Our groups are organic and organized small–scale farmers engaged in poultry, agroforestry, tree nursery, beekeeping and horticulture. The group is registered by the Department of Social Services and has 50 members. The aim of writing to you is to request for monthly copies of the newspaper. Also, please remember our group whenever you organize farmers' tours or training. All this will motivate farmers and encourage them to practise methods that help improve soil fertility.

The Chairman, Tulukuyi Farmers Group, P.O Box 1128, Kimaeti Market

We need assistance

We are an organized farming group wishing to learn more from you and we request you to facilitate us with the following:

First we request *The Organic Farmer* newspaper for our 32 members. We are also looking for an organization to contract this group to grow any identified crop either organic or inorganic for the benefit of the farmers' income, e.g. watermelon, pepper, etc. We would also be grateful if you can identify a donor to finance our farmers to implement most of the projects in our organization. Any other project that can assist the farmers so as to eradicate poverty would be welcomed by members. Your assistance and response will be highly appreciated. Thank you.

Joseph Muigai, Muriganio Farmers Group, P.O Box 44, Solai

Thank you for your letter. However we would like to inform you that TOF's main objective is to educate farmers to be self-supporting in all the activities they undertake. Currently there are very few donors willing to offer financial support to farmers' groups. We would encourage your group to work hard in planned income generating activities. In this way they would raise all the finances they require to develop their farms.

Put us on mailing list

We write to request for *The Organic Farmer*. We are a group of 25 registered farmers based in Kinangop plateau doing organic farming. We would be grateful to be receiving copies of the monthly magazines. The group is in charge of another 20 common interest groups registered under the Department of Social Services doing the same work. We hope you will consider our case.

James Kangethe, P.O Box 565, Naivasha

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Wangige group registered

Certification has made it possible for the group to access organic markets.

Philomena Nyagilo

For the Wangige Farmers Group, January 15 this year was a big day; the group reached a first step on the way to the registration as organic farmers. The registration enables them to sell their produce as "under conversion", meaning that they are in the process of getting full certification as organic producers after one or two years. With the registration, the produce from the group will carry a logo showing their food items are in organic conversion, therefore selling at a higher price than ordinary produce. The group is one of the beneficiaries of *The Organic Farmer* Support Programme, which was launched in June last year with funds from BioVision.

First in the country

Charles Kimani, the group Chairman of Wangige Farmers says : "This is a big step forward for our group and better things seems to be coming our way. With the certification we believe sales will go up. We are happy with *The Organic Farmer* newspaper for initiating the programme." Since September last year, the group has been selling their produce to The Organic Shop at Gigiri owned by Su Kahumbu who runs a question and answer column in our newspaper. This is a major achievement as it is the first farmers' group to be registered in the country. "They will now be able to sell a wide range of organic products as they can now prove their products are organically produced", says Kahumbu.

Currently the group supplies bananas, tomatoes, avocadoes, mangoes, beetroot, cucumber, pumpkins, potatoes and organic honey to the shop.

Getting good prices

Rahab Wairimu, another group member, says that the prices being offered by The Organic Shop are much higher than what they used to get in the conventional market, for example a banana finger is sold at Ksh 5 in the organic shop, while in the conventional market 4 or 5 fingers go for Ksh10, she says.

The road to success has not been easy; the Wangige Farmers' Group had to undergo a rigorous training programme on methods of organic production. The Encert Certification Company then trained the group on certification requirements. The inspection of the farms was later carried out to ensure the farmers met all the requirements for organic certification.

Group to open stall

To expand the market for organic produce, Charles Kimani says the group has already approached the local council to allocate them a stall at the Wangige market, which will offer consumers of organic produce in the area an outlet where they can get their supplies.

A milestone

For *The Organic Farmer*, the registration of the group is a major milestone in the development of organic farming in the country. This program was started after complaints from farmers that they could not get a market for their organic produce. After carrying out a survey among the organic farmers, it was discovered that the problem was not the lack of market, but the fact that small-scale organic farmers lacked certification. The Wangige group has shown a lot of initiative and hard work during the certification process. We hope other farmers' groups will follow their example to make organic farming a profitable venture in Kenya. ■

Members of the Wangige Farmers Group with their organic registration certificate. (Photo TOF)

Marketplace

Calliandra: I would like to buy Calliandra seeds for planting. Anyone with the seeds can get in touch with me. Karago Tel 0734 961391 Ngorika, Nakuru.

Beeswax: I am a young beekeeper and I have 500 g of propolis. Any one interested in buying it may get in touch with me at the following address:
Benard Kirono Marisin P.O. Box 245 Molo Tel.0726 736250 0736 617 134.

Tissue culture bananas: I would like to buy 500 tissue culture bananas for planting. Those interested in selling should get in touch with me. Please indicate prices.
Call Tel. 0721 311 541

Rabbits: I am a farmer from Gatundu and would like to know where I can get Californian rabbits. If you have any for sale, please get in touch with me on
Tel. 0724 873 347

Tissue culture bananas. Do you need organically grown tissue culture bananas as from January 2007? Contact J G Njoroge, 3N-Harvest, P.O. Box 82 Saba Saba Tel. 0721638034.

Organic Vegetables: I have organically grown capsicums, butternut, carrots and courgettes. Interested buyers can get in touch with me at the following address: Joseph Njoroge, P.O. Box 52542, Nairobi, 00100 Tel.0721 647 618

Amaranthus: I have 100 kg of amaranthus seeds (cream colour variety). Farmers interested in buying them can contact me on the following address:

Solomon Sangalo, P.O. Box 2015, Bungoma, 50200 Tel. 0725 660 213.

Articles wanted. Do you have something interesting you would like to share with other farmers? From now on a grateful TOF will award gift items for every article published.

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 23 April 2007

Mushrooms get popular

Mushrooms are becoming a popular crop among small scale farmers in the country due to favourable prices and the increasing demand from consumers. Growing mushrooms is easy because the farmer only requires crop residues which are plenty on the farm. A number of institutions in the country are currently producing seeds (spawn) for farmers.

See page 4 and 5

Conserving soil increases yields

Simple prevention measures can stop soil erosion and increase land productivity.

The Organic Farmer

Soil conservation is a very important activity in a farm, but it is also one of the areas ignored by many small-scale farmers. The topsoil is so valuable because it contains some of the most important nutrients that contribute to healthy plant growth. Soil erosion usually takes place at this time of the year because the topsoil becomes loose after ploughing. When it rains, the topsoil is often carried away to the lower slopes and into rivers. Soil erosion also takes away the organic matter that contains essential microorganisms and nutrients that the plants need. The land becomes less productive and its ability to retain water is also greatly reduced. Whenever you notice small channels of water in your farm after the rains, this is a danger signal that you are losing your fertile soil to erosion. For farmers in areas with land on a slope, the problem is usually severe.

Making terraces and planting Napier grass strips across the slopes can save your soil (see *TOF*, November 2006). The problem of soil erosion is very serious in Kenya and is to blame for poor soils in all farming areas throughout the country. The Ministry of Agriculture has a Soil Conservation Department, but very little is being done to educate farmers on soil conservation these days. This means that farmers have to do a lot on their own to ensure they prevent soil erosion in their farms. A lot of money used in purchasing fertilizers could be saved if farmers adopted simple soil conservation measures that maintain soil fertility. ■

TOF goes on air!

On Thursday evenings, you can hear *The Organic Farmer* in the Kiswahili Service of KBC Radio, from 8.30 to 8.45 pm. We share the programme with the Agricultural Information Resource Centre. Become organic! Listen to *TOF* on Radio! We start on April 18, 8.30 pm

in this issue

Dear farmers,

The Organic Farmer *is exactly 2 years old this month, as we cerebrate the second anniversary; we bring you a story on the production of mushrooms, which have become a hot product in the Kenyan market. Apart from the fact that they are organically produced, demand is high. They are also easy to grow and do not require a lot of investment. The story clearly illustrates the opportunities available for local farmers that are largely unexploited. Mushroom growing can drastically improve farmers' income, but only if the production is done with the market in mind.*

Before starting, farmers should do a small market survey to identify where they can sell the mushrooms, especially to the nearest market. If the market is far from their farms, they can dry mushrooms in order to prolong their shelf life. It is not wise to produce a particular crop just because your neighbour is doing it as it only leads to a glut and poor prices. Market information is available from the radio, newspapers and even mobile phones. Some farmers have even used the Marketplace column in our newspaper and managed to move their products. Farmers with various products need for sale can send an SMS on the telephone numbers provided (see page 7).

The second lesson farmers need to learn from this article is the need to diversify. If a farmer has various products on the farm, they cannot suffer huge losses when the price for any one of the products is low. Most of our farmers grow sukumawiki (kale), cabbages or tomatoes. Whenever the prices go down ,as they usually do, they find themselves in a difficult financial situation. This is largely to blame for the frustration and lack of interest in farming.

Right now there is a huge pork shortage in the country. If you look around your area, you will find that almost all farmers keep cattle, sheep and goats. Very few farmers keep pigs or chickens for commercial purposes. A clever farmer would have made very good sales from pork and poultry if they had them at this time. It is only when farmers learn to produce for the market that farming will truly become a rewarding venture. Farming is a serious business, fellow farmers—it is not a hobby!

MY OPINION

No doubt, the only way to spur Africa's development is to support rural agriculture. But the big question is, again, will such a theory transform into reality? Will the rural African population be able to actually make this theory a reality? And: do they want to? Africa has so many cultures and peoples - will one strategy work for all of them? There are many questions and concerns. But without trying it out we will never know what will really work!

Contribution in an Internet-discussion about agriculture in Africa and the development of the continent.

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, 00100 Nairobi
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, 00800 Nairobi
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Avocado root rot can be controlled

Various preventive methods can save an avocado orchard from infection with avocado root rot without using chemicals.

Philomena Nyagilo

George Gatheca has a problem with his avocado trees. "They are affected by avocado root rot. What can I do as an organic farmer?" he writes. He can do a lot. Root rot in avocados can be controlled without the use of chemicals. Avocado root rot disease, known as *Phytophthora cinnamomi*, is the most serious infection in nearly all avocado-producing countries. It attacks all varieties of avocado through rotting of feeder roots, which can result in death of the tree.

In the last years, many control strategies have been discovered which will reduce the impact of avocado root rot. A well managed package of all these control measures allow the continued economical production of avocados, even in the presence of the disease.

Clean seedlings

The best control for avocado root rot is to prevent introduction of the fungus into the orchard. Because diseased nursery stock has been mainly responsible for the wide distribution of the fungus, clean nursery practice helps prevent avocado root rot from infesting the nursery.

Seeds used to propagate avocados should be picked from the tree, not taken from the ground. Or, the seedlings should be bought at a respectable tree nursery. Alternatively, treat the seeds with hot water to kill the fungus. If you immerse the seeds in water at 49 to 50° C for 30 minutes and then you cool them quickly, the seeds will be free of the fungus.

Site selection

Before you decide on the site for your avocado farm, you should know that avocado root rot is severe in soils with poor drainage, high clay content and high water tables, where water pools after irrigation or rainfall. All water should be prevented from movement from diseased groves into healthy ones.

Grove sanitation

The fungus is easily moved from grove to grove on soil through cultivation equipment. Groves should be fenced to protect them from human and animal traffic.

It is advisable to use equipment (jembes, shovels, shoes, etc.) in the healthy groves before using it in a diseased grove. After use, you should wash the equipment properly and rub alcohol on it and make sure it is dried. If a diseased tree exists near healthy trees, a diversion furrow should be dug to divert rainwater that passes through the diseased groves.

Irrigation management

It is not easy to manage irrigation of avocado to benefit the avocado and not the fungus; avocado roots are very shallow and sensitive to drying. But if it is a must to use irrigation, then be careful: you should use water from deep wells, since surface water from rivers and reservoirs is often contaminated with the fungus. Do not over-water because it will invite more fungus.

Mulches

Organic material in soil acts like a trap to the fungus and reduces avocado root rot by releasing degrading compounds like carbon dioxide, ammonia, nitrates or enzymes that are toxic to fungus. It also helps improve the soil drainage and gives the trees more strength to develop defense mechanisms.

Research in the USA has shown that these integrated management methods are helping to fight avocado root rot. If not, there are various chemical control methods for treatment which a farmer may use to save their affected avocado trees. But be careful in using chemicals, because this is not recommended in organic farming. Rapid soil degradation may take place in some soils if chemicals are used for disease control.

• *Would you like to know more about avocados? Read the very informative Book: Avocado Growing in Kenya, by Jürgen Griesbach, World Agroforestry Centre, P.O.Box 30677 00100 Nairobi, Tel: 020 722 4000* ■

Learn simple methods of weed control

The longer you leave weeds to grow, the harder it becomes to control them.

The Organic Farmer

After planting, weeding is an important activity that a farmer needs to perform in the right way to increase crop production. Kenyan farmers lose between 15 and 90 percent of their crops every year to weeds. One of the major reasons why farmers fail to control weeds is lack of labour. However proper land preparation can reduce this problem by ensuring that few weeds are allowed to grow and compete for nutrients with crops. In organic farming a number of methods are employed to ensure that as few weeds as possible get a chance to grow. If a farmer manages to control weeds, it becomes cheaper for them in terms of labour. If a farmer can give the crops an advantage over weeds by weeding early enough, later weeding becomes easy and labour costs will be drastically reduced. As we mentioned last year, many farmers only start weeding after the weeds have completely covered their crops, taking away essential nutrients.

It is important to use a combination of methods to control weeds. Organic farming promotes the use of sustainable methods of weed control that do not damage or pollute the environment. Below are some of the methods that farmers can adopt to ensure weeds do not become a threat to their crops. Poor weeding methods

Overgrown weeds always reduce crop yields *(TOF)*

are also to blame for persistent weeds on the farm. The methods used in weeding can promote the spread of weeds rather than reduce them. Controlling weeds also prevents pests and diseases.

Early weeding is important

Farmers should know that removal of weeds and ensuring that they do not set seed makes it easier for them to control them in the following year or subsequent seasons. The first plants to grow or occupy space in the soil tend to dominate and make it difficult for other plants to grow. For example if a farmer manages to control weeds in the first three weeks after planting their maize or beans, these crops will occupy all the space and in the process utilise the light, water and other nutrients in the soil. This suppresses the weeds.

Weeds can be controlled using cover crops and other forms of soil cover. Good cover crops spread over the soil quickly and suppress weeds before they can grow. Farmers can select cover crops that have many uses, such as for food, fodder or firewood, and which produce a lot of green matter that covers the surface rapidly. Useful crops such as lablab can cover the soil completely in 2 months after planting.

Cover crop after main crop

A farmer may need to weed once in order to give the cover crop a chance to become established. If the rainy season is long enough, it is advisable to plant the cover crop after the main crop has been harvested. The crops will spread over the soil and suppress any weeds before they grow. Some crops such as the black oat control weeds by producing chemicals that prevent weeds from growing.

Cover crops increase infiltration

Research undertaken by KARI among farmers in Machakos last year, showed that the use of cover crops can reduce the labour for land preparation and weed control by 80 and 75 percent, respectively. Cover crops also increase water infiltration and accumulation of organic matter in the soil, which help to improve maize yields.

Hand weeding is better

A farmer can pull out weeds or slash them with a slasher or a panga. A hoe can also be used, although it disturbs the soil surface. Uprooting weeds by hand disturbs the soil less than using most types of equipment. Farmers should avoid disturbing the soil too much while using a hoe or any other implement. The use of tractors and and ox ploughs has been found to spread weeds, as the ploughs cut down the weeds and pull them along, spreading the weeds into parts of the farm which were previously weed-free. Burning crop residues also promotes the growth of certain types of seeds. ■

Other organic methods of weed control

- Ensure that the land is not disturbed too much during cultivation. Cultivation tends to bring buried weed seeds to the surface.
- Mulching can reduce weeds by denying them space and light. Mulching also helps reduce soil temperatures and conserve moisture.
- Planting a different crop than the one grown previously can break the life cycle of weeds.
- Intercropping helps to cover the soil and suppress the weeds that grow between the rows of the main crop.
- After the first rains have fallen, allow the weeds to grow or new weeds to emerge. Then weed them out before planting.
- Check the weeds every week and control them by pulling them out by hand or scraping the soil surface.

An intercrop of maize and beans *(TOF)*

- Never allow weeds to flower and produce seed. Pull them out before they set seed.
- It takes 3 to 5 years for the number of weeds in a plot to be reduced to a minimum. The farmer should be persistent in controlling them.
- Do not throw away weeds when weeding. This can transfer weeds from one place to another on the farm. Dig a hole and bury them or put them in a compost heap.

It is not difficult to grow mushrooms

All a farmer needs to grow mushrooms is recycled agricultural waste that requires a simple procedure to prepare.

Peter Kamau

Mushroom are grown organically. Their popularity among farmers is due to the fact they do not require a huge capital outlay, which many small- scale farmers can ill afford. They do not need much space; even a disused house, a garage or a godown can be converted into a mushroom production unit. Most farmers currently growing mushrooms are using grass-thatched mud houses reinforced with polythene sheeting. The emphasis on the use of cheap and readily available material is to encourage resource-poor farmers, especially in rural areas, to start mushroom production and improve their income. All a farmer needs to grow this crop is recycled agricultural waste such as banana leaves, maize stalks, beans, millet, barley or wheat straw, water hyacinth, maize cobs, bagasse (sugar cane waste), coffee pulp, sawdust, cotton husks, paper or even tea waste. Below is the procedure farmers have to follow in the production of mushrooms:

Production of mushrooms

Seeds: Mushroom seeds are called spawn- these are very small cells or spores that develop into the mushroom when put in the right environment for germination. Spawn was previously imported from developed countries, but a number of local institutions are currently producing it. The JKUAT produces high quality spawn because they have the latest equipment in their spawn laboratory.

Production structure: The farmer can make a thatched mud-brick room of any size, depending on the amount of mushrooms they intend to produce. In order to keep the costs down, it is advisable to use local material that can make an ideal structure. Shelves should be constructed on the walls of the room on which to place the mushroom bags. Mushrooms should grow in a clean environment to ensure they are disease free. Workers have to disinfect their hands, feet and even tools used in the mushroom house.

A ganoderma mushroom

Material preparation: The material to be used such as the maize stalks or bean leaves (also called substrate), is cut or chopped into very small pieces and put into polythene bags (enough to hold about 2 kg of subtrate) after mixing and applying water to make it wet. The bags are then dipped in boiling water for 3 to 4 hours to kill any bacteria or other disease-causing organisms. The substrate is allowed to stay overnight in order to cool down (to around 27^{o} C) after boiling.

Spawning and harvesting: After cooling, the mushroom spawns are introduced into the bags containing the substrate, this is done in a sterile way to ensure the substrate is not contaminated. The substrate is kept in an incubation room to allow the mushroom fungus to establish itself in the substrate. This process takes about 15 days, when the first mushroom shoots (also called pinheads) emerge from the bags. The mushroom bags are then transferred into the fruiting room. The mushrooms will be ready for harvest after 28 to 30 days. Harvesting can go on for two months, after which the farmer can dispose of the substrate and use it as compost to grow other crops of their choice.

Many varieties

Below are a few of the various varieties available for production:

Button mushrooms (*Agaricus*)

This is a popular mushroom that is grown using straw from wheat, barley or rice as the main ingredient in substrate preparation. A compost from these materials is made by mixing the ingredients with water and letting it stand for a month.

The compost can then be enriched with bran, molasses, chicken manure, cotton seeds or even sunflower to give more nitrogen to the substrate for increased yields. Sterilization using steam is done before adding the spawn. Home made drum boilers are used to generate steam for sterilization.

The spawn establishes itself in the substrate for two months and the harvest starts in the third month. Harvesting can take one or two months before the substrate is exhausted. A

kilogram of spawn for button mushroom production costs Ksh 600 (1000 bags of substrate require 20 to 30 Kilograms of spawn).

Oyster mushrooms

This variety is gaining popularity in Kenya because of its good flavour. It is also a simple mushroom to grow since it does not require pasteurization using steam. It can be harvested in a month's time as does not require composting like other varieties. A kilogram of oyster seeds (spawns) costs Ksh 600.

Shiitake and ganoderma

These two varieties can be grown in the same ways as oyster mushrooms but they are highly medicinal and expensive. The mushrooms are dried, ground and can be used as herbal tea or put in capsules for ease of consumption. A kilogram of shiitake or ganoderma spawn costs Ksh 1000. ■

Medicinal and nutritional value of mushrooms

Mushrooms are full of B vitamins necessary for good health and many varieties have a protein content gram for gram equivalent to meat. They make a tasty addition to the diet and can be added to eggs, vegetables, stew to boost their flavour and nutritional value. Button mushrooms can be eaten raw when very fresh, fried or boiled.

Oyster mushrooms:

Nutritional value: (1 cup= 200 g) calories: 17.5, protein: 2.0 g, carbohydrates: 2.8 g, total fat: 0.23 g, fibre: 0.84 g.

Shiitake:

Nutritional value: Protein: 13-18%, Niacin: 55 mg/100 g, Thiamin: 7.8 mg /100 g, Riboflavin: 5.0 mg/100 g, Fibre: 6-15%.

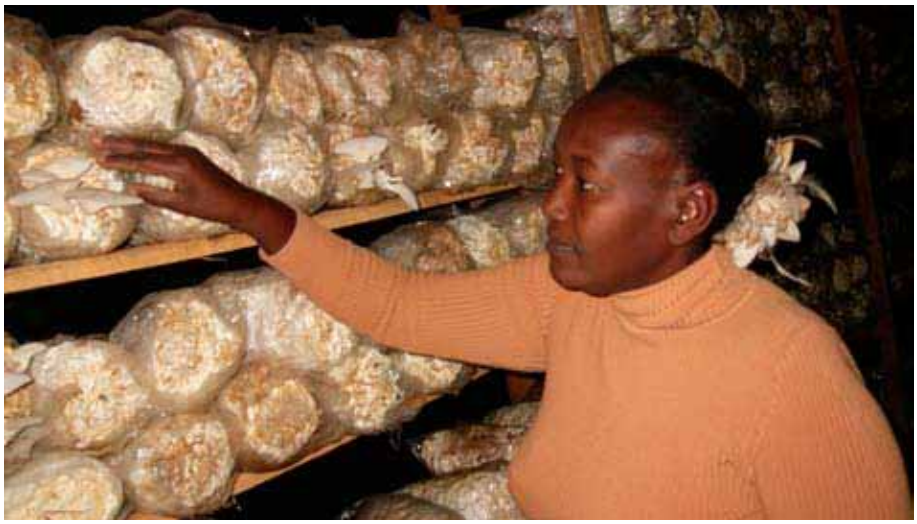
Note: Some wild mushrooms are very poisonous. Avoid them!

The new cash crop for Kenyan farmers

Increased awareness of the health benefits of eating mushrooms has created a big demand in the country.

Peter Kamau, Juja

Very few Kenyans used to grow mushrooms, let alone eat them; this is because most consumers did not know of the health benefits of eating this fungus. Lack of mushroom seed or spores (also called spawn) has been another major problem for local farmers, as no institution was producing spawn. Research indicates that there is a huge shortage of mushrooms to meet the demand for mushrooms in the country following increased awareness. As a result, mushrooms are becoming a real money spinner for a growing section of farmers who have discovered this new crop. Damaris Nyambura, a resident of Githurai Kimbo, is one of them. Nyambura, who doubles as a school teacher at Githurai Primary School, had tried dairy cattle, pig and poultry keeping on her ½ acre plot and given up on all. But when she read a report in a local newspaper about a lady in Nyanza who had changed her fortunes through mushroom growing, she decided to give it a try. "This lady had converted her main house into a mushroom production unit and moved to the servant's quarters. She was producing 30 kg of mushrooms per week. I was so moved by this story and decided to learn more about mushroom production", she says.



Damaris Nyambura inspects mushrooms in her fruiting room (TOF)

Enrolled for a course

In December last year, she enrolled for a course in mushroom production at the Ngong Farmers Training College and got further training from the Juja Pledge Centre. On completion she immediately went into mushroom production. The two houses she had used for fodder storage were prepared for both incubation and fruiting of mushrooms. She harvested 15 kg of mushrooms on February 15. During our visit to her compound she was already putting up additional structures where her pigsty once stood, "I have been selling the mushrooms to my fellow teachers, neighbours and even construction workers in the estate. The demand is so high that I cannot supply all those who need mushrooms. That is why I plan to grow more. I think it is a good enterprise", she says. She sells a kilogram for Ksh 500. She says it is not possible to get supplies from other farmers because they also do not have enough. Recently when customers shunned beef for fear of the Rift Valley Fever, mushroom prices went up to Ksh 600 a kilogram, but there were not enough from the few farmers who are currently growing them.

Mushroom spawn in a lab

How to cook mushrooms

- Slice mushrooms into thin stripes including the stem (the stem is rich in fibre).
- Fry your onion or garlic and capsicum, dhania, tomato, etc. with oil, preferably corn oil (which has no cholesterol)
- Fry the onion until brown.
- Put your sliced mushrooms into the fried onion.
- Continue stirring your mushrooms until all the water is evaporated (use medium heat)

Take care: Prevent mushrooms from sticking on the cooking vessel.

- Add salt to taste plus any other ingredient of your choice.
- Continue stirring until the mushrooms are brown in colour. Do not add water. If you need soup, add milk to the mushrooms instead.
- Serve with ugali, chapati or rice.

Farmers lack marketing skills

With the increasing demand for mushrooms in the country, there is urgent need to educate farmers on all aspects of production and marketing. This will enable them to get maximum benefit from the emerging market opportunities for mushrooms. Jane Gathenya is the managing director of Honey Dew, a marketing consultancy company that specialises in mushroom and honey production. She says that one of the main problems facing farmers in the country is that they are not able to link mushroom production to the available markets. "I visited one of the mushroom farmers recently whose fruiting room was full of mushrooms ready for the market, but the farmer had no idea on where to sell them," she says. She advises farmers to plan their production in such a way that they produce only the amount they are able to sell. They can divide their production units into four sections such that each section has mushrooms at different stages of growth at any one time. This way, she says, the farmer will maintain a consistent supply to the market.

University trains on production

A mushroom consultant at the Jomo Kenyatta University of Agriculture and Technology Mr. Patrick Kanyi, says the institution has a training programme for individual farmers and groups. "Here we teach all aspects of production and marketing. One thing we emphasise to farmers is to take mushroom production as a business in order to benefit from their

continues on page 7

Arrowroots like well fed soil

A farmers' group on a tour to Nairobi saw and bought big smooth rounded arrowroots (nduma) at a shop. Would TOF give tips on how to improve on their declining production? J.G.Njoroge, 3N Harvest

Hi J G Njoroge! Unfortunately I do not have much experience with arrowroots but can offer the following suggestions: All plants need feeding. Make sure when cultivating that there is adequate feed in the soil, in the form of well matured compost. Healthy plants will deter insects and are more resistant to disease. Arrowroot grow in moist conditions, therefore make sure to cultivate them in an area where there is adequate water.

Declines in production could be for many reasons. Uproot an entire plant and look at the root. Is there evidence of insects or nematode damage? Is the root stunted? (This would be evident if the leaves are also small). If this is the case, it could be due to lack of nutrients, and also due to pollutants in the water.

Not too near the river

Many farmers grow arrowroot close to the river sides, without considering the possible pollutants coming from upstream. If the arrowroots are grown continually in the same spot year after year without replenishing the nutrients they take up, then inevitably the yield will decline. ■

Double digging is good, but a lot of work

Can I plant maize using double digging? Do I put dry material or manure in the trenches? Allan

Allan, you can put both dry material and manure in the trenches: The wider the diversity of the mix of any biodegradable material, the better. If I were you I would also add some green plant manure (i.e. healthy crop waste – banana peels, maize stalks, etc.)

Double digging is very labour intensive, however the result is a long-term solution and depending on the area size, it can be very advantageous. Double digging requires digging through the hard pan in the soil and results in better drainage as well as better root penetration.

When done properly, double-dug beds can be productive for up to 3 years before such intensive tilling is required again. It is vital that plants are continually fed, especially if they are heavy feeders. Rotation of crops is also highly recommended in order prevent disease and pest buildup. ■

Chilies need time for germination

I am a volunteer in Kilifi and I have enabled many farmers to get connected to you. Many of them are planting African bird's eye chili, but it takes up to 6 weeds to germinate. Can they soak them for faster germination? What is the preferred method? Soren Green, 0723 100 809

Hi Soren. Yes, you can soak the seeds for 24 hours before planting. Soaking them in warm water is more effective than cold water. Be careful not to leave them longer than 24 hours as they may rot. Also, when planting in the seedbed, drench the bed first with water. Chilies do take a few weeks to germinate, so do not give up on them midway.

Make sure the seedbed is always kept moist. If after 8 weeks you have no germination, there could be other factors involved. This could range from poor seed, nematodes, soil-borne disease and even temperatures that are too cold. ■

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Desmodium good for fodder and seed production

"How do I harvest desmodium and when?" This is one of the many questions we received in the last month on the use of desmodium.

Desmodium is a very helpful plant. If it is planted in rows between the maize, it pushes out the stemborers and at the same time it avoids the growing of striga, a terrible plant that kills the maize. After harvesting the maize crop, desmodium can either be harvested as forage for livestock or left to produce seed before it is harvested for forage.

Desmodium for forage

• When you are harvesting desmodium for forage, always cut desmodium vines so as to leave out a 6-cm stem above the ground. It is a perennial plant. With the first rains it will start sprouting and will give a new crop.

• Chop the harvested desmodium and mix with Napier grass to reduce the wastage when feeding it to livestock.

• When forage is in short supply, particularly during the dry season, chop the desmodium, Napier grass and maize stalks and mix them before feeding to your livestock.

Desmodium for seed production

• If desmodium is flowering and podding, you may leave it for seed production.

• After harvesting the seed, you can harvest desmodium forage for livestock feed (see above).

• One acre (0.4 ha) of well–managed and properly harvested desmodium seed crop can yield 50 – 80 kg of seed. This can earn a farmer between Ksh 30,000 to 50,000 when sold at the current market price of Ksh 600 to 800 per kg of seed.

• There is an informative booklet: "A Primer on Planting and Managing 'Push-Pull' Fields for Stemborer and Striga Weed Control in Maize", published by ICIPE, P.O.Box 30772 00100 Nairobi, Tel 020 863 2000

Tips from Dr. Zeyaur R. Khan, a principal research scientist at ICIPE

Letters to the editor

We need assistance

First and foremost I would like to congratulate you for your tireless efforts to make us knowledgeable in organic farming. We are a community based organization at Kiminini. Our objectives are: Agricultural based activities for alleviation of poverty and hunger in the community. We plan to start a loan scheme. We are therefore requesting you to supply to us with copies of *The Organic Farmer* because this will provide us with materials and help us to advance in agriculture. We are active members willing to engage in collection of garbage and processing of waste papers and use it for our nurseries to plant tree seedlings. So please help us with advice. We are still young and want to change from conventional to organic farming. Our youth are ready to help you carry out information dissemination to the community and teach organic farming, if you are ready to train us. Thank you in advance.

Emmanuel Sirengo, P.O Box 120, Kitale

Thank for your interest in organic farming. The only form of training we can offer your organization is through the newspaper. We have already featured many areas in past issues which we hope your group can use to train the community on sustainable agriculture and especially organic farming. We hope you will make full use of the newspaper to educate farmers in your area to improve on their farming practices. Editors

Mushroom, new cash crop

continues from page 5

production. Farmers' groups of up to 30 farmers pay Ksh 100,000 (about Ksh 3,333 for every farmer) for a three–day training workshop on site. Individual farmers pay Ksh 15,000 for a three day training course at the university. The training is exclusive of meals and accommodation. Writing material, spawns for practicals and an attendance certificate are provided. The institution also links farmers with buyers of mushrooms. Farmers with mushrooms, those who need seeds (spawn) or training can contact the university at the following address:

Business Manager, JKUAT Enterprises LTD, P.O Box 62000, 00200, 0722 728815, 067-52420, Nairobi.

A good newspaper

We thank you for the magazines that you send to us monthly. The farmers welcomed your information and appreciated your humble advice to farmers countrywide. As the chairman of the group wish to thank you also for your advice and still request you to send us more copies of your informative magazine, enough for all the 31 farmers in our group. I thank you in advance for your assistance to farmers groups in the country.

Joseph Muigai, Murigani Farmers Group, P.O Box 44, Solai

We need more copies

Thank you for the newspapers you sent us. We have given to a few of our staff to read and they appreciate. Please give us another 60 to give to our farmers in the common interest groups. They are 20 in each of our 3 divisions. We will really appreciate if can supply us regularly.
Odoyo Bittar, District Agricultural Officer, P.O Box 381, Turbo

We received copies

We are in receipt of your newsletter "*The Organic Farmer*" and take this opportunity to express our heartfelt appreciation for the same. This has come to us at the opportune time and the right time it is required by our farmers and staff. This is therefore is to ask you to send us more copies for distribution to both farmers and staff. All information will reach the target group.

Francis Muthami Tel. 041-522006
Mobile 0723-747422
daokilifi@yahoo.com

Good reference material

I take this opportunity first of all to congratulate and commend you for your excellent publication. I came across the newspaper recently through a friend and found it has good reference material for small-scale farmers like me. I have a lot of interest in farming and am sure I will benefit a lot by reading *The Organic Farmer* regularly. I intend also to share the information with other members of my group. I would be very grateful if you could include me in your mailing list. Thank you.
Stephen Kageche, PO Box 791, Githunguri

Dear farmers,

We have found copies of The Organic Farmer *sent to farmers groups and other organizations lying at the Securicor Courier Company offices even up to two weeks after we had sent them out . This practice denies farmers important information, we cannot affor this wastage. There are hundreds of farmers waiting to receive the newspaper at the beginning of every month. To deny them the opportunity to read the newspaper goes against the spirit of this newspaper. We have decided to remove from our mailing list any organization or farmers group that does not distribute the newspaper promptly. We also request farmers to write to us or SMS their complaints whenever they fail to get their monthly copies or when they are delayed. The newspaper should be available to all farmers by 15th day of every month. We would also like to remind farmers that the newspaper can only be sent to groups and not individuals. This is due to the fact that demand for the newspaper is so huge while our capacity is limited. We can only print 14,000 copies every month. That is why we encourage farmers to share copies within their groups. It is only through sharing that farmers can be able to learn, improve their farming practices and income. Editors*

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Make your own liquid manures

Liquid feeds provide plants with nutrients in a readily available form. Although organic agriculture promotes the principle of feeding the soil, there are times when a liquid feed can be necessary in an organic garden. Suitable liquid feeds are made from manures, plants, animal wastes and rock minerals. These are basically the same materials that are used in feeding the soil, but in a different form, and they are subject to the same constraints as to the source of supply.

Suitable organic feeds can be bought or made at home. It is easy to make organic feeds at home. Liquid feeds are suitable for potted plants but they should only be used as a short-term measure in gardens where the soils are poor or where root damage prevents the plants from taking up enough nutrients for proper growth. However it is important to note that organic liquid feeds should never be used as an alternative to good soil care and management.

Liquid feeds can be made using comfrey or nettle leaves. Comfrey leaves are rich in plant nutrients. The leaves decay rapidly, releasing the goodness they contain. They can also be used as a mulch or compost activator. The leaves are slightly alkaline, so the feed should not be used on acid-tolerant plants. Comfrey liquid is high in potash and has reasonable levels of nitrogen and phosphate. It is good for fruiting plants, although the nitrogen levels may not be enough for proper plant growth.

Comfrey at the edge of a garden

Nettles make a general liquid feed that is a little low on phosphate, but supplies magnesium, sulphur, and iron. Young nettles cut in spring contain the highest levels of major nutrients.

Recipe for liquid feeds

Comfrey

- Steep 3 kg of comfrey leaves in 45 litres of water.
- Cover with a lid and let stand.
- Use undiluted after 4 weeks.

Nettles

- Steep 1 kg leaves in 10 litres of water.
- Cover with a lid and let stand.
- Use after two weeks. ■

Marketplace

Beeswax: I am a young bee keeper and I have 500 g of propolis. Any one interested in buying it may get in touch with me at the following address:Benard Kirono Marisin P.O. Box 245 Molo Tel.0726 736250 0736 617 134.

Tissue culture bananas: I would like to buy 500 tissue culture bananas for planting. Those interested in selling should get in touch with me. Please indicate prices. Call Tel. 0721 311 541

Rabbits: I am a farmer from Gatundu and would like to know where I can get Californian rabbits. If you have any for sale, please get in touch with me on Tel. 0724 873 347

Organic vegetables: I have organically grown capsicums, butternut, carrots and courgettes. Interested buyers can get in touch with me at the following address: Joseph Njoroge P.O.Box 52542 Nairobi, 00100 Tel. 0721647 618.

Farmers, listen to *TOF* on KBC, thursday April 18, 8.30pm.

Mountain pawpaw is difficult to get

A farmer from Karen/Nairobi is interested in getting mountain pawpaw seeds. We would advise him to enquire at the nearest Prison nursery, since they do a lot of tree planting. If you do not find them, maybe a fellow farmer can help. Otherwise, check and let us know the outcome. A friend of one of the editors has a mountain pawpaw in his garden, but the fruits are not yet ripe. There is little information on mountain pawpaw. Additional information can be obtained from the book "A Guide to Propagation and Cultivation of Fruit Trees in Kenya". By courtesy of the author, Jürgen Griesbach, we publish this short note out of this book:

"The mountain pawpaw (*Carica candamarcensis*) is a native plant of Colombia and Ecuador. In Kenya it performs well from 1500 m to 2200 m. Propagation by seed is easy, but since the seedlings develop into either male or female plants, this has to be considered when planting an orchard. Spacing, crop husbandry measures and plant development are similar to the ordinary pawpaw.

"Perfumed" flavour

The only remarkable difference is in the fruit itself, which only grows to a length of up to 10 cm. It develops a deep golden colour and has an acidic and 'perfumed' flavour." ■

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 24 May 2007

Pigs need care and good feed

Pigs require clean, spacious housing and proper feeding. The current shortage of pigs has led to increased pork prices. A six-month-old pig can fetch an average of Ksh 7000 in the local market. Most farmers keep pigs in unhygienic conditions, which lead to diseases and worm infestation. *See page 3*

Plant extracts: safe and cheap

When farmers use plant extracts in pest control, they save money and protect the environment.

The Organic Farmer

As soon as young plants emerge from the soil, various enemies often wait to destroy them. Sometimes these enemies, in the form of pests, are much more powerful than the young, weak plants. There are several organic methods that can be used to control pests on the farm. A wise farmer will always look for the most cost effective way to control pests on their crops. The use of plant extracts is one such method. These natural pest control products are not only easily available, but the farmer will not incur any cost in preparing them. Some of the extracts will also provide essential nutrients to the soil. Aphids, for example, can be easily controlled by use of soapy water—a very simple control measure that any farmer should be able to apply. This is exactly what we are trying to tell you on pages 4 and 5.

There is only one problem we have noticed with the way in which farmers use plant extracts: A farmer will apply the extract only once and expect the pest to disappear. Farmers should understand that plant extracts do not work in the same way as chemical pesticides. They have to be applied to the affected crop several times (sometimes up to three times a week) until the pest problem is controlled. When making plant extracts, farmers should also ensure the solution is concentrated highly enough to be effective. A very dilute solution will not give good results. ■

TOF on air!

On Thursday evenings, you can hear *The Organic Farmer* in the Kiswahili Service of KBC Radio from 8.30 pm to 8.45 pm. The programme is shared with the Agricultural Information and Resource Centre. Learn more about organic farming by tuning in to this programme.

Every Thursday, starting from 8.30 pm!

in this issue

Dear farmers,

A short while ago, a farmer wrote to us lamenting that farming is so unpredictable that it is just like gambling. This statement is painfully true, at least in terms of weather. The weather pattern is becoming more and more unpredictable with time, not only in Africa but even in Europe, where the snow nowadays falls when the crops are already growing.

For Kenyan and other farmers in Africa, climate change is really becoming a challenge. These days it is very difficult to know whether to plant early or late to avoid crop failure. One thing we have to agree is that there is very little we can do about the weather. There are some steps we can take to avoid incurring heavy losses as a result of rain failure, however. For quite some time now, we have been telling farmers to plan ahead and choose carefully at the beginning of the season what crops they want to grow.

For example, there are some varieties of crops that take a short time to grow. If you are growing maize, for instance, it is always wise to select varieties that suit the climate in your area. Last year we met a farmer in the drier parts of Nakuru who did not harvest anything from his maize crop; when we asked what maize variety he had planted, he said he had opted to plant H614, as it is high yielding. We told him that variety is only suitable for high potential areas in the district and regions such as Trans Nzoia or Uasin Gishu, which receive adequate amounts of rainfall.

Every year the farmer should sit down and plan what he/she intends to grow and where. Due to the frequent changes in weather patterns, a wise farmer should be able to plan and decide the best crops they can grow each season and which have a higher chance of survival should the weather change. For every region in the country, our research institutions have developed varieties that can do well in those particular areas. The farmer only needs to talk to the agricultural extension officials in their area or visit and talk to the research institution to know this. A drip irrigation system can help farmers grow vegetables and fruits during the dry spells. We cannot change the weather, but we can change our farming practices and get good returns.

MY OPINION

Nature has much to teach us. Nature is expert in zero tillage, in providing plant diversity, in recycling energy and nutrients through sunlight, animal wastes and vegetation, and in balancing prey and predator numbers.

Our intelligence means we can learn from nature and then forge ahead to enhance natural processes for the benefit of all life forms and to make planet earth itself more fruitful.

Excerpt from the book: Natural pest and disease control, *by Henry Elwell and Anita Maas*

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Passion fruits in high demand

Although production of passion fruits has gone up, farmers do not control Fusarium *wilt disease and pests.*

David Macharia, Eldoret

Passion fruit growing is becoming a popular occupation among many Kenyan farmers. This is due to the increasing demand for passion fruit, both for local processing and export. Unstable prices of traditional cash crops such as tea and coffee also have forced many farmers to start passion growing in order to diversify and increase their income. The major varieties grown in the country are:

- *Passiflora edulis* var *flavicarpa:* It grows in the cooler highland areas, produces yellow fruits and is grown mainly for the supply of fresh fruits.
- *Passiflora edulis* var *purple*: It does well in the coastal strip. It is purple in colour and is mainly used for processing and the fresh fruit market.

Farmers who have tried passion fruit production in many parts of the country have been unsuccessful due to attack by *Fusarium* wilt fungal disease and aphids. This is because farmers ignored advice from agricultural experts on the use of certified planting material and pest control. Farmers need to acquire seedlings from certified seedling producers to avoid using diseased material and spreading infection in their passion plantations. To reduce the incidence of diseases and pests in the purple variety, grafting with the yellow variety is recommended – using the yellow variety as rootstock (lower section of the graft).

Climatic requirements

Passion fruit requires fertile, well-drained soils that are weakly acidic (pH 5.5 to 7). It requires a moist climate with at least 1000 mm of rainfall per year. The purple variety requires about 1600 mm of rainfall. The purple variety prefers moderate temperatures between 18 to 25 °C. The yellow variety can do well in areas with temperatures between 25 to 30 °C.

Land preparation

Passion fruit has a deep root system, therefore proper land cultivation is necessary. Deep ploughing and harrowing is needed due to hard pans in the soil. Planting holes of 45 x 45 cm at the spacing of 2 x 3 m for hand cultivation and 3 x 3 m for mechanized cultivation is recommended at least

Pest-infested passion fruit (Photo TOF)

3 weeks before transplanting. When digging the planting holes, the topsoil should be kept on one side of the hole while the subsoil is kept on the other. Mix one debe (10 kg) of farmyard manure with the topsoil and refill the hole with mixture. The subsoil is added last.

Planting

The soil around the seedling should be made firm but not too firm. The position of the seedlings has to be similar to that in the nursery. After planting, the grafting point should not have any contact with the soil to avoid fungal infection. The seedling should be irrigated to ensure quick rooting and shooting of the plant.

Trellis system

A trellis system is a line made to support climbing plants. In passion planting, the system should be erected immediately after planting. Posts are placed at spacings of 6 m in line with the passion fruit, thus alternating one post with the plants (this means that a post is placed after every two plants). Posts should be dug about 40 cm deep before placing them into the soil and should be treated with a suitable chemical to prevent termite attack. The end-posts should be anchored firmly in the ground. Running along the top of the post is a wire. Use an 8 gauge wire for this purpose.

Maintenance of plantations

Soon after planting, the young plants are tied to training sticks till they reach the wire at the top. Two vines are allowed to grow, while the weaker ones are removed. When the vines reach the wire, the two are wound carefully around it in opposite directions.

continued on page 8

If kept right, pigs can be good business

The pig industry is threatened by the outbreak of swine fever and poor production methods.

Peter Kamau

"More than 48 percent of all pigs kept by small-scale farmers in the country die before they reach weaning stage", says Dr. R. Wahome, a pig specialist and lecturer at the University of Nairobi's Kabete campus. This statement sums up the problem facing the pig industry in the country.

Most farmers do not build the right structures that can offer protection to pigs. Unless provided with adequate space for movement and rest, newly born piglets have little chance of survival, as they get smothered by the sow (mother pig). The construction of the pig shelter has to take into consideration the climatic conditions in an area. For example in cold areas, piglets die from pneumonia. In such areas, it is important that farmers put up structures that help retain heat and protect them from the cold, apart from taking other measures that protect the young from adverse weather conditions. Pig structures can be built using local materials, but farmers have to maintain a high standard of cleanliness. Lack of cleanliness and general neglect by farmers is to blame for the high death rates in pigs.

Piglets drink water from a nozzle (TOF)

Quality of feed is important

Feeding is another challenge for farmers. A pig's digestive system is similar to that of a human being. They therefore require high quality feed and not the common feeds available on the farm such as Napier grass and crop residues. Farmers should be prepared to buy the recommended feeds with the right proportion of nutrients to promote healthy growth in their pigs. A well-fed piglet weighing a half-kilogram (500 g) can attain a weight of 70 – 90 kg in 5 months if provided with a well balanced feed. A lactating sow (mother with young piglets) produces 13 – 16 kg of milk per day (compared to an average cow which produces 7 – 8 kg of milk daily). A sow therefore requires 6 – 7 kg of good quality feed per day to provide her piglets with adequate milk. Proper feeding is therefore important for a farmer to succeed in pig keeping. A pig should also be provided with adequate clean water, as it consumes 2 ½ times the weight of its daily food ration.

Swine fever a major threat

Currently there is an acute shortage of pigs in the country, especially following the outbreak of swine fever in Eldoret and Nakuru. The disease is mainly spread by wild pigs when they come into contact with free-range pigs. Dr. Wahome says that the disease poses a major threat to pig production. This means that pigs should be confined and provided with space where they can walk around. The place should be well fenced so that they do not come in contact with wild pigs.

Confining pigs would also reduce the problem of worms such as *Trichinella spiralis* and *Taenia solium* (tapeworm) that can cause epilepsy when transmitted from pigs to human beings. Another serious pig disease is scouring or diarrhoea, which can be prevented by maintaining good hygiene. Most Kenyan farmers keep pigs under very unhygienic conditions, which is to blame for diseases and worms.

Profitable business

Pig keeping can be a profitable business if practised in the right way, because pigs reproduce twice a year and grow fast. A farmer can start with one pig unit which comprises one boar (male pig) and 10 sows (female pigs) and will have 20 pigs at the end of the year.

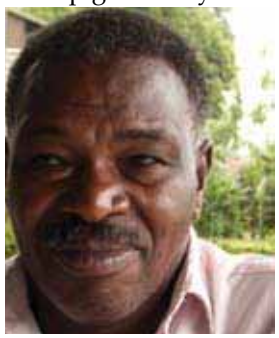
Because they breed fast, farmers should produce only the number of pigs they are able to sell. Another solution is for the farmer to make a contract with a processing company to ensure there is a ready market for the animals. ■

The experience of a pig farmer

Pig farming is an occupation Samuel Gitonga finds easy, having come from a pig-rearing family in Nyeri. He has gone through all problems that have faced pig farmers when he served as pig manager at the Uplands Bacon Factory that collapsed in the late 1990s, and at the Agricultural Development Corporation (ADC), which was one of the major suppliers of breeding pigs to farmers in the country. Gitonga, who studied for a degree in agriculture at Makerere University, Uganda, says the pig industry in the country started facing problems when the tourism industry went down as a result of the Likoni clashes at the coast in 1997.

"There was a big market before the clashes, but many pig farmers were forced to reduce their production capacity due to lack of market", he says. However, he notes that the demand for pigs has shot up following the revival of the tourism industry and after the outbreak of swine fever a few months ago. Gitonga's piggery, located in his 12- acre farm in Lanet on the outskirts of Nakuru town, has 110 pigs at different stages of growth. This ensures he has pigs for delivery all year round to Farmer's Choice, a local pork processing company with whom he has a contract.

Lack of breeding material is another problem facing farmers. Many government institutions that used to supply breeding material stopped production when the industry collapsed. These institutions included the ADC and KARI. "The government holds the key to the revival of the pig industry. It should go back to its role of supplying pigs for breeding to farmers. They can even import new bloodlines", Gitonga says.



Samuel Gitonga

Plant extracts fight diseases

Instead of using harmful chemicals, farmers can fight pests and diseases with fermented plant extracts (FPE).

The Organic Farmer

Organic farming is a method of agriculture that works with – rather than against – natural systems. The incidence of pest and disease damage in organic systems is reduced if a farmer uses a number of fundamental practices.

Crop rotation: Effective crop rotation boosts fertility and pest and disease control in organic farming. Crop rotation provides a break in the life cycles of the pest by removing 'host' crops for prolonged periods of time. Rotation also helps in building populations of natural pest-predators.

Biodiversity: By encouraging and not destroying the insect population in organic crop production, the organic system preserves and enhances biodiversity. Natural enemies of pest species are able to thrive, exerting control on pest populations. Conservation and improvement of natural features of the landscape, such as hedgerows and sown flower strips, will also enable communities of pest-predators to flourish. Grow flowers that attract hoverflies, lacewings and ladybirds, the main predators of aphids.

Crop health: The driving force behind agricultural sustainability and environmental preservation comes through a healthy, living soil. Microbes in the soil process organic matter to provide a balance of minerals and nutrients that are utilised by plants to achieve healthy and vigorous crop growth. When this balance is achieved, the healthy plants are able to withstand pest and disease attack.

Resistant varieties: It is also good to use crop varieties with natural resistance to particular pests and diseases. The problems can be significantly reduced. *Source: Soil Association, UK* ■

Spraying

Fresh plant extracts for use against pests and diseases can be prepared in the same way as the recipe given on Page 5, without adding EM.1 and molasses. It is important that you add a little soap (not detergent) to the extract and that you dilute the extract. Spray only the plants that are affected; repeat the spraying after 2 days.

Watch the stalkborers!

Monitor plant growth throughout the growing season to observe crop conditions and to recognize any attack by maize stalkborers. To monitor, start looking for stalkborer egg masses when the plant is a month old. The egg masses are found on the top surface and underneath the leaves near the midrib (the long vein in the centre of the leaf).

Stalkborer eggs on a maize leaf

Curative methods

- Dust ashes evenly on the leaves to dry out and kill the eggs.
- Spray with wood ash mixed with soapy water.
- Pick pyrethrum flowers, dry them in shade, grind into a powder, dust over the eggs.
- Pour 1 litre of boiling water over 50 g pyrethrum flowers, soak for several hours, add a little soap and spray.

Aphid predator: Ladybird beetles

Control aphids

Aphids are sap-sucking insects that can be found on a very wide range of plants. They will attack all parts of a plant. If numbers of aphids are very high, they can actually kill the plant they are living on. Aphids feed by puncturing and tapping into the plant's veins to feed on the sap. This feeding method can spread plant viruses, as the insects fly from plant to plant. Below are some ways for the organic farmer to control these common pests:

- Make sure conditions are favourable for strong, healthy plant growth.
- Make your garden a friendly place for a range of beneficial creatures by avoiding harmful sprays and providing suitable wildlife habitats. There are many creatures that feed on aphids, including birds, insect larvae, earwigs and bats. Grow flowers that attract hoverflies, lacewings and ladybirds.
- Inspect plants regularly and squash any aphids that are seen. Pick off heavily infested shoots and leaves and drop into a bucket of soapy water.
- An insecticidal soap is helpful, and pyrethrum or chilies can also be used (see table on the left). Also, the sprays based on rapeseed oil can be used, as this does not harm bees, ladybirds or lacewings. ■

Aphid predator: Lacewing

Some of the best plants for FPE preparation

Plant/herb	Pest problem
Marigold	Nematodes, cutworms, caterpillars, ants
Red peppers, chilies	Ants, aphids, armyworms, caterpillars
Onion, leeks, garlic	Ants, aphids, armyworms, caterpillars
Stinging nettles	Maize stalkborer, banana weevils, storage pests
Blackjack	Aphids, ants, beetles, cabbages, mites, caterpillars, crickets, whiteflies, termites
Tomato leaf solution	Cabbage butterfly, caterpillars and other insects
Lantana camara	Potato weevil, cassava weevil, grain weevils
Neem	Maize stalkborer, banana weevil, storage pests
Pyrethrum	Most of the pests mentioned above

Feeding the soil with vital nutrients

The better the soil quality, the stronger the plants and the higher the crop yield.

The Organic Farmer

If you walked around your shamba at the time when your maize and bean crops are just beginning to grow, chances are high that some parts of the farm have crops which have developed a yellow or pinkish colour on their leaves. That is a warning to you that things are not well. The colours on the leaves show that your crop is missing some very important plant food or nutrients. The most important nutrients needed for proper growth are nitrogen, phosphorus and potassium (see box in next column).

Healthy plants are resistant

Of course, the farmer has to take action. A wise organic farmer must have a long-term soil fertility management plan for their farm. The better the soil quality, the higher the crop yield a farmer will get. Healthy plants are strong; they are able to withstand pests and resist diseases.

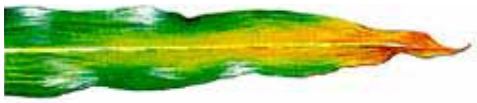
One way to do this is to plant leguminous plants which provide the soil with essential nutrients (see *TOF* Nr. 20). Some of these plants include *lablab* and desmodium. Tree crops such as *sesbania, tephrosia* and crotalaria (ask for these tree seeds from any KARI station near you) can be interplanted into a young maize crop and allowed to grow as a fallow during the dry season. After harvesting the wood from the tree fallows, nitrogen-rich leaves, pods, and green branches are hoed into the soil before planting maize at the start of the following rainy season. The quantities of nitrogen captured are similar to those applied as fertilizers by commercial maize farmers in developed countries.

Another useful shrub is *Tithonia diversifolia*, which is common in roadsides and hedges. Tithonia is so rich in nutrients that when used for example in a maize field it gives twice the amount of fertilizer a farmer would need when using chemical fertilizers. This organic source of nutrients is more effective than urea when applied at the same nitrogen rate because tithonia also adds other plant nutrients, particularly potassium, as well as micronutrients. These include calcium and magnesium. ■

Tithonia diversifolia shrub

Mineral deficiencies

Lack of Nitrogen (N)



Symptoms on leaves of maize, beans and vegetables: Poor growth. Leaves are pale green. In brassicas (sukumawiki, cabbage, etc) leaves may have tints of yellow, red or purple. Lower leaves are affected first. Flowering and fruiting may be reduced or delayed.

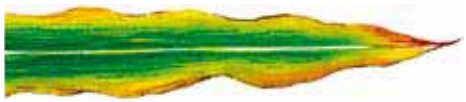
Prevention and care
Build up organic matter levels in the soil. Grow nitrogen-fixing green manures (like *lablab*, desmodium, *leucaenia*). Apply composted green waste and animal manures; mulch plants; apply nitrogen-rich organic liquid fertilizers.

Lack of Phosphorus (P)

Symptoms on leaves of maize, beans and vegetables: Poor growth. Leaves turn bluish – green with purple tints, but not yellow. Fruits stay small and green with acid taste. This deficiency is not easy to diagnose and can be mistaken with drought damage, root damage or nitrogen deficiency.

Prevention and care
Apply Mijingu rock phosphate. Farmers can order directly from Mijingu Phosphate Fertilizer Company in Nairobi, Tel. 0720 81 70 72. A 50 kg bags costs Ksh 1000. The Mijingu company does not have a distribution network in Kenya, so farmers can buy Mavuno fertilizer. It is preferable to DAP, but it is not fully organic.

Lack of Potassium (K)



Symptoms on leaves of maize, beans and vegetables: Brown scorching of leaf tips, which may curl up; purple-brown spots may appear on underside of leaves. Poor flowering and fruit set. Plants are prone to frost damage and disease.

Prevention and care
Improve soil structure; use plant-based potash fertilizers, for instance comfrey leaves or comfrey liquid. Apply well rotted compost or manure. Add some wood ash to compost heap (do not add directly to soil as it is very soluble).

Recipe for preparing 20 litres of FPE

You will need

1 litre Molasses
1 litre EM.1
4 kg of plants of different nutritional value, e.g. stinging nettle, neem, African marigold, tithonia, comfrey, onions, other sappy green vegetation
A 20-litre jerrycan
(Molasses and EM.1 can be found in every Agrovet shop)

Preparation

Mix the molasses with the EM.1 and 5 litres of water.
Chop up the vegetation into small pieces and add to the jerrycan.
Fill the jerrycan to the top with water and seal with a lid to keep airtight for 14 days.

Use

After 14 days, filter the solution, dilute it at a ratio of 1 litre FPE to 100 litres water (1:100) and use as a spray.

Note

Fermented plant extracts used as a foliar feed will feed your plants as well as impart an insecticidal effect if the materials used have insecticidal properties.

It is easy to build a worm breeder

Earthworms can and should be respected as helpful providers of high-value foliar feed.

The Organic Farmer

We can farm these lucrative creatures by providing them with optimum conditions for their survival, and in return we can extract the valuable nutrients from their casts (*mbolea*) in a very simple and affordable way. This is done by breeding the worms in a contained environment and every so often, running water through this 'wormery'. The intention is to collect the nutrient-rich water as it seeps through the soil and dissolves the worm casts (worm *mbolea*) along the way. This nutrient-rich liquid solution makes the basis for a perfect foliar and liquid plant feed. The worms are hardly more disturbed than during a rain shower, and continue to get on with their lives so long as we continue to feed them and make sure their living conditions are suitable.

To begin with, we must recognise the worms' needs as well as potential hazards.

Earthworms need: Moist soils, biodegradable material, air, regular feeding, ambient temperature.

Hazards to earthworms: Dry soils, pollutants in soils, waterlogging of soils, rodents, safari ants, birds, high temperatures.

Armed with this information, we can now consider how to create an artificial environment that will take all these issues into consideration and create a comfortable home that will contain the worms, allowing them to breed happily.

The Housing

Housing for earthworms can be made out of various materials. Since the medium held within the housing will be constantly moist, it is advisable to use a waterproof material to construct the housing. One can use cement and mortar, or more simply a 200-litre well-cleaned plastic drum cut in two. A metal drum may not be suitable as it may contain toxic residues which will kill the worms and, over time, it is sure to rust. A wooden structure may also be used, but unless lined with a strong plastic under-sheet, it will be impossible to collect the worm juice. The structure must allow for drainage in order to collect the juice, and it is advisable to leave this drainage open at all times to avoid waterlogging. This can happen when more water is put into the system than is collected. It can also happen if the wormery is not adequately covered and rainwater collects in the system.

It is important to note when constructing the system that worms are cold composters and cannot survive in a warm compost heap. To prevent the chances of temperatures rising in the worm medium, allow for no more than a 20–cm (8 inch) depth of material. It is also advisable to build the system at an elevation of at least 1.5 metres (3-4 feet) off the ground. This will allow for easy collection of the worm juice and also allow for the creation of barriers for rodents and *siafu* (safari ants).

Su Kahumbu shows farmers her earthworm breeding unit at her farm in Tigoni, Limuru (Photo TOF)

Material for the structure:

A 200–litre plastic drum cut lengthways into two small bathtub-like pieces.
4 poles, 2.5 metre (9 foot).
Some nails
One drum makes two units; therefore you can either produce twice as much juice, or sell the second unit, possibly even rent it out; you could also produce excess and sell or trade the juice with fellow farmers.

Material for the interior:

2 debes of medium-size rocks
A 1 x 1 ½ metre piece of *gunia* or shade net
2 debes maize stalks
1 debe dry grass
1 debe soil
1 debe *mbolea* (compost)
1 debe green materials, garden waste, weeds, etc.
1 debe dry leaves
Some kitchen waste, egg shells, fruit peelings, etc.
20 litres of clean water
A 20–litre container or something for collecting the juice
A handful of earthworms
(Farmers can buy earthworms from JKUAT Enterprises, P.O. Box 62000-00200, Tel. 067 52 420, 0721 167 244)

Construction:

1. Drill a hole in the underside of the drum.
2. Cut posts in half and nail together to make 'cross frames'.
3. Support tank upon a pair of X frames (see page 7).
4. Oil the legs of the frame with used diesel oil to prevent insects, especially *siafu,* from getting into the wormery.

Filling the interior:

1. Lay 8 cm (3 inches) of stones along the bottom of the drum.
2. Now lay the *gunia* or shade netting over the stones and up over the sides of the drum. This net is very necessary as it will act as a 'Kichungi' (sieve). It is very important to have the stones and the net in place. Without them, you will have a very messy system and it will be impossible to collect the worm juice.

continued on page 7

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Letters to the editor

We need information

We request you for some copies of *The Organic Farmer* and to be put in your mailing list. If possible, send us each copy of the past issues. We are interested in biointensive agriculture and doing the little we know, but need to be equipped with additional knowledge which we can use to practise in our farms. We will appreciate any other information on organic agriculture.

Benson Wasike, P.O Box 9, Kapsara

To get past issues, your group will have to send us postage stamps worth Ksh 350. Since we no longer have past issues we have to photocopy them for you and this costs money. If you send us the stamps, the money we would have used to buy stamps for postage is used to do the photocopying for you.

More on organic farming

Lildai Development Group is a registered group and we reside in Bomet District. I would like to request for *The Organic Farmer* magazine for my group. The main activity of the group is farming. Right now we are under training under the Farmer Field School programme.

The Chairman,
Lildai Development Group,
P.O. Box 608, Sotik

Breeding earthworms is easy

continued from page 6

3. Layer the remaining materials, filling the drum almost to the top, starting with the maize stalks, dry grass, soil, green materials, *mbolea*, and soil. The final layer should be the dry leaves; this will act as mulch against evaporation.

Remember, worms do not like deep compost as it heats up. Try to keep materials at about 20 cm (8 inch) depth only.

Now the worm housing is almost ready. If we were to introduce the worms at this stage, however, they would die, as it is too dry. We must therefore pour water over the interior contents until we have ensured adequate moisture throughout the entire materials. This is also a good test to see if your drainage works properly. On adding water, you should see the excess run out of the drainage hole at the bottom of the tank. If this does not happen, something is wrong and the system will cause waterlogging, which will kill the worms. You will then have to reconstruct it from scratch.

One drum makes two units. The photo shows a tap in the front as a drainage and collection hole. This is not necessary and can be replaced with a hole at the base of the drum.

Introducing the worms

Dig four holes about half-way through the moistened materials and introduce a few worms into each hole. Cover the holes.

Feeding

Feeding the worms is very important. Once or twice a week add a few handfuls of kitchen or garden fruit, food and vegetable waste to the holes in the unit, the same way as you introduced the worms, then cover. Do not put this on top of the mulch as it will attract flies and rodents.

Extracting the juice: After about a month, your unit will be ready for its first juice extraction. Pour 20 litres of water gently over the entire system, collecting the run-off in a bucket under the drainage hole. Dilute this liquid 1:10 with water and use as a foliar feed, as a pour-on or through your drip system (be sure to strain off any particles first). For this size of unit, one can collect juice once a month.

Things to note:

- Make sure your wormery never runs dry.
- Construct a shelter over the system to protect from rain and sunshine. A low *mabati* roof is good.
- Make sure no vegetation is touching the unit, otherwise *siafu* will find their way in. ■

Send plant extracts issue

I want to be put on your mailing list to get *The Organic Farmer* monthly. I am associated with one of the schools in the Thika area and with several small-holders, all of whom expressed great interest in your September/October issue, which was lent to me by a friend. Everyone has been particularly interested in the plant extracts special in the centre of the magazine. There is an ICIPE shop in Thika town. Perhaps you could send them several copies each month so that the farmers can collect on their own. Some members of the Earthwatch team, who do a lot of work with small farmers on the Kinangop and elsewhere, also expressed great interest in your magazine. Thank you for your very interesting and helpful publication.

Mrs B. Boy, P.O Box 270, Thika

Newspaper is useful

We hereby kindly request you for *The Organic Farmer* magazine since we found it helpful to our farmers. Through a nearby group we read one of your issues and it assisted us, most especially the article on DBM. The group has 20 members and would like your assistance. Thank you.

Daniel Kemei, Muungano Self Help Group, P.O Box 41, Moiben

Send us newspaper

We are a young organic group by the name Makiki Organic Group. We are registered and we have undergone three basic courses conducted by KIOF. We have been reading your newspaper through friends whose supply seems to be unreliable. We are currently 15 and would be grateful if you could include us in your mailing list. Thank you.

Richard Musembi, Makiki Organic Group, P.O Box 1292, Kangundo

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Seed germination on paper towels

In the *TOF* April issue, Su Kahumbu answered a question about the germination of seeds. A reader went to the Internet and found another method for seed germination which he sent to us. Try it and let us know the results!

There is a very low-tech method of germinating seeds using damp paper towels and plastic bags. Moisten one towel and arrange your seed on the paper towel. If the seed is large (peas, beans, maize), apply another moist towel on top and roll the 2 sheets together into a tube. If the seed is small, the sheet can be folded over and then rolled onto itself.

Once rolled, the paper towel should be placed inside a plastic bag to keep it from drying out. Finally, place the plastic bag in a warm spot. Before rolling the sheets, make sure the seeds are not too close to each other. Seeds

Green gram seeds

that don't germinate can begin to mould and this mould will infect nearby seeds if they are too close or touching.

After about 2 days, check the paper towel at least once a day to see if the seeds have started to germinate. If the towels have started to dry out, re-moisten them with a couple of drops of water. Most seeds will germinate within 5 days at room temperature.

Paul Odhiambo, Kisumu

Horn meal as organic fertilizer

An organic fertilizer *TOF* hasn't introduced to you yet is horn meal, the crushed or cracked horn of cows. It is especially useful as a nitrogen provider, a nutrient which fuels the growth of leaves and shoots and which is as important to the soil as water and light.

Horn meal works as a long-term fertilizer: The nitrogen will only be released into the soil little by little. The smaller the components, the faster the process. It will take six weeks for the meal to completely release the nitrogen into the soil; larger shavings need considerably longer.

If horn meal is applied at the beginning of the planting season, the nitrogen has enough time to fully unfold in the soil. It works for all plants, but is best for vegetables and flowers.

Horn meal is available from the jewellery designer, Ms Marie-Rose Iberl, in Nairobi. She uses horn for producing her designs and gets the meal as a byproduct.

Contact: 0733 736 445, 020 4343 430 or maro@wananchi.com. The 2 kg-packet goes for KShs 80, a 20 kg-bag costs KSh 1,200 (prices without transport costs). ■

Market Place

Installing drip irrigation: I am an engineer working on hydraulic and water systems. I have experience on installation of drip irrigation systems. I run my own company which can do fitting, installing and teach farmers about drip systems. If I can be of assistance to *TOF* readers, I will be happy to arrange a visit to your farm and do the installation.
David Smith, Tel. 020 2044334, 0727 721 694 or 0734 761 587.

The following conventionally certified fruit tree seedlings are available for sale. Hass and Fuerte varieties of avocado, Mango- Tommy, Kent and Harden varieties. Apples- Ann variety, pawpaws, tree tomato, Swedish apples and indigenous trees. Call Lugano Horticultural Farm Enterprises, P.O. Box 323, Kitale, 30200, Tel. 0733 990 574

Farm-fresh produce needed: The Organic Shop at Gigiri is in need of the following products: Garlic, ginger, wheat, oats, barley, passion fruit, grapes, oranges, tea, poultry feed, lamb and beef.
Contact Su Kahumbu: Tel. 0721 100 001, or email: info@organic.co.ke

Mushrooms wanted: Any mushrooms for sale? Farmers with any quantities should contact Jomo Kenyatta University of Agriculture and Technology at the following address:
The Business Manager, JKUAT Enterprises, P.O. Box 62000, 00200,
Tel. 067- 52420 or 0724 256696, 0736 524 200.

Growing passion fruits

continued from page 2

Secondary shoots appearing along the wire of the trellising system must be left while any others are pruned.

Pruning

Old unproductive shoots and deadwood must be removed. Secondary shoots also need pruning when they are about to reach ground level. The lateral shoots which bear the fruits should be left to hang down freely from the wire and the entangling tendrils need to be cut off to allow free air and light penetration. Removal also helps reduce disease and pest incidence. All equipment used for pruning should be disinfected to control the spread of viral diseases.

Weeding and fertilizer application

In organic farming use of organic fertilizer is recommended. Regular application of compost and Fermented Plant Extracts (FPE, *see page 5*) increases yields and helps to control diseases and pests. To avoid the build-up of soil-borne diseases and pests, passion fruits should not be grown for more than two years on the same piece of land. To get certified passion fruits seedlings, you can contact:

Benjamin Lugano, Horticultural Farm Enterprises, P.O. Box 323, Kitale 30200, Tel. 0733 990 574 ■

The Organic Farmer

BIOVISION

The newspaper for sustainable agriculture in Kenya Nr. 25 June 2007

Bees give honey and money

A wise farmer diversifies their farming activities to maximize their sources of income. One way they can do this is to start beekeeping. Here, a beekeeper uses a smoker to calm bees while harvesting a Langstroth hive. See page 4 and 5

Photo P. Luthi

Solving seed potato problems

Allow small-scale farmers to produce seed potatoes for their own use and sale to other farmers.

The Organic Farmer

There is a severe shortage of certified seed potatooes in the country. Small-scale farmers are suffering because they cannot get clean planting material, which has forced them to use commercial potato stock as seed. The practice has led to the spread of bacterial wilt disease to areas that were previously unaffected. To overcome the problem of seed potato shortage, the Ministry of Agriculture with assistance from The German Technical Cooperation Agency (GTZ) and the International Potato Centre (CIP), has trained 120 potato seed growers across the country who it was assumed would multiply seed and sell it to other farmers. However, the Seed and Plant Varieties Act (1975) says that only seed produced by the KARI National Potato Research Centre (NPRC) and multiplied in its sub-centres at the ADC farms in Molo, Njabini and Marindas in Meru under strict supervision by the Kenya Plant Health Inspection Service (KEPHIS) can qualify as certified seed.

Change the law

The problem is that most of the land previously owned by these institutions has been 'grabbed' and they are currently unable to produce the required quantities of potato seed. "Since these government institutions cannot meet the country's seed requirements, we feel the best way to solve the problem is to allow small-scale farmers to produce the seed and sell it to fellow farmers", says Dr Jackson Kabira, the NPRC director. He says about 99% of seed potato in the country is grown by small-scale farmers, but without changing the Seed and Plant Varieties Act, these potatoes cannot be legally sold as seed. *See also page 3.* ■

TOF on air!

On Thursday of every third week of the month, you can hear *The Organic Farmer* on the Kiswahili Service of KBC from 8.30 pm to 8.45 pm. The programme is shared with the Agricultural Information and Resource Centre. Learn more about organic farming by tuning in to this programme, Every third week of the month, starting from 8.30 pm!

in this issue

Dear farmers,

Apart from good soil fertility, another requirement for the successful farmer is quality seed. If the seeds are of poor quality, farmers will incur crop failure, which lowers their own income and also affects the country's food security. In the last few years, many seed companies have been licensed to sell seed in Kenya. However, the quality of some of the seed varieties has raised questions, because there are many reported cases of crop failure and even diseases which have not been seen before. This clearly indicates that something is very wrong with the seed industry in the country. Either the regulatory authorities are not doing their work as expected, or there is a problem with the legal framework under which they operate. In this confusion, how sure are we that the country is not being made a dumping ground for all manner of seed, including genetically modified varieties which are banned locally?

Last month, Agriculture Minister Kipruto Kirwa set up the Seeds and Plants Tribunal, whose mandate is to handle complaints from farmers over the quality of seed sold to them. But the question is: How many farmers are willing to spend their money filing cases against seed companies once they discover the seed sold to them is not of the right quality? Clearly there is a need to overhaul and streamline the seed industry. One area that needs changing urgently are the many archaic laws that are no longer in line with the rapidly changing situation in the agricultural sector. Two years ago, we wrote about the shortage of certified potato seed following the spread of the devastating bacterial wilt disease. The government institutions mandated to multiply seed for sale to farmers had failed to do so because most of the land used to multiply seed had been grabbed.

In developed countries, seed production is done by the private sector while the government's role is only regulatory. But in Kenya, the Seed and Plant Varieties Act does not allow individuals to produce seed. What needs to be done is to change such laws which stifle rather than develop the agricultural sector.

MY OPINION

A farmer gets sent to jail, and his wife is trying to hold the farm. She's not very good at farm work, so she writes a letter to him in jail: "Sweetheart, I want to plant the potatoes. When is the best time to do it?" The farmer writes back: "Honey, don't go near that field. That's where all my guns are buried." When the prison warders read the letter, they all run out to the farm and dig up the entire potato field looking for guns. After two full days of digging, they don't find one single weapon. The farmer then writes to his wife: "Honey, now is when you should plant the potatoes.

A farmers joke

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Organic nitrogen is best

All plants need nitrogen. Organic farming has many ways to add this important nutrient to the soil.

The Organic Farmer

Farmer Paul Macharia in Nakuru likes organic farming, as he writes to our newspaper. "But if I plant hybrid maize, I need to use artificial fertilizers containing nitrogen, such as DAP, urea or CAN, to get a good yield. Otherwise my harvest will be so little, that I will not even recover the cost of the inputs. Nitrogen is the key to a good harvest."

In one way, Paul is right. Even the handbook of the International Federation of Organic Agriculture Movements (IFOAM) says that chemical fertilizers offer large amounts of nutrients to the plants in an easily available form. "They can lead to an impressive increase in the yield." On the other hand, these fertilizers are not only expensive (1 bag now costs Ksh 2000/=), but they also disrupt the natural growth and development of plants.

Damage to soil structure

They do not feed the soil, but merely supply a limited range of nutrients to the plants themselves. Over–supply of nitrogen leads to a softening of the plants' tissues, resulting in plants which are more sensitive to diseases and pests. In addition, soluble nitrates may reduce the numbers of beneficial soil organisms which are essential for stabilising soil structure. This can result in increased soil acidity and a tendency to erosion.

Feeding the soil

Another real problem of using chemical fertilizer is that about half of the applied nitrogen fertilizer usually gets lost through runoff, leaching and evaporation. If there are strong rains or long dry periods, the efficiency of nitrogen may be even lower. This is the reason why farmers often mix these fertilizers with compost or with manure, so it cannot be washed away and so goes slowly into the soil and to the roots.

Desmodium: Nitrogen fixing (Photos TOF)

Lablab: Nitrogen fixing

Organic and sustainable farming does not allow the use of chemical fertilizers. Sustainable agriculture is the approach to agricultural production that stresses the improvement and preservation of the soil while increasing productivity. Organic farming feeds the plants indirectly by feeding the soil with organic matter. It is the main nutrient for the plants. Organic manures usually contain all required nutrients in sufficient amounts and in a balanced composition. Deficiency of a single nutrient can in most cases be avoided by applying compost, animal manure and other organic sources.

Organic soil improvers

Green manure: Green manures are plants grown to improve the soil. These plants may fix nitrogen, protect the soil from drying, improve soil structure via roots, suppress weeds by fast growth, and control pests by harbouring predators. Fallowing is recommended to create a rest period for soils. They may be ploughed back into the ground or cut and left to use as a top mulch or may be cut and used in the compost pile. Examples of good green manure plants are amaranthus, crotalaria, lablab, beans, peas, purple vetch, lupin, mustard or rye.

Animal manures: These manures must be well rotted or composted before use. They are best incorporated together with the bedding of the animals, as this will have most of the nitrogen that is in the animal urine. The bedding will also provide bulk, which will further improve the soil structure.

Compost: All garden vegetative waste can be composted. Animal bedding, cereal straw, maize stalks, etc. are all good. Additional inputs like wood ash sprinkled between layers of material, as well as bone meal and/or rock phosphate are added if required.

continued on page 3

New method to control bacterial wilt

A seed plot can always provide a farmer with stock of disease-free seed potatoes

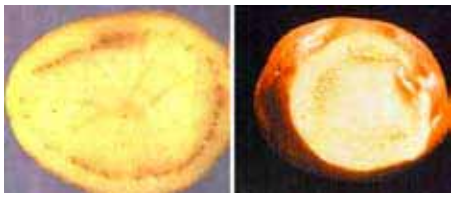
The Organic Farmer

Most potato growers nowadays hardly manage to get good potato yields due to lack of quality seed, pests and the increasing threat of potato bacterial wilt, among other diseases. Lack of certified seed has forced farmers to recycle their commercial potato stock and use it as seed.

The main problem here is that farmers will select the large sized potatoes for the market while leaving the undersized ones for use as seed. The small-sized potatoes do not make good seed. They are also prone to bacterial wilt and other diseases. Researchers have developed a method of making the best use of good quality seed potatoes and maintaining their health to enable farmers to get maximum potato yields. In this method, called the seed plot system, potatoes meant for multiplication as seed are grown on a separate plot from the ware potatoes (potatoes for sale or home consumption). The farmer takes good care of the seed plot by ensuring that they are free from diseases and pests.

Requirements for seed plot

The land to be used for the seed plot should be left fallow or planted with crops that cannot be affected by bacterial wilt, such as maize or beans, and preferably a short season crop. The land should not have a history of potato production nor of other crops of the potato family such as capsicums, tomatoes, bananas or egg plant. The seed plot should be established on fertile land, and there should be no runoff water in and around the plot.



Infected potato tubers (Courtesy KARI-NARL)

Use disease-free potato seed

Farmers should buy seed potatoes from a reliable source, preferably a seed production centre or a recognized seed dealer. Potato seed tubers should be 2.5-5.5 cm in diametre.

Land preparation and planting

Mark out the beds to about 2 metres wide and a sufficient length depending on your seed needs. Loosen the soil to a desirable depth and break the crumbs to make it fine. Spread well decomposed manure and rake it in. Make holes at a spacing of 20 cm (8 inches) by pushing a spade handle or similar tool through the soil to a depth of 15 cm (6 inches) and plant a well-sprouted tuber in each hole. Cover the hole with fine soil.

Weeding and hilling

Hand weeding is recommended. Making hills as is done in commercial potato fields is not necessary so long as the farmer uses the recommended planting depth of 15 cm.

Disease and pest control

Seed plots need to be inspected regularly to ensure that pests such as aphids, the potato tuber moth and others are controlled. Diseases such as early and late blight should be controlled promptly. Farmers can use plant extracts (read the April 2007 issue of *TOF* on plant extracts) for pest control. The fungal diseases can be controlled by use of copper oxychloride, which is allowed in organic farming. Removal and destruction of diseased plants, good field hygiene and crop rotation (avoid planting crops in the potato family) should be practised. This will help control bacterial wilt and other diseases.

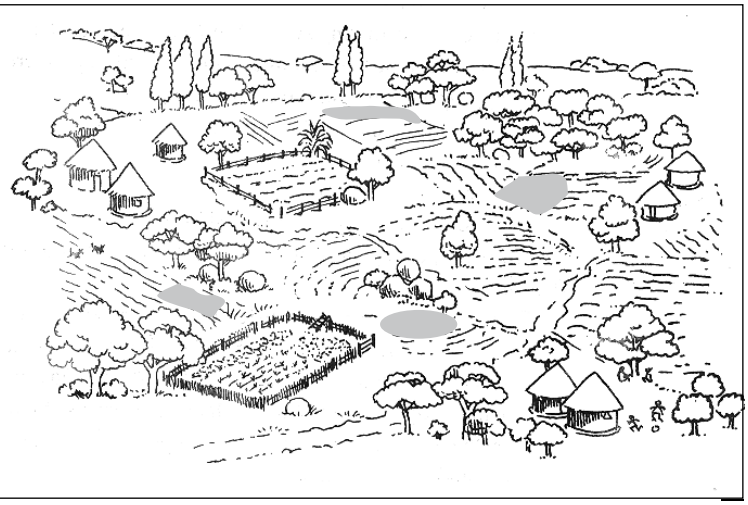
Harvesting and grading

Seed plots must be harvested 3 weeks earlier than in the case of a ware potato crop. Potato vines (stems) must be removed about 2 weeks before harvesting to allow the potato skin to harden. Grading involves selecting unbruised, disease- free tubers, which are 2.5 – 5.5 cm in diametre. Potatoes larger or less than this size are unsuitable for use as seed.

Affected potato plant (Photo KARI-NARL)

How to use seed potatoes

Harvested seed potatoes should be divided into two lots: One lot is used in establishing a new potato seed plot as explained earlier and the other lot planted in the commercial potato field at the recommended spacing of 30 x75 cm and following the usual potato management guidelines. ■



In every farm there are suitable sites for seed plots (in grey): virgin land, bushland, homestead, but not where you have previously grown potatoes or other plants of the potatoe family such as tomatoes, capsicums etc.

Organic nitrogen ...

continued from page 2

comfrey and tithonia leaves added to compost act as a compost activator as well as adding micronutrients. Addition of Effective Microorganisms (EM1) can also help speed up your composting time by adding a ready source of microorganisms.

Permitted organic fertilizers: Organic fertilizers are products of plant, animal or mineral origin that generally release nutrients slowly over time. Some are compound mixtures e.g. bone meal, seaweed meal and, fishmeal, rock phosphate and potash. These organic fertilizers are normally used where there is a deficiency in the crop. One must therefore learn to identify the deficiencies and strive to correct the cause of the problem. ■

Beekeeping is a good sideline for farmers

Honey fetches a good price on the market. Beekeeping is not too difficult, but a farmer needs some knowledge.

The Organic Farmer

Beekeeping can be an ideal source of income for small-scale farmers. It does not need a lot of expensive investments, and it does not need a lot of land or good soil. On the contrary, hilly and rocky land which is not arable can be used productively, provided that there are flowers and flower bushes. Bees are very important, as they act as pollinators of many plants. Bees transfer pollen grains from the stamens (male parts) of flowers to the stigma (female parts) of other flowers, enabling pollination and fruit formation to take place. In this way, bees increase the quality of flowering crops, e.g. coffee, pawpaw, banana, avocado, mangoes, etc. Without bees and other insects, many plants would disappear, for instance onions, cabbages, carrots, fruits, lucerne and cotton. In addition to their pollination activities there are many direct benefits for the beekeeper: Honey is healthy, it is high in energy, is helpful against coughs, ulcers, wound, etc. It is also a source of cash; beeswax is used for making candles, shoewax or soap and in the manufacture of cosmetics; propolis has antibiotic properties and is used in medicine. Royal jelly is used in medicine and pharmaceuticals and as a dietary supplement.

Beekeeping skills are necessary

A farmer who is eager to become a beekeeper should have some knowledge on the life cycle of bees. A beginner should always ask experienced beekeepers or join a group already working with bees to acquire the necessary skills. There are also some books on the market (see box on this page); the most informative is the one written by Thomas Carroll, "A Beginner's Guide to Beekeeping in Kenya". It is a wonderful and easily understandable introduction on beekeeping with all the important tips and advice. In our newspaper, we do not have space enough to go too deep into the details of beekeeping. We can only give you some few requirements which a farmer should consider if they want to start beekeeping.

Inform yourself!

If you would like to know more about bees, there are some books on the market:

•Thomas Carroll, *A Beginners Guide to Beekeeping in Kenya*, Nairobi 2006, ISBN 9966-7078-8-7. Available at Legacy Books Press, Yaya Centre or Baraka Agricultural College, Molo (051 721 091) Price KSh 1,200. It is by far the most informative book. See also www.apiconsult.com

• *Make Money From Bees*, KARI Kitale, P.O. Box 450, Kitale.

• S.K. Raina, *Commercial Insects, A Practical Guide for Raising Silkmoths and Honey Bees in Africa*, ISBN ISBN 0 86098 246 7 Published and available from ICIPE Science Press, P.O.Box 30772, Nairobi, 00100. The book is available in English and Kiswahili versions.

Beekeeping pays!

Every supermarket and most shops sell honey. There is a high demand for it, especially now that Kenya is licensed to export honey to the European Union if it meets export requirements. Thomas Carroll gives a very impressive example of the relationship between costs and benefits in the table below. He takes a farmer with 20 Kenya Top Bar Hives (KTBH) (see opposite page 5), with an 80 percent occupation rate (16 hives are occupied) and an average honey production of 20 kg per occupied hive. Farmers sell honey in bulk at a price of KSh 100 per kg.

Expenditure	Cost in KSh
20 Kenya top bar hives, KSh 2,000/hive	40,000
1 Bee suit	3,270
1 Smoker	800
25 Hanging posts (KSh 150 each)	3,750
Grease and other various items	500
Total	48,320

Assuming it is a good year, and 16 of 20 beehives are occupied (80%), the result looks as follows:

Estimated honey production from one colony	20 kg
Total honey production from 16 occupied hives	320 kg
Estimated price of 1 kg honey in 2007	KSh 100/kg
Estimated income from 16 occupied hives	KSh 32,000
Net income in the first year = KSh 32,000 (sale) minus KSh 48,320 (investments)	- KSh 16,320

This means that in the first year the farmer will not have any income. But the equipment has a lifespan of an average of 10 years or more, supposing a farmer works carefully. In the second year, the investments (capital costs) will be paid off and the farmer will get a good income. The Langstroth hive, which has 10 bars instead of only one bar as in the KTBH, will yield even more honey, although the initial cost of the hive is greater.

(Source: Thomas Carroll, *A Beginner's Guide to Beekeeping in Kenya*)

Making an apiary

A farmer should know where to place the apiary (the structure for housing a colony of bees, see opposite page) on their shamba. The apiary should be away from people and livestock, away from a main road or public areas, and should not contain more than 20 hives. The apiary should be

surrounded by a hedge of shrubs; if they are not growing fast enough, the beekeeper can put up a fence (for instance with off-cuts, which is also good against theft). The apiary should have some trees to protect the hives against strong direct sunshine and wind. And, it should provide the bees with water and, of course, shrubs, trees and flowers to provide nectar.

Trees and shrubs provide nectar

As mentioned above, a farmer should know about the life cycle of bees. When there is plenty of food, bees produce more honey for eating in times when there is less food. Each region of Kenya has its own flowering

Continued on page 7

Beekeeping skills are as important as beehives

The highest costs for a beginner in beekeeping are the beehives. Interested farmers can even make their own.

The Organic Farmer

Most farmers in Kenya use a log bee hive in beekeeping practice. Below we introduce you to two types of modern beehives; the Kenya Top Bar Hives (KTBH) and the Langstroth bee hives which are very efficient in terms of the quantity and quality of honey they can produce. The two hives also make honey harvesting and bee management easy for farmers.

On this page, we briefly give details on the two types of beehives. More information can be obtained from books or from an experienced beekeeper.

The Kenya Top Bar Hive (KTBH).

This is the most common hive in Kenya. The cost of a KTBH is about KSh 2000. Bee-specialist Thomas Carroll says that KTBH are the most convenient hives for beginners since they are relatively cheap. One can buy them at Baraka Agricultural College, Molo (Tel. 051 721 091) or the National Beekeeping Station, Nairobi (Tel. 020 564 302). Beginners can make the hive themselves if they have some carpentry skills or if they can follow the instructions given here on how to build it.

Kenya Top Bar Hives hang on a tree branch

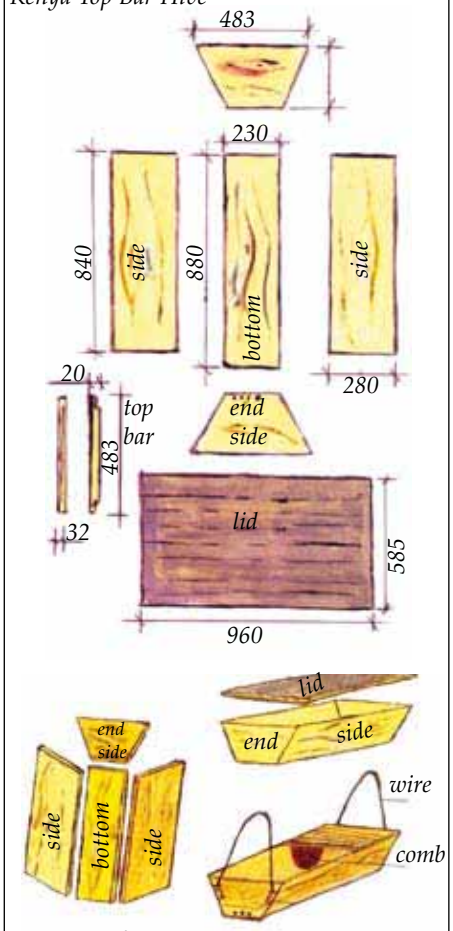
Advantages of the KTBH

- Easy to check for ripe honey.
- Easier to harvest than the traditional log hives on the top of a tree.
- Easy to manage the bees during scarcity of flowers and dry weather, since food for bees and water can be provided during such adverse conditions to maximise honey production
- Honey extraction is easy compared to log beehives or to Langstroth hives, as there is no need for special equipment.
- The hive keeps swinging and cannot be easily attacked by the honey badger (a nocturnal honey-eating animal). It can fill very quickly in the honey season.

Disadvantages

- The combs in KTBH are not supported; therefore, combs tend to break if not handled carefully.
- Beeswax is harvested with honey, forcing bees to build more wax to replace harvested combs, which results in lower honey yields but more harvested wax.

Kenya Top Bar Hive



Drawing of a Kenya Top Bar Hive (measurements are in millimetres) Source: Baraka Agricultural College Workshop

- The volume of the KTBH is fixed, so the hive can fill very quickly in the honey season.

Whichever hive a beekeeper chooses, the most important thing is that they are building up their own skills, capacities and knowledge. Even the best hive cannot be productive if a beekeeper is not able to manage it well to get a good harvest! ■

The Langstroth hive can give more honey

This is a fairly modern hive (see photo on page 1). It is also called a frame hive since it has frames where the combs are fixed. It has a brood chamber where the queen lays her eggs. She is restricted from moving to other chambers by a wire (the queen excluder). In the super chamber (above the brood chamber) is the honey storage area. The combs are formed on the frames and not on the bars as in KTBH. For harvesting, the frames with honey-filled combs are removed and harvested using a centrifugal equipment. Langstroth hives are relatively expensive, and cost an average of KSh 4,000. You can buy them at the two institutions mentioned above or from private companies such as Honey Care Africa (020 574 448) or African Beekeepers (0722 700 226)

Advantages

- The frames make the combs very strong, especially when transported.
- It produces high quality honey and high yields since combs are not destroyed.
- It allows harvesting of other high-value hive products such as propolis, royal jelly, etc.

Disadvantages

- High initial costs.
- They are more complicated to manage and they require more spare parts such as frames, foundation starter sheets, etc.
- A centrifugal machine is used to extract honey. They are not easily available in Kenya and are expensive to purchase, although groups of farmers can share or even rent one.

Important tips

- Grease the posts on the wire loop to prevent pests from getting into the beehive. Cut any vegetation below the hive for the same reason.
- Never use poisonous material for smoking bees while harvesting honey. Some farmers use foam mattresses, human hair, wild fungal material, cypress or tephrosia leaves to smoke. These are dangerous and spoil honey quality. Use only the allowed material for smoking.
- For packing, use clear food-grade plastic or glass jars.
- Maintain a high standard of cleanliness.

Calliandra is good fodder

I would like to grow calliandra. Please direct me as to where I can get it. Karago from Ngorika 0734 961391

It is a good idea, Karago, to grow calliandra. It is one of the best fodder trees and one of great value, because of its high protein content. It is very useful for adding to livestock feed, especially when they are only fed on grasses like Napier, which are often low in protein.

Calliandra grows to a height of 4 to 6 metres. It requires rainfall that is above 1,000 mm per year. It does better in well-drained soils, as it does not tolerate water logging. Fodder is ready for harvesting in 9 months after planting, and 4 to 6 harvests are possible per year.

Two on-farm experiments and one on-station study were conducted between July 1994 and September 1995 in Kenya to determine the effect of supplementation with fresh fodder of *Calliandra calothyrsus* on milk production. One study used grade Friesian and Ayrshire cows in the second trimester of their lactations. The cattle were kept under zero-grazing systems on small farms in the coffee-based land use system at altitudes of 1500 to 1800 m on the slopes of Mt Kenya. These cows form a pivotal part of the farming system since they produce both milk for sale and manure for crop production. Milk production was normally in the region of 10 kg/cow per day when the animals were fed on a diet based on Napier grass and crop residues, together with 2–4 kg/day of commercial concentrate.

In terms of milk production, adding 3 kg of fresh calliandra had the same effect on yield as 1 kg of additional dairy meal, and at normal production levels, the effects of the two supplements were strictly additive. Calliandra had a marked positive effect (about a 10% increase) on the butterfat content of the milk, a factor that was highly valued by farmers, even though institutional buyers as yet offer no premium price for milk quality. The average small farm can produce enough calliandra fodder to supplement two dairy cows. You can purchase calliandra seed from any farmer or tree nursery near your area. Most district agricultural offices now have an information desk which can also assist. Alternatively, you can buy seeds from the VI Agro-Forestry Project P.O. Box 2006, 30200 Kitale, Tel. (054) 20 139 or 30 283.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Soya beans

Soya - a source of protein

Can you please explain to me how soya beans (*Glycine max*) looks like and in which parts of the country it can be grown? Augustine Tel. 0723 170756

The above photo, Augustine, is soya bean. It is a good crop to plant. Soya is one of the world's most important sources of oil and protein. Cultivation is successful in climates with hot summers, with optimum growing conditions and mean temperatures of 20 to 30 °C; temperatures below 20 °C and over 40 °C retard growth significantly. The crop can grow in a wide range of soils, with optimum growth in moist alluvial soils with a good organic content. Soybeans, like most legumes, help fix good quantities of nitrogen in the soil.

Turkeys need proper care

I am a small scale farmer and I keep turkeys, but I find it very difficult to raise even one chick. Do you have any advice? Stephen Sino Butere.

We understand your problem, Stephen. Young turkeys, (also called poults) are very delicate to rear, as they easily succumb to adverse weather conditions such as cold and dampness in the housing pen. Once they hatch, it is important to confine them with their mother for at least one week. The chicks should have ready access to food and clean water at all times. Unlike chickens, turkeys require feed with a higher protein content of 27 percent from birth to about six weeks; this can be reduced to 18 percent later as they grow. If chick mash is used, then it should be supplemented with a high protein source like fishmeal. Unlike chickens, turkey chicks have problems locating their feed, especially when you use artificial brooders. Adult turkeys require at least 0.35 kg per day of feed depending on their body weight.

Turkeys are ready to breed at approximately one year and will lay about 20 eggs before going broody (sitting on their eggs to hatch). A hen will make its own nest, but dark well-protected nests can be provided. One mating for a hen is enough for the whole egg-laying period.

The eggs will then hatch within 25 to 28 days. Although artificial incubators can be used, eggs are best hatched naturally. Turkey should be raised separately from other birds since they would otherwise bully them and keep them away from the feeders. Keeping them separately can also prevent cross-infection of diseases. They should be kept within a fenced area, and a small area should be thatched to protect them from the rains. In the absence of trees, perches for rest should always be provided. *(TOF)*

Letters to the editor

Useful for our project

We thank you for keeping us informed and educated about organic farming. We are a self-help group of 14 members practising poultry, dairy and horticultural farming and we are looking forward to beekeeping. We came across issue No.14 and found it to be very helpful and informative. We are kindly requesting you to send us a copy of the previous issues and supply us with your monthly editions. We shall appreciate.

Allan Njenga, Chambiti Youth Group, P.O Box 11, Maragoli

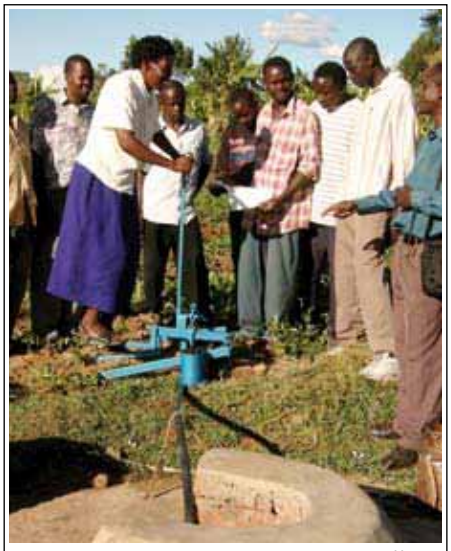
Beekeeping as source of income ...

continued from page 4

vegetation that bees like and which do not flower at the same time during the year. Clever farmers know the floral calendar of their region. They are knowledgeable and are sharp observers of their bees and the behaviour of a bee colony. They plant trees and shrubs according to the needs of the bees and write down this information, because it guides them on when to harvest the honey. Trees and shrubs as hedges do not need a lot of space and do not interfere with other crops. In his book, Thomas Carroll gives very good tips for bee forage in the various regions of Kenya and for beekeeping management.

Managing an apiary

The apiary should be kept clean; cut the grass short and trim branches that reach hives to prevent pests, (e.g. ants) from invading the hives. All the tools that are used for harvesting should be kept clean to avoid infection of the bee colony. Good management means producing good quality honey that fetches a good price. Remember one very important piece of advice at the end: When a beekeeper is harvesting honey, he has to remove the honey from the combs (beeswax structures produced and used by the bees to rear brood and to store honey). For extraction of honey, put the bucket with honey in hot water (warm the honey indirectly); if it is warm enough to drip, sieve it through 3 mm mesh or nylon cloth or mosquito net. But be careful when harvesting: Never boil the honey directly. This destroys important nutrients in the honey which are good for your health and also lowers its value. ■



Miriam Mugwe, a Home Economics Officer shows farmers how to use Å Money Maker pump in Kongoni Division, Lugari District

More copies for our district

This is to acknowledge receipt of five magazines of *The Organic Farmer* posted to our office with thanks. However, the district has seven divisions and we were able to dispatch to four divisions. One was retained at the district headquarters information desk. We would appreciate if you would send us three more copies for the remaining divisions since every division has been encouraged to put up information desks to act as reference points for information. We once again thank you very much and we hope to continue receiving such documents with vital information for farmers.

Augustine K Kenduiwo, DAO, P.O Box 54, Kajiado

Thank you for copies

I do request you to send us your September/October 2006 issue that features plant extracts. Also enclosed are stamps worth Ksh 350 for photocopies of past issues. I very much appreciated being put on your mailing list and have received the November 2006 issue. It has thus encouraged us to practise organic agriculture.

Benson Wasike, P.O Box 9, Kapsara

I also need it

I recently came across a copy of TOF magazine through my neighbour. I found it very helpful, as I have an organic kitchen garden.

M. A. Njoroge, P.O Box 62-0029, Nderu

I have gained a lot from your newspaper

When I got *The Organic Farmer* newspaper last month, I went through and I learned a lot and now I am gaining experience in organic farming. As I am the secretary to our farmers' group, I have to inform you that we have formed a group of 15 members and we have been registered at the District Commissioner's office, and now we have a certificate. Before I summarize, I would like to ask you to remember us with the newspaper when you supply.

Protus M Wasike, Safina Self Help Group, P.O Box 1226, Kitale

Send us past issues

We are a group of 6 farmers who share ideas on how to develop our individual farms. We have been impressed by the information contained in *The Organic Farmer* newspaper No.16 and 17, which were given to us by a friend. We would like to get past copies and continue to receive the newspaper as it is published. We enclose postage stamps worth Ksh.350 to assist you in the noble task of educating us.

Samwel N Ngoru, P.O Box 64, Othaya

I will share the newspaper

Thank you for putting me on your mailing list. I will share the copies with other farmers. 0724 732049

Grateful for copies

We are extremely grateful for the 5 copies sent to us for distribution to our farmers. This is to inform you that we have found it most useful and informative (especially for our extension staff) and would want to request that we get 20 copies every month for distribution to our extension staff and farmers in Baringo district. Thank you and may God bless you.

Dan Odhiambo Guda, DAO Baringo, P.O Box 4, Kabarnet

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!

SMS ONLY

0721 541 590

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

East African Organic Mark is tricky

The planned launch of the East African Organic Standard in Tanzania at the end of May is cause for great concern in the organic industry. At the launch, the 'East African Organic Mark' (symbol) will be unveiled, the purpose of which is to help guide consumers to identify regional organic products. Although this appears to be a step forward in the marketing of organic produce in the region, I fear the use of such a symbol in its current form has major implications for organic producers and may even cause more confusion among consumers of organic produce in the five countries, which now include Rwanda and Burundi.

Organic consumers are willing to pay higher prices (premiums) for foods produced without artificial chemicals and pesticides. These products are globally termed as 'Organic'. But: How can consumers be sure that the products they are buying are organically produced? And how do farmers prove that their products are organic? This is where the issue of verification comes in. There are different forms of verification, the most recognized being certification. This is a process whereby farmers wishing to sell their produce as organic have to undergo a process of inspection by an established certification company. Currently there are three such bodies, namely Encert (Kenya), Tancert (Tanzania), and Ugocert (Uganda) in the East African region. In Kenya, the Soil Association (UK) uses the expertise of EnCert CEO Musa Njoka for their inspections of export organic produce.

National identities

Returning to the East African Mark, the Mark neither claims nor indicates that products bearing it are certified. Certified producers in the three countries are currently acknowledged by consumers through certification symbols of their respective recognized certification body (Encert or Tancert or Ugocert). With the huge consumer awareness campaign for allowing the use of the East African Mark alone, producers may no longer require the national certification symbols. This may result in the three national certifiers becoming inspectorates, forcing them to forfeit their corporate identities.

Secondly, what will happen if the certification companies refuse to inspect against the East African Standard for fear of losing their identities? If they choose that option, it means the East African Mark will not see the light of day. I feel we should be supporting our local certification bodies. In the worst case scenario, what if our pioneer certification bodies threw in the towel? The resulting impact would be disastrous; the industry would be back to square one. Our farmers would be left in limbo. The local organic industry would collapse.

Confusing customers

In a brighter scenario, should the Mark succeed, as a producer I would want to use the promotional advantage of the EA Mark as well as guarantee consumers my products are certified, however the cost implications of double labeling may consume any premiums I may realise on my products. Furthermore, as the Mark can be used without a certification symbol, there is a real danger that producers could use the Mark without third party verification by using a more lenient verification system. This in itself will undermine the integrity of the Mark. It may in turn steer certified producers away from using the Mark, thus causing confusion in the organic industry.

Certification symbols

I feel that for the Mark to have any meaning, it must be used in parallel with a certifying body's symbol. This will guarantee the consumer that the products are certified. One way to do this would be to incorporate national certification bodies' symbols into the Mark, indicating clearly that the products are certified organic. Without the certification symbols, the Mark has no relevance.

Su Kahumbu ■

Market Place

Jomo Kenyatta University of Agriculture and Technology University (JKUAT) has the following items of interest to farmers:

i) **Mushroom spawn (seed)**: Buttons (Agaricus) – Ksh 600 per litre; Oyster –Ksh 600 per litre; Shiitake – Ksh 1000 per litre; Ganoderma – Ksh 1000 per litre.

(ii) **Organic fertilizer**: packed – Ksh 24 per kg, loose – Ksh10 per kg.

(iii)**Red earthworms**: Ksh 2000 per kg.

iv) **Tissue culture banana varieties**: Chinese Dwarf, Vallery, Grand Naine, Giant Cavendish, Kampala, Matoke, Ugandan green, Williams's hybrid, potted bananas– Ksh 85 per plant.

(v)**Aloe seedlings**: Tissue culture aloe seedlings–Ksh 40 per seedling.

(vi)**Chaff cutters**: Manual– Ksh 24,500; mechanized– Ksh 34,500. Contact the Business Manager JKUAT Enterprises for all the above items at Tel. 067 52420, 0736 524200, 0724 256696.

(vii) **Mushroom production training**: Farmers interested in training for mushroom growing can contact Patrick Kanyi, Tel 0721 167 244 or Tel. 067 52420.

Need organic parsley? I am a farmer based in Limuru. I have about 2000 fully mature plants of organically grown parsley under shade net. Unfortunately I cannot seem to find a buyer. Please contact Irene Ngugi, Field Agronomist, USAID - Kenya Horticulture Development Programme, MPPS Building, Mombasa Road, P. O. Box 3074, Nairobi, 00506 Kenya. Tel: 020 - 556728 / 556807 Fax: 020 – 556804.

Fish for sale: We run a fish hatchery called WISE Fish Hatcheries in Bungoma. We supply quality catfish and tilapia fingerlings. Contact us on Tel. 0723 006508. We can arrange to deliver to the nearest town.

Clarification

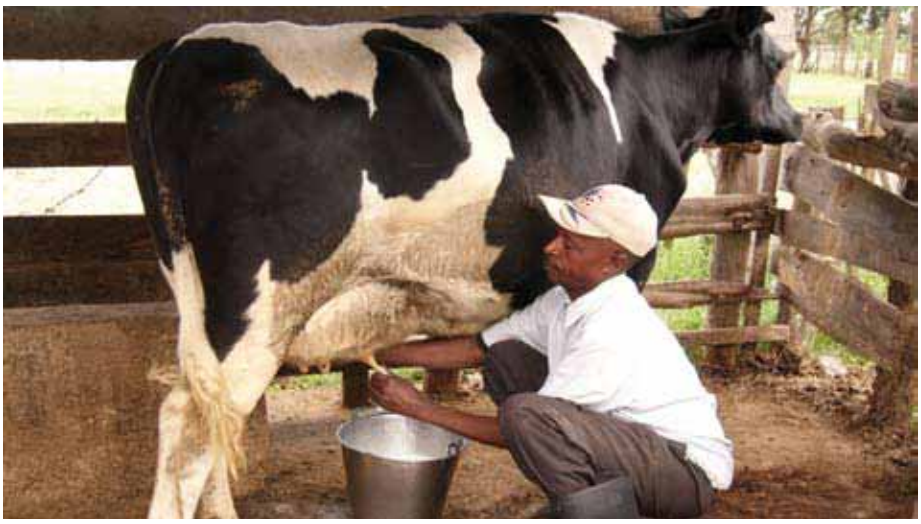
In our last month's issue of *The Organic Farmer*, there is a mix-up of the two passion fruit varieties described on page 2. *Passiflora edulis* is the purple variety and does well in the cool highland areas and is mainly grown for the fresh market, while *Passiflora flavicarpa* is the yellow variety that grows well in lowland areas mainly at the coast, and is used for processing.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 26 July 2007



Many farmers lack good quality dairy cows to increase milk production *Photo TOF*

Cows too expensive for farmers

Small-scale farmers are yet to benefit from increased milk prices, due to lack of good-quality animals.

The Organic Farmer

One of the most important changes that have taken place in the agricultural sector in the last four years is the revival of the dairy industry. The revival of the Kenya Cooperative Creameries (KCC), together with increased competition from the many private processors, has led to good prices for milk and its by-products. However many farmers are yet to reap the benefits of these good prices. One reason is that most farmers had already sold their dairy cattle when the KCC, which was the major buyer of milk, collapsed in the 1990s due to mismanagement. The majority of our farmers lack good-quality dairy cows that would enable them to increase their milk production and improve their earnings. One of the questions most frequently asked by farmers to *TOF* is how they can acquire good dairy cows.

To purchase a quality dairy cow nowadays is not easy, as the prices have suddenly shot up. Even poor-quality heifers today sell for between Ksh 15,000 to 20,000, and high-quality breeds now go for between Ksh 100,000 to 120,000. This is beyond the reach of many small-scale farmers. A few farmers have managed to restock through credit from the Agricultural Finance Corporation (AFC). In order to obtain a loan from the AFC, a farmer has to deposit their title deed as security. Since the majority of farmers have no title deeds, they therefore cannot qualify. It is really sad that there is no credit scheme that can assist most of Kenya's small-scale farmers to acquire good-quality dairy cattle.

Kenyan milk consumption per person is amongst the highest in the world. More than 600,000 smallholders, with between one and three cows, currently produce 80 per cent of Kenya's milk. ■

TOF on air!

On Thursday of every third week of the month, you can hear *The Organic Farmer* on the Kiswahili Service of KBC from 8.30 pm to 8.45 pm. Learn more about organic farming! In the next programme we will talk about legumes, on *Thursday 19th July, 2007*.

in this issue

Rabbits produce high-quality meat. Their manure is suitable for organic farmers. First of all, rabbits can provide farmers with an extra source of income. *Pages 4 and 5*

Dear farmers,

If you hold this issue of The Organic Farmer *in your hands, you might feel that something has changed. You are right. We have used a slightly thinner paper, and for one simple reason: We have increased the number of copies from 14,000 to 17,000. This means that with nearly the same amount of money, we can print 3,000 more copies for you.*

No doubt, the story of The Organic Farmer *magazine is a real success story. In the last few months, we have been receiving at least 10 new applications from farmers' groups every week. At the same time we get at least 10 letters from farmers' groups asking for more copies (indeed almost all letters to the editor on page 7 are sent by farmers who want more copies). We reach nearly 2,000 groups throughout the country. According to our research, every issue is read by an average of six people– that means that we reach about 100,000 farmers every month.*

We thank the Swiss foundation, BioVision, for the commitment it has shown in helping small–scale farmers in Kenya. BioVision supports both production and delivery of the magazine in the hope that farmers will use this free information to improve their farming methods. For us, investing in farmers' education is a worthwhile venture.

Several times people have asked us these simple questions: Do farmers try out the various tips you give in their day-to-day farming activities? Are they changing to organic farming? Of course, we do not know how many farmers take our advice seriously. We do know, on the other hand, that farmers are cautious people; they do not want to make mistakes and lose their precious crops. But we do have some indications that farmers are really interested in trying some of the ideas we provide in TOF. After we carried articles on dairy goats and mushrooms production, dozens of interested farmers, eager to start these enterprises, made enquiries to our magazine and to the addresses we had given.

Every month, we send quite a number of past issues of the magazine to farmers who want to catch up with articles they missed. We have tried to do our part by providing you with the appropriate information, but you farmers also have to do more to make farming a rewarding occupation.

Editors

MY OPINION

In mid-June, the Government released 860 million for payment to farmers for maize delivered to the National Cereals and Produce Board in January and February this year. Up to now quite a number of farmers are yet to be paid for maize delivered in the same period. One can only imagine the problems these farmers have faced in purchasing of essential inputs such as fertilizers, seeds and even other expenses such as payment of school fees. What would the Minister of Agriculture and those responsible at the Cereals Board say if they got their salaries six months late?

John Karanu, farmer, Nakuru

The Organic Farmer

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Find a safe place for beehives

The apiary is a place where beehives are kept. It is important to look for an ideal site.

Eliud Muli*

After our articles appeared on beekeeping (*TOF* Nr. 25, June 2007), we received many responses from farmers wanting to know where to place the beehives. That is why we publish additional advice here from a bee expert at ICIPE. Once all the equipment has been acquired, the next thing is to decide where to put the apiary. Simply said, an apiary is the site where a number of honey bee colonies are located.

Where to place hives

Finding an ideal site is sometimes a problem. Some major considerations are listed below.

• Owing to the defensive nature of African bees, it is not advisable to place hives right on the farm but rather near it (about 150 – 200 metres away from the crop or homestead).

• Hives should be placed in such a way as to minimize drifting (accidental entry by bees returning from a flight into the wrong colony).

• Hives should not be too far apart, to reduce the amount of walking by the beekeeper when servicing the colonies at inspection.

An ideal apiary site should be:

• quiet and away from public utilities (schools, hospitals, playgrounds), and noisy commercial and industrial areas;

• near a freshwater supply – river banks, fish ponds, lake, dishes of water or dripping tap;

• near food (pollen and nectar) sources and crops that need pollination– citrus, avocado, coconut, eucalyptus, acacia, etc.;

• fairly dry – not in swampy areas; humid areas promote fungal diseases and hinder proper honey curing;

• away from unfriendly neighbours and hidden to avoid vandalism;

• easily accessible to the beekeeper throughout the year, to ensure that bees can be moved away at short notice should the need arise;

• with sufficient shade, especially during hours of the day when the sun is hottest; sheltered from winds;

• far from farms where there is insecticide usage.

Shrub or hedge rows that separate the hives both from each other and from dwellings can help minimize stinging incidents. If bees are particularly defensive, it may help to work with the colonies at dusk.

How to place hives

After beehives and sites have been acquired, the next step is to prepare hives for installation:

• Clean the hives to get rid of dirt, spider cobwebs and other debris.

• Bait the hive (beekeepers use raw beeswax or propolis among other baits, and rub them against the inner walls of the hive).

• For installation, a hive can be hung from a tree or from posts or installed on a platform or a rock. This is a decision for the farmer to make – according to his personal preference or depending on prevailing conditions in their locality.

Use of wires

Advantages of using hanging/suspending hives:
- It is cheaper compared to constructing hive stands.
- There is less danger from predators (e.g. lizards) and vandals.
- Suspended hives are better protected from floods and are not easily carried away by flood water.
- It is easier to control ants.

Disadvantages
- Suspended hives usually swing during inspection and bees tend to become more defensive.
- It is not easy to change the location of the hive.

Use of platforms

Advantages of installing on platforms:
- It is easy to place or remove the hive from the stand.
- The location of the hive and stand can easily be changed.
- Installed hives do not swing during examination, thus bees are not unduly disturbed.

Disadvantages
- Grazing animals can easily knock the hive over. A colleague from Uganda once narrated to me the chaos in a rural village when a pig strayed into an apiary and knocked down a hive full of bees!
- Predators can more easily gain access to the hive.
- It is more tedious and expensive to make reliable stands than to buy metallic wires for hanging hives.
- Installed hives are more prone to vandalism: it is a matter of only lifting the hive and carrying it away.

** Dr. Eliud Muli is a scientist at ICIPE in charge of Apiculture* ■

Many farmers have problems with tomatoes

Every week we receive questions asking for advice on early blight, late blight and spider mites. Although we have answered such questions in previous issues, we again give some helpful tips. Organic farming standards allow the use of copper oxychloride (WP) in the fight against blight. We will write about spider mite in the next issue.

Early blight

Strong plants grown in humus-rich soil and fed on compost are better able to resist diseases such as early blight.

Seeds: Early blight is a fungal disease and is seed-borne. The first step to avoid damage is to buy certified disease-free seeds, and to use resistant varieties, e.g. Summerset F1, Zest F 1.

Transmission: The fungus survives from one season to the next in residues of infected plants, particularly if the soil is dry. The spores (the microscopically small 'seeds' of a fungal disease) are formed on infected leaves, stems and fruits, and can be spread by the wind and splashes of water. A combination of warm weather and rain produces serious outbreaks, praticularly if plants are stressed by poor nutrition, nematode attacks or by having too many fruits.

Planting: Do not plant consecutive tomato crops on the same land from one season to the next. Do not rotate tomatoes with related crops such as potatoes, peppers or eggplant. Stake plants to keep them off the soil and keep tomatoes free of weeds. After harvest, residues should be removed from the field or destroyed immediately.

Control: In organic farming, fungicides except for copper oxychloride are not allowed. There are several plant extracts that help in controlling fungal diseases, including:

- African marigold: Fill a drum ½ to ¾ full of flowering plants. Leave to stand for 5 to 10 days. Stir occasionally. Strain before use. Dilute the filtrate liquid with water at a ratio of 1 part filtrate to 2 parts water(1:2). Add 1 teaspoon soap to every litre of the extract.
- Garlic: Bulbs may be dried and crushed. Add water to the powder and spray.
- Milk: Spray every 10 days with a mixture of 1 litre milk to 10 – 15 litres water.

Tomato leaves and fruits affected by late blight

Late blight

Late blight is one of the most serious diseases in cooler and moist conditions and may completely and rapidly destroy the crop. The leaves turn brown; under humid conditions, a white dusty layer that contains the spores can be seen on the underside of the leaves.

Seeds: There are no certified disease-free seeds on the market.

Transmission: When the weather conditions are cool and moist, the spores spread very fast. Splashes of water can transfer the spores from plant to plant. Wind can carry them much greater distances.

Planting: If you plant tomatoes in a field after Irish potatoes, remove all tubers, as the remaining potato tubers in the soil after harvest can be a source of the disease for crops which follow. Crop rotation with crops that are not from the tomato family (e.g. maize, beans, sukumawiki or cabbages) for 3 to 4 years helps to break the disease cycle. After harvest, remove the residues or dig them deep in the soil. There, the fungus does not persist for long.

Control: Use wider spacing. Prop up the plants to keep them off the soil. Mulch to reduce splashes. Pruning will increase air movement, reduce humidity within the crop and thus reduce disease intensity. If you irrigate, do it in the heat of the day; this allows the crop to dry before nightfall and reduce transmission and development.

In wet weather, sprays should be applied as soon as the disease is seen. In organic farming chemical fungicides are not allowed. There are plant extracts that help:

- Onions: Use 100 grammes of leaves per 1 litre water; let it stand for 4 to 7 days in a covered container before spraying.
- African Marigold: Crush 100 – 200 grammes of leaves, roots or flowers. Pour on 1 litre boiling water, soak for 24 hours, add 1 litre of cold water, spray. ■

All Photos courtesy of ICIPE. Recommended further reading:
A Guide to IPM in Tomato Production *by Ana Milena Varela, Abdurabi Seif and Bernhard Loehr, published by ICIPE Science Press, Nairobi 2003.*

Rabbits are good for meat and income

Rabbits provide quality meat and manure; they are also a good source of income.

The Organic Farmer

Rabbit-keeping is one of the simplest farming activities, although it is not very common in Kenya. Many people keep rabbits as a hobby or as pets. If kept clean and well fed, rabbits take a short time to mature. There are three common breeds:

California White: This rabbit is white in colour with black ears, nose and tail. It weighs 7 to 8 kg. With good spacing, it is able to kid (produce offspring) four times in a year, giving around 8 kids each time.

New Zealand White: This rabbit is pure white in colour. It weighs approximately 8 kg. It also kids four times in a year with good spacing. It can produce between 7 to 15 kids each pregnancy.

Flemish Giant: The colour of this rabbit is light grey to black-blue. It weighs 6 kg when fully grown. When cross-bred with other breeds, the offspring reproduces even more than the parents. It is also bigger in body size.

Meat not the only benefit

The most important benefit of rabbits is their meat. As yet, the meat is locally not very popular as in many other parts of the world, but in Kenya rabbit keeping is slowly becoming more popular. In Kenya a mature rabbit weighing 7 kg goes for an average of Ksh 500. Many local hotels prefer rabbit meat to chicken meat. According to John Mucheru, an extension officer with the Dairy Goats Association of Kenya (DGAK), rabbits have many more benefits:

Godfrey Gichuhi with some of his rabbits

Rabbit urine: The urine contains a lot of ammonia and uric acid. It can be diluted with water at a ratio of 1:7 and applied on crops as a fungicide that helps to control most fungal diseases in plants. The urine also acts a foliar feed because of its high ammonia content.

Rabbit dung: The droppings are rich in nitrogen and phosphorus. Added to the soil, it helps give plants resistance against attacks by pests and bacteria.

Proper feeding is important …

Organically grown rabbits have a higher nutritional value compared to conventionally kept rabbits (rabbits fed with commercially produced feeds). To rear rabbits organically, one has to select their feed carefully. Rabbits can feed on all weeds that goats feed on. On these feeds it is advisable to add Mexican Marigold; this plant contains certain substances that control parasites. To protect rabbits against intestinal worms, farmers should feed them with Nasturtium (Indian cress).

… and so is cleanliness

If rabbits are neglected, they are susceptible to the following diseases:

Coccidiosis: The disease occurs when feeds are contaminated with dung (especially from poultry) or when they feed on wet fodder. Signs and symptoms of coccidiosis include diarrhoea and inability to feed. The best way to prevent this disease is to ensure the rabbit house is always kept clean. In case of an outbreak of the disease, amaranth seeds and cucurbit (plants of the cucumber family such as cucumbers, zucchini, melons, etc.) seeds are used to provide lost energy and nutrients to the rabbits. Aloe vera (the white milky liquid in the leaves of the plant) can be used to prevent or cure the disease.

Pasteurelosia: Occurs when the rabbits are exposed to the wind. It affects the lungs. A sign of this disease is abnormal breathing. The only way to prevent the disease is by protecting the rabbits from the wind. This can be done by covering the hutch at night.

Pneumonia: This disease arises by exposure of rabbits to wind. It also occurs when the droppings are trapped in the hutch. The decomposing waste releases ammonia which when inhaled into the lungs causes pneumonia. Protection of rabbits from the wind and making sure that droppings do not build up on the floor will help to protect the animals.

Californian White

Flemish Giant

New Zealand White *(Photos TOF)*

Good housing

Rabbits are very sensitive to diseases if not kept well. They rarely become sick if well taken care of and kept in proper housing and space for rest and movement. The hutch (rabbit house) should be properly built to provide a comfortable and safe place for their stay. The hutch should be 1 metre above ground to keep off predators. Rabbits naturally like dark places. The hutch should be a bit dark but with some light.

The leeward side (the side sheltered from wind) should be completely shielded. The material used to build the hutch should not leave any gaps that will allow wind into the hutch. The floor should be well constructed such that the panels or wood or sticks allow the free flow of urine. Farmers who want to trap the urine or droppings should place a trap (basin) under the hutch. ■

"My family likes rabbit meat"

Peter Kamau, Ruthagati

When 65 year-old Godfrey Gichuhi, a farmer in Ruthagati village in Karatina, started rabbit-keeping 16 years ago, fellow farmers in his village did not take him seriously. But he has proved them wrong. Rabbits have become a major source of his income, as well as providing his family with a good supply of high-quality meat.

"I keep rabbits for several reasons, the most important being the fact that everyone in my family likes their meat, which is soft and nutritious. The second reason is that they are a good source of income, and thirdly, because they provide me with high quality compost that contains all essential nutrients that the soil needs for crop production. I no longer use chemical fertilizers in my shamba," he says. Gichuhi's passion for rabbits started in 1991, when he attended a training course at the Kenya Institute of Organic Farming (KIOF). After the training he bought five rabbits from the Ngong Farmers Training College, where he received further training on rabbit husbandry.

Today, Gichuhi is one of the most prominent rabbit farmers in the country. Every year he has scooped the top prizes during annual Agricultural Society of Kenya shows in various parts in the country. Apart from being a major supplier of rabbits to farmers, schools and hospitals, he has been able to fill orders from across the borders in Tanzania and Uganda. Whenever the Ministry of Agriculture officials get enquiries from buyers, they refer them to him, which has increased his customer base and income. In a year, Gichuhi sells between 300 to 400 rabbits, at an average farm gate price of Ksh 300 to Ksh 400, making him an average of Ksh 100,000 a year. Sometimes the rabbits reproduce so fast that he has difficulties finding markets for them. He is now planning to set up a website on the internet to tap buyers in the international market. Gichuhi also keeps three dairy cattle and grows coffee and other food crops in his 7½ - acre (3 ha) farm.

Gichuhi's awards for rabbit keeping (TOF)

Group campaining for market

Together with other farmers who have embraced rabbit keeping, they have formed the Mathira Rabbit Keeping and Horticultural Fruit Growers. The 80-member group is carrying out a major campaign to educate fellow farmers and consumers on the benefits of rabbit meat and their production. "Many people who could not touch rabbit meat are now becoming consumers and they have started keeping them. This is a sign that many Kenyans could turn to rabbits as a cheap source of protein since they are easy to rear and require little space", Gichuhi adds.

If you need more information, contact Godfrey Gichuhi, P.O Box 137, Karatina, 0720 406 195

What can I feed rabbits in the dry season?

This question from Wellington Njeru, Kianyaga, and other farmers is easy to answer. Rabbits like to eat grass, weeds, garden and kitchen waste, however, during the dry season farmers have difficult time because most of these feeds are in short supply. Rabbits need to feed on concentrates such as maize bran and pollard at this time of the year; however many farmers cannot afford to buy these concentrates as they are too expensive. Gichuhi cuts arrowroot tubers or bananas into small pellets, which he then dries and feeds the rabbits. He also feeds them with maize. Pellets are nutritious and can sustain the rabbits when other feeds are not enough. Rabbits can also be fed on good quality hay. To fatten them, rabbits can be fed with dairy meal, porridge or even bread. ■

Take care of rabbits

Many farmers keep animals in unhygienic crowded cages without adequate light and air. Organic Farming Standards demand that animals are kept in a clean environment with adequate space for movement. They should also be handled in a humane way to reduce injury and stress. Do not hold rabbits by the ears.

Northern leaf blight is difficult to control

How can one deal with the northern leaf blight? Despite good cultural practices in subsistence farms, the disease is still persistent in maize.

***Z.M. Kinyua** **

As with any problem, proper diagnosis (identity) of a disease is important in determining how to control/ manage it. Assuming that the farmers raising the question on how to manage northern leaf blight have correctly identified the disease, the following highlights might be useful:

1. The disease northern leaf blight is caused by a fungus known as *Exserohilum turcicum*, which attacks maize. The disease is also referred to as Turcicum leaf blight.
2. The disease is particularly damaging in high-altitude areas (above 2000 metres), under cool, humid conditions. This is opposed to the southern leaf blight (caused by the fungus *Helminthosporium maydis*) and northern leaf spot (caused by *Bipolaris zeicola*, also known as *Helminthosporium carbonum*), which are prevalent in warmer, humid environments.
3. Northern leaf blight may be controlled by applying the following measures, preferably in combinations:

Control methods

Field sanitation: Destroy diseased plant remains, for instance by ploughing under the residues soon after harvesting dry maize, in order to reduce the survival of the fungus. This will prevent attacks on a subsequent season's crop. Removal of lower leaves if they are heavily attacked is also useful in reducing disease spread.

Crop rotation: Avoid planting maize in the same field during consecutive seasons. Rotation allows the fungus to die due to lack of a host on which to multiply. Again, this is for the protection of subsequent maize plantings.

Use of resistant varieties: A variety named EH05272 has been reported to

continued on page 7

Watermelons don't like it too wet

What preventive / curative means on watermelons are possible in organic farming?

Watermelon and all other plants from the same family, butternut, pumpkin, zuchinni cucumber, etc., generally all suffer from the same diseases. This is a family group that is prone to suffer from viral, bacterial and fungal diseases.

It is extremely important therefore that these plants are kept as healthy as possible. Have you ever noticed how the strongest and largest pumpkins grow around compost pits? In learning from this we realise these plants need a lot of nutrition, they are heavy feeders.

To avoid heavy fungal infections on the leaves that are normally due to powdery mildew or downy mildew, we must recognise the conditions in which fungi thrive, and avoid them. Fungi thrive in areas of high humidity. Thus, when planting in areas of high humidity, make sure to have adequate spacing between the plants, resulting in good aeration around each plant.

Further to this, plants that are in areas with water logging or too much water are easily subject to soil-borne bacterial diseases. This is obvious when the plant starts to wilt and leaves easily rot off the main stalk. It is wise to make sure soil drainage is very good and irrigation is controlled if using this method of watering. Overhead irrigation and rain will also result in the spread of both bacterial and fungal diseases in this plant family group.

Remove infected plants

Finally, these plants can also be subject to virus diseases. This is when the leaves, especially the new growing ones, are mottled, veiny, curled and scrawny looking compared to healthy leaves. Insects and pollinators can spread viral disease from plant to plant. In the case of viral and bacterial infections, it is best to lift the entire plant as soon as you spot the infection and destroy it, preferably by burning.

Fungus infections, however, if detected early can be treated organically the following ways:

- Spray with milk diluted with water 1:5
- Soak 4 kg stinging nettle in 10 litres water, leave for 7 days then spray
- Spray with neem solution
- Spray with Thiovit (sulphur, accepted in organic farming and available from most agro- veterinary shops). ■

Water melons are heavy feeders

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

What about hedgehogs?

How can I control hedgehogs and squirrels?

Squirrels love to eat seeds and often dig up newly planted butternut , zuchinni, cucumber, etc. Fortunately I do not have the problem on my farm, though I have heard about a farmer who does the following. After planting, he sprinkles dried crushed chillies around and over the seedbed or seed holes. Squirrels love to pick the seed in their hands and chew on them. As they walk over the chillies, their feet and hands are contaminated. The resulting chillie taste soon deters them from the field or area.

I imagine the same application of crushed chillies may be a good deterent to hedgehogs, though hedgehogs generally feed on small insects, slugs, snails, beetles and worms and are said to be insectivores. It is not likely they are damaging your crops or seeds. On the contrary, they are helping to control the bug population in your fields and should be encouraged. In many parts of the world especially the UK and other European countries, organic farmers encourage hedgehogs into their fields by creating conducive habitats, for example hedge rows, for the little animals. Some farmers even feed them to keep them around when insect populations area low! ■

Guinea pigs are nutritious but not popular

"Can you print something on Guinea pigs?" asks a farmer (0723 006 508). They can play a major role to promote farm waste recycling and produce quality protein for human food".

You are right! Guinea pig meat is rich in protein, low in fat and cholestrol and is described as being similar to rabbit meat or the white meat of chicken. These animals, a little smaller than rabbits, are a staple food for the population of the Andes, the high mountains in South America. In Peru for instance (28 Mio inhabitants), people consume an estimated 65 million guinea pigs each year. Due to the fact that guinea pigs require much less room than traditional livestock and reproduce extremely quickly, they are for rural and urban families a more profitable source of food and income than many traditional animals, such as pigs and cows. Guinea pigs were once popular laboratory animals for scientific research. Since the middle twentieth century, they have been replaced in laboratory experimental test in many countries primarily by mice and rats.

In Africa and Kenya people tend to see guinea pigs more as rats, they refuse to eat them. In April 2007, the *Daily Nation* wrote an article about a farmer in the outskirts of Eldoret, who is rearing guinea pigs and is totally desperate: he can not find buyers. (*TOF*) ■

Letters to the editor

Radio programme helped us know you

Khwisero United Farmers Organization is a community–based civil society organization currently operating in four sub–locations of Khwisero Division with the following objectives:

- Access to marketing systems of their products
- Access to modern farming technologies
- Soliciting for assistance from the government and other well wishers and addressing food security within our divisions.

On farming technologies, we collaborate with research organizations such as ICIPE, KARI, KEFRI, AATF etc. to reduce striga weed, which is a major problem affecting food security in this region. In your programme aired over the radio, you mentioned *The Organic Farmer* magazine of April which featured mushroom farming. Our group is very much interested and wishes to kindly request if you could be sending us copies of your monthly publication. We will ensure that they reach all members of our group. We enclose a copy of our registration certificate.

Drecky E. Okeno, P.O Box 125-50101, Butere

Dear Drecky, we will send you the issue on mushroom growing. Let us know about your experience in the fight against striga. We are very interested to know more about the problem.

Northern leaf blight a problem

continued from page 5

be 'resistant' to Turcicum leaf blight. It is a late-maturing variety suited to highland areas (between 1800 – 2200 m). More information on availability of EH05272 seed may be obtained from KARI's Maize Breeding Programme or Dr. George Ombakho (Email: irmaktl@africaonline.co.ke). You may also assess various varieties that are available to you for their tolerance/resistance to the disease by planting them in portions on the same field; select the most promising ones (the ones that show no sign of the fungus) for large-scale planting in subsequent seasons.

** Dr. Kinyua is a plant pathologist at the Kenya Agricultural Research Institute, National Agricultural Laboratories (KARI–NARL), Nairobi.*

Our soils improved

We are a registered group dealing with dairy goat breeding under the Dairy Goat Association of Kenya. As an organized group of 25 members we would be grateful to be sent your educative magazine. We learned about it from a friend and found it useful because we also practise other farming activities in our farms apart from goat breeding. For instance we do poultry keeping, dairy farming, maize, potatoes, carrots and beetroot growing among other crops, using EM compost and plant extracts. This group is in Malewa location, Kipipiri Division of Nyandarua District. As an organic farmer, I have experienced soil improvement in texture and fertility since I started using EM and compost in my farm. Also helpful insects like earthworms, sugar ants which attack aphids and cutworms in the farm have increased tremendously. Thank you.

Mwangi Kimani, Kimuru Dairy Goat, P.O Box 5, Wanjohi

Tumejifunza mengi

Nikiwa msikilizaji sugu wa kipindi cha sikio la mkulima kila alhamisi, nimeweza kuwasikia mkizungumzia kuhusu kilimo hai. Ama kwa kweli nimeweza kujifunza na kujiongezea maarifa mengi ambayo ninajaribu kuyatimiza katika mradi wa kijamii ninaoendesha. Hivyo basi ili kuweza kufaridi vyema na kuweza kuwanufaisha wanakijiji wenzangu hasa kutokana na mbinu bora za kilimo hai, naomba mnitumie nakala moja au zaidi ya *The Organic Farmer* hatimaye mko huru kuutembelea mradi huu ili kujionea yale ninayoyafanya mathalani ufugaji wa mbuziwa maziwa, ngombe wa maziwa, ufugaji wa nyuki, ufugaji wa kuku wa mayai na mengineo mengi. Asanteni sana.

Ali H Kimani, Care for the Earth Farm Project, P.O Box 34-40602, Ndori

Tushirikiane

Kwanza pokeeni salamu zangu nyingi sana, nina wapongeza sana kwa kazi yenu nzuri sana ambayo imetuelimisha vilivyo ikiwa kwanza mimi ni kijana ambaye ninajishughulisha na kazi ya shamba, kama vile upandaji mboga na mimea ya migomba nitafurahia sana nitakapoona tunashirikiana vilivyo kupeana usaidizi kwa kazi hizi zetu. Kwa upande wa lile toleo nitashukuru sana nitakapopata ili nizidishe maarifa zaidi kwa yale ambao yalikuwa. Sina ujuzi nao kwa vile ni mara yangu ya kwanza kuwasiliana nanyi tuzidishe ushirikiano kwa shughuli zote. Sina la ziada ila hayo.

Ronald Ben Nzomo P.O Box 78, Mariakani

I heard you on radio

I am a small– scale farmer, and became interested in organic farming after listening to your programme "Kipindi cha sikio la mkulima". Now, please can you send me the magazine. I believe this will help me much in organic farming.

Lawi Mutuma, P.O Box 6383 00300, Nairobi

A valuable magazine

We are farmers in Ol Joro Orok, Nyandarua District. We have found *The Organic Farmer* magazine very helpful. We are interested in becoming organic farmers. Include us in your mailing list.

Peter Kambo, Oraimutia Primary, School, P.O Box 344, Ol Joro Orok

More on zero grazing

We recently received a copy of your very useful magazine from another group in Kangundo. We would like to receive future copies of the magazine as our 25 members were all very impressed by the quality of articles and the many useful tips for dairy farmers. Please kindly put us into contact with somebody who can advise us whether we can conduct our zero grazing in an organic manner, what advantages there will be, and the costs sacrifices involved.

Soo Nzioka, Itethye Ngutethye Group, P.O Box 814, Machakos

Dear Soo, we will send you some copies of an article we carried in our magazine in our March 2007 issue. We hope this will provide your group with the information you need.

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!

SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Blackjack is not just a weed!

As we are getting on with our farm work, I would like to share some practical advice on the so called "weeds". In almost all systems of cropping, weeds are quoted as a big nuisance, causing yield disadvantage to farmers. To get rid of these weeds, herbicide use is promoted by most farmers and the cost is very high. Therefore, agro-management of these weeds in a useful manner is important.

Keep weeds as secondary crops. Farmers should be taught the value of these so–called weeds and how to harvest and utilize them for their own well-being. Let me take you quickly through a known plant (called a weed by many): the blackjack or Latin, *Bidens pilosa*. Honestly, this plant does wonders both health–wise and environmentally in general. *Bidens pilosa* is used as a vegetable (leaves), medicine (for intestinal worms, gas remover, natural antibiotic, eye & ear problems, malaria fever etc.); it is helpful as natural fertilizer, fodder and as insect repellant. In our botanical

garden, people normally get amused when they come across a *Bidens pilosa* garden and also when our workers collect the seeds. To be more precise, the plant can earn huge income to many if well utilized. Take a look: 150 grs. of Bidens pilosa tea goes for KSh 150, therefore 1 kg of tea will give you about KSh 1,050. Fellow farmers, just let us be honest when answering this question (you can text me or answer it through *The Organic Farmer*): How much do each of you spend in eradicating such weeds like the one I have mentioned?

Johannes B. Samikwo, Multiplan International Medicinal Conservation, Endebess, 0735 393 608, Fax: 054 311 26, Email: boscojoannes@yahoo.com

Growing seed potatoes in mid-air

The alternative method can produce more seed and is cheaper than the methods used currently.

The Organic Farmer

The International Potato Centre (CIP) has developed a low–cost and affordable technology of fast production of potato seed without exposing it to soil– borne diseases. Local research institutions have inadequate land to multiply basic seed for sale to farmers. The new method known as aeroponics overcomes this problem by growing minitubers from disease-free plantlets in insect-proof screen houses. In this method potato seedlings are grown on specially made frames in such a way that the roots and the tubers grow suspended in the air without touching the soil.

Growing potatoes are suspended in the air

In the normal way, the production of minitubers is done on soil or compost–based substrate which has to be sterilized to kill disease-causing organisms. The new method avoids the need to disinfect the soil with harmful chemicals and keeps it heathy as well. The frames are covered with black plastic to keep out the light and the plants sprayed with a solution of nutrients to allow them to grow. The method is up to ten times more effective than the use of the conventional methods of seed production which produce less seeds.

Seed production cost reduced

The new technology also reduces the seed potato production cost considerably. Results show that up to 60,000 minitubers can be produced in a single 15 x 5 feet screen house. In the conventional production system, only 18,000 minitubers can be produced. Another advantage is that the tubers can be harvested at any size the seed user wants, say from 5 to 30 grammes. The KARI Horticulture Division has shown interest and is seeking funding to establish the technology within the National Potato Programme. ■

Market Place

Training: Baraka Agricultural College Molo, offers training opportunities for farmers, development workers and rural business people. The following courses of one week duration will be offered in July and August 2007: Dairy farming July 1–7, Bee multiplication July 1–7, Dairy farming July 8–14, Sustainable agriculture July 29–August 4, Introduction to beekeeping August 12–18, Bee equipment making August 19–25.The charges vary between Ksh 6000 and Ksh 8000, covering tuition, food and accommodation. The Certificate in Sustainable Agriculture course takes 60 weeks and the Diploma takes 57 weeks.
Baraka Agricultural College
P.O. Box 52 Molo, 20106, Tel. 051 731 091, Cell: 0725 777 421, email: baraka@sustainableag.org

Watermelon: I am looking for buyers of my watermelon fruits. They are not yet ready for the market but interested buyers can get in touch with me. Call Owino Tel. 0727 127128 Siaya.

Beehives for sale: I make beehives of type ORION 12′. Interested farmers can contact me. Karago, Ngorika Tel. 0734 961391 or 0724 245958.

Fish for sale: We run a fish hatchery called WISE Fish Hatcheries in Bungoma. We supply quality catfish and tilapia fingerlings. Contact us on Tel.0723 006508. For orders we can arrange to deliver to the nearest town.

Indigenous trees: I am from Ngorika and I have indigenous tree seedlings for sale. Contact Daniel Mugi 0723 686960.

Indigenous chickens: I have 100 locally bred indigenous chickens for sale. Any buyer interested can get in touch with me. Chairman Kimasa Youth Group Tel. 0729 750707.

Rabbits for sale: I am a farmer dealing with rabbit production, and I am looking for markets. My rabbits are organically fed. Tel. 0724 857878.

Do you know this farmer? John Njagi, a farmer in Malindi would like to get in touch with Stephen Nguyo, a mushroom grower who also owns a hotel in Nyeri town. Do you know Mr Nguyo? Please tell him to contact Mr Njagi on 0722 171 518.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 27 August 2007

Green manure is best fertilizer

Mucuna or crotalaria or purple vetch (pictured) are not just weeds. Used properly, they are the best way to improve soil fertility.

The Organic Farmer

Crop yields in sub-Saharan Africa have hardly increased since the 1960s. The reason for this poor performance is the declining soil fertility in the continent. On 85 percent of the African farmland, the yearly loss of nutrients is more than 30 kg per hectare – much more than on all other continents. The poverty of the African farmers is the main reason. Smallholder farmers in the region do not have the means to access inputs (such as fertilizers) and extension services needed to raise their productivity. At the same time, traditional methods of replenishing soil fertility, such as fallowing or rotations, are no longer possible due to the diminishing size of land holdings.

A way out of this sad development is the use of green manure legumes to improve soil fertility. Legumes such as lablab, desmodium and purple vetch have many benefits, including soil fertility replenishment, soil and water conservation and weed and pest control, not to forget their use in human and animal nutrition. Research done by the Kenya Agricultural Research Institute (KARI) as well as by many other institutes worldwide is pinning much hope on the use of green manure legumes and their addition of nitrogen to the soil (the most important nutrient for crop production). However, the change is slow and is not seen for three to four seasons.

According to KARI studies in the Kenyan highlands, legumes such as mucuna, lablab, crotalaria and canavalia, planted as a monoculture during one season, added 2 – 15 tonnes of organic matter per hectare and were contributing 35 - 150 kg nitrogen under the same area. Research by scientists and farmers in Kisii discovered the benefit of these legumes in intercropping with maize: Before the use of green manure, the yields were 12 bags of maize per acre, and afterwards, the yield rose to 20 bags per acre. *See pages 2 and 3* ■

TOF on air!

On Thursday of every third week of the month, you can hear *The Organic Farmer* on the Kiswahili Service of KBC from 8.30 pm to 8.45 pm. In the next programme we will talk about income generation with dairy goats, poultry and mushrooms. Tune in on *Thursday 20th August, 2007, 8.30pm*!

in this issue

The fruit fly can cause great loss to farmers' mango trees. How can they control this pest? *Page 4 and 5*

Dear farmers,

One of the most frequent requests we receive from the farmers throughout the country is to provide them with financial assistance for buying farm inputs. We lack resources to help the farmers. As much as farmers are eager to improve their production and income, their request is a clear indication that they are unable to access credit in the local financial institutions. This is mainly because of the many conditions attached to loans.

As we have reported many times in this column, there are many low-cost methods farmers can use to improve their production. One of these methods is to incorporate green manure legumes into their cropping systems. These legumes contain important nutrients such as nitrogen that help improve soil fertility. Although many farmers already know that legumes offer a simple and cheap method of improving soil productivity, many have largely ignored this advice; most of them burn bean residues after threshing the beans.

Apart from the above-mentioned financial dilemma, behind this behaviour lies a structural problem. "Many rural households and have neither the labour to devote to careful crop management nor time to learn new techniques", writes Robert Tripp in an article for the British Overseas Development Institute. Added to this is the fact that new technologies such as the green manure method may require some additional labour, even though it would be more than worthwhile.

We would really encourage small-scale farmers to open their minds and try new methods that could help improve their yields. It is only those who are ready to adapt to new ideas that manage to survive in the rapidly changing situation in the agricultural sector. Instead of looking for solutions to their problems elsewhere, it is time farmers tried to find the solution within their own farming systems and practices. In other words, the farmers' future lies in their own hands.

Finally, we have one point to make: Many farmers' groups are complaining that they do not get our magazine from their distribution institutions, or group chairmen do not hand them out. We know that this may be a genuine problem. Those groups who are unable to get their monthly copies can write to us, giving their full addresses so that we can send the magazine directly to them.

OPINIONS

Quote: There is, of course, a gold mine or a buried treasure on every mortgaged homestead. Whether the farmer ever digs for it or not, it is there, haunting his daydreams when the burden of debt is most unbearable.

Quote: Life on a farm is a school of patience; you can't hurry the crops or make an ox in two days.

Quote: No one hates his job so heartily as a farmer. *H.L. Mencken*

Quote: Never answer a question from a farmer. *Hubert H. Humphrey*

The Organic Farmer

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Mixed cropping is good practice

Planting different crops on the same land has many advantages for the small-scale farmer.

The Organic Farmer

A short while ago, farmer Zachary Mwarari sent us an SMS asking us to show the difference between intercropping, mixed cropping and associative cropping. There is no sharp line to draw, as all three are somewhat related, and all three methods play a major role in sustainable and organic agriculture. Since many farmers send us questions on this issue, we feature it together with the article on legumes on page 3.

Different needs

"Associative cropping" means the growing of two or more crops on the same field at the same time. This method relies on the simple fact that different plant species, or even varieties, have different needs for nutrients, water, light, etc. Different plants require different amounts of nutrients to produce a good yield. Some plants have an especially high demand for specific nutrients. While some plants like full sunlight, others prefer half-light. Plants growing in poor soils prefer to be shaded more than plants growing under ideal soil conditions.

There are two different ways to associate crops:

Mixed intercropping: Two or more crops are randomly sown at the same time, and share the same space (row), or can even be planted in the same hole.

Intercropping in lines: Two or more crops are sown at the same time in neighbouring lines in the same field (as Kenyan farmers do with maize and beans).

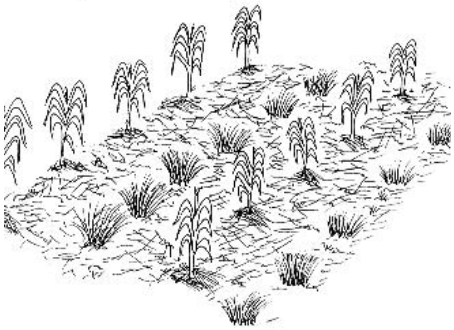
Since different plants have different needs, the root competition should be minimal, and the periods of most active nutrient uptake should not coincide. A farmer has to carefully select the plants that can be planted together (associated):

• Crops with strong rooting systems should be associated or alternated with plants with a weak root growth.

• Planting distances should be such that nutrient competition between plants can be minimized.

• Deep-rooted crops are best grown together with shallow-rooted plants to maximize efficient use of space.

• Mixing broad and small–leafed plants or creepers with plants with taller stems ensures good soil cover and moisture retention.



Row intercropping

• Leguminous crops (e.g. beans) may be grown in association with crops or before crops which have a high demand for nitrogen (e.g. maize).

• Perennial plants can be effectively associated with seasonal plants.

Benefit of associating crops

• Due to the more efficient use of space (over and under the ground), and because of beneficial interactions between the mixed crops, this method permits more intensive production.

• The yields are usually lower for each crop than when the crops are planted separately, but the total yield of the field is usually much higher when two or more crops are grown.

• Diversification is important: Mixed cropping reduces the dependency on only one crop. If one crop fails, the other one will provide food. Intercropping spreads the economic risk among various crops.

• The different crops do not mature at the same time. This means that one crop will remain and provide the much–needed cover when the other crops are harvested. And, there is not so much work in harvesting the entire field at the same time.

• Soil quality improves when nitrogen–fixing plants (such as beans) are mixed with crops or when a green manure legume is planted for this purpose (see page 3).

• Intercropping means that there is less need for rotating crops from one season to the next.

• A variety of crops reduce pest and disease attack compared to single cropping systems. The deterring or attracting effects of some plants helps to prevent pest attack on other crops. Planting garlic or onions next to other plants, for example, helps to repel pests such as nematodes; their smell makes it difficult for the insect to detect its target crop. ■

Legumes are a cheap source of nitrogen

When it comes to fertilizing the soil, green manure legumes are best.Small-scale farmers rarely use this method, however.

Philomena Nyagilo

Instead of spending money on commercial nitrogen fertilizers, farmers can use green manure legumes to improve soil quality and get a better harvest. However, using up space in a small shamba for plants that cannot be eaten is a very strange idea to many farmers.

The green manure method is a pillar of organic and sustainable farming. Green manures are plants grown to accumulate nutrients for the main crop. When they have built up the maximum biomass, they are cut and incorporated into the soil. This fresh plant material will decompose within a short period of time and release nutrients quickly. This is different from crop residues, which decompose at a slower rate and will therefore contribute more to the build-up of soil organic matter than to fertilizing the crop.

Increased yields for the farmer

Green manures penetrate the soil with their roots, bind nutrients and support the infiltration of water into the soil. The contribution of organic matter to the soil from a green manure crop is comparable to the addition of 9 to 13 tonnes per acre (0.4 ha) of farmyard manure.

Leguminous plants fix nitrogen from the air into the soil. This nitrogen enriches the soil and feeds all plants in the area. The portion of green manure-nitrogen available to a crop planted later is usually about 40 to 60 percent of the total amount of nitrogen contained in the legume. For example, a purple vetch crop that accumulated 90 kg of nitrogen per acre prior to plowing down will contribute approximately 45 kg of nitrogen per acre to the succeeding grain or vegetable crop. Lesser amounts are available for the second or third crop following a legume, but increased yields are apparent for two to three growing seasons. Other advantages of green manure are as follows:

• Some green manures can be used as fodder plants, or even to provide food for human consumption (e.g. beans and peas).

• By decomposing, green manures release all kinds of nutrients, including phosphorus, potassium, calcium, magnesium, sulphur, and others. They are accumulated by cover crops during a growing season. When the green manure is incorporated or laid down as mulch, these plant-essential nutrients become available during decomposition.

- Green manures suppress weeds and protect the soil from erosion by wind and water and direct sunlight. Soil cover reduces soil crusting and surface water runoff during rainy periods.

Important points to consider

Green manuring is an inexpensive way to improve soil fertility and the nutrition of the main crops grown. There are some aspects which must be considered:

• Green manuring requires some additional labour.

• If green manures are intercropped with the main crops they compete for nutrients, water and light, but the benefit of having a source of high protein food (e.g. beans) may outweigh this.

• If there is not enough food available in a farmer's family and little space on the shamba, it may be more appropriate to grow a food crop rather than a green manure and recycle the crop residues, or to intercrop a green manure crop with the main crop. ■

How to use green manures

• If you grow green manures in crop rotation, the time of sowing must be chosen such that the green manures can be cut down and worked into the soil before the next crop is sown.

• Green manures need water for germination and growth!

• If legumes and green manure are grown in a field for the first time, inoculation of the seeds with the specific rhizobia (soil bacteria) may be necessary to benefit from nitrogen fixation by the legume; you can find the inoculation material in Kenya Seed Company stores and shops.

• In the undersown method, the green manure is sown at the same time as the main crop or a little bit later, if the green manure grows faster than the main crop.

• The time gap between digging in the green manure into the soil and planting the next crop should not be longer than 2 to 3 weeks, so as to prevent nutrient losses from decomposing green manure.

• Green manures are worked in easily when the plants are still young; if they are taller or too bulky, it is preferabe to chop the plants. The best time to dig in green manures is just before flowering.

• Green manures should be incorporated near the surface of the soil, not too deep: In heavy soils, dig in 5 to 15 cm; in light soils, 10 cm to a maximum of 20 cm!

Legumes: nitrogen factories

All plants need nitrogen to grow well. In theory, there is no lack of nitrogen. Air consists mainly of nitrogen (78 percent), but most plants are not able to take nitrogen directly from the air; they need it in modified form. Some plants, especially from the legume family, are capable of fixing nitrogen directly from the air with their roots, and changing it into a soluble form as nutrients. Some of this nitrogen is spread in the soil and can be used by neighbouring plants. That is why intercropping is important (see page 2). The effect is even better when legumes are dug into the soil. They enrich the soil with nitrogen, and plants growing next on the same field benefit from this readily available nitrogen.

Legumes: Lablab (above), mucuna (below). (Photos courtesy of Top Tropicals)

Protect your mangoes against fruit flies

Fruit flies cause great losses to mango farmers. Here are some methods to control these pests.

Sunday Ekesi (ICIPE)*

Mango production is continually gaining recognition for its potential as a major source of income, especially for smallholder farms. The total area under mango production in Kenya alone is estimated at 16,000 ha. Mango exports from Africa were estimated at 35-40 thousand tonnes annually and worth around KSh 3 billion (US$ 42 million). The EU remains the largest destination market for export from Africa.

Three types of pests

In each region where mango is grown, it is attacked by fruit flies of different types.

• One of the major pests of the fruit fly family is *Bactrocera invadens*. In addition to mango (which is the primary host), the insect also attacks other cultivated fruits such as oranges, tomato, banana, guava, custard apple and avocado.

• Another fruit fly is *Ceratitis cosyra*. In addition to mango, it also attacks guava, custard apple and marula. The insect gradually has been pushed away by other fruit fly species from the lowland areas, but they remain a threat to mango production in the highlands.

• Third in terms of economic importance on mango are *Ceratitis rosa* and its close relative, *Ceratitis fasciventris*. Apart from mango, they also attack a broad range of cultivated and wild fruits.

Fruit flies cause direct losses to mango when the female fly lays her eggs under the skin of the mango fruit. The eggs hatch into whitish maggots that feed in the decaying flesh of the fruit. Infested fruit quickly rot, causing considerable losses in production.

In the past, yield loss on mangoes in Kenya, Tanzania and Uganda due to the indigenous fruit flies range between 30 to 70 percent, depending on the locality, season and variety. This problem became aggravated by the fairly recent introduction of *Bactrocera invadens*, and damage has now increased to between 40 to 80 percent, especially in lowland areas where it is now the dominant fruit fly pest.

Control methods

There are several methods of controlling fruit flies. The approach that is being promoted by ICIPE is to adopt a combination of methods by applying Integrated Pest Management (IPM) techniques.

Baiting technique: The traditional method of fruit fly control is based on use of food baits. The bait attracts the fruit flies from a distance to the spot of application, where the flies feed on the bait, ingest the pesticide and die. The bait is normally applied to a 1 square meter (1 m²)spot on the canopy of each tree in the orchard on a weekly basis, starting from when the fruits are about 1 cm in size and continues till the very end of the harvest. Several commercial baits are available in the market, such as NuLure, Buminal and Solbait, that can be mixed with pesticide such as Spinosad and applied as above. Another commercial product is GF-120 (Success). This bait is already pre-mixed with pesticide (Spinosad) and can be applied using the on-label information on the container.

Fruit flies: Ceratitis capitata *mating*

Bactrocera invadens *male enlarged 800 times (Photos courtesy: Robert Copeland)*

Major problems in the use of baits in Africa is that they are expensive and inaccessible to a large number of fruit growers. Research at ICIPE has shown that a protein bait from brewer's yeast obtained as an industrial by-product provides good control of mango infesting fruit flies when applied in low volumes as spot spray to 1 m² of mango canopy or to the mango trunk. Research is continuing to formulate the bait to enhance its attractiveness to fruit flies. The new bait should be available as an alternative to imported products in the very near future.

Soil inoculation: During development, mature maggots of fruit flies drop from the fruits to the ground, burrow into the soil and form a resting stage called the puparia. An important part of fruit fly suppression research at ICIPE includes soil treatment with a fungal pathogen to kill the mature maggot and puparia. The active ingredient in the granules is a fungus called *Metarhizium anisopliae*, a naturally occurring fungus that is used worldwide as a biological pesticide for controlling different kinds of insect pests. The fungus is formulated as granules and can be manually distributed by hand and then raked into the soil under the mango canopy. Application is usually done once in

continued on page 5

Healthy Tommy mangoes (L). Infested mango fruit full of maggots(R). (TOF / R. Copeland)

Common mango varieties grown in Kenya

A mango orchard should be kept clean to prevent pests and diseases. Good care can improve productivity and income for farmers.

The Organic Farmer

Like other farmers, Linner Sigei from Bomet is interested in mango production. She has 50 grafted mango trees which are about four years old now, and wants to know if she can grow them organically. Yes, she can, as we have shown already in *TOF* January 2006 and as we report here again. Mango trees develop into well–shaped trees within the first four years and do not require pruning unless there are excessive branches or unless they acquire an unusual shape. The orchard should always be kept clean to prevent pests and spread of fungal diseases. The most common diseases are powdery mildew and anthracnose. Powdery mildew is a serious disease in all mango–growing areas in Kenya. Infections can lead to complete crop loss. Anthracnose is also a common disease limiting production, especially in areas with high humidity. Farmers growing mangoes conventionally could use chemicals such as Benomil or sulphur mixed with a sticker. For those growing mangoes organically, copper oxychloride may be used to control these diseases.

Fertilizer application

For farmers who prefer growing the fruit organically, well–prepared compost can be applied every one or two months around the tree following the drip line (where the tree's absorption roots are located). Farmers must be careful not to apply too much compost, as this tends to promote rapid tree growth at the expense of flowering and fruiting. For the mangoes to be certified as organic, the orchard has to be inspected to ensure all certification requirements are met. It is recommended that soil and leaf samples are taken for analysis before any fertilizer application is done in order to know the plant's nutrient requirements.

Kent variety: The Kent variety has a large greenish–yellow fruit with a red or crimson blush on the shoulder. Its flesh is juicy, melting deep yellow and fibreless, with a rich flavour. The Kent tree is large and vigorous with a dense upright canopy. It is late–maturing and is suitable for export.

Ngowe Variety: Ngowe is the most easily recognised of the local mango varieties. Ngowe mango trees are comparatively small and round in shape. The fruit is good for commercial production and export, however the tree is susceptible to powdery mildew.

Haden variety: Because of its good quality, seeds from the Haden variety are used as parent for several other varieties of mangoes. It produces medium to large-sized fruit and is very juicy with a pleasant aroma. The Haden variety has an attractive appearance and is suitable for commercial production.

Tommy Atkins variety: The Tommy Atkins variety has become an important commercial variety. It has a firm, deep–yellow flesh, medium juice, and moderate fibre and pleasant aroma. It is good for export because of its longer shelf life. It can also resist anthracnose and powdery mildew.

Apple Variety: This variety originated from the Kenyan coast. It has a rich yellow/orange colour when ripe, with medium–to large fruits that are round in shape and smooth in texture and that do not have fibres. The tree is susceptible to anthracnose and powdery mildew. ■

trolling the fruit fly...

Continued from page 4

the season at the onset of fruiting; the fungus can persist in the soil for over one year. Additional research is still being conducted on the appropriate formulation and the product should be available in the near future for application by farmers to control the pests.

Additional control methods

Orchard sanitation: Poorly managed or abandoned orchards and a variety of wild hosts can result in a build-up of fruit fly populations. Orchard sanitation, which entails the collection and destruction of all unwanted fruits containing fruit fly maggots on the tree and on the ground, can significantly to reduce damaging fruit fly populations in the orchard. This is a very laborious exercise, but can be quite effective if the fruits are collected regularly and destroyed twice a week for the entire season. The collected fruits should be destroyed by either burning, burying (at least 50 cm deep), or putting them in tied plastic bags and exposing them to the heat of the sun for a few days until the fruit is rotten and all the maggots in the bags are dead.

Mechanical fruit protection: Wrapping or bagging of individual fruits with newspaper or plastic bags to prevent adult fruit flies from laying eggs on the fruits is also a practice for producing fruits that are free from fruit flies. To be effective, the fruits must be wrapped or bagged well before fruit fly attack, at least one month before harvest. Although laborious, it is an effective method for expensive fruit species produced for export or fruits produced in backyard gardens for family use.

**Dr. Sunday Ekesi is a Senior Scientist at ICIPE and leads the fruit fly programme.* ■

Compost kitchen waste well before use

Can I use kitchen waste directly on bananas? Or which is the best way? P. Gachanja, Ruai Tel. 0722 304 469.

Yes, you can use kitchen waste directly on bananas, although it would be better to first compost this waste. By directly applying the fresh waste, the nutrients will not be evenly distributed to the banana roots. However by composting, and then feeding the plants, you will have a better result. If you must feed the bananas directly, try to disperse the different kinds of waste evenly around the plants, and then be sure to cover the roots with grass, hay or banana leaves. These will act as a mulch, thereby reducing the likelihood of nutrients escaping through evaporation, soaking or rodent damage. Beware of rats and other rodents, and even dogs, that may be attracted to the direct fresh waste.

Not all kitchen waste is suitable. The inclusion of meat and bone waste will atttract rodents and will give off an offensive smell. Biodegradable vegetable waste is fine. Old newspapers and cardboard are also suitable. It is also worth noting that given the fact that banana roots will be beneath the added waste material, these need to be watered regularly for optimum absorption. Many banana growers plant bananas in deep holes and add composted waste into the holes, which gradually fill up as more compost is added. Watering a system like this is more effective, as the water and nutrients it carries are retained in the area around the banana roots.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Control bean flies with sodom apple

What ratio of sodom apple fruit or leaves should I use to control the bean fly?
Peter Okello, Sondu Tel 0729 518 628.

Sodom apple solution is made using 1 kg of fruit and leaves to 3 litres of water. Be sure to earth up the beans stems that are already affected by the pest, to allow the beans to send down secondary roots.

If your field is seriously affected, lift and burn the beans. Bean flies are less prevalent during the rainy season, therefore plan your planting of beans accordingly.

If a field or area has a high level of infestation with bean flies, rotate with another crop. Bean fly maggots can persist in the soil for an entire season.

Sukumawiki is a nutritional powerhouse

Do you love kales – or *sukumawiki* ("push through the week" vegetable), as we say in Kenya? I really do. It is an amazing plant. It is one of the most potent health-promoting vegetables known. Sukumawiki is a nutritional powerhouse and is seriously underrated by being considered as a poor man's food. Sukumawiki, a member of the brassica family of vegetables, contains all the important minerals and vitamins for human life and boosts the immune system. But Tiluk Samwel has some doubts: "Using sukumawiki as a vegetable causes heartburn and speeds up blood pressure more than local vegetables", he writes to us. "What could be the cause?"

Sasa, Samwel! Sukumawiki does not speed up blood pressure, on the contrary! Sukumawiki is rich in potassium. Potassium is a mineral used by the body to eliminate blood impurities and improve overall circulation. Therefore, potassium is important in the reduction of blood pressure. However, potassium is partly lost in the cooking process, so it would be better to steam sukumawiki rather than boiling it. Alcohol and caffeine also block the potassium.

Eat Garlic!

Two foods that are especially rich in potassium and magnesium and are easily added to meals and can also be eaten raw are parsley and garlic. Researchers have found that people who eat one clove of raw garlic a day have lower blood pressure, because it helps improve cardiovascular health and prevents the arteries hardening. If you don't fancy smelling of garlic, take a supplement. Other commonly available foods rich in potassium include bananas, avocados, leeks, spinach, peas, beans, chickpeas, lentils and nuts.

Heartburn? Change your lifestyle!

Samwel has another question: Can sukumawiki cause heartburn? One

in four of us suffers from heartburn. Heartburn is an irritating condition called acid reflux; it is very uncomfortable, causing a burning pain behind the breastbone and a taste of acid in the back of the throat or mouth. It occurs when acid is forced out of the stomach via the valve that connects the stomach to the gullet (oesophagus).

Most of the frequent causes of heartburn (or acid reflex) are related to your lifestyle. There are a number of factors that can contribute to the symptoms of heartburn, including smoking, eating too quickly, wearing your clothes too tight around your midriff, and consuming the wrong kinds of food and drinks (alcohol). In this context, *sukumawiki* can cause heartburn; however, this is very rarely the case and only happens if you have a very, very sensitive stomach.

Heartburn can be avoided by good eating habits. You should avoid

- meals containing fatty or spicy ingredients;
- sweet foods;
- eating quickly large portions and not chewing enough, which will force the stomach to produce more acid to digest the contents;
- beverages such as coffee, acidic fruit juices, carbonated drinks and alcohol; instead, you should drink at least 2 litres of water a day;
- eating a big meal immediately before sleeping.

Philomena Nyagilo

Letters to the editor

The E.A. Organic Mark is a step forward

The concern of Su Kahumbu (*TOF*, July 2007) is justified, but with some reservations of what might transpire on consultative forums before the implementation stage. It is my view,that it could be too early to worry on the outcome of the launch of the E.A. Organic Mark. It is important to note that the final draft of E.A. Organic Standard has not yet been perused, debated and ratified by the East African legislative assembly.

Certification requirements

The three certification bodies such as Encert-Kenya, Ugocert-Uganda and Tancert- Tanzania, mentioned by Su Kahumbu are presumed to be recognized and acceptable by their respective countries. They would automatically qualify to oversee the certification process based on the E.A. Organic Standard. I do not foresee any objection on the use of the certifying body's symbol and that of the E.A. Organic Mark on products certified in accordance with E.A. Organic Standard. The future E.A. Organic Accreditation Committee should be able to ascertain a reasonable and affordable charge payable by the certification bodies for the use of the Mark. The cost of the Mark would most likely be passed by the certifying body to the producer who in turn could raise the selling price to the consumer. The cost implication of the E.A Organic Mark is therefore crucial.

The insinuation by Su Kahumbu that the three certification bodies could gang up and refuse to inspect and certify on the E.A Organic Standard would be a scenario which could impel us to consider encouraging the formation of more certification bodies in the E.A region. Allowing the formation of more certification bodies would create a competitive service providers situation.

Involve the ceritification bodies

It is possible that Tancert, Ugocert and Encert participated in the formulation of E.A Organic Standard; their own standards should by now be revised to incorporate the requirements of the E.A. Organic Standard. It is encouraging on our part to note from Mr. Musa Njoka, the CEO of Encert, that their organic standard is already revised to accommodate the requirements of the E.A Organic Standard. It is assumed that Tancert and Ugocert have also updated their standards.

Co-operation needed

To have an Organic Standard and its Mark for the region is a major step forward towards uplifting the economic base of our communities. This could also create the necessary and important international recognition of our capacity to initiate and manage a well-organized and significant organic industry. It is therefore important that all organic stakeholders should support that initiative.

J.T Muriithi Simba, SOHGRO P.O Box 12 10230 Sagana 0726 593 818 SOHGRO@yahoo.com

Mushroom-story helped us

We hereby kindly request to be put on your mailing list in order to receive monthly copies of *The Organic Farmer* magazine. We are a community–based organic group by the name Makerecha Organic Group. We came across a copy of your magazine from a friend of a member in the group. It happened to be the April 2007 issue on mushrooms and you can never imagine how much it has assisted us because that is what we are currently dealing with. We are 15 active members in the group who are interested in becoming more knowledgeable on organic farming. Your consideration will be highly appreciated.

James Gacheru,
P.O Box 521-00902 Kikuyu

Good training material

Mutuambay Self Help Group is undertaking farming activities in Meru North District. Our activities are spread in two sub-locations Morega and Anjuki. The group has started projects which are on-going and are doing well. We collaborate with agricultural extension staff. We also intend to start beekeeping projects.

We have decided to get information from your institution on organic farming technology, now that our group has become a source of information for the members and our neighbours who highly rely on chemicals in their farms and homes. We shall be ready for whatever feedback.

Rebecca Thairora, P.O Box 182 60607, Mikinduri

Good tips for seed selection

We would be grateful if you include us in your mailing list. We have been reading *The Organic Farmer* magazine through others and it has been very useful to us. The February 2007 issue really updated us in selecting the right seeds for the season. Johari enterprise is composed of 10 peasant farmers and businessmen. We grow cereals, vegetables and fruits.

Lawrence J Opondo, Johari group, P.O Box 242, Sondu

Students need magazine

On behalf of Young Farmers' Club in Netima High School, I would like to request you to send us a copy of the above magazine to help our club, which is involved in horticultural projects in our school. We badly need access to information on organic farming.

Mr. Nyongesa Wanyonyi, P.O Box 24, Malakisi

Send me magazine

Kindly do send me a copy of *The Organic Farmer* magazine. I am an enthusiastic farmer and an ardent listener to your radio bulletin on KBC every week on Thursdays between 8.30-8.45. Congratulations!

Kennedy Messo, P.O Box 142-50241, Kipkaren River

Magazine informs us

I am an organic farmer practising sustainable agriculture with my family members. So I request for monthly copies of your magazine. I will appreciate most because it will keep us on our toes and be alert with regard to the benefits of organic farming, sustainable agriculture, as well as sustainable development in our community.

Rila Wamukota Natwati, P.O Box 1996, Kitale

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Spider mites are tricky to control

Spider mites are the most important non-insect pest of tomatos. The pest is spreading rapidly into the drier areas of Kenya. The eggs, which are white/pink and tiny, are usually laid on the under-surface of leaves. The reddish adults (0.25 mm long) have eight legs, and produce a fine silk webbing on leaves which tends to protect them from predators.

Transmission: In warm dry weather, mites can multiply and spread very quickly; heavy rains or irrigation can reduce the population. They can be dispersed by the wind – or even on the farmers' trousers!

Damage: Spider mites prefer the underside of leaves, but in severe infestations will occur on both leaf surfaces as well as on the stems. Heavily damaged plants are weakened, produce smaller and lighter fruits, or can even be killed as result of feeding by large numbers of spider mites.

Control: Patrol the field regularly to determine the level of infestation.

• Cultural practices help control mites. Keep the field clean and keep it free of weeds. Old crops or weeds infested with spider mites are ideal breeding grounds for these pests – remove them or burn them immediately after harvest. Sticks for holding tomato plants should be scrubbed with water and soap before using them again.

• Natural enemies such as ladybird beetles, lacewings or predatory mites can control the spider mites.Therefore avoid broad-spectrum pesticides, especially those based on pyrethrum, since they kill the predatory mites, causing spider mite numbers to flare up. You should therefore use pesticides (botanical or synthetic) only when it is really necessary. If you want to use neem, look for a product that contains a high proportion of neem oil, as it is more effective.

Tomato plant and fruit infested by spider mite (Photo courtesy ICIPE)

• Intercropping with garlic, basil and onion can give some protection due to their strong smell.

• Tomato spray: Boil moderately 1 kg of fresh tomato leaves in 2 liters water; cool and use as a spray.

• Castor oil plant (*Ricinus*) spray: Soak green seeds and leaves in water for 24 hours, filter and spray. Caution: Castor bean seeds are poisonous, so do not allow people or animals to drink the spray or eat tomatoes with spray on them.

Farmers like growing tomato varieties which do not require stakes for support. But these varieties are prone to tomato blight, especially during the wet season as they are near the ground. The varieties pick up contaminated water on the ground leading to rapid infection of the tomato plant by both early and late blight. Farmers are advised to plant these varieties only during the dry season when there is less water on the ground. They could also reduce the blight problem by going for varieties that require support with stakes, but care should be taken when irrigating to ensure contaminated soil does not come into contact with the leaves or the stem, thus reducing the chances of spreading the diseases.

Tomato varieties not supported by sticks are prone to blight. (Photo TOF)

Market Place

Training: Baraka Agricultural Training College offers a wide range of short courses for farmers, development workers and rural business people: Sustainable agriculture July 29-August 4, Participatory project planning August 5-18, Introduction to beekeeping August 12-18, Bee equipment-making August 19-25, ICT for rural development September 16-23, Processing of bee products August 14-20, Sustainable Development October 28 – November 24, Microsaving and Credit Scheme November 4-11, Animal health November 18-24, Community Development November 25-December 1. Charges vary between Ksh 6000 and Ksh 8000 covering tuition, food accommodation and training. Participants must apply at least three weeks in advance to book a place. The college also offers a 16 month Certificate in Sustainable Agriculture and Rural Development. The deadline for applications is August 8, 2007 for the 2007/2008 academic year. Applicantion for a 16-month Diploma in Sustainable Agriculture and Rural Development course that caters for students in East Africa will close on August 8, 2007.

Organic Produce: David Gakere, a Kenyan resident in Johannesburg is keen to contact local exporters or farmers growing organic produce. He would like to buy only certified organic produce. Those with these products can contact him.
Write to: gakere@mweb.co.za

Land for sale: 25 acres in Passenga scheme, well-drained fertile soils on a gentle slope, currently under potato and oats; clean freehold title. Electricity and piped water available. Contact Waiyaki Mungai Tel. 0723-787171.

Amaranthus Seeds: Ronald M Nyabuya has about 300 kg of Amaranthus seeds. Any farmer interested in buying them can contact him. Write to Ronald Nyabuya P.O.Box 995, 30200, Kitale, Tel.0721 562 678.

Charcoal Stoves: Aruba Farmers Group are making charcoal stoves for chicken rearing. Any farmer who is interested can contact the group coordinator, Mr. Kibiwot Cheruiyot, at the following address: William Kibiwot Cheruiyot P.O. Box 596, Kitale 30200 Tel. 0728 342 166.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 28 September 2007

Market day

Do small-scale farmers make any profit, despite the hard work on their shambas? See editorial on this page and pages 2 & 3. (Photo TOF)

Poultry keeping is profitable

With good management, farmers can earn more from rearing both indigenous and exotic chickens.

The Organic Farmer

More than 80 percent of farmers in Kenya keep indigenous chickens. They are popular with consumers because of the good taste of their eggs and meat. Exotic breeds, on the other hand, are faster growing and their egg production is higher because of selective breeding. The main breeds are the white Leghorn, the yellow-skinned Rhode Island Red, Light Sussex and the Black Australorp. In this issue we talk about rearing chickens the organic way. In one of the next issues we will feature the commercial production of indigenous chickens.

Farmers should be aware: Hygiene is of the utmost importance when raising poultry. It is therefore extremely important to avoid contamination of any sort, whether it is through the feed, water or handlers. Illness and disease in chicken production are predominantly spread through handlers via hands and shoes. Biosafety measures can reduce mortality and disease spread by up to 60 percent. See *pages 4,5 & 6*

Budget of a chicken farmer

	Ksh
1. Cost of 200 day-old chicks @ Ksh 77	15,400
2. Cost of feeds (chick, growers and layers mash)	36,400
3. Brooding costs (labour, materials, heating, lighting and disease control) at 15% of total cost of production	7,770
4. Total cost of production	59, 570
5. Average monthly egg sales @ 140 per tray incl. expenses	10, 316
6. Total eggs sales for 12 months (10,316× 12)	123,792
7. Bird sales at culling stage @ Ksh 150 per bird	30,000
8. Total income	153,792
9. Gross profit margin	94, 222

Note: It is uneconomical to keep the birds beyond 12 months, as their egg production goes down. Maintaining them longer eats into your profit.
(Source: William Makechi, Ministry of Livestock and Fisheries Development)

Dear farmers,

A short while ago, on August 9, we visited Kinale market along the Nairobi-Naivasha road. The purpose of our visit was to find out how much money small-scale farmers make when they take their produce to the market (see page 3). In the gloomy weather, with fog reducing visibility on the mud-soaked slippery grounds, were dozens of farmers busy bargaining with middlemen and transporters who had converged on the market.

If one would like to learn more about the desperate situation of our small-scale farmers and the exploitation going on in the marketing of agricultural produce, then they should visit this or any other market in the country. It is a clear indication that farmers will never be able to improve their lot if the prevailing market environment continues.

Why? Let us illustrate this with an example: A watchman in Nairobi in 1995 earned a salary of Ksh 3,500. By September 2007 he earns Ksh 12,800. But at the Kangemi market Nairobi, he still pays Ksh 5 for a bundle of sukumawiki or Ksh 20 for a big cabbage. In the last 20 years or so, any keen observer of producer prices must have noticed that prices of agricultural products have more or less stagnated or even gone lower than they used to be, while prices of other consumer goods continue to rise. It's a contradiction that in a booming economy such as Kenya's, growing at a rate of 6.2 percent in 2007, small-scale farmers are getting poorer and poorer. Even worse, the small-scale farmers lose money due to the fact that most of them cannot sell directly to the consumers. Instead, the marketing cartels operate in a selfish way, where they continue to make hefty profits at the expense of the struggling farmers.

Farmers should take action. One option is to get organised as groups or cooperatives and market their produce directly to established retail outlets in towns nearest to them. Another alternative is to make use of available market information and grow products that can fetch good prices on the market. A third way out is diversification. Farmers should venture into areas that bring them more income, poultry keeping for instance, as we write on pages 4, 5 & 6.

TOF on air!

On *Thursday 20th September, 2007,* you can hear *The Organic Farmer* on the Kiswahili Service of KBC from 8.30 pm to 8.45 pm. Tune in your radio!

OPINIONS

"If current trends in food production continue, child malnutrition in Africa is expected to grow from 38.6 million to 41.9 million children by 2025. Poor governance, inadequate infrastructure, limited access to markets, and low investment in agriculture contribute to the under-performance of Africa's agricultural sector. The continent will fail to meet the Millenium Development Goal to cut child malnutrition in half by 2015 unless more aggressive measures are taken now."

"Food Security in Africa to 2025", report from the International Food Policy Research Institute (IFPRI)

The Organic Farmer

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Farmers work, middlemen profit

Small-scale farmers do a lot of work, but when they sell their products, prices are less than what they were 15 years ago.

Peter Kamau and Philomena Nyagilo

John Mbugua is a farmer in the Kinale area in Kiambu district. It is Thursday morning and he has delivered 300 cabbages from his ½ -acre plot to *soko mjinga* market along the Nairobi-Naivasha highway. The scenario looks promising in terms of business. The market is full of activities, with farmers, traders and middlemen bargaining for better prices. Mbugua sells the cabbages at Ksh 3 apiece. He pays Ksh 1 apiece for transport to the market and Ksh 20 cess to the local county council for the consignment. Mbugua is well known in *soko mjinga*. "I have been here for a long time", he says, "but the situation is not getting any better."

David Thugu transports four big bags of sukumawiki to soko mjinga. On his 1-hectare piece of land he plants cabbages, sukumawiki and carrots. Thugu pays his casual workers Ksh 150 a day. Going to the market, he has to pay Ksh 50 for the five sacks on the donkey cart, not to forget the contribution to the local council: Ksh 40 for parking the donkey and Ksh 20 for the trading space. This morning, he is offered Ksh 200 for 1 full bag of sukumawiki. "This is the same amount as 15 years ago", says Thugu, "but now we have higher production costs. The price of all commodities has gone up. For instance, the price for a bag of fertilizer has gone up to Ksh 2,000. This means that I am getting less than what I got 15 years ago", he says.

Smiling faces

On this chilly and foggy day only the faces of the middlemen and traders are smiling. They have parked their hired trucks and pick-ups beside the market and wait for the middlemen to haggle for prices with the farmers. The middlemen buy directly from the farmers. They decide and mark up the prices for cabbages, sukumawiki, carrots, spinach and potatoes for that particular day, depending on the demand from the traders and the amount being supplied. Although most of the farmers here in *soko mjinga* do have a mobile phone, they do not make any effort to find the market price for the day, as David Thugu confirms.

In this business, the middlemen and the traders are the big winners. They decide the price – and that's why they have reason to smile. Jane Wanjiku sees herself as a broker. She buys the cabbages from Mbugua and other farmers for between Ksh 3 and Ksh 5 and sells it for between Ksh 12 and Ksh 15 to traders from Nairobi, Mombasa and other towns; she has a profit of Ksh 8 to 10 per cabbage. A middleman who will not give his name is buying sukumawiki for Ksh 200 from David Thugu; he sells it to a pick-up driver for KSh 400. This means that in two or three hours and without breaking a sweat, the middlemen earn double the amount of money the small-scale farmers get after months of hard work on the shamba. Middlemen do not have any risk. They only buy if there are traders around or if they have a clear order from a trader. They never sit on a mountain of sukumawiki as farmers do when they lack buyers. In soko mjinga, the middlemen ensure by all means that the farmers do not sell directly to the traders as this would "spoil" the prices.

Cartels control marketing system

We asked small-scale farmer Mwangi Kariuki: "Why do farmers not co-operate and fix the prices? What would happen if the farmers came together and decided, "Today, we will sell a bag of sukumawiki for Ksh 350"? Mwangi Kariuki, a father of four, who is at times forced to work as a labourer in other people's farms, tells us without any illusions, "I have to sell my cabbages at any price. I cannot risk to go home without money". Even if the farmers organised themselves and hired lorries to

In honour of *sukumawiki*

While enjoying their popular daily meal of ugali and sukumawiki (the vegetable that enables one to survive during the week), many Kenyans may not know how sukumawiki came to be such a common vegetable on our dining tables. At the beginning of the 20th Century Africans relied heavily on the various indigenous vegetables which have now been discarded in favour of sukumawiki (or kale) and cabbage. Sukumawiki has become one of the most common vegetables in Kenya following introduction by agricultural extension personnel. It has a lot of nutritional benefits; and is said to contain most essential vitamins and proteins.

Common man's food

Apart from this, sukumawiki is very easy to grow as it does not require a lot of inputs and work to grow like other exotic vegetables such as broccoli, spinach, leeks, or capsicums; it is also not prone to diseases. Sukumawiki was initially very marketable but of late farmers have flooded the markets with it, leading to depressed prices. On the other side, sukumawiki would never have become so popular if so many people in Kenya did not live in poverty. The popularity of sukumawiki variety is synonymous with poverty. With one bunch selling at a price of Ksh 5/=, a low income earner is assured of a meal. Apart from salt and some onions, you do not need many ingredients, and it does not take long to cook. Until such a time that Kenyans can increase their earnings and afford a variety of foods or develop a desire for traditional ones such as *kunde*, *sucha* or even *sagaa*, which enjoy good prices in the market, sukumawiki will continue to enjoy a dignified place on wananchis' dining tables.

transport their vegetables to other markets such as Nairobi, it would still be difficult to sell. This is because the vegetable market is dominated by middlemen who operate like a cartel or the mafia: They are ready to do anything to protect their interests.

From our research two issues become clear: First, small-scale farmers rarely get the real value for their produce. This is the most important reason for the increasing poverty in most rural areas in the country. Secondly, most small-scale farmers do not even try to find ways of avoiding middlemen and traders by taking the produce directly to retailers.

Super profit for traders

Three hours later we are at the Kangemi market in the outskirts of Nairobi. The lorries and pickups with cabbages and sukumawiki and other vegetables are offloaded in Kangemi. Here also many retail dealers are buying the produce they will sell during the day. Joe, a trader, buys a bag of sukumawiki in soko mjinga for Ksh 400; he sells it in Kangemi for Ksh 900. He pays Ksh 60 per bag for the transport, Ksh 5 to the loaders for each of the 30 bags on his own small lorry, and Ksh 10 per bag for bringing the bags to the retailers in Kangemi. The total costs a day are Ksh 14,250. If he sells all the 30 bags for Ksh 900 a bag, Joe remains at the end of the day with a profit of Ksh 12,150.

Chege Gichinga, a trader at the Kangemi market, travels every two days to Naromoru near Nanyuki. He buys between 2600 to 3000 pieces of cabbages at Ksh 11 apiece and hires a lorry at Ksh 13,000 to deliver it to Kangemi, where he sells each piece at between Ksh 20 – 25, depending on the size of the cabbage and season. In a week he makes two or three trips that earn him a weekly net profit of between Ksh 30,000 – 40,000.

On this day, Elijah Muiruri buys a bag at Ksh 900. On his small stand in Kangemi, he ties the vegetables into small bundles, which he sells at Ksh 5 a bundle, making him a profit of Ksh 250 for every bag he sells. Sometimes he cannot sell all the sukumawiki, so he has to sell the vegetables at a throwaway price before they get spoilt. Elijah's neighbour Simon Gitonga says that five days before our visit, a bag was going for Ksh 500, but even then, he only made a profit of Ksh 350 a bag. The two traders sometimes sell cabbage and agree that the earnings are more or less the same. The traders cannot tell what the price for the day will be, as this keeps on changing depending on demand and supply.

The way out

Our research have shown us the difficulties that small-scale farmers face to earn a living from their shambas. There are alternatives, as we have mentioned in the editorial on page 1. The way out might not be easy for small-scale farmers, but it is still better to try them than to remain in poverty. ■

All about...

Raising chickens can be a good business if you take care of them, and keep proper records and strict hygiene.

Su Kahumbu

Before buying your chickens, you should do some preparations. Wash out all feeders and sun-dry before introducing the first water and feeds. Also, heat the room for two hours or so depending on the room size before introducing the chicks.

I use a small stone house approximately 2.5m x 2.5m for my 200 chicks, and cordon off one third of the room for the first two weeks with a wire mesh frame, gradually moving it back and increasing the bird floor area as they grow. I use 2 x 250Watt brooding lamps for the entire 4-week period, gradually raising the lamps to accustom the chicks to cooler temperatures by a few degrees every week.

Brooding

When choosing chicks, normally sold as day-old, look out for listless ones and those that may have oozing umbilical cords. These will be problematic and are better exchanged for healthy bright-eyed ones before you bring them home.

Like the young of all animals, chicks require brooding or incubation during the first few weeks of their lives. Both layers and broilers may be brooded together, say 100 of each. However, it is best to start off with the layers for two weeks before introducing the broilers, as broilers gain weight much faster and may crush the slower growing layers.

Lack of space and minerals causes stress and pecking (cannibalism) in chickens.

A brooding room must be kept free from draught at a constant temperature of 35°C, and must have suitable bedding that enables the chicks to excercise their feet through gripping.

Bedding

The bedding in the brooding room may be wood shavings or straw bedding. If raised on flat slippery flooring, the chicks develop week tendons in their feet that cause problems as they gain weight. Fast-growing broiler chicks may develop spraddle leg, which is a combination of weak feet tendons coupled with vitamin deficiency. This can be seen when chicks refuse to stand and instead sit back with their feet spraddled forwards in front. To avoid this, one can add a few drops of cod liver oil to the chick water once a week for up to 5 weeks. Be sure not to add too much as this may result in runny stools.

The bedding must always be dry, so one must always keep a look-out for water spillage. Wet bedding can cause the growth of fungi and bacteria that will effect the chicks, as well as being a cause of chilling the young birds. Water feeders and grain feeders for chicks should be checked and cleaned regularly, as very young chicks are susceptible to diseases brought about through contamination of these implements.

As the bedding becomes soiled, rather than remove and add new, top up the bedding it with 4 inches of new material at 5-day intervals. Some organic producers believe this allows the bacteria that destroy the eggs of the coccidiosis parasite to grow in number, causing a natural reduction in the parasite prevalence. It is also more cost effective. The resulting deep litter also creates a blanket of warmth on the floor.

Observations

When introducing chicks to your brooding room on the first day, sit back for an hour or so and observe them. They should be quite inquisitive and active and will start pecking around happily as they investigate their new surroundings. After feeding a little they will begin to huddle around the warm areas and start to sleep. If using lamps, the birds will form a round yellow carpet like a patch beneath the lamps. If the lamp is too hot, the chicks will be panting and the area under the lamp will remain chick-free. If this is the case, raise the lamps slightly until they are comfortable. If the chick's start to huddle or crowd into each other away from the lamp, it may be that the lamps are too high and the chick's are cool. In this case, lower the lamps.

The first week of a chicks life is the most important. It is this period that will determine the chicks future potential. It is thus very important to keep a keen eye, ear and nose on the situation in the brooding room. Observe the chicks often and look for any unsual behaviour. Chicks with sunken eyes and arched backs with drooping wings and ruffled feathers are sign of illness.

The same is true for smelly, bloody stools. At a very early stage, blood in the stool could be an indication of coccidiosis, a parasite that effects the gastrointestinal tract of the chicks. If noticed early, this can be prevented with Coccid and may not affect the chicks in the long term. If left unchecked, coccidiosis can result in up to 40 percent mortality of the flock. Cocciddiosis is spread by chicks picking up the eggs of the parasite through litter of other chicks. In some cases, chicks may build up immunity, however good litter (bedding) hygiene is the best control. Vinegar (half a cup to 5 litres of water) can also be added to the chicken water to control bloody stool.

continued on page 5

What do you need at the beginning?

Depending on the type of chickens you choose to rear, it is wise to have all of the necessary equipment available and in clean working condition before you purchase the chicks. The following items are necessary for approximately 200 chicks of either layers or brooders.

- A secure, draft free brooding room with a source of constant heat and good ventilation.
- 4 small water feeders for first 2 weeks, gradually increasing in number as the chicks grow.
- 4 grain feeders, gradually increasing in number as the chicks grow.
- Clean, dry bedding material – wood shavings or straw.
- A packet or two of Coccid (available from any agro vet shop).
- Chick mash produced by a reliable animal feed manufacturer.
- Two bottles of E.M. (Effective Micro-organisms). (*See page 6.*)

Keep an eye on the outside temperatures also, as on sunny toasty days, one can reduce the brooding temperatures and allow windows to be opened.

Hygiene

Always stay alert for illness, diseases and signs of stress. Deal with these as soon as possible, as chickens are quite fragile. Hygiene is of the utmost importance when raising poultry. It is therefore extremely important to avoid contamination of any sort, whether it is through the feed, water or handlers. As part of our biosafety measures, we have a pair of boots dedicated to the chick housing. Handlers must first wash hands and change shoes for the designated boots before entering the chick housing, and these boots must never come out onto the external area. This boot control is practised at all levels of chicken production. Illness and disease in chicken production are predominantly spread through handlers via hands and shoes. Biosafety measures can reduce mortality and disease spread by up to 60 percent.

On a larger scale, when rearing chicks and older birds on the same property, it would be wise to have separate handlers dealing with each. Cross contamination, especially from older birds to chicks, can be a risk. If only one handler is available, the chicks (which are more fragile) should be handled first.

Lighting

Young day-old chicks are terrified of the dark. When lights are put off, they begin to scream! They then begin to huddle together for comfort and in so doing, the weaker ones are crushed and killed. If brooding with lamps, the light they emit is sufficient, however should the power go off, you will need to have a very quick back-up plan. This can be in the form of a kerosene lamp, or a china lamp. For extreme safety measures, we have a solar lamp back-up that comes on immediately and gives us time to ignite a longer-lasting lamp.

Lighting can be expensive and unnecessary, thus we phase the lights off after one week. Most commercial breeders leave lights on to allow chickens to feed for 24 hours, in the belief that they gain weight faster. I personally believe chickens need to sleep and are stronger and better weight gainers when rested and less stressed. If you observe chickens in permanently lighted rooms, they trample over each other as they head for the feeders, waking and disturbing each other continuously.

This feeder, developed by KARI, Naivasha is hygienic and reduces feed wastage. (Photos TOF)

Nesting box should be clean and comfortable for the layers; Inset: an ideal nesting box

Weaning from brooding heat

Broiler chicks are ready to leave the brooding room when they no longer have signs of yellow downy feathers on their heads. You will notice with broilers as they feather out that the head normally is the last area with baby chick yellow fuzz. Once this is gone they are ready to move on and need a lot more space as now they begin to grow quite quickly.

Our chickens are removed into a large secure shed which is especially secure from rodents and predators as well as birds of prey. They have outdoor access to a large area covered in netting where they can come out to enjoy the sunshine, grass, insects, etc. I feel this helps to keep the chickens happy and less subject to stress-related activities like fighting and pecking, which can have fatal consequences.

Layers need to take a little longer in the brooding room before they, too, must be removed to a larger space. To maximise on the quality of eggs, make sure layers also have an outside run, with plenty of greens in their feed.

Nesting box

Layers must also have access to a specially designated area where they can lay their eggs. If not, they will drop them all over the shamba. When making a nesting box area, allow one nesting box for each five chickens. I have a shelving system: two shelves high without partitions but covered on the sides. The shelf is thus dark and allows hens a little privacy. I also cover the shelves with straw and make sure not to have straw anywhere else. (I use shavings or maize stalks for the bedding floor). This prevents chickens from laying on the floor, which they would do if the material used on the floor were the same as the nesting material.

As the chickens grow – whether broilers or layers – always keep an eye out for illness, diseases and signs of stress. Deal with these as soon as possible, as chickens are quite fragile.

It is important when raising chickens that you remember that happy, healthy chickens are less stressed and cheaper to deal with than stressed chickens. *More about feed, water and disease control on page 6.* ■

A dirty waterer: they should be kept clean

… and more about chickens

Chickens need good feed, clean water and a hygienic evironment

Chicks require a balanced feed, and unless you are an expert in this area, it is advisable to buy from a feed manufacturer. Feed continously, and keep an eye on making sure the feed is always clean. It is wise to hang green materials such as weeds inside the chicken coops, as this adds nutrients and vitamins to their diets. Chickens can get 30 percent of their daily feed requirements from grass.

Water

Water feeders and grain feeders for chicks should be checked and cleaned regularly. (For more about hygiene, see pages 4 & 5.) We add a cupfull of E.M. to 5 litres of drinking water for the entire life of the chickens. This helps build up immunity and vitality of the birds. It also helps with their feed conversion, thus resulting in healthier and heavier birds. We also add cod liver oil (fish oil) to their water, 1 tablespoon to 5 litres once a week for 4 weeks.

Give chickens free space

Allowing your chickens access to a large outdoor area during the daytime reduces build-up of chicken manure in their shed. The sun and its effects are the best known sanitizer for chicken droppings, thus disease build-up on the outside is naturally controlled. Chickens also control their own body mites by having regular dust baths.

We use a mobile chicken housing unit on the farm that we move twice a year. The benefits are three fold:
1. The ground is very fertile for crop production due to the chicken droppings which are high in soil nutrients.
2. The insect and nematode population are reduced as the chickens have eaten most of them.
3. By rotating our chickens, we reduce the incidence of disease build-up that otherwise may affect future flocks. This is done in the same way that organic producers rotate their crops.■

Soya is a good source of protein

I would like to get an alternative way of making poultry feed without using omena (fish meal). I saw the formula in one of the recent copies of *TOF* which proposed 8 kg maize, 1 kg sorghum and 1 kg omena at the ratio of 8.1.1. I would like to make my own poultry feed using soya bean, which is an equivalent protein source. What weight of soya bean do I require? Hudson Wanjohi, Tel. 0722 461 772

Soya bean is very rich in all the nutrients necessary for proper growth. It can also be a good substitute for omena (fish meal), so we would recommend that you go ahead with constitution of the feed without the use of omena. Remember to mix at the same ratio as you have given above (i.e. using 1 kg of soya bean instead of omena).

The best way to control poultry diseases

We have a problem with our poultry. There is a disease affecting the 3-week old chicks: Wounds around the eye and beak and the chicks don't feed. What shall we do? Can you also give us signs/symptoms and treatment of fowl typhoid and coccidiosis? Tel. 0728 406720

It is very difficult to pin-point the disease from which your chicks could be suffering, from the symptoms you have given. This is because most poultry diseases show almost similar symptoms that can require different methods of treatment. We would advise you to consult a veterinary doctor near you or animal health assistant who can observe the chicks and give you a correct diagnosis and the best method of treatment. Sometimes the doctor may even recommend a laboratory test if they cannot identify the disease.

Fowl typhoid is a serious problem which is very difficult to eradicate. The best thing to do when the disease strikes is to clear the whole stock of chickens in the homestead and avoid bringing any new stock for up to 4 months. By the end of this period, the disease-causing bacteria will have cleared and any new stock will not be affected. Regular vaccination can protect your chickens against coccidiosis because the bacteria responsible are always present in the soil. One of the best ways to avoid this disease is to make sure the poultry sheds are kept as clean as possible at all times. Wash the floor regularly with organic acaricides such as neem powder to keep the disease at bay. The following vaccinations are important to prevent diseases:

Marek: This is an injection admin-

continued on page 7

Unhygienic feeding conditions are responsible for many chicken diseases.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Letters to the editor

We will distribute magazine to groups

Inter –Diocesan Christian Community Services (IDCCS) Ltd is a faith-based organisation involved in sustainable, participatory and integrated community development programmes in agriculture, health and water sanitation. As a keen listener to your radio programmes, I wish to request for *The Organic Farmer* magazine. Our office covers Kuria, Migori and Rongo Districts and we will make it available to common interest groups (CIG) involved in organic farming. IDCCS mainly partners with CIGs by offering technical trainings to farmers. For the benefit of our health, environment, sustainable crop production and appropriate utilization of natural resources, which reduces cost of farm inputs, IDCCS works with CIGs in sustainable agriculture. Your magazine will definitely be beneficial to our agriculture office and to the community, as we will guide them towards implementation of the various topics covered. Kindly send us 4 copies for onward delivery to farmers. We will be grateful.

Gordon Abwajoh, P.O Box 483 40400, Suna, Tel.0723 458690

Chicken diseases...

Continued from page 6

istered at the hatchery on young chicks.

Newcastle: These are inter-nasal drops applied to the eyes at 2 or 3 weeks and repeated at 18 weeks and after every 6 months.

Fowl Typhoid: This is applied as an intra-muscular injection at 8 weeks in high-risk areas and 18 weeks in less risky areas.

Fowl Pox: This is applied in the wings at 8 weeks in high-risk areas (e.g. the coast and Kisumu) and at 18 weeks in other less risky areas.

Gumboro: It is applied in drinking water at the 4th and 14th day.

Our own chickens, fortunately, are produced vaccine-free and as yet we have not had any problems. It could be that we are in an area that does not have a lot of disease pressure, though I like to believe it is because our birds are raised in a stress-free healthy environment, resulting in happy birds with good immunity! ■

Fighting poverty

Lack of knowledge has contributed to hunger and poverty in Kenya. We are a church-based group and have started passion fruit growing and would like to go organic. We came across your magazine through a friend and it is very informative. We are 20 members and request you to be sending us your monthly copies to help us improve on farming.

J. K. Kung'u, P.O Box 335, Matuu

I read with great interest!

The Ministry of Agriculture gave me your March 2007 issue and I went through it with much enthusiasm. I write to request for a few copies of it, say 10 to enable me and a few farmers benefit from your information. I shall be grateful.

J. K. Arap Kirui, P.O Box 152-20210, Litein

Solving farmers' problems

Thanks for the good work you are doing. Actually, the magazine has come at the right time because it is solving most of the farmers' daily problems. Though I have not been in this field for long, I experienced a hard start and needless to say the going has been tough all through. From a distant friend, I learnt of your monthly publication and just wish that you include me in the mailing list of this wonderful newspaper. I would be very grateful if you consider as I want to start organic farming. Otherwise kudos ICIPE and Biovision.

Peter Gakungi Gichure, P.O Box 598, Nyahururu

Paper should be read worldwide

I thank you for your magazine which has educated me a lot about organic farming. I have been reading it from a friendly neighbour, I also have contact with farmers who keep dairy cattle and goats. Please provide us with more information on breeding of high milk yielding dairy cattle. I will also be grateful if you can send us monthly copies of the newspaper to improve our knowledge. I hope that the newspaper is reaching farmers in other parts of the world in order to spread this useful knowledge. We are grateful to you for sending the magazines to farmers in our region, with whom we have been sharing. We would like you to organize tours and field days for farmers to learn about new methods of agricultural production. Also, we would be grateful if you can provide us with more information on growing of desmodium seed.

David Kamotho, P.O Box Makimen, Via Sotik

We will improve yields

We are a small village in Kitui. We are interested in small– scale farming owing to our small pieces of land. We discovered that your newspaper, *The Organic Farmer* has a lot of useful information to enable small farmers to get maximum production by using the latest information you provide in your articles. We would appreciate if you could send us copies so as to keep ourselves abreast with the new trends in farming; otherwise we have been borrowing a copy each month from friends. Thanking you in advance.

Gabriel Wambua, P.O Box 189, Kitui

Helping young farmers

Following your frequent educative programmes over the radio about organic farming, Isanga Horticultural Farmers hereby request for *The Organic Farmer* magazines. This will teach, educate and highlight important information to our young farmers on new farming techniques and new plants. It is our hope that you will send us the magazines to boost our knowledge on new methods of production.

Daniel Nandasaba, P.O Box 1437 50100, Kakamega

Listening to radio

We, the Riziki Development Group members hereby humbly request for copies of *The Organic Farmer* magazine. We have been duly listening to your radio programmes.

Kenneth Onyango Abuya, Riziki Development Group, P.O Box 124, Kadongo

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

New opportunity for organic products

Certified organic farmers now need not worry about lack of markets for their produce. From the beginning of July this year, Su Kahumbu has teamed up with the Nakumatt retail chain of supermarkets and opened another shop at the new Nakumatt Westgate, an ultramodern shopping complex off Peponi road, Westlands next to Nakumatt Ukay. The Green Dreams Organic Shop offers farmers an opportunity to sell their organic produce in larger volumes since the new branch which is frequented by more than 3000 customers in a day will require a steady supply of organic produce to meet the needs of the city's organic food consumers.

Su Kahumbu says the shop is currently being supplied by farmers trained under *The Organic Farmer* Support Programme, but she is trying to set up a supply chain that will involve all other organic producers whose products are under organic certification. Farmers supplying the shops will have special identification to prove their produce is genuinely organic.

Already-established certified organic brands such as Meru Herbs (which specialise in herbal teas and sauces), Limuru Archdiocese Farm and Nyumbani Children's Home Farm (are supplying fresh vegetables and fruits, dairy products, meat and honey). Su says the main problem at the moment is lack of adequate and consistent supply from farmers, "Most of them can only afford to supply once a week but we need them to supply us three times a week to be able to meet the needs of our customers", she adds. Organic farmers interested in selling their produce can call the shop.

Contact: Zak 0722572717, or Su Kahumbu 0721100001, info@organic.co.ke

Punishing African organic farmers

The Organic Farmer would like to express its total support for African farmers who export their organic produce to the European markets. It is seems strange that the Soil association that has assisted in the certification of producers in Africa can turn around and start punishing the same farmers. Africa's contribution to the total global carbon emissions to the atmosphere is negligible. The campaign on carbon footprints appears punitive and misplaced.

Market Place

Organic Produce: David Gakere, a Kenyan resident in Johannesburg is keen to contact local exporters or farmers growing organic produce. He would like to buy only certified organic produce. Write to: gakere@mweb.co.za

Land for sale: 25 acres in Passenga scheme, well drained fertile soils on a gentle slope, currently under potato and oats, clean freehold title. Electricity and piped water available. Contact Waiyaki Mungai Tel. 0723-787171.

Amaranthus Seeds: Ronald M Nyabuya has about 300 kg of Amaranthus seeds. Any farmer interested in buying them can contact him. Write to Ronald Nyabuya P.O.Box 995, 30200 Kitale, Tel.0721 562 678.

Charcoal Stoves: Aruba Farmers Group are making charcoal stoves for chicken rearing. Any farmer who is interested can contact William Kibiwot Cheruiyot P.O.Box 596, 30200 Tel. 0728 342 166.

Rabbit meat: Anthony Dodds rears rabbits for their skins, however he would like to sell the rabbit meat to anybody interested. Contact him on Tel. 0721 440941.

Rabbits for sale: I am a rabbit keeper and would like to sell them to any interested buyer. Contact me on Tel. 0724 852678.

New information service for farmers

Are your vegetables, let's say cabbages or tomatoes, affected by a pest and you would like to react in organic ways? But how? Is your maize showing strange signs of disease and you do not know what to do? Would you like to know more about tillage, for instance, or about safe maize storage measures, or about the benefits of calliandra? Then very soon you will find help. BioVision, the sponsor of *The Organic Farmer* magazine, is launching in a new service called Infonet in October.

Infonet is an information platform. It presents a lot of information on scientifically proven ecological methods for the prevention and control of pests and parasite infestations of plants, humans and animals. And it is free! You can reach it on two ways:

- Go to the Internet and dial www.infonet-biovision.org and you will find the answers for your questions. So many young farmers nowdays have computer knowledge, and they know how to surf the Internet. But it is not only young farmers who can make use of the Internet. Some weeks ago, members of a farmers' group in Kilifi had the opportunity to use Internet in a cybercafe at the coast. Not one of the farmers had previously sat at a computer, and not one had any experience with the Internet. After ten minutes all were able to do their own research about diseases or pests facing them.
- If you do not have a telephone landline for access to the Internet, you simply order a CD from *The Organic Farmer*. This CD contains all the information and also all numbers of *The Organic Farmer*. All you need to know is somebody who has a computer. We are sure that all farmers' groups have one or two members who know someone with a computer. The Infonet CD will be available in December 2007.

The farmers in Kilifi were very surprised how fast they learned to deal with the computers, and how fast they got the information they needed. "We are happy to get urgent advice about our problems", the farmers said. "We do not have to wait for extension people who never come. We are now more independent."

In the October issue of *The Organic Farmer*, we will give you tips on how to use Infonet, this helpful new information platform designed for small-scale farmers. (*TOF*)

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 29 October 2007

A Sahiwal herd: well-fed and properly managed cows produce more milk (Photo TOF)

Feed and keep animals well

When it comes to feeding, many farmers focus their attention on the quantity and not the quality of feed.

The Organic Farmer

Kenya's dairy industry is growing at a fast pace, especially with the current higher milk prices together with increased demand for milk products in the international market. Kenyan farmers have been unable to supply enough milk to meet the demand, however, due to the poor quality of their animals. There are 14 million cattle in the country; of these, only 3.5 million are dairy cattle that the country depends on to produce milk both for domestic consumption and commercial purposes.

The per capita milk consumption in rural areas stands at 35 litres per year, while people in urban areas consume an average of 70 litres annually. Milk consumption, especially in rural areas, is very low when compared with other countries such as Egypt, which has a rural per capita milk consumption of 62 litres. The main reason for this disparity is Kenya's rural poverty and management of dairy cattle by farmers, who are lucky to own a single dairy cow.

Although many farmers in Kenya have good dairy cows, they neglect them, and farmers are therefore to blame for decreased milk production. Proper feeding, care and disease control contributes to more than 70 percent of a dairy cow's milk production. Feed experts at KARI advise farmers to buy feeds from established manufacturers to avoid poor quality feeds that have flooded the market.

See pages 4 & 5

TOF on air!

On *Thursday 18th October, 2007*, you can hear *The Organic Farmer* on the Kiswahili Service of KBC from 8.30 pm to 8.45 pm. Tune in your radio!

New internet service for farmers

Beginning this month, organic farmers in Kenya and East Africa can get information on all aspects of organic farming on the Internet. The Swiss foundation BioVision, which is also the sponsor of *The Organic Farmer* magazine, has launched a new website - the Infonet. It is an information platform where farmers can do research on ecological methods for the prevention and control of pests and diseases. They have only to go to the following address: www.infonet-biovision.org. BioVision, together with *The Organic Farmer,* will also produce a CD for use by farmers who do not have access to the Internet but know someone who has a computer which has a CD drive. The CD contains all the information in the Infonet and also all the issues of *The Organic Farmer* with an index, where you can find the various articles. The Infonet is sponsored by LED, the Development Service of the European state of Liechtenstein. *See page 2*

Dear farmers,

Whenever we talk to experts on dairy farming, they all hold the same view that Kenya's farmers can produce a lot more milk and improve their income through dairy farming. However, the way in which farmers manage their livestock is a major impediment to increased production. The Organic Farmer *has given very useful tips over the past two years on how farmers can increase milk production through proper feeding, good breeding practices, disease control and the general care of a dairy cow. When we visit most of the farmers, however, we are really disappointed to see that they do not take this advice seriously. This tendency to do things the way they have always done is not only evident among dairy farmers, but also among those in other sub-sectors such as tea or coffee.*

At the moment there are numerous institutions such as KARI and ILRI that are working with farmers to ensure they improve production in order to alleviate hunger and poverty in the rural areas. These institutions produce and disseminate very useful information that is meant to help farmers adopt new and sustainable methods of farming that can change their lives for the better. The problem could be that either farmers do not know where to get the information, or if they do, they do not care to utilise it.

The Swiss foundation BioVision, which funds the publication of The Organic Farmer, *has launched an Internet-information service called Infonet with a great deal of information for farmers (www.infonet-biovision.org). When farmers in Kilifi were shown how to access information from the Infonet last month, they were elated. "This service will reduce our dependence on extension officers, who in most cases are unavailable to solve our problems", said one of the farmers. Right now, the Government is trying to make information and communication technology (ICT) available in all rural areas.*

The main objective of our magazine is to provide you with the most important knowledge on organic farming and farming in general. We know that having the right information is the first step in solving a problem. The new Internet service Infonet is meant to serve this purpose: All the information farmers need is readily available at all times. The challenge now is on you, the farmers, to use this information to improve your farming skills and your livelihoods.

Farmers, do you need help? Go to Infonet!

Infonet opens for farmers a new opportunity to access information.

The Organic Farmer

Isaac Maina is an organic farmer in Subukia. Many farmers know him, since he is representing and distributing our magazine, *The Organic Farmer*, on field days. Isaac has a problem with his beans. In the last issue of TOF he read the article about Infonet (see also page 1). Infonet is an information platform. It presents a lot of information on scientifically proven ecological methods for the prevention and control of pests and parasite infestations of plants, humans and animals.

1. This is the first time in his life that Isaac is sitting at a computer. Chantal, the officer in charge, explains to Isaac in five minutes how to use the computer. In a cybercafe, he is connected with the whole world through a telephone line. Isaac only needs to know how to click on the different pictures and words.

2. Now Isaac is alone at the computer. He types in the address: www.infonet-biovision.org. Isaac finds it very strange. He checks to make sure he has not made any mistake, then he clicks "enter". This is the command to tell the computer", go ahead"!

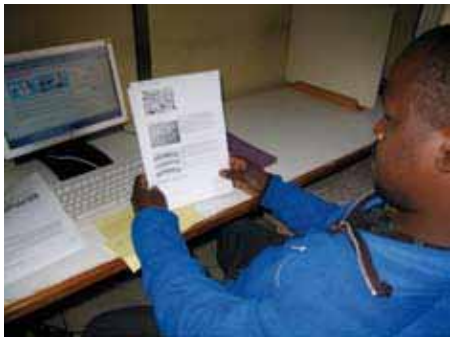
3. One minute later, Infonet appears at the screen. Isaac chooses 'vegetables', and then he clicks on the word 'beans'. Now all possible information with pictures appears on the screen. Isaac finds the disease his beans are suffering from: It is the black spot disease. Infonet gives him a lot of advice to fight the disease, for instance with EM (effective microorganisms). Isaac writes down the advice.

4. Isaac is a curious man, so he reads what is written about other diseases and tips on beans. He thinks: "This information is of high value", so he clicks the bottom 'print'.

pages with all possible diseases and pests on beans and all the possible cures against them. And he learned a lot about beans in general. He pays for 30 minutes of using the computer and for the printing of the 13 pages. It cost him KSh 195/=. "Hey, this is a very good thing", Isaac says when leaving the cybercafe. "I can do my own research with www.infonet-biovision.org and it is so easy"! ■

Isaac went to a cybercafe in Hurlingham/Nairobi, where we joined him.

5. Two minutes later he holds 13



The Organic Farmer

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

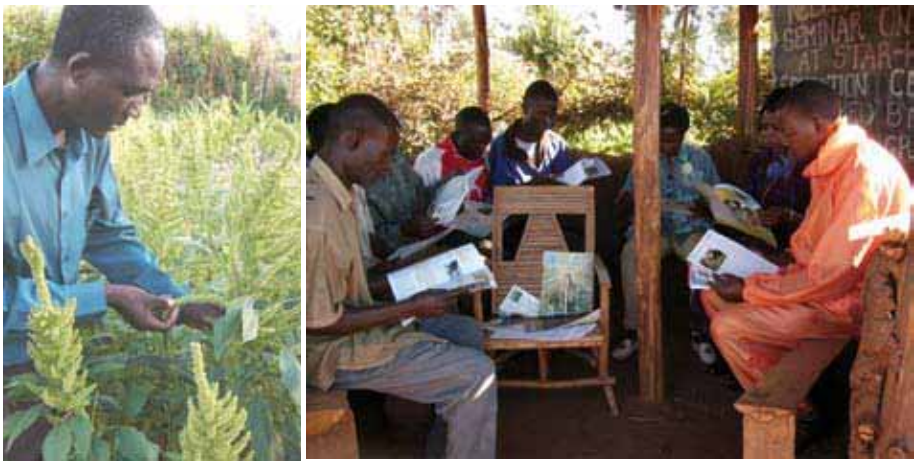
No telephone line for getting Infonet? Use a CD!

From December 2007/January 2008 onwards, you will not even need a telephone line to access Infonet. You only need to know someone who has a computer. In most farmers' groups these days, there is someone who has a computer that can read a CD. You simply order a CD with all the information on it from *The Organic Farmer*. We will inform you in the December issue how to order this CD. Good luck, farmers!

Information centre enlightens community

Farmers need information. A rural information centre in Lugari district has shown the way.

Peter Kamau, Lugari



William Makechi (left) at the Centre's demo plot. Farmers catch up with news from the various publications availble at the Centre's library. *Photo TOF*

Star Rays Education Centre is an institution with a difference. Here, children attending normal classes mingle with adults who have come for a different form of education. For the last seven years, the Centre has served as a formal school, a learning centre for farmers interested in improving their knowledge in farming, and as a church on Sundays.

As we enter the Centre, located in Likuyani division of Lugari district along the Kitale–Eldoret highway, we find a group of men and women sitting in the waiting shed in deep concentration, reading newspapers, newsletters and various other publications such as our magazine *The Organic Farmer*, while the normal classes go on in the main building. Inside the school office more adults are busy reading; these are not teachers but more farmers who have come to read, exchange ideas or to get market information. During the holidays, farmers benefit from training programmes offered by the Government, local NGOs and agricultural institutions.

Every aspect of farming, from compost-making to beekeeping and marketing of farm produce, is taught at the Centre. Last April more than 200 farmers drawn from Lugari, Uasin Gishu, Trans-Nzoia, Bungoma and Kakamega districts benefited from training. The farmers have an opportunity to learn through video shows and also to get practical lessons in the Centre's demonstration plot and from successful farmers in the neighbourhood. Participants are charged Ksh 30 to discourage idlers.

Rural farmers lack information

The rapid growth of the Centre is one thing that surprised even the founder-director, William Makechi, a livestock extension officer with the Ministry of Livestock and Fisheries Development. "For many years, farmers came to me whenever they had problems. There is nowhere a farmer can get information on agriculture here, so I decided to set up the Centre to fill this gap", he says. And why operate a formal school on what is supposed to be a farmers' training institution? Makechi says that the idea of the school came about when he realized that the farmers could not pay for the services provided. "I realised the best way to utilise the facility was to start a school where parents would pay a nominal fee for their children and at the same time farmers could be trained in this region."

We have learned a lot

"At first we thought it was a personal business. I attended the April seminar and it has really changed the way I practise farming. I had left a huge pile of farmyard manure behind my house, but now you can see what I have done with it", says Morris Wanyonyi, a local farmer. His garden holds a lush crop of bananas, potatoes, passion fruit, indigenous vegetables, maize and beans. He uses only compost in his farm. Makechi says that the biggest challenge facing the Centre is lack of resource material for use by farmers. To overcome this problem, he has tried to collect any information or publication he comes across, especially handouts given during workshops and seminars which he has attended. He also subscribes to several local and international agriculture journals. In the office are many files with newspaper cuttings on every subject in agriculture.

Important source of information

When William Makechi came across *The Organic Farmer* magazine, which was given to him by an official from the VI Agroforestry Project in Kitale last year, Makechi immediately subscribed. The magazine has now become an important source of information for training local farmers. "We had no knowledge of organic farming before, but *TOF* has really changed the way we do farming", says Kizito Wanyama. He says in the past, farmers did not want to share information with others, but the Centre has changed all that.

Every month, Wanyama and members of the farmers' groups receive copies of *TOF* and discuss the ideas and tips given in the articles, which they then try to practise in their respective farms. "Instead of buying expensive fertilizers and pest control chemicals, we have learnt in *The Organic Farmer* magazine about simple methods of preparing plant extracts with various nutrients and pest control properties. I have known about the *Lantana camara* plant since I was a young man, but I never knew it could control pests", he adds.

Learn appropriate technology

Lugari settlement scheme is a densely populated farming area, comprised of mainly internally displaced families. They originally came from Turbo, parts of Uasin Gishu and Bungoma districts following tribal clashes in those areas back in 1992. This has led to subdivision of land, with many of the farmers owning an average of one acre. Makechi says one of the objectives of the Centre is to train the farmers to improve and diversify their farming methods for food security, health and income generation. If funds allow, he plans to start training on appropriate technology.

Solar energy

Makechi says he will introduce simple tools such as coolers for perishable farm produce, water filtration, use of animal power, energy-saving jikos and ways of harnessing solar energy to the community. ■

Management is key to good milk production

Feeding, care and disease control accounts for more than 70 percent of a dairy cow's milk production.

Peter Kamau

The management of dairy cows is one of the biggest challenges facing the Kenyan farmer today. Following our article about the problem of availability of dairy cows (*TOF* July 2007), our research reveals that management problems such as feeding, breeding, housing and disease management are to blame for the reduced milk production in Kenya. To keep their animals in good health, farmers need to maintain the highest level of management, which will then lead to increased milk production and higher incomes. Dairy farmers need to observe the following areas that are crucial to the health of a dairy cow:

Feeding: Feeding is one of the most important (and most neglected) areas in the management of a dairy cow. Every day, a dairy cow requires energy, proteins, minerals, vitamins and plenty of water. To get these nutrients, a cow must be fed with good quality fodder, crop residues (by-products), minerals and concentrates. (Concentrates are well balanced feeds with essential nutrients formulated by experts to meet the daily requirements of a cow.) A dairy cow's daily ration should contain 75 percent forage, 24 percent concentrates, 1 percent minerals and an unlimited supply of water. Although many farmers are satisfied to see their dairy cows with a full stomach, this does not mean that the cow is well fed.

Most farmers feed their cows on maize stalks and banana stems, but maize stalks contain only 4 percent crude protein, and a large portion of banana leaves is composed of water that does not add much to the animals nutrient requirements. Hay made from grasses such as Boma Rhodes is a more preferable fodder because it has a higher percentage of crude protein (between 7 to 9 percent). Some farmers prefer feeding their cows with wheat straw, which again is not such a good feed as it has a crude protein content of less than 5 percent.

More than 70 percent of a dairy cow's feed should contain roughage (fodder with a lot of fibre). Roughage is important because all animals in the ruminant class depend on small microorganisms or microbes (protozoa, fungi, and bacteria) to assist them in feed digestion; roughage can only be found in good quality forage in pastures such as hay, Napier grass or lucerne. At least 30 percent of the daily feed should be comprised of feed concentrates (see table below for feed requirements).

Water: A dairy cow requires water to facilitate the digestion, absorption and transportation of nutrients through the bloodstream to all parts of its body. The water must also be clean and adequate. Watering animals only at particular times, sometimes only twice in a day, is wrong. Water should always be available. The amount of water given to a dairy cow determines how much feed it can take in a day, and consequently the amount of milk it can produce. A cow requires an average of 40 litres of clean drinking water per day and an additional 4 litres for every litre of milk produced.

Disease control: A good dairy farmer should be able to take preventive measures to protect their animals, as diseases reduce milk production or even result in death. Tick-borne diseases such as East Coast Fever (ECF) and anaplasmosis should be controlled by regular dipping. Brushing the cows removes dung from the udder and skin that attracts flies that transmit diseases.

Housing: A properly made housing unit should have a rough concrete pavement slanted to allow the free off-flow of urine. The unit should have adequate walking, dunging and resting areas. It should also have bedding material to keep the animals comfortable. Dirty housing is to blame for diseases such as foot rot and diarrhoea.

Breeding: Good breeding of dairy cows starts with fertility management. Farmers need to have adequate knowledge on how to detect the heat of their dairy cows. Many farmers often get confused when they see two cows mounting each other. A knowledgeable farmer should be able to tell which of the two is on heat. The only telltale sign is that the cow on heat discharges a clear mucus, and the sides of the vulva appear swollen. A cow that is not on heat will not accept being mounted. Once identification has been done, the cow should be served within 18 hours for conception to be successful. Farmers should also maintain all Artificial Insemination (AI) records to stop inbreeding. (Read more about this topic on page 5, or read our previous *TOF* issue of March 2007).

Record keeping: A good farmer keeps all records of their animals, for example daily milk records, AI service records, and cost of feeds to determine if they have made any profit or loss in the farming business. ■

Calves need special care!

Calves are especially delicate and require careful handling, as they are very susceptible to diseases. When fed on too much milk, calves can get diarrhoea. Farmers can control this by adding some water to the milk. Diarrhoea in calves can also be caused by poor housing where they are exposed to muddy conditions that cause infection. Calves can also get foreign body pneumonia when fed poorly and if the milk goes through the nose to their lungs. (Farmers are advised to use calf nipples to avoid this.) Calf pneumonia can also be caused by exposure to wind, especially in cold areas. Proper housing can prevent this.

Improving dairy cow breeds

Lack of proper record keeping and poor management is to blame for inbreeding and low quality of dairy cattle in the country.

Peter Kamau

"The main problem facing the Kenyan dairy industry is lack of good quality dairy cows." This is the opinion of William Ayako, a livestock expert at KARI, Naivasha. "One reason for this situation is the fact that the majority of farmers do not understand the benefits of breeding; this has led to deterioration in quality." Although most farmers have access to Artificial Insemination (AI) services, many of them still rely on bulls with an unknown pedigree, that sire dairy cows that produce less milk.

AI services not properly used

The reason farmers do this is to reduce expenses: AI costs Ksh 600 to serve one cow. Another problem, apart from the costs, is that farmers who regularly use the AI services do not keep any records. In this way, they risk the danger of serving the daughter of a particular cow with semen from its own father, since all semen comes from the same bulls based at the Central Artificial Insemination Service (CAIS) at Kabete in Nairobi. This causes inbreeding. Ayako says that of the 3.5 million dairy cattle that the country depends on to produce milk both for domestic consumption and commercial purposes, only 5 percent are registered with the Kenya Stud Book (KSB). The KSB-secretariat keeps records of all animals with known pedigrees in the country. "Without proper dairy farm records, it is very difficult for the country to have a breeding plan", says Ayako.

Dairy farming in the country started facing problems with the collapse of the Kenya Cooperative Creameries and the liberalisation of the sector in the 1990s. This led to low milk prices that forced most farmers to sell their dairy cattle. Ayako advises farmers who would like to restock to buy animals from established livestock breeders' organisations or from individual farmers with good-quality animals that are registered with the KSB.

Farmers can now get credit

James Karanja, a director of the Kenya Dairy Board and breeder, says dairy farmers in the country can improve the quality of their dairy cows by having them inspected and upgraded (See *TOF* March 2007 issue). He is of the view that farmers should not wait for the government to restock them, since the dairy farming sector has been liberalised. "The role of the government now is to provide an enabling environment and formulate policies that will help the dairy industry to grow", he says. He is also concerned that local breeders are selling their high-yielding dairy cows to other countries faster than they can replace them. "It is important that we maintain the national herd. If you have 12 cows, you can sell 4 and remain with 8. This way the country will not lose all its good dairy cows", he says.

continued on page 7

A Sahiwal breed for Kenyan dairy farmers

As the quality of dairy cattle in the country continues to deteriorate due to poor management and inbreeding, one institution has struggled to maintain standards. It is the KARI-National Animal Husbandry Research Centre in Naivasha. Aware that more than 80 percent of the country is arid or semi-arid, the Centre has a breeding programme that breeds dairy and beef cattle suitable for both high potential and arid areas of the country. The Sahiwal breed was imported from the semi-arid and arid region of Pakistan and India in the 1930s, after attempts to improve the local Zebu breed showed little genetic progress. Due to its excellent performance, KARI Naivasha established the National Sahiwal Stud (breeding farm). Its two main objectives are (i) to produce pure-bred Sahiwal cattle for use in the arid and semi-arid areas, and (ii) the cross breeding of Sahiwals with exotic breeds such as Friesians to produce a breed that is suitable for milk production in both high- and low-potential areas.

The Sahiwal–Friesian cow can produce up to 20 litres of milk in a day, yet it does not eat as much as the exotic Friesian breed. The breed is also resistant to most of the common cattle diseases. The Naivasha–KARI Farm has an average of 1400 Sahiwal and Friesian–Sahiwal crosses. Requests for this breed are so high that the Centre is not able to meet the demand from farmers. Ayako says that this year alone the Centre has sold 64 bulls and 23 cows to farmers from Narok, Trans-Mara and Kajiado. Semen collected from bulls bred at the Centre is processed and sold in the local and international markets. An in-calf heifer at the Centre goes for Ksh 40,000 while a bull costs Ksh 55,000. Farmers can place orders through the following address:

Centre Director, KARI National Animal Husbandry Research Centre, P.O.Box 25, Naivasha Tel. 0722 336 589.

A Friesian–Sahiwal crossbreed cow and calf

Garlic likes it hot

Please give some advice on garlic production and uses. Mwongela 0720 143 977

Garlic is grown from garlic cloves that are separated from the garlic bulbs. The plants like a well-drained soil high in organic matter, and a warm to hot climate.

Cloves should be planted 2 inches in the soil at 4 inches spacing between cloves. The larger the cloves, the larger the new bulbs will turn out.

Garlic does not like competing with weeds; therefore weed regularly and mulch well. Feed the plants at least once during their growing season and make sure not to over irrigate. Check bulbs beneath the soil after about 4 months. If they are bulging out of their outer cover they are almost ready. Lift from the soil before the green growing leaves are dried up and cure as in an aerated area. This can be done by hanging the bunches together. Do not cure in the sun as this lowers the quality of the bulbs. When the bulbs are dry, cut off the now-dried leaves and your crop of well cured garlic should keep for up to six months.

Garlic has antibacterial, antifungal and even antiviral properties. It is thus used in alternative medicine to treat or help in these conditions. In the organic shamba, it is used crushed and soaked in water, or as an oil against fungi, as well as being used as an insect repellent when combined in solution with African marigold and chillies.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Marigold plant has many uses

What is the difference between African marigold and Mexican marigold? 0734 418288

The marigolds are members of the Tagetes family, of which we have Mexican, African and even French marigold species. African marigold is known as *Tagetes erecta* and is the tallest of the family, while Mexican marigold is known as *Tagetes minuta* (small).

The Mexican marigolds also have large flowers in comparison to the African marigold, which have the smallest flowers. In Kenya we have both types, with the Mexican species being more exotic and mostly available as seed or seedlings in the roadside flower nurseries. African marigold is fairly widespread all over the country and is commonly treated as a weed. It is the tall, rather smelly, fast-growing weed seen in most shambas. It is sometimes mistaken for a cannabis plant when young, as it has a similar leaf structure.

Organic farmers use the Tagetes family as an insecticide, fungicide, nematicide and also to harbour beneficial insects. To make an insecticide, crush leaves and roots of the marigolds and soak in water for 5 – 7 days until the material has decayed. Sieve the mixture and use the resulting liquid diluted 1:1 with soapy water as a spray. This mixture repels most insects and can also help plants resist fungal diseases such as blight in potatoes and tomatoes.

The African Marigold Tagetes erecta *(above) is taller and has small flowers. While the Mexican Marigold* Tagetes minuta *(below) is small in size and has large flowers. (Photos TOF)*

In areas where there are problems with nematodes, leave the marigold to grow for a season as a lush weed-like cover and plough it back into the soil before it goes to seed. This is one of the most effective plants against nematodes, as the roots of the African marigold give off a substance that kills nematodes. One can also use the plant as a rotation crop on rested soils.

As the flowers of the Tagetes attract beneficial insects, they can be useful when interspersed with your crops or around the crop bed borders. They are also very attractive to look at and brighten up your field. For pets, bedding made up of sacks filled with dried marigolds helps deter fleas and ticks. ■

Be careful with greenhouses

What can you grow in a greenhouse? Wekesa Kibuka, 0724 834 801

Greenhouses are expensive to construct, and create an unnatural environment. Farmers using greenhouses do so in order to control the growing environment. This does seem to go against the logic of organic production, which centres on working with the natural environment, however there are many organic producers using greenhouses.

Greenhouses naturally raise temperatures and thus are used for the production of hot-weather, high-value crops such as tomatoes, peppers, cucumbers, courgettes, chillies, butternuts, melons, etc. My experience with greenhouse production ended with the deconstruction of the entire structure. Due to the controlled environment, I had continuous problems with pests and diseases. If I was not fighting off mites, I was battling with fungus. The entire struggle was not worth any gains.

My advice to farmers preparing to produce organically using greenhouses is to start with one house first and build up the experience you will need before investing in a large operation. As the build-up of pests and diseases in greenhouses can be quite swift, one really does need a solution with a fast reaction, time in order to avert risk of crop failure. Our organic solutions to pests and diseases are not as quick in bearing results as conventional chemical solutions. I believe the success of organic greenhouse production depends largely on the experience of the farmer. ■

Letters to the editor

Happy to come across magazine

We are a group practising organic farming. One day we came across *The Organic Farmer* and we were very happy with the information it carried. We liked the articles so much that we would like you to send us any edition containing more about poultry and dairy keeping. We will be very happy if you address our problem.

Edwin Kavulu Kathuo, Organic Farmers, P.O Box 247, Tulia Kitui, Tel. 0726 385694

We need current and past issues of the magazine

I kindly request for monthly copies of *The Organic Farmer*. I learned about this wonderful magazine through a friend who had the August 2006 issue. Personally, I am a graduate of sustainable agriculture and rural development from Baraka College. In my community in Lugari district, I am promoting sustainable agriculture and I work with Self-Help Groups, youth groups, women's groups and church- based organizations. I am a secretary of two registered groups of 21 and 17 members respectively. It is on this basis that I feel your magazine will be very relevant to me and my community members. I therefore request to be supplied with enough copies to help me spread the gospel of organic farming. Organic farming is the only sure way of ensuring a healthy nation. Long live *The Organic Farmer* magazine. I also kindly request to be sent single copies of the previous issues of this informative magazine. I thank you in advance for considering my request.

Jesse Luchetu Shivachi, PO Box 41 50108, Lugari, Tel 0721 664131

We need it in Ghana

We write to request for copies and subsequent subscriptions of your magazine *The Organic Farmer*, which we realize will help our educational and entrepreneurial programmes. Thank you.

Joseph M.Agbeko, Executive Director Fair River International - (FARIAD), P.O.BOX OS 2369, OSU ACCRA GHANA. (West Africa)Telephone: +233 217012472Direct: +233 24 3107106 Fax: +233 217012472 e-mail: info@fairriver.orgWebsite: www.fairriver.org

Organic farming is cheap

Wakulima Bora is a registered self-help group which has a total membership of 16 people and membership is still open to any farmer who is interested. One of our key objectives is to encourage organic farming, which is more cost effective and is also good for sustainable agriculture. We are small-scale farmers involved in the production of potatoes, maize and wheat. We also keep dairy cows. Some of members are now venturing into mushroom farming while others have gone into poultry farming. We request you to be sending us copies of your magazine.

Gichuru Ikiara, Wakulima Bora Group, P.O Box 1992 60200, Meru 0720 437220

Dairy cow breeds...

Continued from Page 5

Our research has shown that a number of local banks and financial institutions in the country have already initiated credit facilities for farmers who would like to restock. It is easy for farmers to access credit. All a farmer needs is to open an account with the bank and show records of their milk deliveries, which will be the security for being considered for a loan. ■

Total mixed rations for a dairy cow *(See page 4)*

Milk yield target (Kg)	Live body weight (Kg)	Maize Silage (Kg)	Lucerne hay (Kg)	Napier Fresh (Kg)	Rhodes Grass (Kg)	Concentrates (Kg)	Total Dairy Meal Intake (Kg)	Forage Concentrate Ratio	Cost per kg of milk
30-35	600	14	3	3	2	15.2	21.3	1:1.5	8
20-25	550	14	3	3	2	10.4	16.8	1:1.1	15.9
10-15	550	16	-	4	6	6	15.6	1:1.5	15.9

- For 5 kg milk produced above the target, add 0.5 of each individual ingredient.
- Production system is semi-intensive. (Source: KARI, Naivasha) ■

The Plant Extracts Special which appeared in Sept/Oct 2006 issue is now available in English. Interested farmers can order it.

Suitable for farmer training

I am a field extension staff, working with the ministry of agriculture, Mumberes division. I received a copy of your *TOF* magazine from a friend who works in Baraka college. I have practically demonstrated on compost making, using EM1 solution, in three field days and the response has been very good. Your magazine contains very rich, honest and useful information for the farmer. Please consider me in your mailing list, plus five copies for the groups that I train. Samwel K Rotich, P.O Box 36, Timboroa smlrotich@yahoo.com

I want to go organic

I am a farmer in Kakamega district who is specialized in horticultural farming. I want to practice organic farming, as inorganic farming is expensive and has low yield. Accept my request of *The Organic Farmer* magazine. Shadrack Nyikuli, P.O Box 84 50105, Bukura

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you! **SMS ONLY**

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Rabbit farmer swamped by orders

Godfrey Gichuhi, the rabbit farmer from Ruthagati village in Karatina, whose story we featured in the July 2007 issue, must be smiling all the way to the bank. Since *The Organic Farmer* wrote about rabbit keeping as an easy way of income generation, farmers from all over the country have been calling Gichuhi with orders for rabbits. He says he has been swamped with telephone calls from farmers eager to start rabbit keeping since they read the article. "Farmers are calling from as far as Budalangi, Kisumu, Kitale, Kisii and Kericho and many other parts of the country. Every day I receive an average of 10 calls from farmers who want to buy rabbits. So far I have sold 250 rabbits within a few weeks", he says. He organizes delivery to any part of the country.

Gichuhi has been forced to buy rabbits from members of his farmers' group. Increased demand has forced him to start more farmers' groups in his area to breed more rabbits.

Farmers' groups in Budalangi and Bungoma have also invited him to train them. Gichuhi plans to write a book on rabbit keeping. Farmers interested in rabbits can get in touch with him at the following address: Godfrey Gichuhi P.O. Box 137, Karatina, Tel. 0720 406 195. The overwhelming response to the article on rabbits and the others we have done before (as on mushrooms, for instance, or dairy goats), is a confirmation that farmers really appreciate and use the information we give every month in *The Organic Farmer* magazine to improve their farming methods and livelihoods. (*TOF*)

The benefits of a kitchen garden

Currently nearly every farmer owns a kitchen garden for vegetable growing which produces organic products. The Integrated Pests and Disease Management (IPM) system is highly practised in the gardens. The first step is to re-establish the natural order and reinstate the fertility of the soil by minimizing soil disturbance and maximizing soil organic matter. The second stage is to re-introduce plant diversity. This is the most effective way of maintaining pest control and ensuring continued soil fertility. The law of plant diversity says that there should be a wide variety of different plants on the land at any one time. Here is a recipe for pest control:

Neem tree extract

Add 1 kg finely shredded neem leaves to 1 litre of water, shake vigorously, filter, then add 4 litres of water. Add 2 teaspoonfuls of paraffin and a little soap.

Target pests: aphids, bugs, cutworm and nematodes.

Austin Mumo, Development worker, P.O Box 102, Sultan Hamud Tel.0727 554529 / 0735 591678

The watering plant

I am almost making a breakthrough in discovering a system whereby plants are used in irrigating other plants naturally. The plant to be used in irrigating other plants has the capability of absorbing moisture from the air at night and releasing the moisture through the stem. This system wets the ground, enabling it and other plants nearby to grow with little or no rainfall. Through observations in the last 10 years, I have no doubt that the plant is useful for this purpose. During drought spells you will find that the base of the stem around it is always wet. The tap root is relatively long with very short root hairs, which shows that the plant does not necessarily require watering, as it is able to get water on its own.

I have not done further research because the plant has no seeds, as it propagates through spores. I am therefore asking anybody who can help in reproducing this plant to get in touch with me for us to do carry out further research. If successful, the plant could be intercropped with others, such as millet, to provide them with water during drought periods. I hope to have the discovery patented after further research. David Osiako, Umoja Forest Conservation Group, P.O.Box 49, Kesogon Tel. 0735 578 416.

Market Place

Training: The Kenya Organic Agriculture and Environmental Technologies Institute offers a range of courses to farmers in the following areas:

i) Extension services for individuals and farmers groups

ii) Certificate in organic agriculture and environmental science

iii) Diploma in organic agriculture and environmental science

The courses start in January 2008. For enquiries farmers can contact: The Training Manager, KOAETEC Institute, P.O.Box 32 60125 Kubu-Kubu Embu.Tel.0725301195 Fax 06841074

Organic fertilizer: EM Bokashi is an organic fertilizer containing a high concentration of essential nutrients required for plant growth, manufactured under licence from EMRO Japan. The nutrients are made using Effective Microorganisms (EM). Farmers interested in buying EM Bokashi can get in touch with the manufacturers at the following address: EM Technologies Ltd, P.O Box 1365,60100 Embu, Kenya Tel.254 068 41074/ 072640174 email: embu@emtechkenya.com.

Organic produce needed: The Organic Shop would like to buy the following organic farm produce from certified organic growers: All types of fruits such raspberry,sugar,corn oil,sunflower oil, garlic, strawberry, green peppers, eggplant, organic tea, and coffee, grains such as wheat, barley and oats, beef, lamb, duck. Farmers can get in touch with the shop at the following address: contact Zak Tel. 0722 572717 or Su Kahumbu Tel. 0721 100001, email: info@organic.co.ke

Petition: Last month we sent out fliers on a petition against the ban on air freight of organic produce to European markets. Farmers were supposed to fill in the petition form and send it to the Kenya Organic Agriculture Network (KOAN) in Nairobi or send an SMS to show solidarity with those opposed to the ban. Farmers who have not done so are requested to send their forms as soon as possible.

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 16 August, 2006

Through tiny holes in these pipes water flows directly to the plant roots (TOF)

Every drop for the plant

The increasing demand for water by agriculture calls for more efficient use of this resource – for instance through drip irrigation.

Philomena Nyagilo

Water is a crucial element vital to life on earth. Every farmer knows quite well that if there is no water, there are no plants growing – and there is no food. The water taken up by the roots of a plant is combined with nutrients from the soil and carbon dioxide from the air to make food, while some water is lost to the atmosphere through a process usually called transpiration.

Water is therefore an essential resource to the farmer. Its management to a great extent decides how successful a farming enterprise is or can be. Smallscale farmers in Kenya depend on rain to satisfy the water requirements of their farms. Unfortunately, this rainfall is often low, erratic and unreliable. Since water availability is the limiting factor to plant growth, farmers have to devise other ways to minimize the risks of rain-fed agriculture.

More and more farmers have become aware of these problems and are installing irrigation systems on their farms. The most efficient system of irrigation is drip irrigation, which we feature in this month's edition of *The Organic Farmer* (see pages 4,5). In the next issues we will explain methods of water conservation.

in this issue

Dairy goats in great demand by local farmers

After our story on dairy goats in September last year, many farmers have written to us requesting for information on where they can buy the goats. This clearly indicates that the demand for the goats is very high among our farmers. The problem is that very few farmers have managed to get the goats for breeding purposes. Government agricultural institutions do not have any for sale either. Except for a few places such as Nakuru District, where farmers have come together to start a breeders' association, there are no organized dairy goat breeding associations in the country.

It is easy to understand why many farmers want dairy goats. They are easy to handle, while their milk is highly nutritious. On page 2 of this issue, we give you more information on how to take care of them. *(TOF)*

Dear farmers,

In this newspaper, we have laid emphasis several times on the need for farmers to be more creative in order to remain competitive and get good returns from their farms. It appears, however, that many farmers have continued to practice farming as they have done in the past.

If you look around your neighbourhood, you will find farmers growing the same type of crops they grew 10 years ago. This is regardless of whether these crops give them the desired yields and income. Take for example farmers in the maize-growing areas of the country; in these regions, you will find farmers who have grown maize in the same field for the last 30 years. As you have read in this newspaper, this practice wears out the soil and thus it cannot support a good harvest.

Another practice that is not wise is "copy-cat" farming. If one farmer grows tomatoes and makes good returns in a particular season, every farmer in the neighbourhood will switch to tomato growing. What happens is that all these farmers will harvest and deliver the tomatoes to the market at the same time. This flooding of the market with the same product lowers its demand, and in the process pushes down the price. Agricultural product markets are very dynamic and prices change every day. It takes a clever farmer to understand the market trends and only grow what is likely to sell at a particular season. This is the only way farmers can survive in this market environment.

Diversification on the farm has many advantages if it is carried out in a planned way. Different crops take different nutrients from the soil. Crop rotation helps to balance the various nutrients needed to improve soil fertility and maintain plant health. In mixed farming, where livestock and crop production are practised, farmers have the advantage of the livestock converting crop residues into meat and milk.

What we are saying is that Kenyan farmers have enough resources at their disposal. If these resources are well planned and utilised, it is possible to greatly improve the overall productivity of the farm, including income.

MY OPINION

While it is obvious that population increase is to blame for increased sub-division of available agricultural land, I believe the trend is not good for the development of agriculture in the country. The subdivision has led to acquisition of unviable agricultural units that cannot help improve food production. The government is to blame for this problem. Most of our farmers have only been trained to produce food. No effort is made to impart knowledge on value addition which could help create jobs and reduce pressure on land. A major overhaul of the agricultural sector is needed to change the attitude of the farmers for the benefit of the country.

Peter Karimi, a farmer in Nyeri

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Charles Kimani, Farmer, Wangige

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 020 445 03 98
e-mail : info@organickenya.com

Layout
In-A-Vision Systems(k)

Dairy goats need proper care

Proper management of dairy goats can help improve their health and and productivity.

The Organic Farmer

Dairy goats require a high standard of management for them to give good returns to the farmer. Lack of knowledge on goat management is a problem for many farmers. From the many farmers we have visited, it is evident that farmers do not maintain the animals to the expected standards. Most of the goat sheds we have seen are not kept clean the way they should be. Most farmers house the goats in such tiny sheds that the animals do not have enough room for rest and movement. Lack of hygiene also exposes the goats to diseases and pests. Dairy goat owners should observe the following guidelines to ensure the goats are comfortable and productive.

Housing

Except for drinking water, dairy goats do not like wet conditions. The ideal home for a goat should be dry and clean. A simple way of doing this is to build a goat house with a raised timber floor that ensures good drainage and allows the free flow of urine and faeces through spaces left in the timber. This waste is valuable crop manure that can be used to fertilize the garden. Always remove waste products twice a day.

Dairy goats are very selective of what they eat and will often not eat or drink anything that is dirty. That is why their water, fodder and feed boxes are located outside the house, to prevent contamination.

Goats are inquisitive and intelligent creatures and should be allowed to see what is around them. It is important that the farmer allows them to go out every day for exercise and to browse on whatever plants are available. One important practice of organic farming is to allow the animals to move freely. No goat will perform well if it is confined in a room.

Feeding

The food intake of a dairy goat is higher than that of local breeds. This is mainly because its productivity is also higher. The amount consumed by a dairy goat depends on the individual goat's selective habits. However, if good quality forage is available, it will often eat more. If the forage quality is low, the refusal rate is often higher. It is always advisable to chop green fodder into small pieces so that the goats can chew them easily. If more than one type of forage is available, goats will digest the roughage more efficiently. This forage can include potato vines, maize stalks, sorghum, and waste vegetables, among others. Clean fresh water should always be available. A block of salt should also be hung up in an accessible place for the goats to lick.

It is important to know how a goat feeds; it has a big stomach in comparison to its body size, which is what it uses to convert its food into milk. It is more efficient in converting dry roughage into milk than a cow, but it must have good quality clean, dry forage at all times. The amount a goat eats will depend on its size. If there is a lot of waste, either the animal finds the food unpalatable or the quantity is too much. A 45 kg goat should be consuming up to 7% of her body weight, in this case 3.2 kg daily.

A goat should not only eat roughage. It is important to add concentrate to the feed to increase milk production. Dairy meal should be added and fed when it is still fresh. The amount of concentrate should depend on the amount of milk being produced. A small quantity should be fed to a pregnant goat in order to build up her body reserves and help in the development of her unborn kid.

Dairy meal rations should be divided into two, with half being given in the morning and the other half in the evening. A dry female should get 0.5 kg of dairy meal, a female producing 1 litre of milk should be fed 1 kg of dairy meal, 2.0 litres - 1.5 kg, 3 litres - 2.0 kg, 4 litres - 2.5 kg and 5 litres - 3.0 kgs of dairy meal daily.

Breeding

One healthy buck (male goat) can serve up to 30 females in a season. It is uneconomical to keep a buck for a whole year to serve only a few females. It is advisable for farmers in one area to form a breeding group and purchase a buck to be used by each member when needed.

Rearing and milking

Kids reared naturally stay with their mothers until they are weaned at 4 months of age. Since most farmers purchase dairy goats to provide milk for the household, the kid should be separated from its mother at night and the goat milked in the morning to provide milk for the family.

Green maize can raise farmers income

The government fears sales of green maize can interfere with the country's food security.

Peter Kamau

Aloisia Kirembu is a maize farmer with a difference. Unlike many farmers in Wamuini area in the outskirts of Kitale town, she specializes in the production of green maize. She is lucky because there are several springs on her 9-acre farm. This enables her to grow maize on 2 acres all the year round through irrigation. When the green maize is ready for harvest, middlemen from Kitale town, Kiminini trading centre and places as far as Bungoma town flock her farm to buy it.

"Sometimes they come as early as 6 a.m and almost fight over the maize if I do not have enough", she says. The maize is later sold in open air markets and to roadside maize roasters in Kitale town and neighbouring districts.

"Growing green maize is profitable. Sometimes I can make as much as five times the amount of money I would make from dry maize on 1 acre. The yield would be much higher if I grew hybrid varieties, but I prefer growing traditional varieties as they have a better taste that is popular with my customers", she adds. On her farm the first crop is planted at the beginning of January while the second is sown in August. Apart from the 2 acres reserved for green maize, spaces left by harvested maize, cabbages, potatoes or beans are immediately cleared and planted with a new maize crop; this ensures there is always some maize growing as an intercrop on the other parts of the farm to keep her customers supplied throughout the year. She prefers chicken and farmyard manure to fertilize all her crops.

Post–harvest losses to farmers

Aloisia Kirembu is not alone; many farmers in the maize–growing areas of TransNzoia and Bungoma districts have discovered the advantages of selling vegetable maize. There are several reasons why many farmers are turning to vegetable maize production. One reason is that maize can give much more money when it is sold green than when it is dry. For example, during the May–June season, one ear (cob) goes for Ksh. 5 while in the July-August season when the crop is maturing in most growing areas, it costs Ksh 3 per cob. A different crop can also be planted immediately after the maize is harvested, which also fetches extra money. The maize stalks are very valuable as they provide fodder for her four dairy cows and also improve the quality of the farmyard manure. It is easy to see why she does better than other farmers. They have to wait until November to start harvesting, since most of them do not sell the maize immediately, they have to wait for 1 or 2 months before they can shell the maize and sell it to the National Cereals and Produce Board, where payments may be delayed for up to 6 months. Those who are not able to wait due to pressing financial needs such as payment of school fees, land preparation or farm inputs are forced to sell at low prices to middlemen.

There is always a market for green maize

Unlike dry maize, there is no danger of pest damage and rotting in green maize. Research findings by the United Nations Food And Agricultural Organisation (FAO) show that Kenyan farmers suffer between 15 – 50 per cent in post–harvest losses. Farmers who sell green maize overcome all these losses and get a maximum return on their investment.

Money for every cob sold

Japheth Wanyama, a social economist at the Kenya Agricultural Research Institute (KARI) in Kitale says research undertaken by the institute shows that the returns from sale of vegetable maize are much higher than dry maize. He says that at a spacing of 75cm by 30cm, a well tended maize field can produce more than 44,000 maize cobs. Most varieties of maize can produce up to three cobs, which means that the yield can be much higher. Assuming the price of one cob is KSh 5 then a farmer can make up to KSh 220,000 in one acre of maize. He said in practice, farmers earn between KSh 150,000 to 200,000 per acre. Most farmers selling dry maize earn less than KSh 25,000 per acre. However, the production of green maize is confined to farmers whose farms have river frontages where maize can grow at any time of the year. The only other producers are large-scale farmers who can afford to install irrigation systems for maize production. KARI economist Wanyama advises farmers who want to get good returns to practise correct timing and plant early so that the maize matures when the prices are favourable in the market.

Government controls sale

However, Wanyama notes that the sale of green maize can have serious consequences in the household and on national food security if it is encouraged. He says the good prices can be encouraging to those who could end up selling all their maize, leaving none for their families. "The good earnings from green maize production can be very tempting and there is fear that it can be practised at the expense of national food production", says Wanyama. "But if the money is properly utilized it can really boost income for most of the poor farmers".

This is the reason why the government is forced to impose a ban to control the sale and roasting of green maize from August every year to ensure farmers do not sell all their maize at this time. He adds that many farmers often plant early-maturing varieties which they sell as green maize while the late-maturing ones are later sold as dry maize.

Drip irrigation is cheap and efficient

The system brings the water directly to the place where it is needed most– the roots of the plants.

Philomena Nyagilo

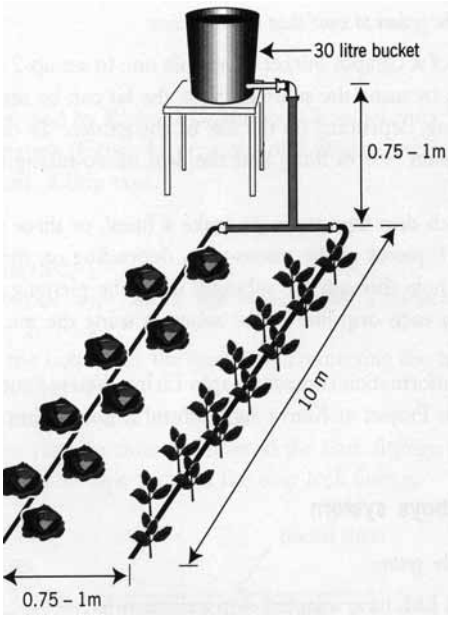
Since Ann Wangare Mwangi, a smallscale farmer in Kiserian, started using drip irrigation, her life has improved. "My water tank has a capacity of 6000 litres and irrigates about 3/4 of an acre", she says. "Last year I irrigated and harvested tomatoes worth KSh 100,000. Drip irrigation is working efficiently".

Ann is not alone with her opinion. Thousands of farmers in Africa and all over the world use drip irrigation to water their crops. Su Kahumbu, for instance, says it very clearly: "You need less water, and drip irrigation allows you to farm 12 months a year".

Simple operating system

Drip irrigation is an effective system that uses water most efficiently to produce vegetables and other crops during drought periods. Smallscale farmers in semi-arid areas who are already using the system are finding the technology to be very appropriate and suitable for production of fresh vegetables, field and tree crops throughout the year.

The system is easy to explain: In drip or trickle irrigation, water is allowed to drip to the soil around the plant roots. Water flows out very slowly in drops from a small-diameter plastic pipe fitted with outlets. This means that water is applied only to that part of the soil immediately surrounding the plant.



Bucket drip is the simplest system

There is no water wasted.

There are different types of drip pipes. Some have the outlets at a distance of 20 cm or 30 cm apart. You plant the seedlings near the hole in the drip pipe. The spacing between plants depends on your crops. Cabbages need a spacing of 30 cm between the holes, lettuce or onions require 15–20 cm.

Working efficiently

Drip irrigation allows you to produce crops the whole year – much more compared to rain fed irrigation. It has many other advantages:

• It is very efficient; this is because water soaks into the soil before it can evaporate or run off.

• Water is supplied to the soil around the plant. This means that less water is wasted, while high moisture conditions are maintained close to the roots of the plant. This makes drip irrigation appropriate for areas where water is scarce.

• Drip irrigation is easy to install and can be inexpensive if locally available materials are used.

• It allows you to add soluble nutrients into the water, so they can feed the plants directly. This economises on your fertilizer use, and is called 'fertigation'.

• It gives you a higher yield because you can plant on both sides of the pipe.

• It helps reduce diseases associated with excess moisture on some plants: With drip irrigation you do not wet the leaves. Fungal spores need hours of leaf wetness to develop.

• Drip irrigation can be used in fields that have uneven landscapes.

• It decreases weed populations. Since water is applied close to the roots of the plants, the soil surface between rows is dry, so weeds cannot grow.

• The drip irrigation system does the watering without any labour, reducing costs.

Costs and installation

Ann Wangare Mwangi bought her irrigation system at the Kenya Agriculture Research Institute (KARI) in 2004 at a price of KSh 37,000. The installation was also done by the same institution at a small fee. However, there are smaller and cheaper systems which make the applications available to smallscale farmers. At the cost of about KSh 8,500 you will get a system for more than 500 plants. It is advantageous for smallscale farmers to buy the materials in groups so they can bargain for a discount. For instance, if a roll of irrigation pipe is normally sold at KSh 8 per metre, farmers can get it for less if they buy it in bulk.

It is important that the pipes are fixed properly, otherwise the water

continued on page 5

Maintenance of drip irrigation pipes important

Ann Wangare Mwangi advises that for the drip irrigation system to work well, there is need for constant maintenance so as to remain efficient and operate at the optimum. According to her, farmers should:

• Use clean water to avoid clogging the water emitters.

• Be careful during farm activities like weeding to avoid damaging the water pipes, hoses and drip pipes.

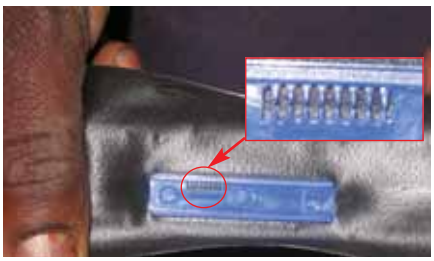
• Inspect the system on a regular basis so as to detect any destruction from pests (such as termites, rodents), blocked emitters, and leaks that cause water loss.

• Ensure the filters are cleaned regularly.

• Make sure you put away the system and store it when not in use.

• Use mulch (dry plant material like grass) between the plants to minimize water loss through evaporation and reduce the growth of weeds.

With all the gains that can be achieved through these measures, changing to drip irrigation can increase food production, especially where irrigation has not been explored before. There are numerous economic and social advantages when farmers use drip irrigation.



Inside a drip pipe: Only clean water can run out of the small holes shown (arrow)

Choosing the appropriate drip system

Farmers should know the type of crops and soils before making a decision on which drip irrigation system to buy.

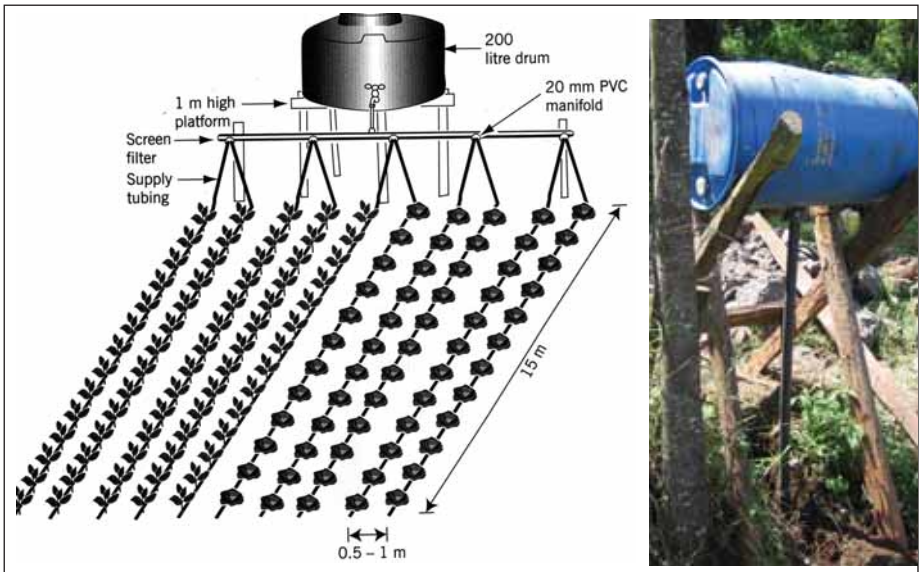
There are many drip irrigation components available. Choosing a particular combination depends on various factors. Using clean water is very important. Water from ponds, rivers and wells may contain small particles that can block the holes that release water to the plants (see photo). It is necessary to have a filter to remove these particles. If there is no money for a filter, you can let the water run through a piece of cotton or a sock when filling the bucket or the drum.

The best approach for smallscale farmers is to keep their systems as simple as possible. They should try to wet only the areas close to the desired plant, so that the roots can easily access the water. It is important to realize that the larger the plant, the more the water it will need; the number of holes on the pipe (emitters) that discharge water to the plant may need to be increased, depending on the type and size of the plant. The system might need to run more often during dry weather than during wet or humid conditions. The type of soil also determines the number of emitters to be used. In sandy soils, the pipes need to be closer together than in clay soils.

The bucket kit system

This system is ideal for growing vegetables in small home gardens during the long dry season. The bucket kit consists of fittings and 30 metres of irrigation drip tape connected to a 20-litre bucket. The bucket is placed at least 1 metre above the ground so that gravity provides sufficient water pressure to ensure even watering for the entire crop (see page 4).

Water is poured into the bucket twice daily and passes through a filter; it fills the drip tape and is evenly distributed to 100 watering points. The multi-chambered plastic drip tape is engineered to dispense water through openings spaced at 30 cm. A seedling is planted at each wet spot so that all the moisture is absorbed directly by the plant roots. Two bucket kits will produce more than enough vegetables for a family of seven.



A 200 litre drum can provide water for 500 plants as shown above (Photo TOF)

Main pipe supplies the drip water

The drum irrigation system

The drum system will cover a garden 6.5 metres wide and 16 metres long. The drum kit is used to cover five planting beds and therefore the plant population depends on the type of crops grown. Water is supplied from a 200-litre drum that is fixed on a platform at a height of at least 1 metre above the ground.

The 1/8 farm system

This system covers 1/8 of an acre (a 15 metre x 30 metre plot). A platform 2 metres high is constructed to create enough water pressure. A drum with a capacity of 1000 litres would be ideal to supply enough water per day. (*PN*)

If you wish to know more about drip irrigation, the Regional Land Management Unit (RELMA) has published a very informative book: "Drip Irrigation: Options for Smallholder Farmers in Eastern and Southern Africa";" Technical Handbook No. 24, Nairobi 2001. The illustrations and a lot of information for the articles on pages 4 and 5 were obtained from this book.

Farmers interested in buying drip pipes should make enquiries at the following institutions:
The Kenya Agricultural Research Institute, National Research Laboratories (**KARI-NARL**), Waiyaki Way, Nairobi, Tel. 0722 397750,
Ask for Esther Muriuki
Or
SHADE NETS LTD,
P.O.Box 2127, Thika
Tel. 067 31051/6 Ask for Judy
E mail: shadenet@wananchi.com

Drip irrigation... *continued from page 4*

will leak. Proper installation can guarantee a lifespan of at least 10 years. When your drip irrigation is on, watch how deep the water has gone, so you can see how long a time the water needs to run.

Smallscale farmers can make modifications to the drip irrigation system to satisfy their practical needs in their farms. According to Esther Muriuki, who works as a technician at KARI, the bucket and the drum systems are simple designs that can be easily assembled and maintained on the farm.

We have to understand Mother Nature

Barbara Lamperth Hounnou from Zimbabwe has sent us a picture of a diseased plant. "As a regular reader, printer and distributor of *The Organic Farmer* here in Zimbabwe, I would like to ask you a question. I run my garden exclusively organically and I am shocked how much people here rely on fertilizers and chemicals for pest control. In the picture is a leaf of a paprika plant. The owner of the field says that if she doesn't treat her plants very soon, they will all become like this and she will have no harvest. So she is going to spray; she mentioned about seven different possible products, all of them sounding quite toxic and being awfully expensive. What natural measures can be taken to protect paprika plants? Can they be intercropped with something protective? What is the cause of the disease?"

Firstly, if grown in optimum conditions, crops rarely suffer from chronic disease, deficiency or even insect damage. Organic production creates fertile soils, and diversity in both flora and fauna (plants and animals), resulting in a natural balance and thus a stable environment. Where we upset, defy or challenge and change these conditions, we create problems. More often than not, we use artificial solutions to correct these. In the case of the paprika leaf, at first glance it does look like a fungal disease. Its presence may be due to many reasons. It could have spread from neighbouring plants, by being wind-blown, or have come from the soil, from insects, or frompoor crop hygiene. It may be due to pathogen build-up in the soil, as there may be poor or no crop rotation practised. It is difficult to make a diagnosis based on a snapshot photograph without the surrounding history and evidence. It also looks fairly well established, which would make a cure both organically and conventionally difficult.

Though there are many organic botanical solutions to a wide variety of problems, it must be recognized that using organic solutions in conventional crop production may not result in the desired effects. As long as the production methods are out of sync with nature, nature will always try to fight back. This natural adjustment then becomes viewed as a problem, when it is in fact Mother Nature producing a solution to the man-made imbalance.

Change to organic farming

Barbara, a starting point would be to encourage your friend to incorporate intercropping, crop rotation and soil fertility-building in her planting. Nature has many intrinsic links which we need to discover and understand. Hopefully your friend will start exploring the exciting world of organic production. The more knowledge we have on the workings of nature, the better able we are to understand her fragility and persistence. We also then recognize how our existence is dependant on nature.

I also asked Dr. Zachary Kinyua, a plant pathologist at the Kenya Agricultural Institute (KARI). Here is his answer:

"Diagnosis of plant diseases from a picture may not be too accurate unless verified through laboratory tests. This is because different agro-ecological zones have different disease-causing organisms and pests. Unfortunately it is not possible to send the sample to Kenya because of phytosanitary restrictions that prevent the transfer of plants from one country to another. We therefore recommend that you take samples of the plant to the Zimbabwe Plant Protection Research Institute (PPIR), who will carry out a test and give you an accurate answer on the cause of the disease."

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Greenhouses not suitable in organic farming

Elijah Nyarangi (Tel. 0733 88 85 87) wishes to start greenhouse farming. He asks: "Is it possible to do this organically?"

Elijah, this is a very important question to ask before you have actually started. On a personal level, I invested in a greenhouse four years ago, and took it down this year. Last week, I visited a farmer who started off producing organically in three greenhouses and who has now, one year later, resorted to conventional production. In my case, the problems associated with the greenhouse far outweighed any benefits. Pest populations in a controlled environment can very easily get out of hand and disease is very often swift in its onset, and difficult to control. One requires a lot of vigilance and knowledge to succeed with organic greenhouse production. These issues can be overcome, but can this be done economically? Organic production aims to create a sustainable balance with many players in nature.

Greenhousing requires a financial investment where space becomes prime property and unless done on a very large scale, the outside conditions that create a balance cannot be copied on the inside. One easily gets into a vicious cycle of trying to control one outbreak after another of pests and diseases. Soil pathogens also thrive in humid greenhouses.

The farmer who eventually turned to conventional production could not

continued on page 7

Letters to the editor

We need support

I am an organic farmer living in the most remote part of West Pokot District, Sigor Division. I hold a certificate in Bio-intensive Agriculture from Manor House Agricultural Centre, Kitale. But am not employed. Currently, I have managed to come up with a small grass root group called Kapon-pon youth group for sustainable development (KAYG-SD) which operates with limited resources and therefore requires support.

Samson Kuyo, Mbara Primary, School, P.O Box 211, Kapenguria

Dear Mr. Kuyo,

Thank you for your initiative in starting a group. Although the newspaper is currently giving part assistance to selected farmers' groups to facilitate the marketing of their organic produce, we do not give financial support to farmers' groups because all our funds go to the production of the newspaper-Editor

Will dairy goats survive?

I take this opportunity to thank you for *TOF* newspaper. I understand the shortage and postage. Our members have accepted to share the copies. They are 14 in number. I have distributed all and the farmers are always anxious. About the milk goats, we would like to know whether there is a problem with climate because when we compare Nyahururu and Nakuru, it is different by far. We have booked one male and one female goat from Mukurweini Nyeri and they will be brought on the 15th of this month for demonstration because they are a bit expensive and we fear that they may not do well in this area.

Rachael Nduriri, Gikingi Church Group, P.O Box 1334, Nyahururu
Tel.0720 616435

Organic material is not waste (TOF)

Waste management

The Green Towns organization was initiated in the early 1990s and has projects in over 48 towns with varied regional projects that are aimed at conserving the towns sustainably with respect to the environment. One of the key areas of intervention is waste recycling and utilization. Organic waste, being over 70% of most urban waste, necessitates its use in agriculture. Through our farmers' network we have been able to train urban and peri–urban farmers on the skills.Your newspaper *The Organic Farmer* has complimented our work because farmers experience many problems. Working together with you will make us reach more farmers. This will enable them acquire skills in organic farming and improve food security. We will therefore be grateful if you can increase the number of copies to serve the more than 200 farmers in the programme.

Elijah Githee, Green Towns, P.O Box 766, Nakuru

My questions answered

Personally I am very happy and grateful because you have answered my questions in the last issue and I am satisfied. The magazines are helpful, educative and full of advice

Francis Ndungu Kungu P.O Box 69 Solai

Excellent and informative

I have just finished reading the February 2006 copy of *The Organic Farmer*. May I congratulate you all on an excellent magazine, with some very informative articles. I would be very grateful if you could please add my name to your mailing list, as per the address at the end of this letter. I work with various communities all over Kenya and also in Malawi, doing workshops on sustainable and organic agriculture, water harvesting, tree planting and health matters. *The Organic Farmer* will be of such help to me and the communities I work with. If I may be so brash as to ask for at least 2-4 copies each month? If you have any spare copies of the magazine from last year I would be so grateful to have them, as I feel I have missed out on a lot of information! "He that plants trees loves others besides himself." My very best wishes.

Grete Davey, Box 285-00204,
Athi River, Kenya,
kikoken@wananchi.com
Cell. +254 (0) 722 243 774.

More organic substitutes

In our area now everyone who has heard about your newspaper has reduced the use of chemical fertilizers and pesticides. Many have started organic farming. Why don't you give us organic substitutes to chemical dewormers, vitamins and even vaccines?

Aruba Farmers Group,
P.O Box 596, Kitale

Good for arid areas

Our geographical area as stated in the questionnaire is semi-arid. Some of the organic methods can assist our farmers. Please assist us to get past issues and ensure we do not miss any other issue of this educative magazine.

Samwel Maina Mburu, Arutani Self Group, P.O Box 85, Nakuru

greenhouses...

continued from page 6

afford to take down such an expensive investment. Her greenhouses are full of diseases and pests that she is now frantically trying to control with synthetic poisons. It will never make financial sense to leave her houses vacant. Pest problems are to be expected. Most greenhouse production is monocropping, therefore there is an abundance of food for those pests that survive on the crop. They will therefore breed very successfully. Looked at another way, if I were to find a market for the leaf miner pest, I would want to breed them in large numbers. I would concentrate on containing them and feeding them, hoping they would breed in massive numbers. I would plant a greenhouse full of tomato plants as food for insects. So then, is it not natural that pest problems are common in greenhouses?

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please send us (with sms) your contacts. We shall get back to you!

Tuma maoni yako! Asante.

tips and bits

from farmers, for farmers

Tephrosia is helpful but dangerous

In the last few months, we received some letters from farmers asking about the use of the plant *Tephrosia vogelii* (Utupa). Mrs. Rosalie Faull (Mugie Ranch Ltd., P.O. BOX 30 20321 Rumuruti) for instance, wants to know if we have written anything about the uses and method of preparation of *Tephrosia vogelii*. "It has been very good against aphids on sukumawiki and broccoli here."

And John Sprite (P.O Box 1781, 30200 Kitale) sent us the following letter: "Last season farmers discussed in a Farmer's Field School class (FFS) on how to control stemborers locally using tephrosia. Those who practised it managed to control the pests without buying chemicals.

How do you prepare and use it?

1. Crush 50 fresh leaflets in 1 litre of water and let stand for 24 hours, DO NOT USE SOAP. (Tephrosia is said to be most effective against aphids if the water is warm when sprayed on crops.)
2. Crush stems and leaves and dry, then grind into powder and put 2 tea-

spoons in the maize funnel to control maize stemborers. Repeat every 3 weeks.
3. Crush 1 kg leaves and stems and ferment in a plastic container for 4 days. Add 1 litre water, sieve and apply in the maize funnel.

Results showed no maize losses caused by stemborers, especially when applied early. The tephrosia pesticide solution is also effective as a contact treatment spray on vegetables against aphids, cutworms, caterpillars, beetles and termites.

Many different uses

The NGO Pelum Zambia proposes tephrosia for many other uses:

Protecting stored grain: Pick fresh leaves from the shrub and allow to dry. Pound the leaves to a powder. Mix approx 100 grams of powder to 100 kg of stored maize. Before eating maize, thoroughly wash the maize grains (see below).

Animal welfare: For control of ticks, lice and flies: Pound fresh leaves and small branches. Dilute 1:5 in water and allow to soak for 8 to 12 hours. Alternatively, boil to extract the toxins for no more than 30 minutes. Wash animals with the solution.

House hygiene: For repelling mosquitoes, cockroaches and bedbugs in the house, beat the walls (particularly in corners and furniture legs) with fresh branches of tephrosia.

Moles: To prevent root rats from entering the farm or field, plant tephrosia along the boundary at 1 metre intervals. After approximately 12 months, the bounded area should be free of root rats. But caution! Once root rats are gone from the field, remove the plants, leaving only those in the field boundary. Therefore sow crops such as maize (not affected by nematodes) after a tephrosia fallow.

Be careful!

If you are working with *Tephrosia vogelii*, be careful! Ideally, wear protective clothing and gloves. Try to avoid skin contact with the pesticide. Should you come into contact, wash affected parts immediately and after handling the compound. Foliage (leaves) and seed of tephrosia are not suitable for human and livestock consumption as it is poisonous.

Tephrosia also attracts root knot nematodes and may cause high infections in susceptible crops such as beans and tomatoes.

Organic regulations restrict the use of *Tephrosia vogelii*, as Su Kahumbu writes: "According to the local EnCert Organic Standards, the use of tephrosia must allow for a 7-day post-harvest period. According to the Soil Association Standards (UK), the use of rotenone (the active ingredient in tephrosia) is restricted. This means one must first request permission to use it and get written permission from the certifying body before one can use it. That means: be careful with tephrosia!"

Marketplace

Potatoes for sale. Patrick Nganga, a farmer from Molo, has potato seed, Tigoni variety for sale. The seed is certified by the Kenya Plant Health Inspection Service (KEPHIS). Any farmer interested in the seeds should get in touch with him through the following:
Patrick Nganga, P.O. Box 893 Molo, Tel. 0722 946 823

In the last issue we asked farmers who have dairy goats to give their addresses. The following farmers have responded:

Astone Ndude Olutali, P.O.Box 1, Bukura, Kakamega. Tel. 0723 938 649

Joseph Kimunge Macharia, P.O.Box 36, Mukurweini, Nyeri, Tel. 0722 506114.

Samuel Njoroge, Technical Manager, P.O. Box 14748-20100, Nakuru, Tel. 0723 793 414.

Samuel Thiongo, Ruthimitu Organic Group, PO Box 489-00605, Uthiru, Tel: 0722 565 642.

Need potato beet? I have potato beet and other organic farm products which are ready for sale. Please contact me! Doris Njuguna, Tel: 0723741 955

Farm credit. I am also in contact with financial institutions interested in providing credit to small and medium organic farmers. Only farmers who have formed groups with five to 30 members and which are well managed, transparent, accountable and honest to their members need to apply. If your group meets these conditions please get in touch with us. Please call Tel. 0723 484 810, ask for David Ngugi Kimani.

Land for sale. 2.2 hectares, prime agricultural land situated at Meru farm next to Kitale showground in Kitale Municipality. Please contact the owner. Kihara Mwai, P.O Box 24214, 005200 Nairobi, Tel 0722 575 816

Immune Boosters. Kabete HIV/AIDS Vigilante Group is appealing to those affected by HIV/AIDS to grow and eat organic health foods to boost their immunity. For more information contact David Ngugi Kimani, P.O.Box 1388 Kikuyu, Tel. 0723 484 810

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

BIOVISION

Nr. 17 Sept/Oct 2006

Plants solve farmers' problems

Organic farmers have a wide range of natural methods for fighting pests and diseases on their crops. In this issue, our newspaper brings you some of the plants that can be used to prevent these problems instead of applying harmful chemicals. This is the right way to protect the environment and our future.

Feeding and housing a dairy cow

The Organic Farmer

All over the country, farmers are now trying to rebuild their milk herds in order to sell more milk following increased prices from the newly revamped Kenya Cooperative Creameries (KCC). However most farmers may not realise their milk production targets due to the way they keep and maintain their milking herds. While the well established farmers get as much as 30 litres from a single cow per day, most ordinary farmers get an average of 6 litres from one cow (see *The Organic Farmer* Nr. 14, June 2006).

The difference in milk production has a lot to do with the way farmers feed and manage their animals. Many farmers cannot see the relationship between feeding and milk production, and if they do, then they lack the most basic knowledge on dairy cattle management. Take yourself as an the example - if you cannot eat for the whole day, then you will not have the energy to perform any work on your farm. In the same way, a cow cannot produce enough milk unless it is given adequate and quality feed that provides it with all the essential nutrients.

The zero grazing sheds that many farmers put up nowadays are like prison cells, with up to four animals put in one small enclosure. The animals have no room for movement and rest. The sheds have no drainage to allow the free flow of urine and animal waste. If the animals are not comfortable, they become stressed, and this affects milk production and even their health. For more information see pages 2 and 3.

in this issue

Pushing out stemborer

Are you one of many Kenyan maize farmers who lose much of their yield every season to stemborers and the witchweed striga? On *page 5,* we explain how you can fight these pests, double your harvest, and earn additional income, by using the push-pull strategy. In this strategy, the plant desmodium plays an important role.

Dear farmers,

In Kenya, many cabbage and sukuma wiki (kale) growers have suffered losses because of the diamondback moth (DBM). Our newspaper has written two articles on the wasp that kills the pest. The wasp was discovered and imported from Taiwan by scientists at the International Centre of Insect Physiology and Ecology (ICIPE) in Nairobi. ICIPE, with assistance from KARI, has released a lot of these wasps in the important cabbage-growing areas in the country. In most of these regions, the diamondback moth has disappeared, and farmers are harvesting healthy cabbage.

The moth is still a problem in some parts of the country, as our newspaper is still getting letters from farmers seeking assistance from ICIPE on the same issue, since their cabbages are affected. ICIPE is willing to assist, as you can read in the answer given by Dr. Bernhard Loehr, a scientist at the institution, who coordinated research on the diamondback moth (see page 6). While we admit that the problem is still there, it is important to note that farmers can make the problem worse by using chemicals to control the diamondback moth. These chemicals kill the wasp, but not the diamondback moth, which hides under the leaves of the cabbage. This means that if the farmers did not use chemicals, the wasps would do their work, which is to lay their eggs in the larvae of the diamondback moth and in this way kill them.

Our newspaper has on many times warned of the dangers of using chemicals. There are many natural ways to kill or to expel damaging insects from the farm (see the article on push-pull for stemborer control on page 5). This is why we have published a special insert in the centre pages on important plants that can be used in the fight against pests and diseases.

As you can see in this issue, we have prepared additional pages for you. In September, we will take a break as we did last year, so we will not have an issue in October. This will give us time to reflect and plan on future articles for the newspaper. It will also provide us with the opportunity to visit some of the farmers' groups in the country.

MY OPINION

Sometimes it is difficult to believe that farmers will ever get fair prices for their farm produce. The recent hike in fuel prices has led to a hike in transport costs. While the cost of production has continued to rise, the price given to farmers for their commodities has remained the same or even reduced. A big bunch of spinach vegetables is sold for only Ksh 40 in the supermarkets. Also, despite a government ban on the use of extended bags for potato packaging, traders are back into the game of farmer exploitation. Traveling to Nairobi recently, I could see mountains of extended potato bags. It seems there is no end in sight to farmers' problems

Phillip Kiget, a farmer in Molo

The Organic Farmer

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.

www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 (020) 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat
Lucy W. Macharia

Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Charles Kimani, Farmer, Wangige

Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. +254 (020) 445 03 98
e-mail : info@organickenya.com

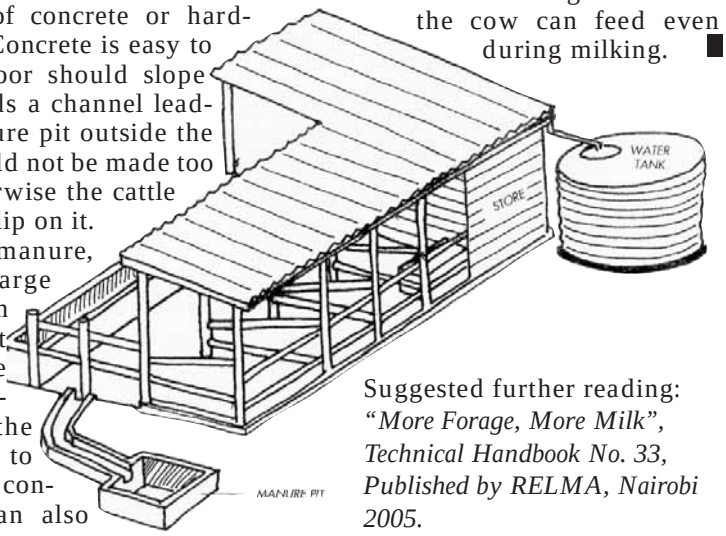
Layout
In-A-Vision Systems(k)

Requirements of a cowshed

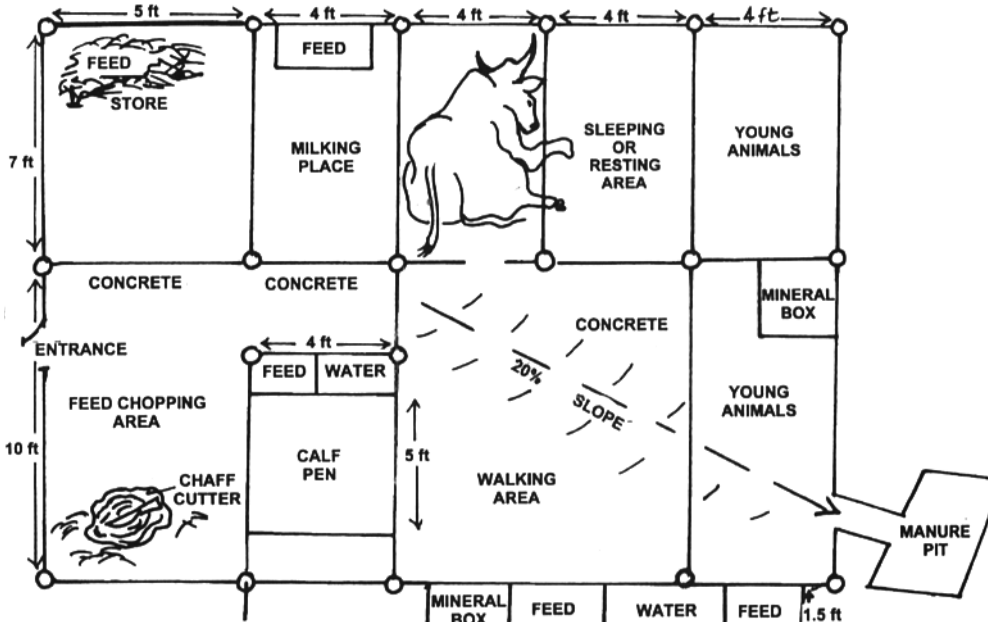
Philomena Nyagilo

When building a cattle shed, most farmers do not consider the space, size and number of the animals to be kept in the shade. They build the sheds too small to allow the free movement and the behavioural needs of the animal. Building a shed is therefore not only hammering together some timber. Building a shed costs money, so farmers should avoid mistakes and consider several demands of their animals:

- The shed should be close to a reliable source of clean water, and if possible near your fodder farm.
- The roof can cover the whole pen or just animal cubicles and should slope away from the pen so rainwater doesn't fall into the pen. It should be high enough for a person to stand up.
- The walking area should have a floor made of concrete or hard-packed soil. Concrete is easy to clean. The floor should slope gently towards a channel leading to a manure pit outside the pen and should not be made too smooth, otherwise the cattle are likely to slip on it.
- To hold the manure, dig a large enough manure pit and line the channel leading from the walking area to the pit with concrete. You can also make a paste of red soil, cow dung and ash, and smear this paste on the sides and bottom of the pit; then allow it to dry. Repeat five times to build up a leak-proof layer.
- Each cow should have its own cubicle. The cubicle floors should be made of dry soil, as cattle prefer to lie on soil rather than on cold concrete.
- For calves, put in temporary barriers of wood to make smaller pens. The calves' pen floor should be raised about 4 cm and be made of wooden slats, to help keep the floor clean and protect the calf from diseases.
- A stall for use as a milking area should be set aside.
- Provide troughs for water and feed in the walking area and the calf pen. A trough should also be provided in the milking area so that the cow can feed even during milking. ■



Suggested further reading:
"More Forage, More Milk", Technical Handbook No. 33, Published by RELMA, Nairobi 2005.



If done well, zero grazing is profitable

Proper feeding and housing of dairy animals increases milk production and income for farmers.

Philomena Nyagilo

Proper feeding and housing of dairy cows can increase their productivity (TOF)

"The scarcity of land and animal destruction of crops made me realize the importance of practising zero grazing." With these words, James Kamau Kungu explains why he changed to zero grazing. Kamau, a farmer in Kibichiku, Wangige area, is one of those many farmers in Kenya who have embraced the practice of keeping and feeding their cows in a pen, by providing forage and not allowing the cows to graze freely in the fields.

It requires labour

Population growth and urbanization in Kenya have reduced pasture land available for grazing; this has degraded the environment due to overgrazing and deforestation. As a result, smallscale farmers have adopted the system of zero grazing, which is an eco-friendly practice for animal husbandry if dairy cows are kept in good living conditions. Kamau says: "It is an intensive method of farming that produces a lot of milk from a small amount of land. But it requires sufficient labour to provide forage and maintain the unit."

The labour constraint to the use of fodder is closely tied to the size of the farm. Kamau has planted Napier grass, improved Kikuyu grass from South Africa and Kakamega grass in his half-hectare (1 acre) farm; he also grows bananas and maize. "I cut the Napier grass and mix it with maize stems and with the banana stems and leaves from my farm. It was a good decision to change to zero grazing", he says.

James Kamau started off zero grazing in 1986. He now has 3 heifers and 2 cows; he has sold 3 bulls in the past 5 years. He has a constant supply of milk; his cows give around 40 litres of milk per day, which is enough for the family income and nutrition. Kamau prefers imported or cross-bred cows. "They grow faster and produce a good amount of milk if well fed". However, he adds, "If the cows are not properly fed with the right quantities and at the appropriate time, during all stages of growth to maturity, their milk production drops. The same happens if they are not kept in a clean shed".

Numerous advantages

James Kamau is convinced that zero grazing is a good and suitable system for smallscale farmers in Africa. He points out a lot of advantages:

- Zero grazing reduces the number of pests such as ticks and intestinal worms, since the animals do not graze on infested pastures.
- There is enough milk for the household nutrition and for sale, hence in return, enough money to buy forage for cows during the dry period.
- In case of a disease outbreak, it is easy to control.
- It reduces damage to crops caused by grazing cattle.
- The farmer is assured of manure, made up of cow dung and urine, which sustains soil fertility where fodder and crops are grown.

"If you feed your cows well, the price of milk is usually high enough to meet the costs of production and make a profit", he says. On the other hand, money is required in order to build and maintain the shed and manure pit; labour is also involved.

A farmer should be ready to cut and carry the feed, and fetch water for the animals. James Kamau is in a good position with respect to water: he pumps the water from a nearby river up to his zero grazing shed in the homestead.

Feeding is important

A constant supply and sufficient quantities of good quality forage is a basic necessity for increased milk production and keeping the animal healthy. "Without good food, not a lot of milk is produced", says Kamau. Forage includes all plant materials used to feed livestock. Leguminous forage is very important. It improves soil fertility through its ability to fix nitrogen, and the quality of feed is higher because it contains proteins. Some of the protein-rich forages include lucerne, desmodium, calliandra, lablab or leucaena species. For an energy feed, maize germ, bran and other cereal milling by-products are good for the animals. ■

Standards for organic animal husbandry

In organic farming, zero grazing is allowed under the conditions set by the organic standards of the Kenya Bureau of Standards. Farmers should ensure that the environment and the facilities are adequate for the size and number of the animals, so as to provide for the behavioural needs of the animals. Some farmers keep their animals in crowded sheds without adequate space for free movement. We should not forget one thing: If you stress the animals, their milk production drops.

Organic standards demand that:

• There should be sufficient free movement and opportunity to express normal patterns of animal behaviour. All animals should have access to pasture, an open-air exercise area or run, whenever the physiological condition of the animal, the weather and the state of the ground permit. This means that landless zero grazing is not allowed.

• The farmer should ensure sufficient fresh air, water, feed and natural daylight to meet the needs of the animals; where animals require bedding, adequate natural materials must be provided.

• Access to resting areas, shelter and protection from sunlight, high or low temperatures, rain, mud and wind are ways to reduce animal stress.

• The animals' social structures must be maintained by ensuring that herd animals are not kept in isolation from other animals of the same species.

Conserve water to boost production

Reducing water wastage can help farmers grow crops all year 'round.

By Peter Kamau

All Kenyan farmers know the importance of water in agriculture; without it, no crop can grow. Indeed, if all farmers had an adequate supply of water, we would not be talking of food shortages and the devastating famine that affects parts of the country so often. But the questions we should all ask ourselves are: Do we make use of the available water resources in the right way? Why is it that so many farmers lack water to sustain agricultural production?

One way in which we can solve this problem is to understand and adopt practices that can help us make maximum use of the available water to improve food production. In the last issue of *The Organic Farmer*, we covered the most effective way of water use - by drip irrigation. In the next issue we will feature the different methods of water conservation that farmers can adopt in their farms. Here we will look at the importance of water in sustainable agriculture.

Farmers in nearly three-quarters of the country experience severe water shortages in their farming operations. One reason for this is that they lack simple water harvesting technologies that help conserve water for use during the dry spells. The concentration of rainfall in one season means that farmers have to use conservation methods that enable them to store and use the water when the need arises. This would ensure that they get maximum benefits from the available water resources. Organic farming involves use of the available farm resources in a sustainable way. Active water retention, water harvesting and storage are therefore very important to organic farmers. It is important for farmers to learn water conservation methods in order to increase production.

Water management

Managing water involves practices that protect available supplies and which help reduce losses. This can be done through conservation. The way in which water from different sources is used for people, crops and animals is a part of water management. A farmer has to take these into account, because agricultural practices can affect the water supply either positively or negatively. The amount of water available in a farm depends on factors affecting the sources of water and also on the ways the soil is managed. In rain-fed agriculture, for example, a farmer can store water in a tank for use in the dry season. In organic agriculture, however, farmers are taught how to conserve water through methods which prevent water loss, such as mulching, prevention of soil erosion and correct soil cultivation practices. The challenge that faces farmers is therefore to ensure that as little as possible of the available water is lost in order to promote plant growth and ensure the farm has adequate water for other uses.

Bare soil loses water faster...

Keeping water in the soil

In many farms today, farmers overcome water shortages by installing irrigation facilities. However, the first step farmers should take to conserve water is to improve the water retention and infiltration (penetration) capacity of the soil. During the dry season, some soils can hold water for plant growth better than others. The ability of a soil to absorb and store water largely depends on its composition and the content of organic matter. Soils rich in clay can store water up to three times more than sandy soils. Soil organic matter acts just like a sponge for storage of water, and soils rich in organic matter will preserve their moisture for a long time. To increase the content of organic matter, farmers are advised to apply organic manures, compost, mulch or green manure. A thin layer of mulch can considerably reduce the evaporation of water from the soil. It protects the soil from direct sunlight and prevents it from getting too warm. While preparing land, the farmer should avoid digging too deep and disturbing the sub-soil, as it contains small channels that help the water to rise to the surface for the benefit of plants. (See our previous issues on mulching and organic manures).

...than well covered soil. (Photos TOF)

Let the water go into the soil

During heavy rains, only a small percentage of water penetrates the soil. A large part of the water flows away as surface run-off. The run-off does not benefit the crops; instead, it makes the situation worse, because the best soil on the surface is swept away. In order to harness this water for crop production, the infiltration of rainwater needs to be increased. To achieve a high infiltration rate, a farmer has to maintain a topsoil with a good soil structure. Earthworms, cover crops and mulch application can also help to slow down the water flow and allow more time for its infiltration.

On steep slopes, the infiltration of rainwater can be increased through digging of trenches along contour lines. If this done, running water is slowed down, allowing infiltration into the soil. The *tumbukiza* method is used by many Kenyan farmers. These semi-circular bunds (plant pits) also help to collect water flowing down the slope and encourage its infiltration near the root zone of the crop. The effect of these water traps can be increased if a layer of mulch is added into the pit.

Excess water can be used for irrigation in the dry season if it is well stored. Generally, reduction of water loss and wastage through proper management can go a long way in increasing farm productivity and income. It is important that farmers use this scarce resource in the right way for their own benefit. ■

Pests	Pest Damage	Solutions	Diseases
 Diamondback moth		**Repellents:** African marigold, black jack, tephrosia, garlic, crotalaria, chilli and peppers, eucalyptus, tomato. **Insecticides:** African marigold, black jack, tephrosia, lantana, garlic, tea, papaya, pyrethrum, crotalaria. **Antibacterial**: African marigold, garlic, tea, tomato. **Antifungal:** African marigold, garlic, papaya, crotalaria, tithonia, sweet potato, tomato, oleander, rhubarb. **Nematicide**: Cassava, oleander, garlic, papaya.	 Maize smut
 Stemborer			 Maize Streak virus
 Cutworm			 Mosaic virus
 Aphids			 Late blight

Herbal cures safer than chemicals

All African farmers know about the damaging effects of insect pests. These are responsible for 20–30 percent of the crop being destroyed. And all African farmers know that modern chemical pesticides are not only poisonous and harmful to human health but they destroy the environment. In most cases, chemical insecticides do not solve the problem.

There are many safe, natural and simple methods of protecting plants. On the following pages we give you some useful advice for environmentally safe alternatives to replace agro-chemicals.

But this is not enough. Farmers should observe nature closely, then they will find the answers. First, they should reinstate the fertility of the soil; healthy plants are more resistant against pests. Second, they should provide habitats for predators; while the insect pests live directly on the plants, the predators which prey on these pests live in hedges and trees and do their work during day time. That means farmers should never spray during day-time, but early in the morning or late in the afternoon, when the predators have gone back to their habitats. Thirdly, farmers should re-introduce plant diversity into cropping. This is the best way to maintain the pest/predator balance.

Every farmer should be an observer and examine carefully what is going on in their shambas. Every farmer also has to be a researcher: They have to know which method can be used to restore the natural balance that restores the natural balance. Plant extracts are slow in acting, they do not work like chemicals; this means that farmers have to use them several times a week to produce good results.

Hedges are natural barriers

Plants can act as a physical barrier to the movement of pests. Hedges hinder the movement of aphids into the garden. A hedge of Tithonia, for instance, is a natural barrier against many insects. A row of pigeon peas (*mbaazi*, also called Congo peas) has been used to protect tomato, potato and cabbage crops against red spider mites. Beans have been planted as decoys in rows around cabbages to protect this vegetable from spider mites. Beans are an ideal decoy for it serves four functions: insect control (decoy), improvement of the soil (legume), food for livestock, material for mulching or compost. Hedges are also habitats for many predators. Here agro-forestry can play an important role.

Tithonia

Pigeon peas

Beans

African marigold / Mbangimwitu (*Tagetes erecta*)
Inazuia: Bacteria, fungi, nematodes,
Wadudu: Ants, beetles and many other insects.
Kutayarisha:
1. Ponda gramu 100-200 ya matawi, mizizi na maua; mwaga kwa lita moja ya maji yaliyochemka; lowa kwa masaa ishirini na nne; ongeza lita moja ya maji baridi, nyunyiza kwa mimea au mchanga.
2. Panda mimea tofauti kila wakati ili kuzuia hawa wadudu.

Blackjack / Kishonanguo (*Bidens pilosa*)
Inazuia: Insects
Wadudu: Repels aphids, ants, beetles, cabbage root fly, caterpillars, crickets, mites, termites and whitefly.
Kutayarisha:
1. Funika kikombe kilichojaa mbegu ambazo zimekomaa na maji; chemsha kwa dakika kumi au lowa majini kwa masaa ishirini na manne, kisha upoeshe. Ongeza lita moja ya maji na kijiko kimoja kidogo cha sabuni; halafu unyunyizie mimea.
2. Mbegu zinaweza kutawanyishwa karibu na vichaka kuvutia mchwa. Mmea waweza kupondwa au kusuguliwa kisha maji yake yatumiwe kunyunyizia mimea.

Maelezo zaidi: Kiasi kingi cha dawa hii chaweya kuyadhuru baadhi ya maua ya mimea.

Cassava / Muhogo (*Manihot esculenta*)
Inazuia: Nematodes and aphids.
Kutayarisha:
1. Toa maji ya matunda kwa kuponda mizizi; pima kiwango kimoja cha maji ya matunda sawa na maji ya kawaida (1:1). Nyunyiza haraka ukitumia lita nne kwa mita moja mraba, inasemekana kuwa na athari kubwa. Ngoja siku ishirini kabla kupanda.
2. Tumia maganda ya mihogo kuzuia nematodes.

Maelezo zaidi: Mizizi ya muhogo iliyo chungu ina sumu, kwa hivyo lazima iondolewe kabla kuliwa.

Castor oil plant / Mbariki, Mbono (*Ricinus communis*)
Inazuia: Panya, fuko na mchwa pamoja na magonjwa ya Ukungu (fungi)
Kutayarisha:
1. Kama kinyunyizo cha kawaida lowa mbegu ya kijani kibichi na matawi kwa maji masaa ishirini na nne; chuchunga na unyunyize.
2. Kausha mbegu za kijani kibichi na matawi na usage kuwa hali ya unga.
3. Kwa sota (cutworms), weka vikombe vinne vya maganda ya mbegu iliyopondwa kwa lita mbili ya maji; chemsha kwa dakika kumi. Ongeza sabuni kiasi, changanya maji kufikia lita kumi kisha unyunyizie haraka kwenye mchanga.
4. Weka mbegu za kijani kibichi kwa shimo ya fuko au njia za panya kuwa kama vizuizi.
5. Lima mbegu, matawi au oil cake, kwa mchanga ili izuie magonjwa ya ukungu (fungal diseases)
6. Majani yanayotiwa shinani mwa mimea ili kuhifadhi unyevunyevu hufukuza mchwa:

Maelezo zaidi: Matawi yenye shina nyekundu yana matokeo mazuri kuliko yale yenye shina ya kijani kibichi.

Chilli and Sweet pepper / Pilipili kichaa, pilipili hoho (*Capsicum frutescens*)
Inazuia: Mchwa na wadudu wengine
Kutayarisha:
1. Nyunyizia kawaida; saga mikono miwili ya pilipili; lowa kwa maji lita moja siku nzima. Tingiza vizuri kwa dakika chache, chuchunga; ongeza lita tano ya maji na sabuni kidogo.
2. Pilipili ya unga inaweza kupakwa kwa nguzo za mimea kuzuia ants, cutworms, slugs and snails na aina tofauti za wadudu mchangani.
3. Maji ya matunda kutokana na pilipili tamu, itazuia virusi vya mosaic na kukataza ueneaji wa virusi vinginevyo.
4. Pilipili hutumika sana kama kizuizi.

Maelezo zaidi: Inazuia virusi aina ya mosaic na kukinga virusi vinginevyo.

Crotalaria / Marejea (*Crotalaria Juncea*)
Inazuia: Huzuia magonjwa ya Ukungu (fungal diseases)
Wadudu: Huzuia wadudu aina nyingi.
Kutayarisha:
1. Panda mmea mahali na wakati tofauti ili kuwafukuza nematodes na wadudu wengine kutoka kwa mimea yako.
2. Weka sehemu ya mmea uliopondwa ndani ya maji kuunda kinyunyizo

Onyo: Ni sumu kwa ngombe kwa kiasi cha chini. Usiweke mbegu kwenye chumba ambacho watu wanamoishi.

Garlic / Kitunguu Saumu (*Allium sativum*)
Inazuia: Bacteria pamoja na magonjwa ya ukungu.
Wadudu: Ants, aphids, armyworms, caterpillars, moths, grubs, mice, mites and mosquitoes.
Kutayarisha:
1. Kinyunyizo cha kawaida, ponda kitunguu saumu; ongeza kwa lita moja ya maji kisha changanya ndani ya sabuni kidogo, halafu uitumie haraka.
2. Kitunguu chenyewe chaweza kukaushwa, kupondwa na kutumiwa kama poda. Poda inaweza kugeuzwa kuwa kinyunyizo kinachopendekezwa kwa scab, mildew, bean rush na tomato blight.
3. Kitunguu saumu ambacho kimepandwa kuzunguka miti ya matunda na mimea mingine huzuia aphids, fruit tree borers, panya, fuko na mchwa.
4. Mchanganyiko ambao umeundwa kwa kufunika vipande vitatu vya saumu vilivyopondwa na kuwekwa ndani ya mtungi na nusu kikombe cha mafuta ya mboga; lowa na uongeze lita kumi ya maji ya sabuni yaliyo joto kadiri; inasemekana kuwa inatengeneza kinyunyizio kinachoweza kuwauwa wadudu wa aina nyingi.

Maelezo zaidi: Usitumie kwenye mimea ya jamii ya kunde,inadumu kwa muda wa mwezi mmoja,inaua wadudu wote.

Lantana / Mwingajini (*Lantana camara*)
Inazuia: Aina nyingi ya wadudu
Kutayarisha:
1. Ponda mkono mmoja wa majani kwa lita moja ya maji; ongeza sabuni kidogo, halafu nyunyiza.
2. Panguza ukitumia jivu, kausha na usage iwe poda. Choma utanzu na umwagilie jivu kwenye wadudu kama beetle na leaf miner.

Onyo: Mmea ni sumu kwa mifugo

Oleander (*Nerium indicum*)
Inazuia: Fungi, nematodes, rice brown leaf spot
Wadudu: Repels ants, flies, beetles, diamond back moth, rodents, and weevils
Kutayarisha:
1. Kata na ulowe matawi, ngozi na maua kwa maji kwa dakika thelathini halafu nyunyiza
2. Kausha na usage sehemu ya mmea kuwa poda.

Onyo: Majani huwa na sumu kali

Papaya / Mpapai (*Carica papaya*)
Inazuia: Fungi, nematodes, coffee rust, powdery mildew and rice brown leaf spot na wadudu aina kadha.
Kutayarisha:
1. Nyunyizia kawaida, ongeza kilo moja ya majani yaliyokatakatwa kwa vipande vidogo vidogo kwa lita moja ya maji, tingiza kwa nguvu, ongeza lita nne za maji na uongeze sabuni kidogo (20g or ml) halafu nyunyiza kwa mchanga kuzuia cutworms.
2. Toa maji ya matunda kutoka kwa mbegu ambazo hazijakomaa kuzuia mchwa.

Pyrethrum / Pareto (*Chrysanthemum cinerarifolium*)
Inazuia: Aina yote ya wadudu.
Kutayarisha:
1. Chuna maua siku ya joto, anika kwa kivuli; saga iwe unga, halafu umwagie wadudu.
2. Mwaga lita moja ya maji juu ya gramu hamsini ya unga wa pareto (au 20g poda); lowa masaa kadhaa; ongeza sabuni kidogo, chuchunga na kinyunyiza.

Maelezo zaidi: Nyunyizia jioni kabisa na uwe mwangalifu ili kuwalinda nyuki.

Rhurbarb (*Rheum* spp.)
Inazuia: Magonjwa aina ya Ukungu.
Wadudu: Aina ya wadudu walio na miili nyororo kama aphids, whitefly, caterpillars.
1. Lowa gramu mia moja ya matawi mabichi kwa lita moja ya maji kwa masaa ishirini na nne; ongeza sabuni kidogo, halafu nyunyiza.
2. Kutoa nyunyizo lililo na nguvu zaidi, tumia hadi matawi tano.
3. Mmea wa rhubarb uliopandwa karibu na kabeji huzuia ugonjwa wa club root.

Maelezo zaidi: Majani ya mmea huu huliwa kama tunda.

Stinging nettle / *Thabai*
Inazuia: Fungi
Kutayarisha:
Chemsha kilo mbili za stinging nettle katika lita tano ya maji. Chuchunga na unyunyizie mimea. Mchanganyiko huu waweza kuzuia magonjwa ya ukungu kama mildew.

Sweet Potato / Kiazi kitamu (*Ipomea batatas*)
Inazuia: Rice brown leaf spot, rice blast and other fungi.
Wadudu: Aphids
Kutayarisha:
1. Ponda na ulowe majani kwa maji, nyunyiza
2. Maji yanayo wanga mzito baada ya kupika yanaweza kunyunyizwa kwa wadudu wadogo kama aphids.

Tea / Chai (*Cammelia sinensis*)
Inazuia: Magonjwa ya ukungu.
Wadudu: Wooly aphid, squash bug, konokono na mchwa.
Kutayarisha:
1. Matawi ambayo yametumika yaweza kutawanywa karibu na mimea kufukuza dudu makamasi (konokono).
2. Maji baridi yaweza kunyunyiziwa kwa mimea.
3. Matunda ambayo yamelowa kwa maji hutumiwa kufukuza mchwa.

Tomato / Nyanya (*Lycopersicon esculentum*)
Inazuia: Bacteria, fungi
Wadudu: Aphids, ants, asparagus beetle, cabbage, worms, diamondback moth,cockroaches,mites, nematodes, whitefly na magonjwa ya ukungu.
Kutayarisha:
1. Chemsha kwa moto kiasi kilo moja ya matawi yaliyokatakatwa kwa maji, nyunyiza.
2. Katakata mikono miwili ya matawi au matunda kwa lita mbili ya maji ndio maji ya matunda ya kijani kibichi ikongolewe. Wacha kwa masaa matano, chuchunga na uongeze sabuni kidogo; nyunyiza kila baada ya siku mbili wakati vipepeo na wadudu wa kabeji wanapo pepea. Ni vizuri kutumia majani mabichi iwapo yatatumiwa wakati huo huo.
3. Sehemu zilizokauka zaweza kupondwa kuwa poda na kuchanganywa na maji ili kupata kinyunyizo au kupakwa kama poda, lakini adhari yake haina nguvu kuliko sehemu ya mmea ambao haujakauka.
4. Nyanya ambazo zimepandwa kuzunguka mimea mingine hukinga mimea kutokana na asparagus beetles.
5. Mmea mzima unaoninginia kwa shamba la matunda au ndani ya nyumba hukinga miti ya matunda kutokana na wadudu wengi wa nyumba kama mende.

Onyo: Matawi ni sumu kwa binadamu.

Many insects are friends of the farmer

Su Kahumbu, well known to the readers of *The Organic Farmer*, calls beneficial insects "good guys" (see photos below). There are indeed a lot of insects that are of benefit to farmers; they feed on insects which damage crops. Farmers should take care of these predators. A farmer who is interested in natural order and balance should create good living conditions for predators so that they can carry out their task of keeping all crop-eating insects in check.

Ladybirds

Ladybirds are really good biological control agents. Adult ladybirds will prey on greenfly and blackfly and especially on aphids.

Lacewing

The green lacewing is widely used to control many different pests. The lacewing is always hungry; it is the most voracious and will eat nearly all pests.

Spider

All spiders are predatory on insects. Their catching system varies, and not all spiders use webs as traps.

Ladybird larvae

Ladybird larvae feed mainly on aphids, but also on other bugs. While it is in the larval stage, one ladybird beetle can eat nearly 500 aphids.

Wasps

Wasps are good biological control agents. Adult females lay eggs in other insects and the wasp larvae develop as parasites, killing the host.

Centipedes

Centipedes are in general ground-based predators, feeding on slugs, slug eggs and soil-dwelling insects.

Photos courtesy Encyclopedia of Organic Gardening, London 2005.

Published by: The Organic Farmer, PO Box 14352, 00800 Nairobi, Tel: 020 4450398, email: info@organickenya.com

Fight maize's worst enemies with push-pull

Farmers can increase their maize yield by 25–30% in areas where stemborers are a big problem - by practising a very clever method.

Anja Bengelstorff

Desmodium planted between the maize rows covers the soil and repels the stemborers while the Napier grass attracts the pests and traps it. (Photos Dr. Z. Khan,ICIPE)

Stemborers and striga weeds are the most powerful enemies of maize in Africa. The moths can destroy up to 80% of a harvest in a short period of time; striga causes losses of 20–80%. When both pests occur together, the entire crop can be lost.

Based on ages-old African practices of mixed cropping, which help restore the balance of nature, ICIPE together with research partners and farmers, developed a strategy to limit yield losses by stemborers and striga. The so-called push-pull technology is effective, cheap and easy to use. The idea is to trap stemborers on highly susceptible trap plants (the pull) and drive them away from the maize crop using repellant intercrops (the push). The most effective trap ("pull") plant has proved to be Napier grass (Sudan grass can also be used); its partner for the push effect is the desmodium legume (silverleaf and greenleaf desmodium). In the world of insects, fragrances (smells) are very important. They are used for orientation, but also to push the insect away from one plant and to pull it towards another. This secret of nature is applied in the push-pull strategy.

How push-pull works

Desmodium is planted in between the rows of maize. It produces a smell or odour that stemborer moths do not like. The smell "pushes" away the stemborers from the maize crop.

Napier grass is planted around the maize field as a trap plant. Because of its smell, the Napier grass is more attractive to most of the stemborer moths than the maize itself. It pulls the moths to lay their eggs on it and leave the maize alone. But Napier grass does not allow stemborer larvae to develop on it. When the eggs hatch and the small larvae bore into the Napier grass stem, the plant produces a sticky substance like glue which traps them, and they die. Very few stemborer larvae survive and maize is saved in the 'push-pull' strategy: Pushed away from the maize field by desmodium, pulled by Napier grass outside the maize field (see sketch). Push-pull also works for sorghum and millet farming systems that are especially important in dry areas.

This is by far not the only advantage of the approach. In addition, the ground cover of desmodium, which is interplanted among the maize, reduces the striga weed, whose roots penetrate the maize roots and draw nutrients from the host, causing severe stunting and yield loss. Nitrogen fixed by desmodium and chemicals produced by the roots of desmodium are responsible for suppressing the striga weed. (Once the striga emerges above the soil, much of the damage to the maize will already have been done.) Therefore, striga does not grow where desmodium is growing. Being a legume, desmodium also fixes nitrogen in the soil and thus improves the soil. Both Napier grass and desmodium are useful protein-rich fodder plants.

Benefits of the push-pull strategy

When adopting the push-pull strategy, farmers enjoy the following gains:

- Increase in maize yield by 25–30% in areas where stemborers are the only problem. Where both stemborers and striga occur, the maize yield can be doubled (100% increase in yield).
- Increase in the supply of cattle feed from harvesting Napier grass and desmodium. These can feed a farmer's own cattle or can be sold on the market.
- Fixing nitrogen into the farm soil by desmodium, enhancing the soil fertility the organic way.
- Soil protected from erosion, as desmodium acts as a cover crop.
- Soil retains moisture, as desmodium acts as a mulch, too.
- Money earned from the sale of desmodium seed at an attractive price of KShs 600 per kg.
- More income from increased milk production.
- Savings on farm labour (after initial phase), as farmers don't have to manually remove striga weed from the farm.

continued on page 7

Grow and sell desmodium

Growing desmodium seed to meet the high demand is a new income-generating activity for farmers. So far, only the Western Seed Company in Kitale is producing desmodium seed locally. Before, it had to be imported at high costs from Australia. Western Seed buys the desmodium harvest from its 600 smallscale contract farmers, processes it and sells most of it to ICIPE for distribution to new project farmers. By the end of 2006, Dr. Zeyaur Khan estimates that desmodium seed will be sold on the open market. Seed can be multiplied and used on the farm for more than 10 years, depending on the care with which the farmer manages the desmodium.

Organic farming is a process

I would like to practise organic farming says Michael Karago of Ngorika Ol-Kalou. “I have 6 acres. How can I go about it? 0724 245958.”

Great to hear you are considering organic farming, Michael. Wanting to start now is the most important step, far better than having to do so after destroying your land with synthetic chemical inputs.

Organic farming is all about improving soil fertility. Therefore a starting point would be to learn as much as you can about how this can be done.

If you are currently farming conventionally and depend financially on your farm products, it would be advisable to start your organic production in stages. True organic production can result in lower yields for about a year as your soil adapts. If, however, you are committed to going full on organic, then your first step is to rid your stores of all synthetic inputs and empower yourself with as much information on organic production as possible.

A copy of the Organic Standards is an indispensable tool and can be purchased from Mr Musa Njoka of EnCert (PO Box 74510, 77200 Nairobi, Tel 0722 767 755). In the Standards you will learn the expectations of organic production and will also find information on all of the banned practices and products. From there, detailed information on production can be found in *The Organic Farmer* magazine which has already produced 17 editions. You can order it (address see page 2). They are excellent tools to guide you through your conversion.

Record keeping is important

If your intention is to produce commercially and you will be seeking certification, it is extremely important that you start a record-keeping system as early as possible. A certifier makes decisions based on records. It can take 2–3 years to reach organic certification status, however with a history of good detailed records, this time period can be reduced. This is advice to all farmers and must not be taken lightly. Alternatively and even better, register with a certifier as soon as you start, and as you get the hang of it, you will be certified.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

Choosing the right irrigation system

Plants do better in rainwater or overhead irrigation than furrow irrigation. Can you show us the advantages and disadvantages of each?

Different plants require water in different quantities. Added to this, some plants do not do very well with overhead irrigation, as it encourages the spread of fungal disease. Examples of these are the Solanacea family: potatoes, tomatoes, peppers, aubergines, etc.

Some plants are better suited to furrow irrigation if managed well. Problems occur when there is too much

water, resulting in stagnation around the plant roots. This encourages root rot and diseases that use the capillary action of the water as a route to spread between plants.

Rain-fed irrigation is erratic and unreliable; it limits our agricultural productivity. Both furrow and overhead irrigation can be very wasteful, especially where lack of fresh water is a growing global concern as it is today.

Knowing your crops’ water requirement and investing in a system that conserves water like drip irrigation is the way forward this century. It should be a consideration for every modern farmer.

Tithonia is excellent for foliar feed

"I want to know how to prepare foliar feed using Tithonia." Moses Juma, Box 37, Kwanza, Kitale.

This question is asked time and time again. Most of our botanical (plant-based) foliar feeds are made the same way. Soft sappy material is taken from the plant, shredded or chopped up and added to water at a 1: 4 ratio. It is left to steep for a few days, during which time the nutrients are released into the water as the plant material breaks down. After about 7 days the foliar feed is ready for use, and is diluted 1:10 with water. You can use more than one type of plant. In fact, the more diversity, the more balanced a foliar feed. We use a combination of tithonia, comfrey and African marigold. To add to this, we also add EM 2 and some farmyard manure. We have a 3000-litre tank and suspend a sack of each product in the water. After 7 days we then remove the sacks and use their contents in the seed beds. The resulting water is diluted 1:10.

The same day, the tank is refilled and new sacks filled and submerged in the water. This way every week on the same day we are sure we have a liquid feed available.

ICIPE answers

Many farmers ask: "Why do we still lose so much of our cabbage to the diamondback moth"?

The main reason why the diamondback moth is such a bad pest is its resistance to most insecticides. The farmer uses a product without knowing the resistance status of the pest, and then the product often just kills the beneficial insects, making the problem worse. Diamondback moth parasitoids were released almost all over Kenya and are certainly in your area. Be patient with pesticide application. If you have to use a pesticide, use a *Bacillus thuringiensis(Bt)*-based product, like Dipel, Javelin, Thuricide or Xentari. They kill the diamondback moth and do not harm the beneficial insects. Aphid control should be by spot application to affected plants only, then any conventional pesticide can be used without affecting natural enemies.

Dr. Bernhard Loehr, ICIPE

Letters to the editor

We need paper for our resource centre

We are a community-based organization registered with the Department of Culture and Social Services and working in Keringet Division, Kuresoi Constituency with 57 other self-help groups. Our core objectives are:

1. livestock and agriculture-based activities for alleviation of poverty and hunger among community members;

2. promoting the use of information and Telecommunications technology in community development;

3. participating and contributing to environmental natural resource management;

4. contributing to education and literacy efforts;

5. sanitation, housing and better shelter provision to community members.

We intend to establish an information resource centre to serve the farmers and the Mau complex community, focusing on improving productivity for poverty alleviation and sustainable socio-economic development. We hereby request your support to building this resource, and subscription to your publication.

Rono Suleiman, Baraka Development Initiative, P.O Box 124, Keringet

Farmers listen as Su Kahumbu explains a point on organic farming. The 25 farmers were taking part in a tour organized by The Organic Farmer *newspaper last month.*

Your advice worked

I am member of a farming youth group. On behalf of fellow members, we are extremely grateful for what we have just discovered from some of your magazines. They were really helpful owing to the rising cost of production and now the limited farming land. We have tried some of your ideas like the ones on pests, disease control and land preparation. We really appreciate the results and this is why we regret the long period we have remained ignorant. Finally, we would like to have past issues and also to be retained in your mailing list. We are still young and want to change from the conventional to organic. Farming is our only source of livelihood and we like to improve the way we do it.

Dishon Odero Owuor, P.O Box 259, Rongo

Newspaper motivating

First and foremost I would like to congratulate you for your tireless efforts to make us knowledgeable in the use of organic methods in farming. Fortunately I came across your issue No.8 and after reading it, I was motivated to try organic farming. My members are organized smallscale farmers in poultry, agro-forestry, tree nurseries, bee keeping and horticulture. The group is registered by the Department of Social Services and has 32 members. We will be grateful if send us monthly copies of the newspaper.

Rulas Mosoh Barango, Muungano Youth Group, P.O Box 319, Nyamira
Tel. 0735 913 319

Research helping us

Please continue sending more information on 'How to avoid using chemicals on our foods' and continue training more trainers and supply them to rural areas so that the community can benefit from this important research. Our agro-forestry group has played a good role and this has changed life in most active groups here. Even though most of them are only one year old, we can see some improvements.

James Munialo, Guyana Garden of Hope, P.O Box 461, Kitale

Newspaper helps us

Receive many thanks and God's blessings. I am requesting you to supply us with copies of *The Organic Farmer* through the above address. I am one of the founding members of the group. I have read some of your issue copies and gathered a great urge to read from the copy No. 1. Please enclose some for me to update myself. The materials in some of them will no doubt help us to advance more in agriculture. Thanking you in advance.

David N Kimani, P.O Box 23195-00604, Lower Kabete
Tel.0720 884549/ 0722 633426

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us (**sms!**). We shall get back to you!

Tuma maoni yako! Asante.

push-pull...

continued from page 5

- Maize plants protected from falling over in strong winds by Napier border rows.

Even though the push-pull approach demands a high labour input at the beginning, the benefits are likely to increase as time goes on. For example, desmodium is labour-intensive to establish, since the plot requires frequent and thorough weeding if the emerging seedlings are not to be overcome by weeds. However, once established, the desmodium can grow for up to 5 years, as it is a perennial.

According to Dr. Zeyaur Khan, who developed push-pull for ICIPE, there are currently 6,000 farmers in Kenya and 300 in Uganda who use the approach with great success. Apart from higher maize yields, many farmers make a significant additional income from selling Napier grass and desmodium as forage, investing the new assets in buying dairy cows or using it to meet family needs. ■

tips and bits

from farmers, for farmers

Need clean water? Try the SODIS method...

Do you lack clean water? Are your children getting sick because of drinking untreated water? Then you should try the SODIS-method to clean the water. SODIS stands for Solar Water Disinfection. Developed in Switzerland, it is a very easy method to apply. All you need are empty transparent plastic bottles. You fill the bottle three-quarters with water from the well or the river, shake it 20 seconds, then fill the bottle completely. Then lay the bottle in the sun. After 6 hours in the sun, all microorganisms which cause waterborne diseases are destroyed. The water is safe to drink.

How does SODIS work? Sunlight treats the contaminated water through two mechanisms: Very powerful rays called the ultraviolet (UV) go through the plastic bottle and kill the microorganisms. The process is very fast because the temperature in the water bottle rises due to heat from the sun. If the water temperature in the bottle is higher, the cleaning process is three times faster. Why do you have to shake the bottle? The reason is simple: The more air in the bottle, the faster the microorganisms get killed.

You may ask, "What can I do when it is cloudy"? Normally, the bottles

need to be exposed to the sun for 6 hours if the sun is shining or 50% cloudy. If the sky is too cloudy, let the bottles renmain exposed to the sun for two consecutive days. During days of continuous rainfall, SODIS method does not work well. Rainwater harvesting is recommended during these days.

If you take the water from a river, you may discover some dirt in the water, since it is not clear. You should remove this dirt, because the cleaning process of dirty water will proceed more slowly. In this case, you take a piece of cotton and sieve the water through the cotton. Fill it in the bottle, then shake it and lay it in the sun. You can then drink the water without any fear of a stomachache!

Felix Mbitu Murimi, P.O.Box 14352 00800 Nairobi

Broad spectrum treatment for chickens

Organic farmers can make their own natural antibiotics for the control of diseases in chickens. Below is a recipe:

Boil the bark of *Erythrina abyssinica* (also known as the rubber stamp tree or *omurembe* in Luhya) and the bark of *Croton megalocarpus* (*mukinduri* in Kikuyu and *musine* in Luhya). Mix 1 part of the solution with 3 parts of water and give to the chickens to drink for 3 days and repeat every 3 months. It is advisable to administer this mixture before any outbreak.

Erythrina abyssinica (TOF)

David Osiako, Umoja Forest group Group, P.O.Box 49 Kesogon.

Facts and myths

Myth: A good farmer is the one whose field has been ploughed and cleared of everything. A farmer with crop residues is lazy.

Fact: A good farmer is the one who conserves the soil with crop residues which provide organic matter and increases yield.

Myth: Many farmers think they must plough to make the soil soft so that plant roots can penetrate easily.

Fact: The opposite is true; ploughing destroys the soil structure and creates a hardpan.

Adapted from Conservation Agriculture: A Manual for Farmers, by the Institute of Rural Reconstruction, Nairobi 2005.

Market place

Shop for organic products Natures Organics, run by Green Dreams Ltd, (belonging to Su Kahumbu) is opening an organic products shop in Gigiri Nairobi in September 2006. Farmers wishing to supply their commodities to the shop can contact her through the following address:
Su Kahumbu, Tel. 0721 100 001;
e-mail: info@organic.co.ke

Goats! Due to the increased demand for dairy goats among the farmers, we have requested those with dairy goats to provide us with their addresses. The Nakuru District Sheep and Dairy Goats Breeders Association works with 42 groups that breed quality dairy goats and sheep. It also deals with 6 groups that rear Dorper sheep. They have quality male and female goats, as well as sheep. The group offers training to new goat and sheep owners. It also assists in the establishment of goat breeding centres and can assist farmers get high quality breeding stock. Interested farmers can get in touch with the association. Any farmer who may be interested to buy or get information on dairy goats should get in touch with the following farmers who have given us their addresses::

Joseph Muraya, The Marketing Coordinator, Nakuru District Farmers Marketing Federation, P.O.Box 2816, Nakuru, Tel. 0722 457 260.

Kubukubu Organic Farmers Group has four German Alpine male goats for sale. They also have other goats. Call Jacob Rware, P.O.Box 453 Embu, Tel. 0733 273 240; 068 53 075

Astone Ndude Olutali, P.O.Box 1, Bukura, Kakamega. Tel. 0723 938 649

Joseph Kimunge Macharia, P.O.Box 36, Mukurweini, Nyeri, Tel. 0722 506114.

Samuel Njoroge, Technical manager, P.O. Box 14748-20100, Nakuru, Tel. 0723 793 414.

Samuel Thiongo, Ruthimitu Organic Group, PO Box 489-00605, Uthiru, Tel: 0722 565 642.

Need potato beet? I have potato beet and other organic farm products which are ready for sale. Contact me! Doris Njuguna, Tel: 0723741 955

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 30 November 2007

Farmers lose a large portion of their harvest due to poor timing and storage (Photo TOF)

Avoid post-harvest losses

The longer the maize stays in the shamba after maturity, the higher the loss due to pests and rotting.

The Organic Farmer

One of the most important areas farmers tend to neglect is the timing of the maize harvest. Many farmers do not know when to start making preparations for harvesting. The result of delayed harvesting is pest infestation and the decaying of maize, especially during prolonged rains, while the crop is still in the shamba. Farmers in Kenya and most African countries lose between 15 to 40 percent of their harvest due to these two factors.

If you plant your maize in March or early April, then it should be ready for harvesting in October, especially in warmer areas where the maize matures early. This means that by September, farmers should be able to cut and stake the maize in readiness for harvesting. Some maize varieties mature early. If allowed to stay too long in the field, the maize husks tend to open, exposing the maize to weevils and rainwater that is responsible for the yellow discolouration and rotting. Instead of using expensive chemicals to protect the maize from pests, there are several cost-effective measures that farmers can take, for example the use of diatomite. *See pages 3 and 6.*

Cassava

The new cassava variety Migyera produces six times more yield than the traditional varieties. *See page 8*

Questions? Go to Infonet!

Infonet is an information platform for organic farmers. Whatever you would like to know about the ecological methods for the control of pests and parasite infestations of plants, humans and animals – Infonet will have an answer. You just go to the Internet, either at home or at a cybercafe and type in: www.infonet-biovision.org

From January 2008 onwards you can order the entire Infonet-service on a CD. More about this in the December issue of *The Organic Farmer*!

Dairy farming is popular

Many dairy farmers have sent us questions on dairy cows and their management, following our articles on the same topic in our March and October 2007 issues. This shows that farmers want to improve the quality of their dairy cows. The problem is that most farmers have poor-quality breeds. On page 5, William Ayako (a livestock specialist at KARI) talks about the importance of breeding. Local farmers lack management skills; their dairy cows are not provided with quality feeds. They also require extension services to educate them on animal nutrition and breeding. *See page 5*

Dear farmers,

At this time of year, farmers all over the country are either harvesting or preparing to harvest their maize – reason enough to look at two problems facing our farmers: storage and marketing.

Farmers risk the danger of losing their precious harvest due to rotting and pest damage in the field and during storage. One of the easiest methods to save the harvest is to apply diatomite on the maize. This is a refined diatomaceous earth that kills pests, as you can read on page 6. It is cheap and sustainable. Diatomite works physically rather than chemically, so there is no chance of insects building up immunity or resistance against it.

Proper storage is even more important when it comes to securing good prices for your harvest. Since all farmers harvest and sell more or less at the same time, the prices tend to go down. Ideally, farmers should be able to store their maize a little longer until the prices are more favourable. Of course, we know that many small-scale farmers cannot wait. They have to sell their crop immediately in order to pay the school fees for their children and meet other pressing needs.

The situation is closely related to the other problem that is a major hurdle for small-scale farmers: marketing of their produce. Although they invest a lot of time and energy producing various crops, what they get in return is "nothing to write home about". This is because the market is dominated by exploitative middlemen out to make hefty profits at the expense of the farmers.

Farmers should think of marketing even before they begin planting any crop. A clever farmer will always do a market survey to find which products are likely to fetch good prices at a particular time in the year. Such a farmer will not plant what everybody else is growing, but will carefully choose the types of crops likely to find a ready market and give him/her a good return.

When the crops are ready for harvest, there are modern ways to find customers, for instance using mobile phones, as the example from Tanzania shows (see page 4). Marketing is just one of the many challenges that face you farmers, and you have to find ways to overcome them. Proper planning is the first step. Careful planning is the foundation of any successful enterprise, and remember, farming is a business!

OPINION

Even in areas where agriculture has the potential to drive growth, widespread and significant poverty reduction will only be achieved when agricultural growth stimulates rapid growth in rural non-farm employment, with institutional development, markets and trade relations all eventually favouring the non-farm sector. Agriculture alone will not be able to drive the growth and structural change needed for poverty reduction.

Rethinking Agricultural Policies for Pro-Poor Growth,ODI-Papers 94, Sept. 2004

The Organic Farmer

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Organic agriculture – a real benefit?

Organic farming is sustainable and ecosystem-friendly. But what is its real economic impact? A long-term study should give the answer to this and other questions.

The Organic Farmer

Numerous studies have given much evidence on the advantages of organic agriculture in terms of ecosystem services. Organic farming is now increasingly being taken up by farmers, non-governmental organisations (NGOs), national programmes and agricultural development agencies in tropical countries as a means to improve food security and rural livelihoods in a sustainable way. Demand for reliable data on the environmental and economic impact of organic agriculture is high, but thus far only a few attempts have been made to systematically compare this farming system with conventional practices.

Approach

To fill this gap, the Switzerland-based Research Institute of Organic Agriculture (FiBL) and its partners in the developing world are running long-term farming system comparisons of 10 – 20 years' duration in Kenya, India and Bolivia. Already a similar study in India shows that farmers growing cotton organically spend less on chemicals and got higher prices because organic cotton fetches more money in the market.The replicated field trials now make it possible to monitor the effects of organic agriculture on yield, yield stability, product quality, soil fertility and biodiversity, as well as on natural and economic resource efficiency. The impacts of organic agriculture on livelihood systems (for instance on farm income), education, health, gender relations and farmers' social mobility, will be studied in farm surveys.

In Kenya, the study focuses on a subsistence farming system based on maize and vegetables. It seeks to compare organic systems to conventional systems at two levels:

- the high-input levels that target farmers growing crops for commercial purposes and target external markets;
- the low-input levels that target farmers growing crops for self-consumption and for local markets.

The trial is being conducted on-station in Chuka, Meru South district and KARI-Thika in Thika district of Kenya. The project started in March 2006 with the basic research foundations such as field preparations, preliminary farm surveys and definitions of the trial concepts and details. The first maize season with treatments was planted in March 2007 and will be followed by a vegetable crop in the short rainy season in October. The trial is based on a three-year rotation in which a cereal crop (maize or baby corn) will be planted in the first season every year and a vegetable crop (cabbage, kales, French beans, potatoes and African leafy vegetables) in the short season.

Objectives and beneficiaries

The strategic objectives of the study are to:

- place the debate on organic farming in developing countries on a rational basis;
- foster agricultural policy dialogue in the developing world;
- identify the challenges for organic agriculture in tropical countries and thus gain the ability to address them in a targeted way;
- contribute to the development of organic and sustainable agriculture in developing countries.

The beneficiaries of the project will include farmers, marketing organizations, trading companies, consumers, agricultural NGOs, extension services, national and international research institutions, national authorities and development agencies.

The research is being implemented by the following partners: International Centre of Insect Physiology and Ecology (ICIPE), Tropical Soil Biology and Fertility Institute of CIAT (TSBF-CIAT), the Kenya Agricultural Research Institute (KARI), the School of Environmental Studies and Human Sciences of Kenyatta University, and the Ministry of Agriculture. The project is funded by Swiss Development Cooperation, Coop-Supermarkets, Switzerland, and Bio-Vision Foundation of Switzerland, the sponsor of *The Organic Farmer*. ■

Protect your maize from pests and decay

Post-harvest losses could be reduced considerably if farmers took simple measures to protect maize from pests.

The Organic Farmer

The major causes of post-harvest losses incurred by farmers are insect pests, rodents and development of mould. Farmers can greatly reduce these losses if they take the following measures to protect their maize:

Store preparation: A good store should allow space for air circulation at the lower end and even more space in the upper section. Pests like a warm environment, so if the store is well ventilated, it helps keep them away. If you stored your maize in the store the previous year, then it should be properly cleaned to remove any remains of the previous harvest, which could be harbouring pests. Weevils reside in cracks in the wood that is used to build the store; these cracks need thorough cleaning to remove any weevils before the grain is stored.

Sorting: Before storage, sorting of the maize is very important, as it removes any cobs that may have been damaged by insects and mould. Studies from West Africa show that sorting reduces the amount of damage in the stores by over a third. This ensures that the maize is as clean as possible and will not help spread the insect pests and mould to the rest of the clean maize. Shelling the maize will reduce pest damage since most pests prefer maize while still on the cob.

Drying: Shelled maize should be dried in the sun for three to four days to prevent mould, which could lead to aflatoxin poisoning. Drying in the sun also kills some of the pests already in the maize. There is an easy method to check if the grains are ready or dried enough for storage (see box below).

Fumigation

One of the most common ways used to kill pests is fumigation. But fumigation is not easy to do and is even dangerous if inappropriately handled. It is also costly, since one has to apply the chemicals every month. Furthermore, pests are developing resistance against fumigants. In organic farming, fumigation is not allowed. A much more efficient and cheaper way to fight all the pests in the stored maize is to use diatomite, which kills the pests. *See page 6* ■

Maize infested with the larger grainborer (above). The photo on the right shows the lesser grainborer. It is important to treat grains before they are attacked by the pests.

Metal silo: safe storage

The Catholic Relief Services (CRS) has devised a metal silo for storage of maize and other cereals to protect them from moisture, rats and insect pests. The silo is an airtight cylindrical metal structure constructed by trained local *fundis* for grain storage. The metal silos come in various capacities ranging from 2 to 20 bags.

How to load the grains

Before loading the grains into the metal silo, tie the grain outlet lid with a rubber band. Open the grain inlet lid, then load the dried, treated grain, tie the inlet lid with a rubber band. Leave it airtight for 30 days in order to complete the life cycle of any weevils that may have entered with the grains.

Where to place the metal silo

Look for an appropriate place in your house in which to place the silo. It should not be exposed to direct sunlight or rainwater. Avoid water spillage on the metal silo. It must also be kept at least one metre or three feet below the roof. It must not touch the house walls. The silo must be placed on a platform. To remove the grains, untie the rubber band on the outlet lid, then place a container below the outlet. After offloading, put back the oulet lid and tie with the rubber band. A 10-bag metal silo costs Ksh 10,050 while a 20-bag one goes for Ksh 16,890. Farmers can make enquiries on the metal silo from the Ministry of Agriculture or Catholic Relief Services offices near them; alternatively, they can contact Mr Kin'goo Tel: 0733 262 543, Machakos.

How can you test for moisture level?

This is an efficient method to check if grains are dry and ready for storage. All you need is an empty glass or bottle and dry salt.

1. Put a handful of grains and half a handful of dry salt in a dry bottle or glass.
2. Shake for 2-3 minutes and allow to settle.
3. If salt sticks on the walls of the bottle, then the grains are not properly dried or have not attained the lowest required moisture content.
4. Dry your grains again and repeat the test.
5. If there is no salt sticking on the walls of the bottle, then the grains are dry and ready for storing.

Use your mobile phone for marketing

Sending an SMS can earn farmers profit and bargaining power while dealings with middlemen and traders.

Anja Bengelstorff

In today's tough business environment, it is not enough to know a lot about farming and bring in a good harvest. A farmer, more than ever before, needs to appreciate the value of information, especially about market prices of commodities in different markets, who is selling or buying what and where, who is transporting, who are the middlemen, and much more. The good news is that accessing this information has become easier than ever before. Just use your mobile phone!

Pushing Tanzanian farmers

Tanzania provides a good example of this. An initiative called 'The First Mile Project' aims to instruct and support Tanzanian small-scale farmers, traders, processors and others from poor rural areas to reach markets and get market information. Modern communication technologies like mobile phones, Internet and e-mail are instrumental to achieving this goal. For example, one member of a farmers' group is sent to marketplaces and finds out the current prices for various produce. From there, he/she sends those prices quickly via sms to other members of their group, who share the information among themselves or put it on a village billboard for everyone to read. Vital and current information is shared, such as prices and quantities needed.

By knowing the prices in the market, the farmers' group now has a bargaining power with middlemen or traders who approach the farmers on their farms and offer a price. Farmers can now compare the offered price with the one in the market and can calculate if they will make any profit. More importantly, they are able to negotiate a better price.

Value of information

This system works best when farmers are organized. If each member contributes a few shillings to enable one of them to go and find out prices at the markets, this will go a long way in increasing everyone's farm revenue substantially. In other words, farmers must be ready to invest and pay for the information and services that give them profit.

A mobile phone can link farmers to potential buyers, saving money and time. (Photo TOF)

"Most people don't know the value of information, unless they are used to dealing with it", says Joseph Kariuki, agricultural expert at the consultancy firm Cardno Agrisystems in Nairobi. "It's the attitude towards information that farmers need to change." Concerning the use of mobile phones, the scientist says passionately: "It is the most accessible technology in Kenya, but so far its potential remains hardly explored."

The Ministry of Agriculture does not have any measure in place to help small-scale farmers use modern communication technologies to increase their income. "We don't have enough information yet to implement country-wide marketing measures", says Kenneth Ayuko, Director of the Agribusiness Division in the Ministry, established in 2005.

SMS for 7 Shillings

The good news is that Kenyan farmers still have the chance to benefit from information transmitted via mobile phones and the Internet, even though on a rather small scale. The private company Kenya Agricultural Commodity Exchange (KACE) collects market information from as early as 4:00 am (0400 hrs) when major markets open, and sells it to interested clients. For example, it runs a sms service in cooperation with Safaricom, called SMS Sokoni, which provides daily wholesale buying prices of maize, potatoes, cabbage, beans and tomatoes at wholesale markets in Nairobi, Mombasa, Nakuru, Eldoret, Kitale and Kisumu, as well as buying and selling options for farm produce. A sms with the text "maize prices", for example, must be sent to the number 411. The sms costs KSh 7 in total. Per month, this service is accessed by 8,000 to 11,000 users only, admits Abraham Okolla, Marketing Manager at KACE.

Another option to access prices and trade information or to place an advertisement for any agricultural commodity is the Kilimo Hotline at 0900 552 055. The recorded voice mail costs KSh 20 above the normal rate. Only 2000 - 3000 callers so far make use of this offer in a month.

Farmers and buyers who have an e-mail address can subscribe to the electronic database RECOTIS, run by KACE. Every morning at 9:00 am, explains Abraham Okolla, e-mails are sent to subscribers with Kenya market prices for 25 commodities, including fruits and livestock. Also available is information about buyers and sellers. The membership rate for six months is KSh 5500; an entire year costs KSh 10,000. According to Okolla, about 500 subscribers reside around the world, but mainly in East Africa.

In addition, KACE runs 12 Market Resource Centres, mostly in western and central Kenya, from where farmers can obtain this kind of information as well.

Kenyan farmers stay away

In Kenya, the problem remains that too few farmers make use of this valuable but accessible information — and stay poor as a result. When they manage to organise themselves to share costs and have a stronger voice when dealing with wholesalers or processors, mistrust among individuals often makes farmers' groups fail in their endeavours. "Kenyans are good in individual enterprises, but they fail as a group", observes Joseph Kariuki. Abraham Okolla shares this experience. Kariuki suggests that, "Younger farmers' groups, familiar with mobile phones and the Internet, should be targeted for the use of communication technologies to demonstrate that it works". ■

Farmers show great interest in dairy cows

Our articles on dairy cows have generated a lot of interest from farmers. This shows that small-scale farmers realise the benefit of well-kept and well-fed cows and are also eager to get information about breeding. On this page, William Ayako answers some of your questions sent to* The Organic Farmer *magazine.*

Boosting butterfat

May I know if cross breeding of bigger animals with smaller ones can increase or lower the milk production and boost butter content? Tel. 0720 063460

Depending on the breeds, say a Friesian for the bigger animal and a Zebu for the smaller animal, the offspring would have half the genes of the two breeds of animals. In this case, the potential offspring may acquire the vigour as a hi-breed to produce more milk. But in general terms, the chances of her producing as a Friesian are minimal. Yes, it would produce more milk compared to a Zebu. The butterfat content of the milk would be higher than a Friesian's since Zebu have low milk yield but higher butterfat.

The same scenario is likely to happen if you cross, say, a Jersey with a Friesian. Zebu and Jersey both have a higher butterfat index compared to a Friesian. It should be noted however, that milk composition can as well be influenced by the diet on which the animal is fed. Generally, high-energy diets such as good quality maize silage would tend to increase milk solids (all the other constituents of milk minus water), which include butterfat.

** Dr. William Ayacko is a livestock scientist at the KARI Naivasha Animal Husbandry Centre*

Proper selection of breeds improves the quality of dairy cows (Photo TOF)

Careful crossing of breeds needed

Q. When a Friesian is crossed with an Ayrshire, the calf born is likely to be a Friesian. Is it upgrading or degrading of the calf? Maurice Abuoro, Rongo Tel.0720 063 460

The genetic merit of a large number of offspring will be the average of that of their parents. This means that some individuals will be genetically superior to the average of their parents while others will be inferior. The offspring of a Friesian and an Ayrshire would contain 50% genes of both breeds. In terms of milk production, a Friesian generally has a higher genetic potential than an Ayrshire. The offspring as a hi-breed could produce a similar quantity or more milk than a Friesian due to high-breed vigour. The breeding goals of the breeder may depend on whether he/she requires more milk, or higher protein yield/ higher fat yield or to maintain the pure Friesian characteristics.

If the goal is to maintain a pure Friesian, then we could term the breeding plan as downgrading of the Friesian breed. A pure Friesian has 100% genes of a Friesian, whereas the crossbred calf in this case would contain only 50% of the Friesian. In this case, therefore, based on the genes, it would mean downgrading of the Friesian genetic makeup.

What can I do to enrich a ruminant diet?

Is it true that mixing highly nitrogenous feed encourages bull fattening? George Oyeng, Muhoroni, Tel. 0725 587 146

A ruminant's diet should contain at least 7% crude protein for efficient functioning of the rumen microbes to enhance better digestion. The crude protein content of the feeds is basically made of nitrogenous compounds.

A proper feeding plan should embrace this concept to enable the digestive system of the ruminant animal to work well. In a situation where the basic diet of the animal contains less than 7% crude protein, the population of the microbes in the rumen would be decreased to below the required level to enhance proper digestion of the feed. If this occurs, the performance of the animal in terms of growth and weight gain would be poor. The concept of mixing highly nitrogenous feeds such as forage legumes with low-protein feed like wheat straw would result in better performance. An all-legume feed like lucerne hay is a wholesome feed for a ruminant compared to grass hay.

Lucerne (top) and calliandra (bottom) are protein-rich feed for cows. (Photos TOF)

Balanced feed is important

Some legumes, however, such as the calliandra tree, leucaena and some others contain some anti-nutritional factors (e.g. tannins) which inhibit protein digestion by ruminants and therefore cannot be fed as a sole diet. Mixing of such high-protein feeds with high-energy feeds (e.g. concentrate) would provide the animal with the required nutrients and enhance better utilization of such feeds by the ruminant and would further improve the performance of the animal. ■

Diatomite is a powerful insecticide

Today, I would like to write again about diatomite, as I consider this an incredibly valuable product in organic farming.

Diatomite is not available in most countries, and thus is quite expensive and difficult to access in the organic farming communities around the world. We in Kenya are very lucky to have a deposit being mined right here in Gilgil.

What is diatomite?

Often referred to as DE (diatomaceous earth), diatomite is the fossils of diatoms, single-celled algae. This algae obtains silica from volcanic ash which falls into the water in which the diatoms grow. With this silica, the diatoms produce non-crystalline silica skeletons, and over time as these lakes dry up, exposed diatomateous earth sites remain.

How does it work?

Diatomite has many uses, all of which are non-toxic. In the organic farming world, its biggest use is insecticidal. As it works physically rather than chemically, there is no chance of insects' building up immunity, or resistance. This is an absolute bonus for we organic farmers! The microscopic fossils perforate all body parts of insects and at the same time absorb the body fluids. This results in total dehydration and finally death of the pests.

Diatomite can thus be used as a powerful insect killer and can be used both on crops and livestock. On livestock, it can be used for both external and internal parasites. When added to stored grain, diatomite kills weevils and protects the grain from further damage. Diatomite is non-toxic and therefore will not harm humans or animals that consume it. Grain should be washed before cooking, however. To treat stored grain, just add 500 g (1/2 kg) of diatomite to each sack of grain.

On crops, it can be dusted on for control of ants, flies, mites, slugs, snails, ticks, scorpions; almost any insects with a waxy coating will succumb to dehydration when the sharp dagger-like points scratch them. For dry application of diatomaceous earth, use a duster and cover the entire plant; apply to both top and bottom of the leaf. For young plants, as little as 1 kg per acre (2.5 kg/ha) may be adequate. For larger plants, about 2 – 2.5 kg per acre (5 – 7.5 kg/ha) is probably sufficient. Diatomite will need to be reapplied after rain. It is best to apply it when there is dew or after a light rain.

Helpful for animals

For livestock, diatomite can be applied to poultry as a dusting powder, used indoor or outdoor around the barn or house, or any place that is dry. It can also be dusted on dogs, cattle, pigs, goats, etc. for control of ticks and fleas. Beddings of these animals should also be dusted.

Diatomite can be mixed with animal feed. Your livestock will also get the benefit of over 14 trace minerals that make up diatomaceous earth. The following are the amounts to use:

- Cows/Horses: 30 – 60 g per day
- Sheep/Goats/Hogs: 15 g per day
- Chickens or other poultry: you need to weigh the feed and mix in 2% of that weight with diatomaceous earth.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

I tried diatomite, and it worked!

Peter Kamau

Preserving maize during storage is one of the most difficult tasks for any farmer. My own experience shows that most chemicals used for this purpose rarely protect maize against pests. I spent an average of Ksh 2000 worth of pesticides to protect my 200 bags of maize, but the weevils would persist, forcing me to repeat the same process every month.

In February 2002 a pest protection dealer advised me to try the fumigation tablets he was selling; the tablets proved to be slightly better than the other pesticides. I still discovered, however, that they can only protect the maize for about two months, and only if it is properly covered with airtight polythene sheeting to stop the fumes from escaping. Another fact I discovered is that the fumigation tablets could only kill the weevils which had not yet entered the maize grains. It is very difficult to protect the grain if it is already infested, and that is why farmers are advised to ensure they harvest early—before the weevils establish themselves in the maize.

Successful trials

In 2005, I learned about the use of diatomite powder in the preservation of maize during storage. Luckily I had already bought six bags of the powder to protect my newly planted tea bushes against pests. I therefore decided to apply 1/2 kg (500 g) of the diatomite dust on each of two bags of shelled maize on a trial basis. On checking three months later, there were no weevils on the two bags on which I had applied diatomite.

As the rest of my maize was already showing traces of weevil damage, I decided to apply diatomite on the whole consignment. Since then I have been using diatomite dust on all my maize during storage with spectacular results.

Diatomite is mined by the Diatomite Industries at Kariandusi in Gilgil along the Nakuru-Naivasha road. It sells at Ksh 20 for 1 kg. Farmers can apply as little as 3 kg of the dust for every tonne of maize, wheat, barley or even millet with very good results. The Sales and Marketing Manager, Mr Roger Oluchiri, says diatomite is available in 20-kg bags to any farmer who is interested. Farmers can get in touch with him at the following address:

African Diatomite Industries, P.O.Box 32, Gilgil Tel. 050-4015209, Mobile 0722 277 120

Letters to the editor

Requesting for your magazine

We wish to be included in the mailing list of *The Organic Farmer* newspaper. We need thirty copies for distribution to our extension staff and farmers. I have personally read the June 2007 edition and found it quite informative both to staff and farmers. In case our request is considered, we will ensure that the magazine reaches our clients who are the mixed farmers within Machakos district.
Aron M'Ringera, District Animal Production Officer, P.O. Box 1188, MACHAKOS, Tel. 0721566796 e-mail: aronringera@yahoo.com, Email:dlpomks@yahoo.com Telephone – 044-24247

TOF for our library

Congratulations for a job well done. I am an extension officer interested in organic farming. I would like to request for monthly copies of your magazine for the divisional library and to distribute to our farmers' groups. We will appreciate your response. Rebbeca Yegon, District Agricultural Extension Officer, P.O. Box 33, Bungoma

Help us fight poverty

I happened to come across *The Organic Farmer* magazine and found a lot of information which, when put into practice, can help alleviate poverty among small-scale farmers across the country. Please put me on your mailing list. I am even ready to pay the postage charges. I do not want to lose the opportunity to read it as it will improve my life and that of other farmers. Isaiah Ogwalo, P.O.Box 162 Homa Bay, 40300

I don't want to miss it

I request to be included in your mailing list. I am a farmer by profession and I believe in natural systems of production, so I do not want to miss any of your issues.
William Chesongol Tiyoi, P.O.Box 2540, Kitale 30200

I discovered tithonia plant

I have finally got the valuable tithonia plant in my shamba which is now in a seedbed for multiplation (vegetative), though the divisional agriculture office did not assist me in this area I do hope they will be of help in future. I will be visiting them as need arises. I would be grateful to receive more literature on the plant. I am waiting for your positive reply to my request. Moses Gitau Maina, C/o Mawingu pri. School, P.O Box 245, Molo.

Give us information on pineapples

You have featured chicken and mango production. I grow pineapples and would like to avoid the use of chemicals. If I have additional information on how to grow them organically, I would have an advantage. The new Infonet service, which you intend to launch, will be an added advantage to farmers. We welcome it and hope it will provide us with relevant information to help us increase production. J.K. Kirui, P.O. Box 152, Litein, 20210

Article on rabbits was informative

I wish to request for 5 copies of *The Organic Farmer* magazine. We have school-based gardening and would

like to start rearing some animals such as rabbits. I found your July issue on rabbits very informative. I did not know they can provide very good meat. Looking forward to learning more from you. Bramwel S. Njeri, Golden Tots Preparatory School, P.O. Box 42 Matunda 30205. ■

Increase our knowledge

I am a regular reader of *The Organic Farmer* magazine and am a practising organic farmer in Tongaren division, Bungoma district. I would like to request you to consider sending me copies of this valuable magazine to supplement my knowledge and that of my students. I need 20 to 30 copies. Kenneth Wapakala, St Francis High School, P.O.Box 178 Misikhu

Send it to East Pokot

I request to be sent 6 copies of your monthly magazine, *The Organic Farmer* to East Pokot. East Pokot is a new district that has five divisions. We intend to give a copy to each of the five divisions. Caleb Ogola, District Agricultural Officer, East Pokot District P.0. Box 50, Chemolingot.

Does organic fertilizer require certification?

I'm a member of a community cooperative in Nakuru dealing with waste recycling issues. We are focusing on solids and water recycling which also includes organic waste. We have members who live in the peri-urban areas and deal in composting of farm waste. We are going commercial and want to produce organic fertilizer (dust and granulated form). Our product has been tested by Kephis, KEBS and other agricultural institution labs. It has been found free of any pathogens or heavy metals, but the biggest question is: Are there standards for organic fertilizer? Please let me know because we wish to fully comply. We are also keen on providing solutions to managing organic waste within our town, through recycling and composting. Please advise us on this. Our members are low-income earners and we are about 100 members. This initiative will provide employment and increased income to our members.
Please assist! Mildred. daymillie@yahoo.com

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Infonet service is finally launched

Farmers in East Africa now have free access to information on sustainable agriculture following the launch of Infonet, an Internet-based platform that provides information on natural methods for prevention and control of pests and parasites on plants, animals and people.

The site was officially launched on October 9th by the Prime Minister of the European state of Liechtenstein, Mr.Otmar Hasler.The Infonet is sponsored by LED, the Development Service of Liechtenstein through the BioVision organisation and ICIPE. The website, www.infonet-biovision contains information on 40 major pests and diseases that affect more than 35 major crops, vegetables and fruits grown in East Africa. Farmers visiting the site can identify diseases and pests affecting their crops and at the same time get advice on biological methods of their control. Biovision CEO Mr. Andreas Schriber said that the new information service will greatly improve the exchange of information between research institutions and farmers. He added that unlike other internet sites with difficult scientific language and terms, farmers will find the new site easy to access, understand and use. The Infonet project leader, Ms Monique Hunziker said the website will be updated daily to ensure farmers have access to the latest information on such areas as soil and water conservation, processing of agricultural produce, organic farming and plant nutrition. In addition, the website contains information that is relevant to problems specific to the region. Farmers with no access to Internet services will initially be able to use an offline version that will be made available on Compact Discs (CDs) or USB flash sticks by May 2008. ■

The Prime Minister of the State of Liechtenstein Mr. Otmar Hasler (right), addresses participants during the Infonet launch.

Market Place

Organic produce: The Organic Shop would like to buy the following organic farm produce from certified organic growers: All types of fruits such as raspberries, sugar, corn oil, sunflower oil, garlic, strawberries, green peppers, eggplant, organic tea and coffee, grains such as wheat, barley and oats, beef, lamb, duck. Farmers can contact Zak Tel. 0722 572717 or Su Kahumbu Tel. 0721 100001, email: info@organic.co.ke

Guinea pigs: We would like to buy Guinea pigs from any farmer rearing them. Contact us on Tel.0729 302 858.

Dairy cow wanted: I am interested in buying a high yielding dairy cow. Any farmer with a ready cow for sale in my area can contact me. Tel 0729 553 517 Endebess, Kitale

Kenbro chicken: I need to buy 100 day-old Kenbro chicks. Any hatcheries selling them should contact me. Tel.0722 257 796

Pumkins for sale: I am an organic farmer in Kericho. I specialise in pumpkins (sugar pie). I have 3 tonnes in stock for sale. Contact me on Tel. 0725 396 961.

High yields with new cassava varieties

The introduction of new cassava varieties in western Kenya has significantly contributed to food security and reduction of poverty in the region.

Cassava is an important staple food in western Kenya. The region produces and consumes 60% of the national cassava production. In 1994/95, a most severe form of cassava mosaic disease attacked cassava crops and devastated all traditional varieties in Teso and Busia districts. The disease rapidly spread to neighbouring districts and by 1997, it had become pandemic, such that farmers abandoned growing cassava altogether. (A pandemic is a disease that has spread over a whole region or country.) People in the region suffered serious food shortages and evident poverty as a result.

New clones selected

In 1997, the Kenya Agricultural Research Institute (KARI) collaborated with the International Institute of Tropical Agriculture (IITA) through the East Africa Root Crops Research Network (EARRNET) to mitigate the pandemic. Strategies to tackle the pandemic included introduction and evaluation of germplasm (varieties) and multiplication and distribution of cassava mosaic-resistant planting materials to farmers in western Kenya. In the past six years, over 1400 cassava clones have been introduced and evaluated for the disease and other important agronomic characteristics. Fifteen clones have been selected and rapidly bulked for planting materials and distributed to farming communities in western Kenya.

Over 302,000 households in the region are growing the improved healthy cassava varieties, which yield six to eight times more than the traditional varieties. The preliminary results of the impact study shows that the overall adoption rate in the five districts surveyed in western Kenya is 30% in terms of the proportion of farmers growing the improved varieties. The variety Migyera (TMS 30572) is the most commonly grown (by 25.6% of households) and therefore the variety of interest among improved varieties.

Higher yields

The area covered by the new varieties is approximately 21,000 ha, which is a recovery of 38% of the area in western Kenya that was under cassava production prior to the pandemic. In some districts such as Teso and Busia, where adoption of the technology is high, the recovery area under cultivation with cassava mosaic disease-resistant varieties is over 80%, while in terms of production restoration, it is over 100% because of the higher yields of the improved varieties. (TOF) ■

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 31 December 2007

Indigenous chickens need proper feeding and housing to be productive. (Photo TOF)

Taking care of indigenous chickens

Many small-scale farmers seem to have resigned themselves to the belief that it is difficult to improve their earnings due to the falling prices of most agricultural commodities. But we hold a different view. There are many opportunities available if only farmers can accept to adopt new ideas and start farm enterprises that can increase their income and uplift their standard of living. For instance, every rural household has chickens especially of the indigenous variety. Indigenous chickens fetch premium prices on the market, but they are the most neglected of all livestock in rural households.

If well managed, indigenous chickens could change the fortunes of many small-scale farmers. In this issue we provide you with tips on how to manage them. *See page 5*

Farmyard manure is not garbage

In every homestead or farm across the country, a heap of farmyard manure dumped outside the boma is a familiar sight. It seems that many farmers do not know the value of farmyard manure as a valuable fertilizer that could enrich their soils and save them a lot of money which they spend currently in buying chemical fertilizers. Farmyard manure loses essential nutrients when it is exposed to the sun or rain. *See page 3*

Farmyard manure should always be covered to prevent nutrients loss. Photo P. Luthi

Tiny pests, but huge damages

Nametodes cause serious damage. They are tiny thread-like worms that live in the soil. Most of them stay in the topsoils and contribute to the decomposition of organic matter. The damaging plant-feeding nematodes differ from other predatory nematodes because they have a sap-sucking mouth. Important environmental factors that influence development of the most damaging nematodes are moist soils and relatively warm temperatures. Under average conditions a female produces 300–800 eggs. A new generation can arise within 25 days. More about nematodes on *page .*

Do you need TOF?

Would you like to read/print your own copy of *The Organic Farmer*? Then go to our new website.

www.organicfarmermagazine.org

Dear farmers,

The year is now coming to an end, with most farmers preparing to harvest the crops they planted during the course of the year. Apart from the festivities marking the end of the year, including the coming general election, this is an important period for the farmer. It is time when all of us should take stock of what we have achieved during the year and at the same time start planning for what we intend to do in the coming year.

If you managed to go through all the issues of The Organic Farmer, *that we sent you this year, you will notice that we have introduced various ventures that farmers can start to greatly improve their income. These include new ways of marketing, working together as groups to stop exploitation by middlemen, poultry keeping, beekeeping and mushroom production.*

We have stressed the need for farmers to change and adopt new ideas that can help them improve production and income. Some of these ideas are not difficult to try. They are simple farming techniques such as crop rotation that have so many benefits, not only in improving soil fertility but also in controlling pests and diseases. It is encouraging to note that so many farmers have made a notable improvement in their farming practices.

An important event that took place in October this year is the launch of the Infonet service. Farmers will now be able to access information on sustainable agriculture and organic farming at www.infonet-biovision.org. *Moreover:* The Organic Farmer *now has its own website! If you would like to read the latest issue, just go to* www.organicfarmermagazine.org. *For those who do not receive the magazine, this will be an opportunity not only to read it, but they can also be able to print copies and make the necessary reference in future. We do hope that farmers will make use of this service.*

We would like to thank you for the encouraging letters, telephone calls and SMSs. Our magazine is always working hard to ensure that farmers in Kenya are well equipped with the information they need for productive, sustainable organic farming. We have lined up lots of useful articles, tips and advice for next year. Finally, we wish all of you a bumper harvest, better market prices, seasons greetings and a Happy New Year.

OUR OPINION

Malnutrition is the biggest risk factor for illness worldwide. For both children and adults, malnutrition reduces the body's natural defences against a vast range of diseases. The death rate from diseases such as lower respiratory infection, malaria and measles are much higher in children who are underweight than in those who are adequately nourished. Undernourished People infected with HIV/AIDS develop the full symptoms of the disease more quickly than people who are well fed.

The Millenium Project for Africa

The Organic Farmer

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Managing your Napier grass

Napier grass is the most popular fodder crop in Kenya. However, is also the most neglected.

The Organic Farmer

It is approaching the dry season. One major problem likely to face farmers is lack of adequate pasture to feed their animals in order to increase (or at least to maintain) milk production and income. Although most farmers have adequate land on which they can grow good fodder, these pastures are poorly managed and can hardly sustain their animals. Good management of pasture ensures the farmer has enough feed the animals all year' round.

The most popular fodder crop in Kenya is Napier grass. Napier grass gives the highest yield per unit area compared with other types of fodder. Strangely enough, in most farms Napier grass is the most neglected crop. Farmers do not get the maximum benefit because they do not manage this valuable plant in the right way.

Napier needs nutrients

Since chemical fertilizers are not allowed in organic farming and are too expensive and beyond the reach of many small-scale farmers, the best alternative is to apply well-composted farmyard manure on Napier grass. Apply 5 to 10 tonnes/ha of farmyard manure at planting. In subsequent years, apply the same amount preferably in splits after every harvest. Very few farmers apply farmyard manure on their Napier grass; they neglect even the manure (see page 3). A good way to improve yields is to intercrop Napier with forage legumes like desmodium. This improves the quality of the feed and reduces the costs for nitrogen fertilizer.

Tumbukiza is a new method of planting Napier grass (see page 3). The initial labour costs for digging pits and trenches are higher than the conventional methods, but *Tumbukiza* produces more herbage yield than the conventional method, hence less land is required to keep one dairy cow.

Weeding is also a very important aspect of Napier management. Weeds take up a lot of nutrients and water that would have been used by the fodder crop and which in the process reduces its productivity. Weeding should be done after every harvest to maintain high productivity.

Farmers with inadequate fodder are often forced to cut immature Napier grass more frequently. Immature Napier grass is unsuitable for feeding as it contains too much water and very little dry matter. Harvest Napier when it is 1 m high or at every 6–8 weeks to obtain optimal quality and quantity. Maintain a stubble height of 5–10 cm above the ground level at each harvest to avoid weakening of the root system, which leads to low production in subsequent harvests.

Feeding

Many small-scale farmers keep too many animals without adequate land for pasture (overstocking). An average dairy cow requires 70 kg of fresh, unchopped Napier grass per day to produce 7 kg of milk, or 9–12 kg milk per day when fed on Napier/legume mixture. One acre (0.4 ha) of Napier grown in the conventional way should ideally support only one dairy cow if there is no other supplementary feeding being done. One acre of *Tumbukiza* Napier grass can provide enough feed for 2 – 3 dairy cows for one year.

Controls soil erosion and pests

Napier grass has other benefits for a farmer; for example, when planted around the maize fields, it helps to control stalk borer (stemborer) infestation. Farmers are advised to plant three rows of Napier all around the maize field. When planted along the contour lines in a pure stand or in a mixture of fodder legume trees, Napier reduces soil erosion. ■

With manure fodder crops grow faster

Many small-scale farmers do not use manure properly. Carelessly stored manure can lose half of its nitrogen content.

William Ayako*

No doubt, manure promotes the growth of all crops. The only problem is that many dairy farmers lack skills for improved management. This is shown in a study on methods of manure management on smallholder peri-urban dairy farms in Bahati division, Nakuru district. The results of the study, conducted in July, 2005, are significant for other regions in Kenya too.

A total of 30 smallholder dairy farmers in the Bahati region were randomly picked; their farming system is mainly small-scale mixed crop/livestock type. The farmers kept an average of 1 - 2 mature cows, mainly of Friesian, Ayrshire and Zebu crosses. The feeding was mainly "cut and carry" (zero gazing) in stables with planted Napier grass as the main feed resource and crop residue found within the farm.

It became clear that smallholder dairy farmers, neglected by policy makers, could not afford to apply inorganic fertilizers on Napier grass. The inputs were relatively expensive, and the availability of those inputs was always untimely. This means that the farmers were therefore in dire need of skills to improve manure management to boost fodder production for their dairy cows. This was even more important as the high human population in the division led to further decline in soil fertility due to over-cultivation of land.

Manure exposed to sun and rainwater loses essential nutrients. *(Photo TOF)*

Soil degradation as well as poor livestock nutrition and livestock diseases were responsible for the low milk production. Labour shortage and lack of capital was evident since over 90% of the farmers in Bahati used family labout and simple tools to apply manure. Some of the farmers used bedding from unused maize stalks for compost making. This is very helpful since the compost takes time to decompose under field conditions and hence increased the nitrogen ratio.

Improve Napier grass yield

The use of manure on Napier grass plots was a common practice among smallholder farmers in the division. The study observed that 70% of cow dung manure was returned to Napier grass while 30 % was applied on maize as compost. Due to labour constraints, manure management to preserve nutrients was poorly done by the farmers.

Since the majority of the farmers stored manure in open heaps for convenience, the method caused high nutrient losses, estimated at over 30% of nitrogen conten when the storage duration exceeded 3 months. Extended storage in open heaps further increased losses estimated to be more than 50% of nitrogen when the storage exceeded 6 months. During the season of land preparation, planting and weeding of the field crops, labour became scarce and manure management suffered at the expense of other activities. Therefore, it was estimated that smallholder farmers in the division incurred nutrient losses of over 60% in manure nitrogen due to lack of improved handling and application methods. In other words, through negligence, farmers reduced Napier yields and hence milk production and their income.

Recommended methods

The manure application technology, developed by KARI Naivasha, has two options.

- The farmers on the hill slopes and with less than one acre of land should use the 'tumbukiza' method of manure management on Napier grass. The system involves digging pits of about 3x3x3 cubic feet. The pits are spaced at 2 metres apart and are filled with 3 debes of slurry (a mixture of manure and water), then a 1-foot layer of top soil is added on top of the manure. Thereafter, 6–10 cane cuttings of Napier grass are planted on each pit. The *tumbukiza* method has been known to increase fodder yield by approximately 30 %. It is advised to plant sweet potatoes or forage legumes between the pits to increase the quality of forage and to control weeds.
- Farmers should also plant Napier grass along the contours using the *Fanya Juu* method. In the *Fanya Juu* trenches, they should apply the slurry as explained above, then add top soil and plant Napier grass. This would prevent soil nutrient losses through erosion and secondly, it would reduce the frequency of additional labour. The most important advantage is increase in Napier grass yield per given area.

Farmers in less hilly areas should apply slurry in a shallow trench dug between the rows of Napier grass and cover with the soil. Although this method is labour-intensive, it enables better utilization of nitrogen in the urine and reduces other loses arising from evaporation.

** Dr. William Ayacko is a livestock scientist at the KARI Naivasha Animal Husbandry Centre*

Making manure pits

Proper manure management practice begins as soon as manure is deposited as dung and urine by the cow. To minimize nutrient losses in smallholder zero grazing farms, it is recommended that manure from the stable should be collected twice daily and stored in a well-constructed manure pit as a slurry. It is even easier since most farmers house the animals in well-designed cattle stables with aconcrete floor.

Maize stalks are essential in trapping minerals (Nitrogen) in manure when used as bedding material. The farmers should invest on manure storage pits to preserve nutrients in slurry. It is equally important to reduce the storage duration; increasing the frequency of manure-application feeds the soil with more nutrients.

Sweet potatoes: Good for people and animals

Farmers should not neglect sweet potatoes. They provide feed for humans and animals and contain more vitamin A than any other plant.

Philomena Nyagilo

Sweet potatoes is an easy-to-grow, adaptable crop.It tolerates some degree of drought, requires little weeding and little or no fertilizer. It has few insect or disease problems. And, it is a nutritious and tasty food.

Sweet potatoes are an excellent crop for small-scale farmers. You can eat both the leaves and the tubers. Together the leaves and tubers of sweet potatoes are likely to produce more nutrients per square metre in poor soils than any other crop (see box below). The young leaves contain protein and vitamins. The tubers provide protein, starch, vitamin C and vitamin A. The leaves are available throughout the long growing season; the tubers can be stored.

Sweet potato vines are good fodder and nutritious vegetables for people. *(Photo TOF)*

Easy to grow

Sweet potatoes grow best in sandy soils with a bit of clay in them, but they will grow well in almost any soil as long as water doesn't collect in the soil after a rain. If the soil is not well drained, it can be worked into ridges or mounds. Some people add compost to the ridges and mounds before planting.

In the tropics, most people start sweet potatoes planting vine cuttings that are 30 to 40 centimetres long. Plant the cuttings with at least 2/3 of their length underground, spacing them about 90 cm apart between rows and 30 cm within rows. Cuttings from the tips of the vine are the best planting material. If you can't get vine cuttings, you can plant the potato tubers directly into the soil.

For the first few weeks after planting, water the cuttings and make sure the soil does not dry out. Sweet potatoes are hot weather crops. The hotter it is, the faster they grow. Once the new plants get established, they can survive drought. Often when other crops are wilting in the heat, sweet potatoes are at their best. As the vines grow and spread, they choke out weeds, creating their own living mulch so they don't need much weeding after the first few weeks.

Rotate with other crops

The sweet potato weevil is the main insect pest of sweet potatoes. One way of dealing with this problem is to rotate sweet potatoes with other crops from year to year. Another solution is to plant quick-maturing varieties and harvest them as early as possible.

Once the sweet potato plants are established, the leaves can be harvested throughout the growing season. This will not affect the production of the tubers. Usually only the tender tips of the vine are harvested for cooking, like any other green leafy vegetable. The other parts can be fed to the cows or goats.

When the tubers are big enough for harvesting, dig them up and take them inside for storage right away. If they are in the sun for more than 30 minutes they get spoilt. Store them in a cool, humid place. You can feed the vines to your animals. They are high-value feed in terms of protein, potassium and nitrogen. Sweet potato vines can be fed to cattle as a supplement. It has the following benefits:

- increases growth rate of calves;
- promotes rumen development;
- is good for recently calved and sick animals;
- increases milk yield; ■

Sweet potatoes are vitamin A-boosters

Sweet potatoes are very useful plants, since they produce Vitamin A. Sub-Saharan Africa suffers Vitamin A deficiency more than any other continent. This does not kill its victims directly. Rather, it weakens the immune system, leaving the person susceptible to deadly diseases such as measles, malaria, and diarrhoea. Those most severely affected are young children and pregnant and lactating women.

Many types of fruits and vegetables, as well as meat and milk, are rich in Vitamin A. If consumed in sufficient quantities, these foods can eliminate or greatly reduce the impact of Vitamin A deficiency. However, according to scientists at the International Potato Center (CIP), the orange-fleshed sweet potatoes are higher than any other plant in beta-carotene — a chemical that the body uses to produce Vitamin A. CIP-studies indicate that the consumption of just small amounts orange-fleshed sweet potatoes, usually less than 100 grams per day (roughly half a cup), can eliminate or greatly reduce vitamin A deficiencies in both children and their mothers.

Some years ago, the Center for Science in the Public Interest compared the nutritional value of sweet potatoes to other vegetables. Considering fiber content, carbohydrates, protein, vitamins A and C, iron, and calcium, the sweet potato ranked highest in nutritional value. According to these criteria, sweet potatoes earned 184 points, 100 points over the next on the list, the common potato. (PAN)

Indigenous chickens need feed and care

*Indigenous chickens **fetch** good prices in the market; they can improve farmer's income if they are kept well.*

The Organic Farmer

Almost all Kenyan households keep chickens, mainly of the indigenous variety. Very few farmers, however, have ventured into commercial production of indigenous (kienyeji) chickens for income generation. This is despite the fact that keeping indigenous chickens can be turned into a highly productive enterprise that can improve a farmer's income. Furthermore it does not require much space to practise. Farmers can earn more from indigenous chickens than exotic ones; currently an indigenous chicken egg costs Ksh10 in the market, while that of an exotic hrn goes for Ksh 4.00. A kilogram of indigenous chicken meat goes for between Ksh 250–300 while exotic poultry meat costs Ksh 150 a kilogram. The high prices offered for indigenous chickens is due to the good taste of their meat.

Another advantage of indigenous chickens is that they are adapted to all climatic zones in the country. They also cost less to maintain and feed. One of the reasons why farmers do not get good returns from their indigenous chickens is that the birds are left to scavenge for feed. They are not provided with enough feed to improve their quality and weight. The chicks are also left to scavenge and compete for feed with adult birds. Many farmers do not even bother to provide the birds with adequate water.

Good shelter needed

Sheltering for birds is very important, to ensure they are not exposed to predators, thieves and bad weather. Hens need to have a good place to lay their eggs, away from any disturbance. If they are not provided with adequate food and water, brooding hens are often forced to leave their nests frequently to look for feed. Due to poor management in many households, 8 out of 10 chicks tend to die within the first two months after hatching.

Improved management

To increase their weight and be able to lay more eggs, indigenous chickens need to be provided with supplementary feeding as they are allowed to scavenge for feed in the free-range system. Chicks also need protein-rich feeds such as balanced starter feeds or simple supplementary feeds such as omena fish or even termites. Provided with the right conditions, an indigenous hen will lay her first egg at 28 weeks. In one year an indigenous hen should be able to lay 30 to 60 eggs. Hens start laying eggs at the age of 22-32 weeks depending on the breed, feeding, health and overall development. Laying hens should have easy access to calcium sources and may be supplemented using limestone, bonemeal or crushed eggshells.

Feeding: Feeding should be on a clean and hygienic surface or feeders such as the Naivasha feeder. Feeds should be provided every morning and evening. Clean water should be provided at all times.

Housing: Poultry houses should be spacious and well-ventilated. Provide perches where the birds can rest. Indigenous chickens like dry places for dust bathing; ash and sand can be added to this area to reduce parasites.

Disease control: It is important to vaccinate the birds regularly to prevent diseases. Vaccination is done every two months to control diseases. Isolate all new birds and observe them for any signs of disease before introducing them to the flock.

More about chicken housing on page 8

Manipulate brooding and egg-laying

A poultry farmer can increase the production of their indigenous chickens by manipulating their brooding and egg-laying behaviour. With proper feeding, an indigenous chicken can lay 15 to 18 eggs in one cycle, after which it becomes broody (wants to sit on the eggs). When the eggs hatch, the farmer should allow the hen to stay with the young chicks for about a week; the chicks are then taken away. Since the hens are still in the brooding mode, they are given false eggs (some farmers use false eggs made of Kisii soapstone). When the other chickens have laid enough eggs, the false eggs are replaced with genuine ones and the hen continues brooding until the eggs hatch. Brooding hens should be provided with adequate feed and water. Hens that are not needed for brooding purposes should be released into the flock when their chicks are taken away. They often start laying eggs after 15 to 16 days. Each egg laid is clearly marked to indicate the date when it was laid — this prevents the poultry farmer from mixing freshly laid eggs with the old ones; alternatively, a farmer can confine the brooders and the layers in separate rooms to ensure they do not mix their eggs.

How to manage chicks

When chicks are separated from the mother hen, they should be kept in an artificial brooder. They should be kept warm with heat from kerosene lamps. In the artificial brooder they should be fed with chick mash mixed with glucose and provided with clean water at all times to promote fast growth. Temperatures in the brooder should always be monitored with the help of a thermometer to ensure they are not exposed to excessively high or low temperatures.

Nematodes can cause serious damage

Please help me fight nematodes. They have ruined my mobbydick flowers." G. Gitonga (Meru. 0735 566 220) is not the only farmer who is asking us to help him control nematodes. They really are a dangerous pest, but there are also control methods.

The Organic Farmer

Root-knot nematodes are widespread and among the most dangerous plant parasitic pests of tropical and subtropical regions. They occur as a pest on a very wide range of crops, particularly vegetables, but not on cereals, onions and all types of cabbages.

Su Kahumbu

has been invited by Biovision to a symposium in Switzerland. Where she is to give a speech on Small-Scale Organic Agriculture in Africa.

They average about 1 mm in length. The young nematodes penetrate the root tips and occasionally invade roots. Invaded nematodes initiate the development of giant cells in the root tissues and galling of roots occurs. Inside the gall are shiny white bodies of the female nematodes (about the size of a pinhead). At the root surface, shiny white to yellow egg masses are found. A closer look with a magnifier may show the adults, but mostly they are too small to be seen with the naked eye.

Severe nematode infestation results in stunted growth, yellowing of leaves, wilting and poor yield because the galls disturb the roots' ability to absorb water and nutrients. They also serve as openings for pathogens such as fungi and bacteria, which cause plant diseases.

Destroy affected plants

Root-knot nematodes are soil inhabitants. They do not move more than about 10 cm per year. They can suvive in nearly all types of soil but tend to do more damage to plants in sandy soil and in furrow-irrigated areas. The structure and fertility of the soil is therefore very important for the natural balance of nematodes pests. They are spread by transplanting infested seedlings or plant material, or from soil washed down slopes or sticking to farm implements and farm workers. They may also be spread by irrigation water.

Affected plants are stunted and yellow with reduced yields of poor quality. They have a tendency to wilt in hot weather Very heavily infested plants are killed. Other symptoms are those of general starvation and debilitation of the plant, often mistakenly assumed to be caused by waterlogging, bad soil conditions or viral diseases. If infested plants are pulled from the soil, the roots are severely distorted, swollen and have lumps known as galls or root knots. The galls range in size from smaller than a pinhead to 25 mm or more in diameter.

Prevention

- Do not locate seedbeds where vegetables have been grown previously. After preparation of the seedbed, burn the topsoil using dry leaves or other waste plant material.
- Practise crop rotation
- Weed regularly
- Uproot entire plants from the field after harvest and destroy crop debris.
- Mmaintain high levels of organic matter (compost and manure, particularly chicken dung) in the soil.
- Incorporate neem cake powder into the soil if it is available. Best results can be obtained by mixing Neem cake powder with organic fertilizers like farmyard manure or compost.
- Mustards can be used as an intercrop on infested fields. As soon as mustards are flowering, they are mulched and incorporated into the soil. While incorporated, plant parts decompose in a moist soil and do kill nematodes. Two weeks after incorporating plant material into the soil, a new crop can be planted or sown.
- Mixed cropping with marigold can also minimise root-knot nematode damage. Leave marigold to grow for a season as a lush weed-like cover and plough (dig) it back into the soil before it goes to seed. This is one of the most effective plants against nematodes.
- Earthworms generally feed on soil and organic matter that has started to decompose; some even feed on nematodes. It has been found that the nematode population may decrease by as much as 60% when earthworms are added to soil.

Plant extracts control nematodes

These methods have a long-term effect. If you need to control nematodes with a short-term effect, you can use some plant extracts as shown on this page. ■

Control methods

Cassava

1. Obtain juice by crushing the roots/tubers. Dilute 1:1 with water, spray immediately, using 4 litres diluted extract per square meter.
2. Use cassava peelings as a mulch against nematodes.

African Marigold

1. Crush 100-200g leaves, roots, flowers. Pour on 1 litre boiling water, soak for 24 hours, then add 1 litre of cold water, spray on plants or into the soil.
2. Grow marigolds in rotation with crops to control nematodes.

Papaya

Common spray: Add 1 kg of finely shredded leaves to 1 litre of water, shake vigorously. Add 4 litres of water and a little soap (20 g or ml). Spray or water into the soil for nematodes.

Neem seed extract

Remove the shells, pound seeds gently. Place in a pot, add 10 litres of water. Cover the mouth of the pot securely with the cloth and leave it as such for 3 days. Strain to get clear extract. Dilute 1 liter of this extract with 9 litres of water, add 100 ml of soap, stir well. Spray on the infested plants or into the soil around the infested plant.

Photo: Toptropicals

Letters to the editor

Your advice on silage was timely

I salute and thank the team involved in the production of your magazine. I am glad I did follow your advice on silage making and did not buy Napier grass during the dry spell last year. Thank you Tel. 0724 868053

It has good advice

I would like to commend you for the February issue of *The Organic Farmer* magazine which was given to me by a friend. You are really helping the farmers with good advice. I am a new farmer dealing with horticulture and food crops and I would like you to assist me with monthly copies of the magazine which I will pass on to other farmers. I would also like to request you to assist me with any other documents which can be of help to me in farming. Irene W. Thuku, P.O Box 288-00901, Ngewa, Ruiru

We need book on drip irrigation

Kosirai Small-Scale Farmers Group take this opportunity to sincerely thank you for including our name in your mailing list. We received your June/July issues and are looking

forward to receiving future copies. *The Organic Farmer* magazine is very informative and educative, in the August 2006 issue, drip irrigation was discussed at length, We would like to know where we can purchase RELMA's publications on drip irrigation and how much it costs. Suleiman Magut, P.O Box 3384, Eldoret

RELMA's publications can be obtained from the World Agro-forestry Centre (WAC/ICRAF) P.O. Box 30677-00100 Nairobi, Kenya Tel. 20 722 4000 email: relma@cgiar.org

Magazine is invaluable

I take this opportunity to thank you most sincerely for your magazine. We came across it recently through our divisional office and found it had good reference material for small-scale farmers like us. We have a lot of interest in farming and we are sure we will benefit a lot reading *The Organic Farmer* regularly. Our group is registered by the Department of Social Services and has 50 members based in Lugari. The aim of writing to you is to request for monthly copies of the newspaper. We hope you will consider our case. Also please remember our group whenever you organize farmers tours or training. Thank you Chairman, Mbumbere S.H.G, P.O Box 48, Lugari

Magazine suitable for farmer education

Much appreciation for doing a good job to educate and inform farmers on all aspects of the farming industry to make it a success. I am a service provider recruited by Kenya Agricultural Productivity Project (KAPP) to train farmers in Butere and Mumias divisions on mushroom husbandry. We request you to be sending us monthly copies of *TOF* magazine. I have been closely reading information on mushroom production but have the authors realized that the technique they offer is not adoptable because it is complicated, labour-intensive and expensive, rendering mushroom production a non-profitable venture? I have been in this undertaking for the last seven years and will share my experiences with others in later issues of TOF. Reuben Ogutu, Marama West Mushroom Growers, P.O Box 79, Lunza via Kakamega

Letter from Congo

My name is Mike Imani from the Democratic Republic of Congo (DRC). I am a small-scale banana farmer. I am very interested in agriculture and I believe I can get more information from you, Is there a variety of bananas that can produce within 6 months? Can you advise me how I can get it and provide me with tips on how to manage it? I grow bananas the organic way. I expect to hear from you soon

Mike Imani Tel. 243 81 056 74 82 Democratic Republic of Congo.

Thank you for your interest in acquiring a fast-maturing bananas variety. However we must advise that there are restrictions on the movement of plants

from one country to another. We will seek for guidance from the Kenya Plant Health Inspectorate Service (KEPHIS) on the procedure you need to follow to get the banana seedlings to your country

I have learnt more on tomato production

I recently attended a Farmers' Field Day at Kirinyaga Technical Institute and was lucky to obtain a copy of TOF No 26. I found the magazine very informative and helpful in my tomato farming. Could you please send me some past issues of this good magazine? James Mithamo, P.O Box 901, Kerugoya

Good for organic farmers

On behalf of all the department members, I wish to apply for copies of your monthly magazine. In our department, we have 30 active members. At the moment, we are undergoing an in-service training course on how to keep a productive dairy cow with the current limited piece of land. The series of teachings are normally done once a month after church service. One member introduced to us your monthly magazines, whereby every member became enthusiastic and wanted to receive monthly copies. We hope it will equip us with the necessary knowledge on sustainable of agriculture. Thank you in advance.

Paul Rotich, P.O Box 118, Bomet

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!

SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Biofuels compete with food crops

Since the price of fuel is rising daily, experts predict that the end of the fossil resources is not far away. Therefore people have begun to talk about biofuels. This is fuel produced from sugarcane, maize, wheat or other crops. Many governments now place great hopes in the production of energy from biomass. But at the same time, the opponents voice their concerns with increasing urgency. They point out that, above all, the energy crops will compete with food crops for limited land and water resources. Especially in Africa, where millions of people are faced with food insecurity, it is a crime to use land to produce biofuel while thousands of people are dying daily because of hunger.

Fueling vehicles instead of feeding children

Soil fertility affected

Adrian Mueller, a scientist at the Center for Corporate Responsibility and Sustainability at the University of Zurich (Switzerland) adds an aspect that usually receives less attention and that is important for organic farmers. Mueller says that large-scale production of energy crops contradicts the principle of sustainable organic agriculture in a very fundamental way. In particular, Mueller argues that organic agriculture seeks to operate within closed nutrient cycles: nutrients extracted from the soil are returned by applying compost, mulching or manuring.

By contrast, in crop production for fuels, nearly 100 percent of the biomass (sugarcane, maize, wheat, etc.) leaves the farm, making it necessary to bring in external inputs to counter the risk of soil fertility degradation, which would be disastrous for the traditional weak African soils. The global energy problem, however, cannot be overcome by shifting to biofuels. The only way out to meet this challenge is to cut energy consumption. (TOF)

Source: inforesources No.4/07. Interested farmers can order the study of Adrian Mueller at the TOF-office, write an e-mail to: info@organickenya.com

Market Place

Organic Farmers Market: The Kenya Organic Agriculture Network (KOAN) will be holding an Organic Farmers Market on Saturday December 15th in Nairobi City Park.

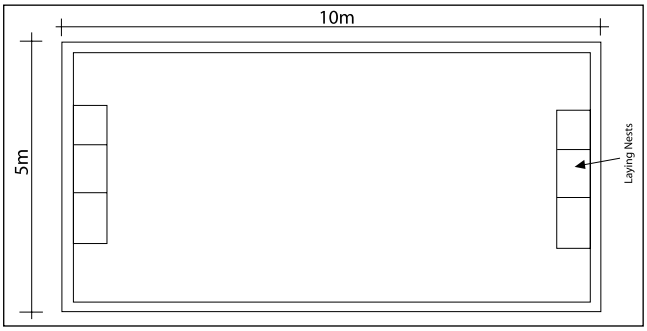
It will feature fresh produce, processed products, natural health and beauty products and green Christmas gift shopping. Entrance will be free. Entertainment will include live music, acrobats, Children's entertainment, an art gallery and a solar cinema showing environmental films. To exhibit at this exciting event, contact Samuel Ndungu at 0721-949546 or Wanjiru Kamau at 0733-573752, or send an email to koansecretariat@elci.org.

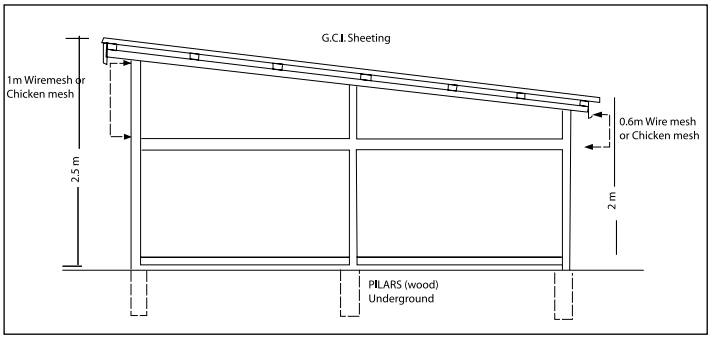
Questions? Go to Infonet!

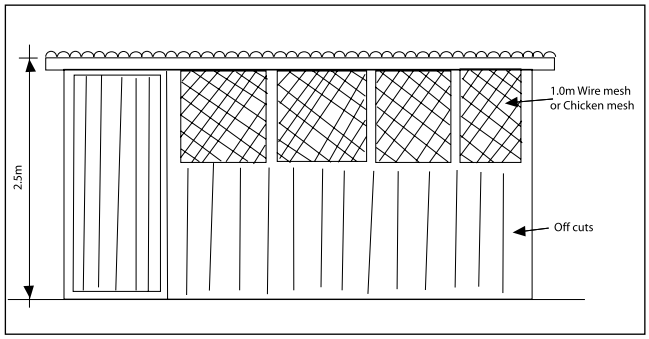
Infonet is an information platform for organic farmers. Whatever you would like to know about the ecological methods for the control of pests and parasite infestations of plants, humans and animals – Infonet will have an answer. You just go to the Internet, either at home or at a cybercafe and type in: www.infonet-biovision.org

A model poultry house

Many farmers have requested for a model poultry house. Most of the farmers rarely provide proper housing for their chickens. Chickens should be provided with spacious and comfortable housing that allows them room to move freely and exercise their normal behaviour. Congested rooms create stress which is to blame for pecking and cannibalism in flocks. A good shelter should be able to protect the birds from bad weather, predators and even thieves. The housing should have nesting room for laying eggs. *See page 5*







N.B: If the place is very cold at night it is advisable to hang gunny bags on spaces with chicken wire. In hot areas front ventiation should be made as big as possible i.e space with chicken wire can be 2 metres from the top.

Source: A Livestock Extension Manua, Revised Edition 2003.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 32 January 2008

Kenya's organic market is growing

There are a few certified organic farmers. And they do not grow products that the consumers want.

The Organic Farmer

The market for organic food products is growing faster than the supply of organic produce from farmers. The increasing demand for organic products is a result of increased awareness among Kenya's middle and upper class consumers on the health benefits of organic foods. The demand is also high among the expatriate community. But local farmers are not able to supply most of the exotic fruits and vegetables that this market segment requires.

Education of farmers important

Consumption of organic food is still low in lower income groups due to lack of awareness of its health benefits. Most players in this field are of the view that there is need for a stronger creation of awareness among this group to help increase the consumption and expand the market for organic food products. Su Kahumbu, a pioneer organic farmer who now runs two marketing outlets in Upmarket Gigiri and the newly opened Nakumatt Westgate in Westlands, Nairobi, says the few certified organic farmers in the country are not able to supply organic food products that the consumers want: "I think we need to do more training and awareness creation so that farmers are sensitised on what to grow and how to grow it."

Demand for organic products in the export market outstrips local supply by far as John Kang'ethe, the International Markets Development advisor of KOAN (Kenya Organic Agricultural Network) emphasizes. International buyers have expressed interest in buying local organic coffee and tea. Kang'ethe says that during the BIOFAC exposition in Germany in February 2006, an international company was willing to buy 10 tonnes of organic coffee every month from Kenya, but there was not a single company or co-operative society producing organic coffee. *See page 8*

More consumers are going for organic foods. All organic food should be certified and labelled clearly for easy identification. (Photo TOF)

Tick control a big problem to farmers

Ticks cause great losses to farmers. These could be avoided if farmers acted in time.

The Organic Farmer

According to a report by the UK's Department for International Development (DFID), farmers in East and Central Africa lose more than 300 million dollars (Ksh195 billion) a year to East Coast Fever (ECF), one of the diseases transmitted by ticks. There are 70 species of ticks in the region. Ticks are one of the most difficult pests to eradicate due their ability to develop resistance to the drugs used to control them (acaricides).

The privatisation of veterinary services in Kenya two decades ago, affected tick control in most livestock keeping areas. All the personnel trained in tick control were sent home leaving the management of cattle dips in the hands of untrained farmers. Most of the cattle dips were abandoned while those that are still operational use too diluted chemicals to which ticks developed resistance. As a result, most farmers have stopped taking their animals to the cattle dips altogether. Most farmers never take tick control seriously until they lose their prized cows to tick-bourne diseases. It costs Ksh. 4,000 to treat an animal suffering from ECF and other tick related complications. There are alternative tick control measures such as plant extracts. *See page 3*

Dear farmers,

After the hectic electioneering period, life is returning to normal in the countryside. There is a lot of hope that our new members of parliament will be good advocates of the interests of farmers in the new parliament. Farmers expect that the MPs will be able to lobby and help improve the infrastructure in all the farming areas in the country, schools, roads and electricity. But as we have told you repeatedly since we started this newspaper, farmers should not rely too much on words alone. You should trust on your own skills, power and creativity to improve your lot.

As you can see in this issue, we have slightly changed the layout of our magazine. This does not mean that we do not have much to say in the editorial column; however, due to the size of our newspaper, we sometimes lack adequate space for more important information. Our aim is to improve the content of the newspaper. We are going to do this in our inside pages as well in order to give you a variety of articles. We should never forget the sentence "Knowledge is power". Only well informed farmers are able to improve their livelihood.

Do you need *TOF*?

Would you like to read/print your own copy of *The Organic Farmer*? Then go to our new website.

www.organicfarmermagazine.org

MY OPINION

After tending our crops for the whole year, it is time for harvesting. This is one period in the year when every farmer has some money in the pocket. We should not forget the task ahead. We will need to pay fees, buy inputs and settle some of the outstanding debts. With proper planning, one might even be able to start that new project they have been thinking about or even open a savings account in the local SACCO or bank. This might turn out to be the foundation of a prosperous future. Let us not waste our hard-earned money on unproductive ventures.

Paul Mokaya, Farmer Nyamira

The Organic Farmer

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Technical Editing: Annalee N. Mengech

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Animals like Boma Rhodes grass

Boma Rhodes grass is easy to grow and ensures a consistently high milk production if well managed.

The Organic Farmer

In Kenya, Rhodes grasses are important pasture grasses. They produce large quantities of feed for grazing livestock, making hay or silage. All varieties of Rhodes grass are palatable and are readily eaten by livestock, goats and camels, even at coarser stages when the quality of the feed is low. A good establishment of these pasture grasses ensures consistent high milk production all year round, especially when the pasture is well-managed. Pasture can be established anywhere as long as there is adequate water and good certified seed for planting.

The most common Rhodes grass in Kenya is Boma Rhodes. Farmers can establish good Boma Rhodes pasture if they adhere to the following guidelines in its management:

Land preparation: Plough the land towards the end of the rainy season; this should be done on previously cropped land. Plough again during the dry season and harrow to control the weeds. On virgin land, it advisable to plough 3 times and harrow twice in order to obtain a good seed bed.

Sowing: Early sowing at the onset of the rainy season is important. In areas with two rainy seasons, sowing is prefereably done during the short rains in order to eliminate annual weeds. Most farmers practise direct sowing, where the Boma Rhodes grass is planted alone. Then the seed is sown on a fine, weed-free seedbed. It is always advisable to plant pasture on land which has been cropped for two or more years. Seeds should be sown close to the surface in order to get in contact with moist soil so as to promote quick germination. Grass seeds should not be buried deeply into the soil as they may not be strong enough to push through the heavy topsoil. The seeds can either be broadcast or drilled in rows of 20-30 cm apart. Mix the seeds with sawdust, rough sand or phosphate fertilizer for even distribution. If mixed with fertilizer, planting should be done immediately to prevent scorching of the seed by the fertilizer. Small-scale farmers may practise handsowing in smaller acreages where close supervision is possible. For large-scale farms, use of wheat planters is recommended for effective sowing. Immediately after sowing, the seedbed should be compacted to enhance germination by improving contact with the soil. This can be done by use of tree branches or even trampling by feet on small plots.

Fertilizer application: Use farmyard manure at the rate of 10 tonnes/ha (about 5 tonnes an acre). The manure should be broadcast and harrowed in before planting. Only well-composted manure should be used.

Weed control: Weeds can reduce the productivity of the sown pastures particularly during the year of establishment. Control weeds as much as possible by hand weeding or slashing, hand pulling and mowing.

Grazing management: During the year of establishment, Boma Rhodes grass reaches the flowering stage 3 to 4 months after planting. At this stage, the grass is not firmly anchored into the soil. It is therefore advisable to cut the grass and make hay rather than graze the pastures to prevent the animals from pulling out the young shouts. Graze or cut the grass at intervals of 4 to 6 weeks leaving the stubble height at 5 cm.

Feeding: One cow needs 1 to 2 acres of Boma Rhodes grass per year in areas with 900 mm rainfall. In Zero-grazing an average-sized dairy cow requires 80 to 100 kg (about 3 gunny bags) of freshly cut grass per day.

Sources: Various KARI publications ■

Fodder grasses

December 07: Napier grass
January 08: Boma grass
February 08: Lucerne

Alternative methods of tick control

Natural tick control techniques are not only cheap for the farmer, they also minimize damage to the environment.

William Ayako*

Ticks cause direct and indirect losses to farmers. They transmit a large number of parasites that are responsible for dangerous diseases such as East Coast Fever (ECF), Anaplasmosis, Babeosis, Heart water, etc. The most common methods of tick control consist of dipping or spraying cattle with chemicals (acaricides) or through grazing management. However, latest research shows that farmers can spend less by using natural methods to control ticks.

In a study conducted in Bahati division of Nakuru District it was found that a number of herbs effectively control ticks and tick-borne diseases in cattle. Plant extracts from a number of plants mentioned by farmers and herbalists during a survey, were collected and tested. Preliminary tests were carried out to verify the plant's efficiency in controlling ticks at rates recommended by farmers and herbalists. Preparations from pyrethrum flowers, Tephrosia species, *Tagetes minuta*, *Datura stramonium* and a concoction from a herbalist which included a mixture of 5 plants, 3 active against ticks, 1 preservative and 1 stabilizer, were tested.

Most dips in the country are abandoned after the government withdrew support. (TOF)

Different plant extracts used

Pyrethrum flowers obtained from farmers were sun-dried, ground and sieved; about 250 g were mixed in ten litres of warm water and left standing in a dark room for 12 hours. The suspension was then passed through a strainer to remove coarse particles; 5 litres of the suspension was then sprayed on the entire animal's body using a knapsack sprayer. In the same way, *Tephrosia*, *Datura stramonium* and *Tagetes minuta* leaves were prepared as directed by the herbalist; 250 g of fresh leaves were pounded and boiled in 500 ml of water for 30 minutes. The greenish yellow mixture was then separated from the leaf particles by sieving through a tea strainer. Five litres of the concoction was sprayed on the entire animal body. Six ml of the concoction from Waweru, the farmer/herbalist, was added to 18 litres of water and the mixture stirred for 2 minutes. Three litres of the mixture was applied on the entire body of the animal.

The trials were conducted on Sahiwal bulls. They are naturally infested with ticks. The results revealed that the animals sprayed with pyrethrum had 83% reduction in tick infestation while those sprayed with Tephrosia had 75% reduction in ticks. Those sprayed with *Datura stramonium* had about 5% reduction while those sprayed with Tagetes minuta had 55% reduction. The concoction from Waweru achieved 88% reduction in tick infestation.

More tests necessary

Three bulls out of five from the control group and one from the *Datura stramonium* group contracted East Coast Fever (ECF) and all recovered after treatment with Butalex (Cooper Kenya). One bull from the pyrethrum flowers group and two from the *Tagetes minuta* group were treated with tetracycline for Anaplasmosis and Babeousis. The study concluded that some plants tested showed significant effect against ticks. Since they are readily available and affordable, farmers should be encouraged to use them together with other tick control techniques. However, the study recommended further trials to verify the efficacy of the tested botanical drugs and their implication on the environment if they were to be adopted by the farmers. For example, *Datura stramonium* is very toxic to all mammals.

Apart from the plant extracts named in the above study, there are other plants that have proved to be effective against ticks, among them *Gynandropis gynandra* (Kikuyu: *thageti*; Kamba: *mukakai*; Kisii: *chisaga*; Luo: *akeo*), *Ocimum Suave* (Luo: *Bwar*, Kikuyu: *mukandu*; Taita: *murunde*; Kamba: mutaa; Masai: *Sunoni*; Pokot: *chemwoken*), as well as neem (*mwarubaini*) which repels ticks.

** Dr. William Ayacko is a livestock scientist at KARI Naivasha Animal Husbandry Centre*

Some tips on tick control

- Ticks easily develop resistance to most acaricides used by farmers; therefore farmers should frequently change chemicals to control ticks. Acaricides made from synthetic pyrethroids have been found to be more effective in tick control.
- Burning pastures in order to kill ticks does not work because ticks often hide below the soil and reappear when the pastures start growing.
- Ticks can survive without food for upto two years. Farmers should dip their cattle regularly to ensure that they are not infested since the ticks are always present in the pasture.
- Farmers should not graze their animals on the roadsides where they are likely to get ticks. Fodder harvested on the roadsides also habours ticks and should be avoided.
- Zero-grazing animals have less exposure to ticks; thus it should be practised in areas where tick problems are serious.
- Dipping of animals is more effective in tick control than spraying as all the parts of the animal's body are evenly covered by the acaricide.
- Even without causing diseases, ticks can degrade an animal's health; their bites can cause wounds on the skin and reduce the quality of the hide; they can also inject poisons into the animal causing complications and interfering with the animal's normal growth. (*TOF*)

Plant extracts are readily available to farmers, but they have to be handled with care.

Six golden rules for a better soil

One of the most important tasks in sustainable agricultural production is to increase the level of soil fertility. To be successful, farmers need to keep to the following six rules to improve soil productivity on their farms.

1 Don't disturb soil too much

Soil is the most important productive factor for crops. It is a living system. Therefore, soil cultivation should aim at minimum disturbance of the soil life. The most important reasons for cultivating the soil are to:

- Loosen the soil to facilitate the penetration of plant roots
- Improve the aeration (nitrogen and oxygen from the air)
- Encourage the activity of the soil organisms
- Prepare the site for seeds
- Increase infiltration of water, reduce evaporation
- Incorporate crop residues and manures into the soil

2 Let the soil breath

Like humans, the soil organisms needed for healthy soils as well as plant roots require oxygen to breathe. Mixing mulch, compost or manure into the soil is important, they improve the aeration. Micro-organisms, insects, worms and other animals also aerate the soil.

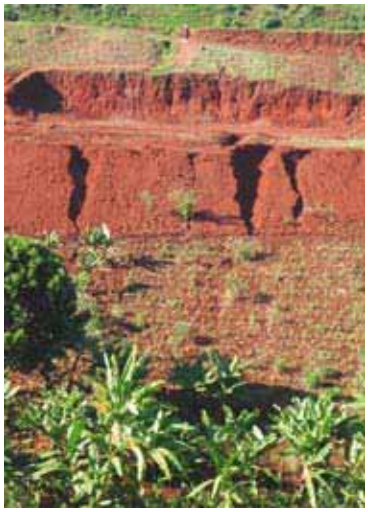
3 Mulching conserves water, enriches soil

For many farmers, a clean garden without mulch is the best. They are wrong. Mulching is a method to protect and to feed the soil. It is the process of covering topsoil with plant material such as leaves, grass, twigs, crop residues, straw etc. Of course, it needs some labour to spread the mulch. But mulch protects the soil from wind and water erosion, it improves the infiltration of rain water, no crust is formed; it keeps the soil moist by reducing evaporation. While decomposing, organic mulch material continuously releases its nutrients, thus fertilising the soil; and apart from these, the mulch will be transformed to humus. If the process of decomposing needs to be accelerated, organic manures such as animal dung may be spread on top of the mulch, thus increasing the nitrogen content.

Mulching has a lot of advantages, but it can also cause problems. Green vegetative matter should not be used as it may encourage pests and diseases. Harmful organisms such as stemborers may survive in crop residue. Plant material infected with viral or fungal diseases should not be used if there is a risk of a disease being transmitted to the next crop. Crop rotation is the best way to avoid these risks.

4 Take care of the water

Water is a blessing, but too much water is a disaster. Soil erosion is the most serious and irreversible threat to soil fertility. It carries away the topsoil, the most fertile parts of the soil.



- Contour planting reduces the speed of the water.
- Hedges planted along contour lines contribute to terracing and leveling the site over the years, as eroded soil gets accumulated at the hedges.
- On steep slopes, walls or trenches are the only sufficient way to prevent soil erosion. Combined with plants such as fodder grass (e.g. Napier), they prevent erosion and also provide fodder for livestock.

Apart from mulching (see rule 3), cover crops are the most effective method of stopping soil erosion. The water drops reach the soil with less speed and therefore have a lesser smashing affect on soil crumbles, reducing the possibility of a run-off. At the same time, cover crops act like an sun shade. Every plant which covers the soil and improves soil fertility can be a cover crop, for instance beans or leguminous plants which enrich the soil with nitrogen. An ideal cover crop is cowpea. It is drought tolerant, can fix nitrogen, yields eatable grains and can be used as an animal feed which is rich in protein. In addition, it is resistant to pest attacks.

5 Feed the soil to feed the plant

Can you work without eating? No! Can soil produce crops without getting nutrients? No! This is the most important task for every farmer: to feed the soil with compost, manure and green manure (leguminous plants!). Remember: overused soils are dead soils!

6 Crop rotation

Crop rotation is planting of different crops in the same field in consecutive seasons. If, for example, the land has been planted with maize and beans one year, the farmers can rotate these by planting another crop the following year. The most suitable crops for rotations are legumes or fodder crops such as sesbania which help improve soil fertility. ■

Simeon Ojekwu's tricky fertilizer-question

If Africa cannot improve agricultural productivity by the year 2025 it will be able to feed only a half of its population.

Felix Mbitu Murimi

In contrast to most developing countries in Asia, Latin America and the Middle East, Africa is experiencing a decline in overall per capita food production. Its farmers generate the lowest food output per hectare of any major region in the world.

Poor quality of the seeds and low-yielding crop varieties, mentioned by many farmers is one, though not the only reason. In the last 40 years, the adoption of improved crop varieties has been uniformly high in all developing regions except in Africa. Their contribution to crop yield increases has been 66 % to 88 % in Asia, Latin America and the Middle East, but only 28 % in Africa. Overall, in Africa, soil nutrients and water management are the major limiting factors; thereby, the potential of improved crop varieties cannot be realized on nutrient-depleted soils. Apart from affecting food supply, soil degradation also diminishes agricultural income and economic growth.

No trials on the dosage

Compared to the temperate parts of North America, Europe and of Asia, most African soils are not very fertile because they are amongst the oldest soils in the world and exposed to all forces of erosion and leaching. Also, high temperatures cause fast decomposition of organic matter.

The subsidies for fertilizers between 1960 and 1985 in Kenya for instance improved to some extent crop productivity but not soil quality. As in most of Africa, the slash-and-burn-method was in many parts of the country the common way to prepare the land. This method increases yield in the short run, because nutrients become easily available to the plant. However, in the long run slash-and-burn depletes the soil. Concomitantly, the increase in population pressure on land resulted in shorter or even zero fallow periods.

Moreover, in most African countries hardly any soil analyses were done to check which nutrients (nitrogen, potassium, phosphorus etc.) were the most limiting factor. This is a prerequisite for optimizing fertillizer dosages in order to obtain maximum yields. Yields increase for a given fertilizer dose.

Use of compost has long-term effect of building soil feritility and structure. (Photo P. Luthi)

Two ways for feeding plants …

When African governments stopped the subsidies for fertilizer because of lack of money, the farmers were cultivating on even more degraded soils. Nowadays small-scale farmers can hardly afford fertilizers, since one bag goes for KSh 2,500/= - this during a time, when the pressure on land is enormous.

This is now, as we have mentioned many times in our magazine, a big challenge for African organic farmers. Conventional agriculture feeds the plants directly by using soluble mineral fertilizers; when used alone, they do not contribute to a higher quality of the soil. Organic farming, however, goes in another direction: it feeds the plants indirectly by feeding the soil organisms with organic matter. Nutrient supply is ensured by sound management of the organic matter in the soil. Organic manures usually contain all required nutrients for healthy plants in sufficient amounts and in a balanced composition. Today we are faced with the fact that many farmers lack the knowledge about natural ways of improving soil quality and soil fertility management as well as the understanding of the dynamics of organic matter in the soils.

Last month, we got a letter from the Nigerian farmer Simeon Ojekwu asking us if there is no way in-between these two methods "for small scale African farmers who have to deal with poor soils, let's say some kind of combination?"

Indeed, this is a tricky question, which he sent to *The Organic Farmer*. The Organic Standards of the International Federation of Organic Agriculture Movements (IFOAM) states clearly: "No chemical fertilizers containing nitrogen can be used, Chilean nitrate and all synthetic nitrogenous fertilizers, including urea, are prohibited." These standards should also be binding for African organic farmers.

… or a combination?

However, farmer Ojekwu from Nigeria is by far not alone with his idea of a way in-between. In the last years, quite a lot of studies on soil fertility in Africa propose a mixture between conventional and organic agriculture. The US-scientists David Weight and Valerie Kelly bring the problem to a point: "Fertilizers and organic matter are complements rather than substitutes – both are required to improve African soils." The movement "African green revolution for the 21st century" of the former UN-secretary general Kofi Anan takes a similar line. It promotes the planting of leguminous trees that fix atmospheric nitrogen in the soil and low-cost water harvesting techniques; this approach should be complemented with increased use of conventional methods, including well-dosed chemical fertilizers.

The idea with the trees is nice, but is far behind reality. Nitrogen-fixing trees are amongst the slowest and least efficient agents of soil improvement; also, they are by far the most labour demanding. It is strange that Kofi Anan's Movement is not promoting cover crops (leguminous plants for instance), which are capable of producing positive yield responses within one year, requiring little additional labour and changing of

continued on page 7

How nutritious is potato flour?

I have managed to produce potato flour. Can you test it's nutritional value?

Congratulations on your achievement of value addition! You now have a potato product with a shelf-life, thus it can be stored and consumed when potatoes are out of season, perhaps in soups or mash?

You can test the nutritional value by taking a clean sample in a clean container, to Analabs Limited, situated in the Cooper complex off Kaptagat Road, Kangemi (Nairobi) Tel. 020 418 analabs@africaonline.co.ke Tel:0727 531230

Please let us know of your results!

I need a book about weeds

Is there a book in the market showing pictures of plants and weeds, pictures of harmful and beneficial insects? David Smith 0727 721 694

Unfortunately I have not come across a good weed book locally. At least we can recommend to you two books: Encyclopedia of Organic Gardening, The Henry Doubleday Research Association, London 2005; Useful trees and shrubs for Kenya, by Patrick Maundu and Bo Tegenäs, World Agroforestry Center, Nairobi 2005. However, you can find a lot of information on the internet. With regards to pests, diseases and deficiencies, TOF has done a four-page special issue on these topics which you can order from the TOF office. BioVision has also just launched the new website www.infonet-biovision.org. This site has been developed to help organic farmers access information related to the topics you are enquiring about.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

How to attract bees to a new hive

Many farmers have problem of attracting bees to their new hives, as the following question shows: "We are 30 members of Up rise Youth Group. We decided to start a beekeeping project and have put our 12 hives at a suitable site, but the bees have not yet come. Zablon Orina 0735 373 650

Low hive occupation is one of the problems that face many farmers who want to start beekeeping. Whenever you encounter the problem, it is important to check the following:

- Have you waxed your top bars?
- Is the hive clean and pest–free?
- Are there any ants or rats nesting in it? If so, clean it and re-grease wires. Bees do not like a dirty hive.
- Is it the swarming season? Ask a friendly beekeeper in your area. Swarming occurs when bees reproduce themselves and fly out of the old hive looking for a new home. During the swarming season, it is easier for hives to be occupied quickly. Farmers should also choose a good site for hanging the hives.
- Farmers can also catch a swarm of bees. They can ask an experienced beekeeper to help them to do it. The bee swarm has better chance of staying in the new hive during the nectar flow period. They should ignore small swarms of bees but go for the big ones.

How to catch bees

To catch the bees it is important to observe the following:

1. First, prepare your hive by smearing it with some melted beeswax, so it smells nice for the bees.
2. Use your smoker and bee suit. Some swarms may be hungry and difficult to manage. Always be careful with strange bees.
3. Look for a swarm with bees clustering on a branch where you can catch them. Wear your bee suit and smoke them gently so as not to disturb them (Don't smoke if you can avoid it). Shake bees into a catcher box or similar container e.g. a cardboard box. If the queen falls into the box, the rest of the bees will follow. Wait for 20

minutes or so. If the bees return to the original site, try the same process again.
4. Once you have the bees, leave the box in a shady place until evening. Make sure it does not become hot in the container, sometimes covering with a damp cloth helps.
5. When evening comes, you can take home the bees and shake them into your empty hive.
6. If you have another hive, give bees a comb with some uncapped honey and a brood comb with eggs from another hive to encourage them to stay. (*Thomas Carroll)* ■

The right soil for mango trees

How well can mangoes grow on a rocky ground compared to deep soils. Ogal Opiyo Tel. 0722 800 403

Mango trees grow and produce well on various soil types. The tree often develops a fairly strong taproot shortly after planting. This taproot can continue growing until it reaches the soil water-table, and under favourable conditions can penetrate the soil to a depth of 6 m. However, most of the roots responsible for nutrient uptake are found in the top 500 mm of soil, with the largest concentrations in the top 250 mm.

Soil depth

Depending on the conditions under which the mango is grown, i.e. dryland or under irrigation, the response to the soil type will vary.

Under irrigation, mangoes grow well in soils with an unimpeded depth of more than 1 m. If irrigation scheduling is well planned, there should be no problem on soil with a depth of 750 mm, provided that any soil or rocky layers that restrict root growth to a depth of 750 mm allow excess water to drain easily. If not, a temporary shallow soil water-table could develop above this layer, with resulting damage to the trees.The ideal soil has a fairly loose, brittle, crumbly structure. Compact or strongly-developed soil structures prevent effective water infiltration and root penetration. (*TOF)*

Letters to the editor

Interested in watering plant

I refer to David Osiako's letter, Umoja Forest Conservation Group, which appeared on the October 2007 issue, about a watering plant. I am interested in getting it. Can he tell me how I can get it? Alternatively, if is difficult to send it to me all the way to Kilifi, he can give me its botanical name so that I may try to get it from Gede forest which is near me. Francis Hinzano, P.O. Box 285, Kilifi

We need past issues

We are a Community- Based Organization composed of small-scale farmers. We are residents of Kinamba location in Ng'arua division of Laikipia West district. We read issue Nr. 23, which had the information on mushroom growing, soil conservation, liquid manure, organic methods of weed control among and every member appreciated the information contained there in. We would be delighted if you could send us all the past copies and continue to send us the future copies of your magazine on organic farmer. Francis Looremata, Boma Beekeepers, P.O Box 82, Kinamba

It is good for training

I am pleased to inform you that I have had the opportunity of reading some past copies of your magazine and I do appreciate the various articles and technologies which are being applied in organic farming. I am a technical officer and I have farmers groups in Kilifi and Malindi districts growing various horticultural crops, especially African indigenous vegetables. We are training these farmers groups using the Farmer Field School approach on how to grow these vegetables by organic methods. If you send us a copy of your monthly magazine, it will further broaden our knowledge on the various methods and technologies available for organic farming and this will be of great benefit to the large farming community we are working with. Martin Mwakangalu, P.O Box 16, Mtwapa

I need plant extract issue

I wish to request you to send me your monthly magazine as from this month. I received a copy of your magazine from Etang Kenya Ltd. As a farmer who believes in organic farming, I hope to receive it for more information. Please also send me the plant extracts special issue.
Andrew Oriedo, P.O Box 1493, Kitale

Magazine is helping us

We are a group of farmers called MEROF (Mt Elgon Rwandet Organic Farmers) and are 96 in number. This magazine is very educative and we have been reading it from a friend working with the ministry of agriculture. We kindly request that you send us a few copies of the magazine to improve our knowledge and skills. Andrew Mukung, Chairman MEROF, P.O Box 240, Cheptais

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

Simeon Ojekwu's tricky fertilizer-question

continued from page 5

management, doing erosion control better than trees and not 'locking up' massive amounts of potassium and phosphorus in their wood.

Scientists call these combined methods the "Integrated Natural Resource Management". In mixing small amounts of fertilizers with compost and manure and applying it later to the plants keeps the nitrogen longer in the soil, avoids the washing out by rain and produces higher yields. The dosage and the needs of the respective plant play an important role. Recent efforts have improved the technical and economic efficiency of recommended mineral fertilizer doses, and farmers are nowadays more willing to read and to follow the recommendations. Research in Burkina Faso and Niger has shown that it is possible to increase millet and sorghum yields profitably by using fertilizer in combination with organic/natural techniques that conserve and concentrate soil moisture and organic matter.

According to the promoters of the "Integrated Natural Resource Management", this complementary method

produces more biomass, which can be used again for the replenishment of the soil with organic matter. This would make sense especially in areas where organic matter is inherently low. There is a notorious lack of fodder, so crop residues are fed to animals and are not used as organic matter to feed the soil.

Special approach for Africa?

In his letter Simeon Ojekwu asks if the IFOAM-ban of fertilizers containing nitrogen "is an European approach which does not consider the poor soils of the poor African farmers." No doubt, besides being ecologically questionable, synthetic or chemical fertilizers have many disadvantages. If not properly applied, a big share of the nitrogen fertilizer gets lost through runoff, leaching, and volatilisation, thereby polluting the ground water.

On the other hand the correct use is a question of knowledge and management; this would be the task of the "Integrated Natural Resource Management", namely to teach farmers how to use fertilizer in an efficient manner and minimize wastage, and to apply it when the plant needs it most, i.e., split it rather than applying it in a single dosage.

Way forward for organic farmers

As mentioned above, this is a tricky issue. It is up to the farmers to decide which way to go. For us from *The Organic Farmer* magazine, the answer to Simeon Ojekwu is simple and clear: "There is no way in-between!" Organic farmers have to rely on the natural methods to improve the soil's quality with compost, manure, and green manure (leguminous plants). It requires more time, more labour, and more planning. But in the long-term it is the safer way for sustainable agriculture. ■

tips and bits

from farmers for farmers

Few people know organic food

The Organic Farmer

Although the market for organic products is expanding at the rate of 20 percent every year, a large section of the Kenyan population does not know what organic food is all about. A well-coordinated and sustained campaign is needed to educate the local consumers of the benefits of eating organic foods.

Women know more than men

A survey conducted by organic agriculture movements in East Africa last year on consumer attitudes and preferences towards organic foods, shows that awareness of organic foods is very low especially among the low-income groups in the region. Although 40 percent of the consumers knew about organic food, none had tasted it. Those who had tasted it did not know that it was organic while a majority of the consumers did not even know what organic food was. Most of the respondents in the survey could not give any reason why they did not eat organic foods. "For any awareness campaign to succeed, messages about the advantages of eating organic food should link the food to the health benefits that consumers stand to gain from eating it", says Samuel Ndungu, the KOAN National Marketing Development Advisor.

A vegetable stall along Nairobi-Naivashs road

The survey found that, apart from being enlightened, the high income groups consumed organic foods because they had more purchasing power and therefore could afford to choose the type of food they wanted. Awareness was slightly higher among women than men and tended to match the educational level of the respondents, with those who had secondary education being more informed on the benefits of organic food than those who had a lower level of education.

A lot of cheating

Organic farmers and the consumers need to be made aware of the integrity system which ensures that both farmers and retailers sell products that are really organic. One way to do this is to ensure all organic products carry labels that distinguish them from conventional farm products. Currently there is a lot of cheating where farmers offer conventional produce as organic. This may erode the confidence of the consumers. Efficient quality control systems need to be put in place to ensure that organic standards are maintained.

The findings from the survey show that organic agriculture movements need to intensify their awareness campaigns on the benefits of organic food through aggressive advertising in the local media, trade fairs, exhibitions and any other means that will get the message to the wider population. If the campaign succeeded, it would not only widen the market for organic food. It would also encourage more farmers to go into organic production and also make it affordable for them to pay for certification to be able to sell their produce in the local and international markets at a higher price. ■

Training is necessary

Following increasing demand for local organic food products by exporters, a number of local companies are training farmers' groups to produce various products. One of these is Earth Oils which has contracted farmers in Nanyuki to plant the tea tree for extraction of essential oils for the export market. The company provides farmers with training and seedlings. It also assists them to pay for the organic certification. The company ultimately buys the product for oil extraction. An ICIPE project is also working with more than 1000 farmers in Mwingi district to process organic honey for the export market. Another very successful company is Meru Herbs which has trained a lot of farmers in the region and sells a bulk of its products to Europe. (*TOF*)

Market Place

Rabbits for sale: I have more than 300 rabbits for sale. Anyone interested can call Tel.0724 857 878

Kenbrow Chickens wanted. I need 100 day-old Kenbrow chicks. Please call Z.K. Mburu Tel 0722 257 796

Soybean processing: I do soybean processing and use. Kindly contact me on Tel. 0727 180 840

Training: Ikinyukia Self-Help Group in collaboration with KARI-Muguga trains farmers on baling of purple vetch hay. Farmers interested with training can get in touch with the group. Contact the chairman Tel. 0724 492 456

Dried Mushrooms: We have 150 kg of dried Oyster mushrooms for sale. Interested buyers can get in touch with us. One Acre Fund Tel. 0736 798 214, Email: horticulture@oneacrefund.org.

The Plant Extracts Special which appeared in Sept/Oct 2006 is now available in English. Interested farmers can order.

Questions? Go to Infonet!

Infonet is an information platform for organic farmers. Whatever you would like to know about the ecological methods for the control of pests and parasite infestations of plants, humans and animals – Infonet will have an answer. You just go to the Internet, either at home or at a cybercafe and type in:

www.infonet-biovision.org

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 33 February 2008

Beware of fake seeds in the market

Poor selection of maize seed is to blame for the poor harvest obtained by many farmers.

The Organic Farmer

Small-scale farmers are increasingly finding it difficult, due to lack of money, to buy the required inputs to boost maize production. The problem is even more serious when it comes to maize seeds. Every year, many farmers buy poor quality seeds, often sold to them by middlemen, because it is cheap.

These farmers always end up with a poor harvest. Even for those farmers with adequate resources, poor selection of seeds has led to poor yield. Seed varieties are developed for use in different geographic areas, depending on the amount of rainfall, altitude, temperatures and other conditions. Competition among seed companies has created more confusion in the seed market. Many resources are spent on production and promotion of new varieties but very little time and resources are invested in informing and educating farmers. In this issue, we provide farmers with tips and guidelines they need to follow while selecting seeds to ensure that they get the best seed for their agricultural zones. *See page 4 and 5*

Good seeds are essential for a good harvest

Diseases threaten banana production

The Organic Farmer

Bananas are one of the most important tropical food crops in the world. However, their production in Kenya and the rest of East Africa is threatened by poor management and the spread of fungal and bacterial diseases. Consequently banana production has declined in all banana producing areas.

Most farmers do not know much about banana diseases. Like many other crop, bananas need proper management. This starts right from the land on which they are planted. Bananas should be planted on land that has been left fallow for at least one year. Field sanitation is very important for keeping pests away. Cutting banana pseudostem and leaving it in the field overnight can serve as a trap for banana weevils. Take extra precaution in using animal manure as banana fertilizer. This type of manure promotes the occurrence of banana weevils.

It is very dangerous to obtain banana seedlings from neighbours because their banana crop may be diseased, and the disease could therefore be transferred into your farm. One source of clean banana seedlings is tissue culture bananas; farmers can get it from KARI research stations near them or certified seedling producers. Never buy planting material from roadside nurseries. More about banana diseases and how to control them on *page 3*.

Banana affected by Panama disease

A tragedy

We are really shocked by the wave of violence that has swept our country. As much as we condemn the vote rigging, which is the root cause of the unrest, we condemn the organized killing of our fellow farmers and innocent wananchi in parts of the Rift Valley province. We appeal to all of you, fellow farmers, not to listen to the voices of violence. Does one benefit from burning a neighbour's house? Can one fill the stomach with feelings of revenge? Fellow farmers, respect and take care of each other. Do not forget that it is the ordinary wananchi, who are struggling to earn an honest living, that have to bear the consequencies of the fighting. (*TOF*)

Dear farmers,

It seems that with the higher living costs and the increasing prices for fertilizers, seeds and fuel, maize growing for commercial purposes is no longer viable for small-scale farmers. Since the beginning of the harvest season in October last year, middlemen have been paying as little as Ksh 800 for a bag of maize. This amount is a disregard of the small-scale farmers' work even when paying for labour cost at the rate of Ksh 20 a day.

It is simply not wise to invest in a crop that no longer ensures a good return. It would be better if farmers could store their maize until prices become favourable. But most small-scale farmers do not have safe storage facilities. And at the beginning of the year they need the money for school fees and other financial commitments and obligations.

What can be the solution for small-scale farmers? There is no perfect or simple solution whatsoever. What we recommend is that farmers should start diversifying their farming activities (apart from maize for self-consumption). At least those who can afford (or have access to) small loans should try alternative farming activities such as dairy farming, poultry keeping, mushroom production or even horticultural crops. These products are currently on demand in the market and are fetching good prices.

Do you need *TOF*?

Would you like to read/print your own copy of *The Organic Farmer*? Then go to our new website.

www.organicfarmermagazine.org

MY OPINION

Minimum tillage or reducing soil disturbance in agricultural systems encourages an increase in mycorrhizae or root fungi which are very essential for a healthy, productive soil. Mycorrhizae are negatively affected by soil heating especially when the land is put under fire to clear it for planting. They are also affected by ploughing or overgrazing. The fungi which occur around the root zone, extend to areas where the plant roots cannot reach. They facilitate water uptake during drought when there is little water in the soil. This makes it possible for many plants to sprout and grow healthy.

The farmer's weekly

The Organic Farmer

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

ICIPE

The Organic Farmer is sponsored by Biovision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

BIOVISION

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O. Box 30772, Nairobi, 00100
KENYA
Tel: +254 20 863 2000
e-mail: icipe@icipe.org
website: www.icipe.org

Editors
Peter Kamau, Peter Baumgartner

Secretariat:
Lucy W. Macharia

Advisory Board
Bernhard Loehr, ICIPE
Nguya Maniania, ICIPE
Fritz Schulthess, ICIPE
Charles Kimani, farmer, Wangige
Joseph Mureithi, Deputy Director, KARI

Address
The Organic Farmer
P.O. Box 14352, Nairobi, 00800
KENYA
Tel: +254 020 445 03 98
e-mail: info@organickenya.com

Layout
In-A-Vision Systems (k)

Lucerne is a nutritious fodder

Only a few Kenyan farmers grow Lucerne because they do not know its advantages.

The Organic Farmer

Willy Kirui, a farmer in Elburgon, has been growing Lucerne, a highly precious forage legume, for his 10 dairy cows for the last 4 years. His cows like Lucerne because it is very palatable and nutritious. Before, he used to feed his animals on Napier grass and other fodder. When he introduced Lucerne to the cows' feed, milk production did not only increase (to an average of 18-20 litres a day), as farm manager Philip Rotich explains. "But also the animals became stronger and healthier." He mixes the Lucerne with silage made from green maize, and supplements it with concentrates. The farmer has 3 out of his 6-acres of land under Lucerne.

Lucerne is one of the most nutritious feed for dairy cattle. Many farmers ignore it because they think it is difficult to grow, but Lucerne can do well in most areas, especially with good management. There are three main varieties of Lucerne that are grown in Kenya – Cuf 101, Hunter River and Hairy Peruvian. Hairy Peruvian does well in high altitude while Hunter River and Cuf 101 are suited to lower altitudes.

How to grow Lucerne

Seedbed preparation: Lucerne requires fine, firm and a weed-free seedbed that is well prepared before the onset of the rains. The sub-soil should be well broken with forked jembe. Apply 10 tonnes of thoroughly decomposed farmyard manure or compost manure and dig it up to sub-soil.

Planting: Make furrows 30-40 cm apart and 2.5 cm deep. Use 10-15 kg seeds of Lucerne per hectare. In areas where Lucerne has not been grown before, use Lucerne inoculant available at the University of Nairobi. If an inoculant is not available, collect soil from areas where Lucerne has been previously grown and mix it with the seed before planting. In acidic soils (with pH less than 4.9) agricultural lime is applied at the rate of 10 tonnes per hectare. Phosphates, inoculant and liming promote root development, nodulation and nitrogen fixation.

Farmers interested in growing Lucerne must have the soil tested for acidity before planting. Soil samples can be taken from the top soil (0-10 cm) and from the sub-soil (30-40 cm).

If the sub-soil sample has a pH of less than 5.5, the soil is too acidic and not suitable for growing Lucerne.

Management of Lucerne

Weed Control: Hand weeding should be done 4-6 weeks after planting and thereafter whenever the weeds appear. Use plant extracts or organic pesticides such as neem two to three times a week to control pests. Continue applying farm yard manure to the Lucerne field to improve soil fertility, structure and herbage yields. Harvest Lucerne when it starts flowering (when it is about 30 cm high) to a stubble height of 4-5 cm from the ground level. 6-8 cuts can be obtained in a year. Once it is established on the farm, Lucerne competes strongly for light and water and is able to control other weeds. Its long tap root enables it to get water from deep down the soil. Thereby it remains green even during the dry season when other fodder crops tend to dry out due to lack of water. It is a good nitrogen fixer and helps improve soil fertility. The crop can last up to 4 years if properly managed.

Utilisation

Farmers should allow Lucerne to wilt before feeding it to their animals as fresh one can cause bloating. A farmer may conserve excess Lucerne as hay (whole or chopped). Lucerne gives 5 to 6 tonnes of dry matter per hectare per year and 25-30 % crude protein. ■

Fodder grasses

December 07: Napier grass
January 08: Boma grass
February 08: Lucerne
March 08: Kikuyu grass

Know banana diseases and control them

Using clean material and planting disease-resistant varieties can help control most of the banana diseases.

Michael Waweru

Banana diseases are on the increase and farmers need to take preventive measures to control them. The practice of sharing planting material is mainly to blame for the spread of diseases from one area to another. Lack of information on the diseases is yet another problem because most farmers do not take preventive measures to contain the diseases. The following are the most common diseases responsible for declining production in most of the banana producing areas:

Panama diseases (fusarium wilt)

Panama disease, also known as Fusarium wilt of banana, is caused by the fungus *Fusarium oxysporum* f.sp cubense which attacks the pseudostem and corms of susceptible cultivars. The fact that the pathogen remains in the soil for up to 30 years after the soil is infested makes the Panama disease one of the most devastating banana diseases. The pathogen occurs in three races (Race 1, 2 and 4). Race 4 is one of the most dreaded because Cavendish bananas, that are resistant to other races succumb to it. The most susceptible cultivars are Gros Michel (Kampala), Apple banana (sukari ndizi), Mararu, Bluggoe (Bokoboko) and Psian Awak. Tolerant varieties in Kenya include Kiganda and the Cavendish group, e.g Nyoro.It is a soil-bourne disease.

Symptoms & effects

•Yellowing of leafs, beginning along the margins and advancing towards the midribs.
•Yellowing progresses from older to younger leaves as the plant dries up.

Panama disease: branches hang from the stem

•Leaf petioles turn brown and bend or become twisted (buckle).
•Brown spots of various shapes and sizes appear on the yellow leaves.
•Pseudostem frequently split longitudinally just above the soil level.
•Outer leaf sheaths may separate from the pseudostem and collapse.
•Diseased rhizomes and pseudostems release offensive smell due to rot caused by secondary pathogens
•Discoloration of the vascular tissue (red)

Control

•Cut off the affected part of the plant and burn them.
•Reduce movement of infested soil from the area around the plant, use soil conservation methods.
•Treat the banana corm (root base) with hot water; this reduces the disease by 20 %.
•Sterilize garden tools by placing them over fire flames to reduce spread of the disease.
•Plant disease-tolerant varieties, e.g Cavendish.

Black Sigatoka

Black Sigatoka (black leaf streak disease) is one of the most devastating leaf spot diseases in the world. It is a major problem in Western Kenya causing a yield loss of up to 50%. The leaf spot disease Black Sigatoka is caused by the fungus *Mycosphaerella fijiensis*. It is spread by spores carried in the wind. Black Sigatoka spores can infect all the banana plant including leaves, suckers used for planting as well as leaf litter. It is more damaging and difficult to control than the related yellow Sigatoka disease.

Symptoms & effects

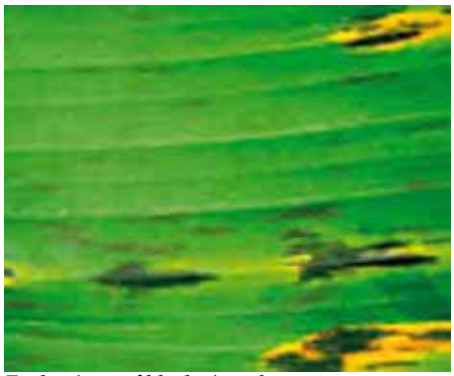
•Young leaves are mainly infected.
•Initial symptoms are thinly black streaks (1-2 mm) on the underside of the leaves which enlarge to 5-10 mm with no distinct border.
•The streaks form black leaf spots that later merge to kill the entire leaf.
•Premature ripening of the banana bunches.

Yellow sigatoka

This is also a leaf spot disease caused by *mycosphaerella musicola*. It resembles black sigatoka but yellow borders surround the streaks..

Symptoms & effects

•Initial symptoms are pale yellow streaks on the upper side of the leaf surface that enlarge to form dead



Early signs of black sigatoka

areas with yellow holes and grey centre.
•The disease resembles Black Sigatoka in every other aspect.

Control of black and yellow sigatoka

Black and yellow Sigatoka diseases are very difficult to differentiate and may even occur together on the same plant.
•The use of clean planting materials significantly reduces the spread.
•Remove affected leaves and burn them.
•Create adequate spacing of plants.
•Open up the canopy by pruning since sunlight discourages the germination of the fungus that causes Sigatoka.

Cigar–End Rot

Cigar-end rot (verticillium theobromae)

This is a fungal disease, which is increasingly becoming a more evident disease in Kenya especially in Kisii and Western Kenya. The Dwarf Cavendish and Gross Michel varieties are particularly susceptible.

Symptoms & effects

•The bananas appear as rot on immature fingers with an ashy appearance (spores) on fruit tips. This rot looks like the tip of smoked cigarette, hence the name.
•The rot affects a few centimetres of the banana fruit tip and becomes bigger with the fruit growth.
•The pulp develops a dry rot and becomes fibrous.

continued on page 7

Take great care during seed purchase

In order to save money, many farmers fall for cheap seeds on offer by middlemen – only to end up with a poor harvest.

The Organic Farmer

As the planting season approaches it is important that farmers decide on the inputs they require in order to increase their production. Chief among the inputs are seeds. Sound knowledge of the right seeds to buy is very important because low quality seeds reduce the maize yield at harvest. Variations in altitude, rainfall, type of soil and temperature require a careful selection of seeds that perform well under specific local conditions. To cater for the different regional growing conditions, different seed varieties have been developed and are available in stock. Therefore, farmers should know the type of seed that is most suitable for their geographical area before buying any seed. To know the type of seed required, it is important to seek guidance from agricultural extension centres or research institutions near them. Fortunately, some farmers know the right varieties for their areas and can provide useful advice to fellow farmers.

Seed companies confuse farmers

The main problem with the selection of seeds among farmers is the increasing number of companies that have entered the market with different varieties of maize. The aggressive marketing of new seed varieties being introduced every year makes it very difficult for farmers to select the right seed varieties. The result is that most farmers fall prey to these marketing tactics and end up buying the wrong seeds. This cheating is to blame for the decreasing maize yield and new diseases that now affect maize in many parts of the country.

Seed selection determines the quality of maize.

A clever farmer who intends to buy a new seed variety first of all tests the quality of the seed. He isolates a small portion of land where he can plant the new variety. He should observe whether the maize is prone to lodging (falling), if the ears open early, which is responsible for decay, and if the variety gives a good yield in that particular geographical region. When the farmer is convinced of the seed quality, then they can use the seed the following year. But they should not forget that even with good quality seeds, they will only obtain good yield if the crop is well managed. Low soil fertility, late land preparation, poor weeding and even wrong seed application can markedly lower maize yield.

Beware of "Dubai seed"

Another mistake made by most farmers is the use of uncertified seed called "Dubai seed". Dubai seed is mainly sold by middlemen, who offer it to farmers, claiming that the seed is obtained from seed growers. Investigations established that most seed growers usually sell the seeds even if seed companies, which contracted them to produce the seed, reject it. The seed may be rejected because it does not meet the quality standards of the companies. When the seed is rejected, the seed producers are advised to sell it as commercial maize. But most of the growers do not do so. Instead, they sell the maize to middlemen who offer it to farmers as genuine seed. Eventually farmers bear the consequences of poor yields.

Due to lack of resources, many farmers use their commercial maize as seed with the hope that with good management, they will still obtain a good harvest. Such farmers should know that maize seed is produced in a particular way that enables it to produce more when planted. Commercial maize does not have these qualities. Therefore, it will give a very low yield when used as seed. Commercial maize is also responsible for the transfer of diseases and pests such as leaf inflammation, stalk and the larger grain borer. Some unscrupulous traders buy commercial maize, treat it with the same chemicals and packaging used by seed companies and then sell it as genuine seed. In such a case, it is very difficult for farmers to tell whether the maize seed is genuine or not. ■

Important tips for seed-buyers

Before buying seeds, farmers should consider the guidelines below to maximise yields in maize production:

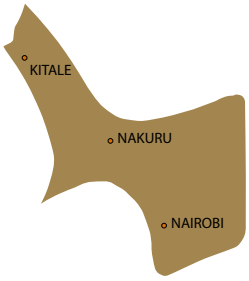
- They should only buy seeds from seed stockists who are licensed to sell seeds. The farmers should insist on seeing the licence if they do not know the stockist well. Alternatively, they should buy seeds from well-known distributors in their areas. A certified seed stockist will rarely sell fake seed.
- All genuine seeds have company tags and the labels of the Kenya Plant Health Inspection Service (KEPHIS) inside the seed bags. To ensure that the seed is genuine, farmers should verify that tags and KEPHIS labels are present when they open the seed bag.
- Each seed company has its own colour to distinguish their seeds from the rest. Farmers should be able to tell the colour of the seeds from different companies.
- Farmers should buy their seeds early enough to avoid last minute rush. They should remember that fake seeds are mainly sold around March and April every year when the popular varieties of maize seed are sold out.
- All seeds should be stored in a cool and dry place.
- Maize seed is treated with dangerous fungicides and insecticides. It should never be eaten!

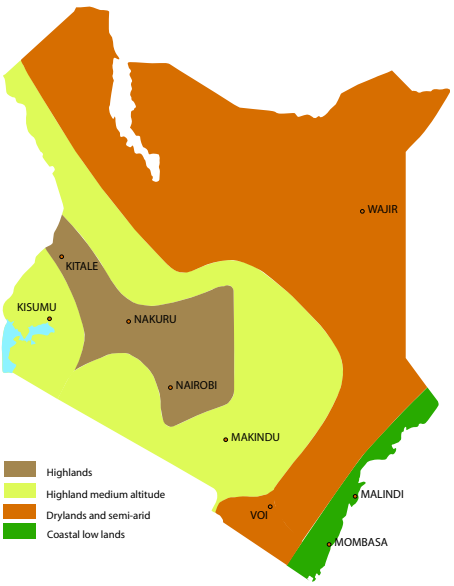
Buy the seeds appropriate to your region

The following guidelines are only recommendations. There are many varieties which are not mentioned here. Farmers are advised to contact local extension staff on other suitable varieties. An area may have totally different climatic conditions, farmers can only get information on the right variety for their locality from agricultural extension personnel.

Highland: (High altitude)

Variety: H6213 Kenya seed
Altitude: 1700-2100 metres above sea level (m asl)
Rainfall: High
Suitable growing areas: Trans Nzoia, Uasin Gishu, tea growing areas of Kiambu, Nyeri, Meru, Nyandarua
Yield: 52 bags/acre
Qualities: The variety does not fall in windy conditions, it is resistant to cob rot, rust, Grey leaf spot disease, stem and leaf blight.





Variety: H614 D KARI
Altitude: 1500 – 2300 m asl
Rainfall: high
Suitable growing areas: Trans Nzoia, Uasin Gishu, West Pokot, Keiyo, Marakwet, Laikipia, Nakuru
Yield: 38 bags/acre
Qualities: Most popular variety in the country, can withstand sudden climatic changes and does well even under poor management.

Variety: H6210 Kenya Seed
Altitude: 1700 – 2100 m asl
Rainfall: 1000 – 2000 mm
Suitable growing areas: Trans-Nzoia, Uasin Gishu, West Pokot, Keiyo Marakwet, Laikipia, Nakuru.
Yield: 50 bags / acre
Qualities: Can withstand strong winds, it is resistant to cob rot, rust, Grey leaf spot, stem and leaf blight.

Drylands

Variety: DH01
Altitude: 800 - 1000 m asl
Rainfall: Low
Maturity: 100-120 days
Suitable growing areas: Kitui, Makueni, and Baringo areas.
Yield: 16 bags/acre
Qualities: It is resistant to blight, common rust and ear rot. It can remain green for a long time.

Variety: KH 600-14 E Kenya Seed
Altitude: 1800 – 2500 m asl
Rainfall: 1000 – 2000 mm
Suitable growing areas: Slopes of Mount Elgon, Trans-Nzoia, West Pokot, Uasin , Nandi, greater Kericho, Nyeri, Laikipia, lower Nyandarua
Yield: 38 – 48 bags/acre
Qualities: The variety has good rust and blight resistance, it can also withstand Grey leaf spot disease.

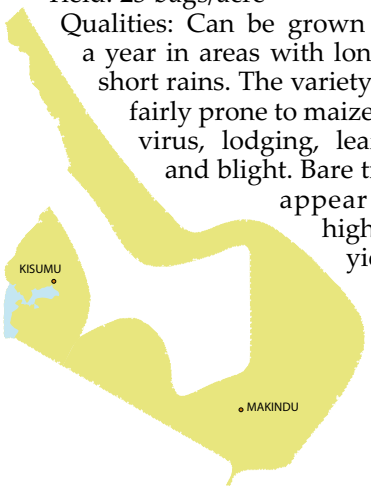
Highland (Medium altitude)

Variety: H515 Kenya Seed
Altitude: 1200 – 1600 m asl
Rainfall: not less than 800 mm/year
Maturity: 4 – 5 months
Growing areas: Busia, Kisumu, Siaya, Embu, Muranga, Nyeri, Nakuru, lower parts of Kisii
Yield: average 26 bags/acre
Qualities: More resistant to leaf blight, leaf rust, Grey leaf spot (GLS) and does not fall.

Variety: H 516 Kenya Seed
Altitude: 1200 – 1600 m asl
Rainfall: not less than 800 mm/year
Maturity: 3 – 4 months
Suitable growing areas: Busia, Siaya, Embu, Muranga, Nyeri, Nakuru, Lower parts of Kisii.
Yield: average 28 bags/acre

Variety: H 512 KARI
Altitude: 1000 – 1800 m asl
Rainfall: moderate
Maturity: 4-5 months
Suitable growing areas: Busia, Siaya, Embu, Muranga, Nyeri, Nakuru, Lower parts of Kisii
Yield: 18 bags / acre
Quality:

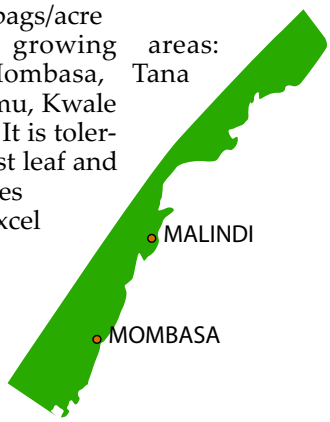
Variety: H511 Kenya Seed
Altitude: 900 – 1500 m asl
Rainfall: Long and short rains
Maturity: 4 – 5 months
Suitable growing areas: Coffee zones of Central ad Eastern province, Lake Victoria region during the short rains
Yield: 23 bags/acre
Qualities: Can be grown twice a year in areas with long and short rains. The variety is fairly prone to maize steak virus, lodging, leaf rust and blight. Bare tips appear at high grain yield.



Lowlands (Coastal)

Variety: PH1 KARI
Altitude: 0 – 1200 m asl
Rainfall: at least 400mm/year
Suitable growing areas: Kilifi, Mombasa, Kwale, irrigated lowlands of Tana River districts
Maturity: 3 – 4 months
Yield: 14 bags/acre
Qualities: It has better husk cover and can be intercropped.

Variety: PH4 (Pwani Hybrid 4), KARI
Altitude: 1- 1200 m asl
Maturity: 3 – 4 months
Yield: 16 bags/acre
Suitable growing areas: Kilifi, Mombasa, Tana River, Lamu, Kwale
Qualities: It is tolerant to most leaf and ear diseases and has excellent husk cover and does not lodge.



Cleanliness is important when handling milk

Dairy milk is an important source of income for small scale farmers. But they have to respect cleanliness and hygiene as top-priorities.

Recent studies (done by ILRI in 2007) on the dairy sector in Kenya indicate that 80 percent of all the milk in the country is traded through the informal sector. Only 20 percent is sold to the large processors. This study has thrown new light on employment statistics as it shows that each litre of milk produced and traded informally generates an income for 10 Kenyans, whereas the same in the formal sector generates an income for only 2 Kenyans. With respect to employment creation in the country, the push towards all milk being channelled through the processors is now on the back burner.

A milk giant

With the liberalisation of the dairy sector and the increasing number of Kenyans getting into dairy farming, Kenya is now recognised as the second largest milk giant producer in Africa, a continent with huge milk exporting opportunities both within the COMESA region as well as internationally. However, recently, shipment of milk to both Zambia and the Democratic Republic of Congo was rejected due to contamination. This has resulted in closer observation and testing of milk locally, within the formal as well as informal sector. The test results conducted on over 2000 samples taken from a wide range of outlets, kiosks and even supermarkets are quite shocking. Contamination of milk with hydrogen peroxide and river water is common. Bacterial contamination including *salmonella*, E.Coli (*Escherichia coli*) which are a sign of unhygienic situations), Streptococcus and Aflatoxins were detected and shockingly even evident in branded pasteurised milk.

How can this happen in a system that we believe is monitored by both the Kenya Dairy Board and the Kenya Bureau of Standards (KEBS)? The problem unfortunately is that the industry has grown faster than the regulatory frame work can manage. We now have hundreds of new dairy farmers without experience in milk hygiene. There are also hundreds of old farmers who are neglecting standards of hygiene and no one is policing the system even at the formal sector.

Take preventive measures

Milk is one of the few products with a no-recall chance once it is sold. It is highly perishable and has a short shelf-life. The tests taken on samples of milk require a few days before results are available. By this time the milk has already been sold and consumed. Therefore it is only by taking preventive measures within dairies that we can ensure the safety of our milk.

Formal processors are expected to adhere to milk standards of quality and hygiene recommended by KEBS. They are expected to test their milk regularly. This is to ensure that they can trouble shoot effectively and efficiently if contamination is detected. This is not expected or affordable in the informal sector. There is however, a serious drive to ensure milk producers all over the country have access to information on dairy hygiene, to ensure safe milk and other dairy products.

Milk straight from a healthy cow carries a bacterial load of 8 parts per ml. This in itself is not a problem at all. The bacteria, some of which are good and others harmful, can however double every 20 minutes given the right conditions. If you do the calcultaion, you will see that within 6 hours of milk sitting at ambient temperature, the bacterial load can reach 2,000,000 parts per ml. It is thus extremely important that raw milk from healthy cows is consumed as soon as possible. If milk must be kept, the temperature must be dropped as soon as possible and maintained at a cool temperature of 4 to 7 degrees centigrade. Fresh raw milk that is cooled to these temperatures has a 3-4 day shelf life.

Wash the udder before milking

Most contamination occurs after milking! Bacteria are picked up from dirty hands, contaminated dirty milk

continued from page 7

What you should observe

1. Have hot water available when milking;
2. Wash the cow's udder with warm water
3. Wash the milk bucket with hot water before commencing milking;
4. Wash your hands with hot soapy water before milking;
5. Ensure that the cow's tail and legs do not contaminate the milk;
6. Remove the milking bucket from splashes if the cow urinates or defecates during milking; the bacteria E. coli (*Escherichia coli*) for instance, which are rarely harmful, but can cause diarrhoea, are transmitted by manure;
7. Use a good milking salve during milking;
8. Check the udder for mastitis; if the udder is hot or the milk clotted. In such a case, discard the milk and treat the cow. If milking more than one animal clean the bucket with very hot soapy water and rinse it thoroughly;
9. Ensure that all milking utensils are cleaned with hot water before and after milking;
10. Sieve milk through sterilised gauze into milk churn or container;
11. Drop the temperature as soon as possible after milking by refrigeration, or raise temperature to pasteurisation and then drop to 4-7 degrees centigrade.
12. Respect your animal and the consumers of your milk.

What you should avoid

- Do not smoke while milking or in between milking.
- Do not leave milk in churns or *mitungis* in the hot sun.
- Do not use unboiled water to clean milking utensils.
- Do not add contaminants like hydrogen peroxide to extend milk's shelf life.
- Do not add water to milk.

Su Kahumbu answers your questions

Write to
The Organic Farmer
P.O. Box 14352
00800 Nairobi Kenya
Tel: 020 445 03 98, 0721 541 590
e-mail: info@organickenya.com

...keep milk clean

continued from page 6

containers, dirty milking machines, dirty water (water from shallow wells can be contaminated). Hygiene during milking is of utmost importance.

Aflatoxin ...

Be careful, contamination after pasteurisation or boiling can be more harmful to ones health as the good bacteria which help to fend off the bad ones are destroyed during heating. Aflatoxin traces in milk often come from the animal feed. It is important to make sure your animal feed is stored properly or/and purchased from a reputable dealer to ensure that it is aflatoxin-free.

... and dangerous hormones

While on the topic of milk, it is also important to mention at this stage the use of Bovine Growth Hormones in the dairy industry in Kenya. These hormones were previously used in developed countries to increase milk production. They are however now banned in most countries as they have been passed through the food chain into our own bodies and are being blamed for obesity and other related problems. These hormones are banned in organic farming. *Please report any known use of Bovine Growth Hormones to consumerwatchkenya@gmail.com* ■

...banana diseases

continued from page 3

•The rot induces immature ripening.

Control

•Remove dried floral parts from the fruit tips 8-11 days after bunch emergence. Pruning helps to open up the canopy.

•Cover the banana with a polythene bag (6/100) thickness before fruits emerge.

Bunchy top diseases

The disease is caused by a virus which is disseminated by banana aphids (*pentalonia nigronervosa*). The long-term dispersal however is primarily through planting of infected materials.

Symptoms & effects

•Dark green streaks in the petiole and leaf veins are the first symptoms.

•Leaves of young suckers become chlorotic and curled.

•Infected plants are stunted in growth.

Control

•Seedlings should be disease-free.

•Infested plants should be uprooted and burnt. ■

farmers forum

An informative magazine

I kindly wish to ask you to honour us by sending to us monthly copies of your highly informative and educative magazine. The newspaper exhaustively tackles areas that we are yearning to be literate, that is organic farming and sustainable development in both crop horticulture and animal husbandry. In particular, please include the edition which featured mushroom growing – a field in which we are currently undergoing training. We stand to benefit enormously from *The Organic Farmer*. Thank you. Stanley K Muhia, P.O Box 483, Ol Kalou

Good work for farmers

I received a copy of *The Organic Farmer* from a friend. I enjoyed the contents and I want to encourage our church members to practise sustainable agriculture especially on poultry and dairy goat farming. Please include us in your mailing list. We would also request you to send us past editions. Thank you for the good work you are doing for the country. Johnson K Wachira

We want magazine

We are a group of farmers from Nandi South. We are very much interested in organic farming. We hereby submit our request for monthly supply of *The Organic Farmer* magazine, we shall be grateful if this is done. Wilson K Mosbei, Mosombor Farmers, P.O Box 39, Kapcheno

Can I get monthly copies?

I have come across your magazine and it is very useful to farmers so I am asking if I can get monthly issues. I am a farmer in Ngong. Thank you. Kimani Thiongo, P.O Box 267, Ngong

I need past issues

Thank you very much for *The Organic Farmer* magazine and for the enormous research carried out in organic farming. Having read several copies of the magazine, I have discovered my failure in neglecting farming, especially organic farming, which has proved to be of good potential in food production as well as money generating enterprise. No doubt I have missed a lot from past issues. I kindly request for issues Nr 1 to Nr 7 and Nr 14. I started practicing organic farming in the year 2006 with tips from *The Organic Farmer* magazine. I am a young farmer determined to introduce it in Bagaria area in Naishi Njoro. Thank you John Karanja, P.O Box 42730 00100, Nairobi

A great loss

It is with deep sorrow that we inform you of the death of Dr. Annalee Mengech, the technical editor of The Organic Farmer. She passed away after a short illness. Since the launch of TOF, Annalee went through every issue of the magazine, correcting scientific errors and language mistakes, which might have slipped in during the production process. She was resourceful and had vast knowledge of farming, livestock diseases as well as plants. She provided useful ideas, tips and advice that helped shape the newspaper to what it is today. Her patience, kindness and willingness whenever we sought her assistance, often humbled us. Annalee will be missed by all who knew her. We join her family in celebrating her illustrious life.

The Organic Farmer team

We need it too

I hereby request for *The Organic Farmer* magazine. I have other farmers who are also interested in reading it. So kindly be sending me 5 copies. Samwel Moses Nyangau, P.O Box 461, Nyamira

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

tips and bits

from farmers for farmers

Tree tomato has good income

"Can I make additional income with tomato trees?" asks Paul Njoroge from Nyeri. Farmer Koech of Olenguruone Division, Molo district (Tel.0721 167 915) also wants to get more information on tree tomato production.

Yes, you can increase your income, as many farmers' groups in Rwanda have done; they have started planting tomato trees in plantations. They export the fruits and make good money. Tomato tree (also known as tamarillo, mountain tomato or guava tamarillo) is generally believed to be native to Latin America. It is cultivated and naturalized in many Latin American countries and widely grown in New Zealand as a commercial crop.

Tree tomato is a small, attractive, half-woody, evergreen or partially deciduous, shrub or small tree. It is brittle and shallow-rooted, growing to a height of 3 to 6 m. It is small enough to fit into many parts of the shamba as long as the site is well-drained. They grow best in full sun except in hot, dry situations, where partial shade may be needed.

The tree tomato cannot tolerate tightly compacted soil with low oxygen content. Tamarillos require a fertile, light soil that is rich in organic matter. Perfect drainage is also necessary. Water standing for even a few days may kill the plant. The plant cannot tolerate prolonged drought and must have ample water during dry periods. A mulch is very beneficial in conserving moisture at such times. Protection from wind is necessary as the tree is shallow-rooted and is easily blown over. It is also brittle and its branches are easily broken by strong winds, especially when laden with fruits.

Tips for tree-tomato farmers

Propagation: Seeds or cuttings may be used for propagation. Seeds produce a high-branched, erect tree, ideal for sheltered locations. Cuttings develop into a shorter, bushy plant with low-lying branches, suitable for exposed, windy sites. Seedling trees are pruned back the first year after planting to a height of 3 or 4 ft (0.9-1.2 m) to encourage branching. In plantations, tomato trees reach a height of not more than 1.50 m. Annual pruning thereafter is advisable to eliminate branches that have already fruited. Induce ample new shoots close to the main branches, inasmuch as fruit is produced on new growth. Otherwise, the tree will develop a broad top with fruits only on the outer edges. Wide-spreading branches are subject to wind damage.

Pest and Diseases: The tree tomato is generally regarded as fairly pest-resistant, although it is occasionally attacked by green aphids. Fruit flies will also attack the fruit in areas where that is a problem. Nematodes are also a potential problem. The principal disease is powdery mildew, which may cause serious falling off of the leafs if not controlled.

Powdery mildew is characterized by a dusty-white to gray coating and talcum powder-like growth commonly infecting plant's leaves. It begins as circular, powdery-white spots that turn yellow-brown and finally black. In most cases, the fungal growth can be partially removed by rubbing the leaves. Remove infected plant materials. Prune overcrowded plants to increase air circulation, reduce the relative humidity, reduce infection, and increase light penetration. Do not place infected plant materials on the compost pile. Powdery mildew can be controlled with neem seed extract, papaya extract or baking soda.

Harvest: Tree tomato does not ripen simultaneously and several pickings are necessary. Fruits are ready for harvest when they develop the yellow or red color. Ripe tree tomato may be merely cut in half lengthwise, sprinkled with sugar (and chilled if you like) and served for eating by scooping out the flesh and pulp. The fruit should not be cut on a wooden or other permeable surface, as the juice will make an indelible stain. For other purposes, the skin must be removed, which is easily done by pouring boiling water over the fruit and letting it stand for 4 minutes before peeling. ■

Market Place

Training: Baraka Agricultural College offers various courses on sustainable agriculture. Dairy farming – February 3 – 9, Dairy goat farming- April 13 - 19, Bee product processing April 20 - 26, Poultry production May 4-10 Mushroom growing June 8- 14. Farmers interested in pursuing these courses can contact the college at the following address: The Principal, Baraka Agricultural College, P.O.Box 52 Molo, Tel. 051-721 091, 0725 777 421 email: baraka@sustainableag.org http://www.sustainableag.org. The fees charged vary between Ksh 6000 and Ksh 8000, covering tuition, food and accommodations. The certificate course in agriculture takes 60 weeks and the diploma course 57 weeks. Farmers can contact the institution for details.

Fruit Seedlings: We have more than 10,000 fruit seedlings for various fruits such as grafted mangoes, avocado, budded citrus and hybrid pawpaw. We also have refined honey. If interested please contact us at the following address: Peter Mbogo, KADI, P.O.Box 60100 Tel. 068-214 72/27, 0721 608 644, 0733 566 059.

Mushrooms for sale: I have oyster and ganoderma mushrooms for sale. Interested buyers can call Tel. 0720 214 482

Rabbits needed: I am interested in buying grade rabbits, if you have any for sale please call Tel. 0724 717 592

Do you have products for Export? A marketing consultant from Israel is looking for farmers or institutions with certified organic products for sale in Israel. If you have any such products, please contact David Goldberg on Tel. 0721 768 618.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 34 March 2008

Food prices up over crisis

Insecurity in food producing areas pushed up the prices; middlemen have taken advantage of the situation.

The Organic Farmer

The current political crisis had far-reaching implications on the overall food security situation in the country. According to the Ministry of Agriculture estimates, more than 3 million bags of maize were destroyed during the skirmishes in parts of Rift Valley province. This is quite a significant loss especially taking into account the fact that many of the affected farmers may not be able to go back to their land in time for the planting season, which is supposed to start this month. Food prices all over the country have gone up for various reasons, many of which have to do with the current crisis. The middlemen as usual, have taken advantage of the situation to hike prices and make hefty profits at the expense of the consumers, some of them citing increased transport costs and unavailability of supplies.

Areas hit by the clashes are mainly the high potential food producing regions where most of the agricultural commodities are produced. This makes it very difficult for the farmers to harvest their vegetables and fruits for fear of attacks. Transporters are also wary of going to insecure areas for fear of their vehicles being destroyed. Those who manage to go to these areas therefore naturally hike the prices citing the risks they have to take in order to bring the commodities to the market. Matters are worsened by the fact that we are now in the dry season when scarcity of the various food commodities tends to push up the prices. We hope that the politicians will find a solution to the conflict and save the country from an all-out famine.

Food prices have gone up locally, (TOF)

Farmers go for organic manure

Exorbitant fertilizer prices have forced farmers in the Rift valley to go for farmyard manure. The price of one bag of DAP fertilizer has shot up from Ksh 1700 to Ksh 3500 in the maize growing areas of Uasin Gishu and Trans-Nzoia districts. Most farmers are reportedly visiting Agricultural Development Corporation farms and other large-scale farms in Trans-Nzoia in search of farmyard manure for use in planting. This is after realising that they cannot be able to afford chemical fertilizers due to the high prices.

Since we started *The Organic Farmer* magazine, we have always emphasised the need to use sustainable methods of production, first to reduce costs to the farmer and secondly, to help build soil fertility and increase yields. Chemical fertilizers can increase yields in the short term but they have an adverse effect on the soil when used for a long time. The use of compost on the other hand reduces soil acidity while increasing organic matter and releasing essential nutrients to the soil and in this way feeding the plants. *See pages 4, 5&6*

Do not ignore mastitis

Mastitis remains the most common infectious disease of dairy cattle and the most costly disease affecting the dairy industry. Despite decades of research focused on mastitis, no effective control measures have been established upto this time, proper treatment of the disease remains controversial. *See page 3*

Cowpeas is healthy fodder

Cowpeas was domesticated in Africa over 4000 years ago. Research conducted in South Africa reveals that cowpeas has high energy value for livestock. *See page 8*

Eradicate malaria

Malaria is not fate, we can fight it. Its transmission can be reduced by preventing mosquito bites. Read more about this deadly disease in *The Organic Farmer* special insert!

Use mosquito-nets

Plant insect repellants

Avoid stagnant water

Dear farmers,

For the last two months, farmers in some parts of the country have lost relatives, land, property and their livelihoods. We are deeply saddened by the fact that this has happened in Kenya which, in the past, has remained to be an island of peace in a region full of conflicts. We only hope that this animosity and hatred between various communities that broke out after the disputed elections can be brought to an end and people continue to live in peace and harmony as they did before.

Of course, our big concern is agriculture. We strongly feel that it is time that we begin to rethink about the issue of land ownership. The government should have a clear policy on land which in the future will help reduce conflicts. Our only fear at this time is that the displaced people may not be resettled in time to begin preparing their land in readiness for the planting season which starts this month. The violence started just when most of the farmers were harvesting their crops. A lot of stored food was also destroyed since most the victims abandoned it as they fled their homes in fear of attacks. It is sad to imagine that farmers who were just preparing to harvest or sell their farm produce are are now threatened with famine. Our political leaders should resolve the post-election conflict so that farmers can resume their activities.

Kikuyu grass suitable for big farms

Kikuyu grass controls soil erosion and can withstand heavy grazing. But it requires intensive management.

The Organic Farmer

Kikuyu grass is common in many farming areas in the country. Most farmers rely on this grass to provide pasture for their animals. Kikuyu grass is palatable and easy to digest especially when young, a reason why animals like it (farmers are advised to feed their animals with some little hay after grazing on young kikuyu grass as it causes bloat).

The grass does well in most climatic zones. Although it tolerates low fertility soils, it tends to grow better in fertile soils. However, overgrazing and poor management of this grass is evident in many farms. For good establishment as a pasture, Kikuyu grass requires intensive management. Unless by using specialised harvesters, it is difficult to harvest its seed for planting because its flowering stems are very short. Farmers are advised to use cuttings when they want to plant the grass.

Research shows that dry matter and crude protein content in kikuyu grass is higher than that of Boma Rhodes grass especially when the grass is eight weeks old. The grass is also an excellent source of riboflavin and provitamins in the animal diet. It helps to control soil erosion and can withstand heavy grazing. It can grow naturally even with little mineral supplementation.

Kikuyu grass (Whittet), this is an improved variety popular with many farmers. (TOF)

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org,
website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Advisory Board Bernhard Loehr, icipe, Nguya Maniania, icipe, Fritz Schulthess, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, Deputy Director, KARI

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

Layout In-A-Vision Systems, 0720 419 584

The right size is important

Well managed Kikuyu grass can produce very good pasture for farmers. Many farmers make the mistake of grazing their animals on kikuyu grass before it has attained the right size. Pasture specialists recommend grazing when the grass has grown to an average of 4 to 5 leaves. Experienced dairy farmers in developed countries have been able to raise dry matter production of between 16 and 24 tonnes per hectare, especially when improved Kikuyu grass (whittet) is grown with other grasses such as rye grass. However under the local production systems where the land sizes are small, it is difficult to obtain this yield. Production of Kikuyu grass is more successful in commercial large-scale dairy farming systems where land is not a limitation.

There are three major Kikuyu grass varieties in Kenya– Rongai, Molo, Kabete, Whittet and Breakwell:

Rongai: The variety has rough, broad leaves and thick stems which develop rapidly after cutting.

Molo: A finer grass with narrow leaves and more slender stems which produce shoots from the centre after cutting. Its pollen is sterile.

Kabete: This is a medium size variety that has longer stamen that produces pollen.

Whittet: This is a taller and rougher variety. It has more broad leaves than the Kabete variety. It survives better than other varieties under less fertile conditions. The variety is becoming popular with local farmers as it produces more pasture compared to the other varieties.

Kikuyu grass needs management

Kikuyu grass does well under the following conditions:

Rainfall requirements: In its natural habitat the grass requires 1000-1600 mm of rainfall either falling in one season or two seasons.

Soil requirements: Kikuyu grass grows naturally in soils with good fertility, but it also adapts well to other soils such as alluvial or moist sandy soils which are fertilised with farmyard manure or even mineral fertilizers.

Land preparation: A well-prepared seed-bed is necessary for good establishment where seeds are used. For stem and root cuttings, a rougher seed-bed is necessary.

Sowing: Hand planting of vegetative stem and root cuttings is recommended. Cuttings containing two or three nodes planted at a spacing of 1 m are planted. When using seed, sowing at approximately 5 mm depth is ideal. The whittet variety can germinate at a depth of 6 cm. ■

Fodder grasses

With this article, we close our series on fodder grasses. The series featured the following fodder grasses: December 2007: Napier grass, January 2008: Boma Rhodes grass, February 2008: Lucerne, March 2008: Kikuyu grass.

Know about mastitis and how to control it

Farmers should observe cleanliness while milking to prevent their cows from getting infected with mastitis.

William Ayako

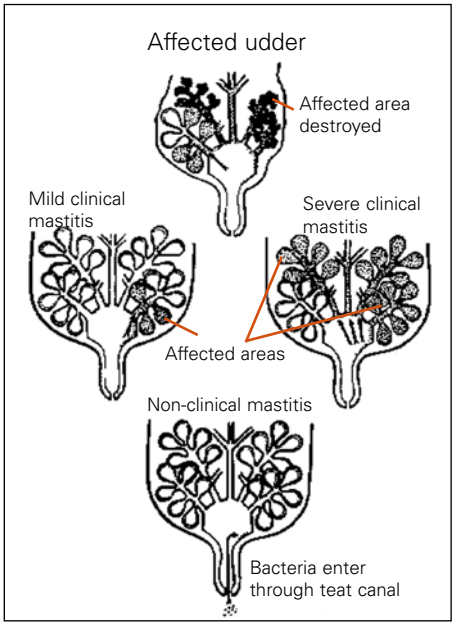
Despite the progress that has been made in the Kenya's dairy industry, mastitis remains one of the diseases of economic consequences to the Kenyan dairy farmer. Mastitis is an inflammation of udder caused by bacterial micro-organisms mainly of the streptococci and the staphylococci family, which are common in animals and their environment. The infection occurs when the micro-organisms gain access to the udder through the teat canal. The infections in the udder affect the quantity and quality of the secreted milk. The disease is known to cause economic losses of up to 40 % of the herd's productivity. The disease occurs wherever dairy cows are bred, fed and managed for milk production. There are high chances of the occurrence of the disease, unless very strict control measures are continuously put in place. The animal is predisposed to the disease by several factors such as age, state of lactation, milk yield, hereditary factors, trauma and lack of hygiene.

Clinical signs of mastitis

There are 3 clinical forms of mastitis:
Sub-clinical mastitis: This type can only be detected by a laboratory examination of milk drawn from the udder of an infected cow. This form of mastitis is mainly caused by *streptococcus agalactiae* which is found in the animal. Where production of milk is meant for export market, this form of mastitis is known to contribute to a bigger proportion of rejected milk.

Mild-clinical mastitis: In this form of mastitis the animal shows distinct changes in the udder, sometimes detectable by palpation. The udder becomes firm to the touch in one or more quarters. The changes in milk are, however more definite. This form of mastitis can be examined using the black plate in the strip-cup. Milk can be seen to be of watery consistency and of abnormal colour, which often could be pinkish, or yellowish due to blood staining. Flakes or clots in milk can be noticed by the strip- cup test.

Acute or severe clinical mastitis: The milk changes are more definite with the udder having typical inflamed signs. Such changes consist of yellow sediments at times with blood clots. The milk may also appear green or yellow-green and even with a foul smell especially when the infection is caused by the *Corynebacterium pyogenes* (pus forming bacteria). The udder is swollen and painful to touch. At a closer observation, the teats may reveal signs of injury. As the disease progresses, the udder becomes hard, the milk yield decreases and also becomes thin, watery or grey in color.



Diagnostic kits

Since the dairy industry is showing a steady growth going by the numbers of the revived Kenya Cooperative Creameries (KCC) factory and processing plants, better milk price (Ksh 18-20 / kg) and increased local and international demand for milk (EAC, COMESA and the Middle East countries), farmers are advised to carry out regular milk sampling for bacteriological and chemical analysis in well-equipped laboratories to guarantee quality and ensure safety. These analyses can be done by the Depart-

Continued on page 6

Measures farmers can take to control mastitis

Since mastitis is a management disease in a dairy farm, the disease can persist even with utmost hygiene in the farm. With this in mind, dairy farmers are advised to adhere to the following seven control measures.
1. Infected cows should be milked last.
2. Milkers should thoroughly wash their hands before and after milking each cow.
3. Hot water mixed with a dairy disinfectant should always be available in the dairy.
4. A separate clean udder cloth or a disposable tissue paper should be at hand for cleaning of the udder.
5. First streams of milk from each quarter of the udder used to test for mastitis should not be dropped on the floor but should be directed into a separate container with a dairy disinfectant.

A veteranarian attends an infected teat of a cow.

6. Where machine milking is practiced, footbath with disinfectant should always be provided.
7. Normal milk room hygiene including washing of containers and equipment should be continuous.
8. Always change cow beddings to keep the udder clean.

It is worthwhile for farmers to note that the most essential prerequisite for developing any control program is an accurate determination of the extent of the disease in the herd. A suitable control program can be achieved if farmers carefully and frequently use the tests described above. Furthermore, if the above control measures were followed by the farmers, the veterinary costs of treating the disease would be minimized.

Plant early and increase your harvest

Farmers should start practising crop rotation and adopt sustainable methods of production to increase maize yields.

The Organic Farmer

The planting season is a very important period for the farmer; any decision made at this time shall determine the amount of harvest a farmer will get at the end of the year. Timeliness in planting is a very important aspect of farming. Any delays in planting can cause great losses in both yield and income. One of the causes of delayed planting is lack of early preparation – early planting therefore calls for proper planning. Planning involves making timely decisions on required inputs.

One problem is that popular maize seed varieties tend to be in short supply during the planting season which may force farmers to go for varieties that are not suitable for their agricultural zones. The sale of expired maize seeds is also a common malpractice in the seed market at the time of planting. Some seed stockists sell expired maize seeds! Unless stored in a cool and dry facility, maize seed exposed to sunlight for a long period becomes weak and cannot grow well. This can be avoided if farmers are able to plan and buy seeds early enough.

The first rains often start in mid-March, at this time farmers should be ready for planting. Any delay in planting will lead to reduced yields. Maize planted after the onset of the rains cannot germinate well because the soil temperatures tend to go down as the rainfall increases. Dry planting (planting when the rains have not started) is especially advisable because germination tends to be vigorous. Researchers have proved that a farmer loses an average of 2 ½ bags of maize per acre every week if they plant after the rains have started. Maize planted early also benefits from nitrogen flash- this is a process where the new maize plants are able to utilise nitrogen in the soil before it is lost through leaching when the rains come. Farmers should also observe the following guidelines to increase their maize yield.

Land preparation

Hand digging is particularly recommended in small-holder farms because it does not disturb the soil much. Tractor ploughing compacts the soil, reducing air circulation and killing important soil organisms that help promote plant growth.

Seeds

Some farmers use farm stored maize as seed, but this is wrong because hybrid seed cannot be re-planted; for hybrid seed, the farmer has to buy new seeds every year.

Spacing

Most farmers plant their maize very closely in the belief that when the maize is crowded, the yield will be higher. When the plants are crowded, growth is poor because the seedlings compete for sunlight, water and nutrients thus becoming weak. The correct spacing should be 60 cm (2 ft) between one hole and the next. Spacing between rows should be 75 cm (2 ½ ft). It is important to plant only two seeds per hole. ■

Reduce use of chemical fertilizers

One the biggest problems facing farmers in the country is the declining soil fertility. Maize as a crop is a heavy feeder; it takes away a lot of minerals and nutrients from the soil.

Farmers who have planted maize in the same field for the last 20 or more years is a common occurrence these days. To increase their yields therefore, they are forced to use more fertilizer. As they use more fertilizers, soil acidity increases. The eventual result of this practice is that whatever amount of fertilizer or seed variety the farmer may use, the yield cannot increase. The use of chemical fertilizers such as DAP is to blame for this problem. Too much acid causes available nutrients to dissolve too fast while too little acid may reduce nutrient intake by plants.

The amount of acidity is measured on a mathematical scale called pH. The highest acidity level in soil has a pH of 1. The highest alkaline level in the soil has a pH of 14. At pH 7, the soil is said to be neutral. Most healthy soils have a pH of between 5.5 and 7.5. A good uptake of minerals and other essential nutrients can only take place within this neutral range of acidity and alkalinity. Any serious farmer should be able to know the pH level of their soil before planting any crop; to know the state of their soils, farmers can take several soil samples from different parts of the farm and have the soil tested at an agricultural research station near them. Some agricultural extension personnel have access to pH metres which can test the soil and give instant results.

Another way in which farmers can improve the condition of their soils, is by ensuring continuous use of organic manures. Every year, the farmer should incorporate crop residue back into the soil instead of burning it as is the practise with most farmers. Soil fertility can be replenished by application of well-composited farmyard manure at the rate of 4 tonnes per acre (8 tonnes/ha). Planting a different crop in the same field every year will not only reduce the problem of pests and diseases but will also help build soil fertility and increase your maize yield in subsequent years. (TOF)

Conservation agriculture protects the soil

Farmers have concentrated more on food production and forgotten to take care of the soils. Minimum tillage restores soil fertility.

The Organic Farmer

Farming as practiced by many local farmers is very destructive to the soils. Farmers rarely use sustainable methods of soil cultivation that can protect its structure and fertility. If they cared to look after the soils, they would not only be able to increase production but also they would improve on their income. Rapid population growth has forced many farmers to over-cultivate land. They have consequently abandoned traditional methods of land cultivation that helped to protect the soil. Careful soil cultivation can improve its capacity to retain water, allow movement of air (aeration), infiltration, warming up and even minimize evaporation.

Soil over-cultivation can harm soil fertility as it accelerates soil erosion and the decomposition of humus. Any soil cultivation activity has one or more destructive effect on the soil structure. In Africa and other tropical countries, regular ploughing has accelerated the decomposition of organic matter which has led to tremendous nutrient loss. The mixing of soil layers through tractor ploughing can severely harm some soil organisms. After ploughing, uncovered soil is prone to erosion when it rains heavily.

It can save costs

Minimum tillage systems help to build up natural soil structures with a crumbly top soil rich in organic matter and full of soil organisms. Nutrient losses are reduced to a minimum as there is no sudden decomposition of organic matter. If the soil is not disturbed much, nutrients in the soil are retained by a dense network of plant roots. In such a case soil erosion cannot be a problem because there is a permanent plant cover and enough organic matter. In addition to this the farmer also saves on labour costs which they cannot afford.

Maintain the soil structure

Conservation agriculture (or minimum tillage) has three basic principles: Maintaining the soil structure through minimum tillage (land preparation), keeping the soil covered as much as possible and practising crop rotation. The main aim of encouraging conservation agriculture is to ensure that the farmer gets a high crop yield while at the same time maintaining soil fertility and also conserving water.

Do not disturb the soil too much...

... do not burn plant residue. (Photos TOF)

In conventional farming, farmers plough or use hoes to improve the soil structure and control weeds. By ploughing, they actually destroy the soil structure and contribute to soil infertility. In conservation agriculture, ripping the soil to make planting lines is practiced. Ripping helps break the hard pan which forms on the top soil when the soil is compacted. Alternatively, holes are dug into the soils and the seeds planted. The idea is to plant directly into the soil without ploughing it.

Provide soil cover

In conventional farming, farmers remove or burn the crop residues such as maize stocks and bean residue or incorporate them into the soil with a plough or a hoe leaving the soil bare. When it rains therefore, all the top soil is washed away by rain or blown away by wind during the dry season. Farmers who practise conservation agriculture leave crop residue in the field. The residue is used for mulching to cover the soil to prevent soil and wind erosion. Farmers who practice conservation agriculture also plant cover crops to protect the soil from erosion and limit the growth of weeds throughout the year.

Practise crop rotation

In conventional farming, the same crop is sometimes planted each season on the same piece of land. This practice allows certain pests, diseases and weeds to survive and multiply, resulting in lower crop yields. In conservation agriculture, farmers choose various crops that are planted in the same field but rotated from season to season, a practice that helps maintain soil fertility.

To gain the full benefits of conservation agriculture, the three principles discussed here above have to be applied at the same time. Practising conservation agriculture can be a challenge for a farmer who is not used to it, but it is important to change the way farmers have practised farming before in order to increase their yields and income. For example, many farmers are used to clearing their land of all the residue and leaving it "clean" but they do not know that they are denying their soil essential organic matter that can help enrich it.

By switching to conservation farming, farmers may save on labour, reduce costs, improve their soils' fertility and ability to hold water. Minimum tillage can enable them get higher crop yields and income. The time and resources saved by adopting this sustainable farming method can be used to cultivate more land or even start other enterprises to diversify their sources of income. ■

Tips on minimum tillage

- If there are crop residues near your shamba, carry them to your field and spread them on the soil surface as mulch.
- Plant a cover crop during the first season. Choose a cover crop such as lablab which has deep roots to improve soil fertility and structure. A cover crop can be grown on a separate field then cut and spread on the soil at the beginning of the second season.

The cover crop can give you seeds for your future use and can also be sold to your neighbours. At harvest, leave the crop residue in the field to cover the soil during the dry season; this helps retain soil moisture.

>>> from page 3: control mastitis

ment of Veterinary services in the Veterinary Investigation Laboratories (VIL) of the Ministry of Livestock and Fisheries Development.

In cases where highly sophisticated testing equipment and techniques are not available, the use of a strip-cup when milking is strongly recommended as a means of giving a first indication of the presence of mastitis in the herd. A strip-cup is cup-shaped metal container of a quarter – litre capacity with a ledge about 3 cm down from the rim on which a disc of fine gauze or shiny black top plate sits. The gauze allows milk to pass through but flakes and clots are held while the black plate shows discolorations as well as other abnormalities in milk. ■


A strip-cup

Food prices increasing worldwide

As global food prices continue to soar to new highs despite a record world harvest last season, governments in poor countries have begun exploring export bans, subsidies and price controls, among other measures to help the poor cope.

High food prices have been triggered by various factors, including dwindling stocks and a continuing strong demand for cereals, according to the latest Crop Prospects and Food Situation report by the Food and Agriculture Organisation (FAO). International wheat prices in January 2008 were 83 percent higher than a year earlier, said Liliana Balbi, senior economist at FAO.

According to the FAO, there a several factors behind the crisis: More intense weather events as result of climate change, the global economic crisis, fuel prices and the pressures brought on by biofuel. This is fuel produced from sugarcane, maize, wheat and a variety of other crops.

Example of Swaziland

Forty percent of the population of Swaziland is in acute danger of starvation. A long dry period has led to one of the poorest maize harvests ever. At the same time, the Government of Swaziland has decided to make land available to a private enterprise to cultivate cassava for biofuel production. This example clearly illustrates the dilemma faced by many developing countries in their struggle to achieve food security for their populations. (FAO)

farmers forum

Resolve the land issue immediately

The problem of land is at the heart of current unrest in parts of the country. Despite the efforts by successive governments to sweep the matter under the carpet, it keeps recurring every time we have elections. Since independence, successive governments have not solved the problem of landlessness. They wish it would just go away. The Kenyatta and Moi regimes did little to resolve the problem; during their time in power, land was dished out to favoured groups which supported their stay in power. Thousands of Kenyans remain landless with no hope of ever owning a small parcel of land they can call their own; at the same time, well-connected people who walked the corridors of power now own thousands of acres which lie unused. Nobody talks about these issues; instead people's anger is being directed at fellow poor people who happen to come from particular communities. Killing our fellow poor Kenyans and burning their houses will not solve the problem. It is time all of us came together to explore the root cause of the problems we face. We cannot do this when we are fighting.

Mike Kibowen, Moiben

We are all Kenyans

I feel very sorry for fellow Kenyans who have been declared "foreigners" and thrown out of their land. Some of the victims of the current violence are the second generation of land owners who were born in those areas; they even talk the local language and do not even know the so called ancenstral lands. After 40 years of independence, why should we call fellow Kenyans "foreigners' in their own country? I think something must be very wrong with our society. We badly need to re-examine ourselves and stop the country from self-destruction.

George Kegoro, Nyamira

Consider my request

I wish to apply for the magazine because I am very much interested in organic farming. I am a small-scale farmer in Nakuru district. I will appreciate if you consider me.

Z. Maina, P.O Box 3863, Nakuru

Magazine for training

I am an agricultural extension worker. I have read a number of TOF magazines and found them very useful in my work with farmers. I am kindly requesting you to be sending a copy every month.

Cheruiyot K S., P.O Box 1236, Kitale

Share the knowledge

First I want to commend you an excellent magazine. I happened to have received your Nr. 20 2007 copy through the Diocese of Nakuru. I have a group of 20 farmers promoting the upgrading of dairy cows and your magazine will assist us in sharing ideas with other farmers. *M. K Yego, P.O Box 2 - 20209, Fort Ternan*

No chemical pesticides

The information I have received have made it possible for me to eliminate synthetic pesticides completely. I am now in the process of producing good quality compost to enrich the soil and avoid synthetic fertilizers by the end of March this year. I would be glad to receive a copy of plant extracts special. This will serve as a plant extract production manual for the various pest and diseases encountered on the farm. I never thought synthetic pesticides could be avoided.


Chemicals are harmful to humans and the environment. (TOF)

J. Mithamo P.O. Box 901 Kerugoya

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

The best way to plant tomatoes

What are the right measurements for planting tomatoes? Carl J. Michael, Kapenguria.

The right spacing for planting tomatoes depends on the type of tomatoes being grown. There are three types of tomatoes, determinate, semi-determinate and indeterminate.

Determinate varieties

This type of plants grow to about 3 feet high and produce medium size fruit. They are easy to manage and thus can be grown slightly closer together. They are still best staked (mostly salad types) to avoid touching the ground and also to allow good aeration. These can be spaced at 2.5 feet. The fruits on determinate plants all ripen around the same time. In this category we also have the cal J types that are more hardy and do not require staking. These tomatoes are mainly for processing and grow best on a bedding of dry mulching. They usually do better with wider transplant spacing, of approximately 3 feet.

Indeterminate types

If tomatoes are of the indeterminate type, they will continue to grow up to a height of more than 7 feet. This type needs to be supported and grown on stakes or up vines, strings or fences. They are also quite difficult to desucker. The best way to grow them is to form a structure and frame using poles above the plants. As the plants grow, you should support them with strings. The harvest of fruits should be from the lower trusses first as indeterminate tomatoes ripen up the plant stem at different stages. As this is done, the lower leaves and trusses can be removed and the supporting string lowered allowing the tomato main stem to form a coil on the ground. This allows you to manage your plants without having to try harvesting them on a ladder. Due to the vigorous growth of this type of tomatoes, it is advisable that they have good, wide spacing. Spacing of 3.5 feet is suitable. This spacing also

allows for better aeration and less humidity build up, which discourage pest and fungal diseases.

Semi-determinate varieties.

As the name implies, these varieties are taller than the determinate type and not as tall as the indeterminate variety. Their spacing is best done at around 3 feet.

It is important to remember that tomatoes are very fragile and extremely difficult to grow organically. Thus, all precautions necessary must be taken to avoid loss of crop. Spacing at transplant is very important. Know your variety well before planting.

In my experience, some of the hardiest tomatoes are the little cherry variety that grows wild around most homesteads. These plants seem to be fairly resistant to many problems that affect our hybrids.

In my recent visit to Switzerland, I was very impressed to see extremely successful tomatoes being grown in a green house half way up the mountains! It apparently became clear that the differences between the very cold winter and warm summer allow for the total eradication of pests and disease. They cannot affect consequent plantings. We in Africa do not have such big weather differences. Here, pest and disease cycles are continuous in many areas. **Su Kahumbu**

Tamarillo What is the right spacing, economic span and productivity per tree of tree tomato or tamarillo? Anne, Nanyuki, 0725 210'160

It depends on soil fertility and the location of your farm. The trees are planted 2.5-3 m apart in paired rows 2.5 m apart with 4.25 m between each pair. If the soil is very rich, a spacing of 2.75 m is allowed between the rows and 5 m between the pairs. Closer planting is recommended in windy, unprotected locations, for instance 1.5-1.8 m between the plants and 2.5-3 m between the rows. The trees may be staked to prevent swaying and disturbing the roots.

The tree usually begins to bear fruits when 1 ½ to 2 years old and continues to be productive for 5 to 6 years. If it is adequately nourished, it may keep on fruiting for 11 to 12 years. On average, each tree is expected to yield 15-20 of fruit annually. **TOF**

Credit I was once a poultry farmer and I still maintain a 50ft by 20ft and well-cemented timber house. How can I get credit and start afresh? Francis M K., Nyeri, Tel. 0720 100 447

We are getting so many questions from farmers in need of credit. Some even apply to us directly. We do understand this quest for finances since we know that many farmers would like to improve their livelihood. That is the reason why we publish this magazine to help farmers improve. We are a small organisation with no resources to offer any form of credit. We know that there are many SACCOs and micro-credit-organizations all over the country that can offer credit. If you get the loan, ensure that you repay it in order to be considered for loans in future. **TOF**

Trees We have a tree planting project in Turi and would like to do organic farming. Do you organize seminars? Mary Tel. 0721 985324

No Mary, we do not organize seminars. The only way we can assist you is to give you the addresses of institutions where you can get training in organic farming and tree planting.

- Baraka Agricultural College P.O. Box 52, Molo, Tel. 051 721 091, 0725 777 421 e-mail: baraka@sustainableag.org
- The Kenya Institute of Organic Farming, P.O. Box 34972-00100, Nairobi, Tel.067 524 66/ 25009, Tel.0733 799 072 , 0733 817 240.

It would also be useful to get in contact The World Agro-Forestry Centre P.O.Box 30677-00100, Nairobi, Kenya, Tel. 020 722 4000 e-mail: relma@cgir.org **TOF**

tips and bits

from farmers for farmers

Cowpeas: good food and fodder

Research done in South Africa established the importance of cowpeas as a high value fodder for animals.

The Organic Farmer

Our magazine has often highlighted cowpeas as important legumes for improving soil quality. All farmers know that cowpeas is nutritious food for people. But they are not well-known as fodder for animals; that's why a farmer asked us this question: "Can I use cowpeas to feed my animals?" Yes, indeed he can; in the South-African farmers' magazine, the Farmers Weekly, we found an interesting article about cowpeas. It shows that cowpeas are one of the fodder crops with a high nutritional value for animals.

A flowering cowpeas plant

The sheep gained weight

According to a research conducted by the Department of Agriculture at Kwa Zulu Natal region (South Africa), about 200 Merino sheep were allowed to graze on a 15 ha cowpea field for a period of 43 days. The cowpeas produced 5.8 tons of dry matter per hectare. This study showed that cowpeas had a high energy value and it was easy for the sheep to digest. The crude protein value was especially high at a time when the plants had produced pods. The cowpeas were found to have adequate calcium and phosphorus. The leaves also exhibited high levels of iron, selenium, and vitamins A, C and E. These minerals and vitamins contributed to the high performance of the animals, thanks to coepeas.

The research further established that the dry sheep gained an average of 115.8 g per day over the period of 43 days. Lambs grew at an average rate of 278.9g per day for the entire duration of the experiment. Although they were lactating (suckling the young ones), the ewes (female sheep) managed to gain weight at the rate of 36.6 g per day, which positively contributed to their health. These figures are an indication of the advantages of using cowpeas as fodder.

Cowpeas are a well-adapted and reliable fodder crop in Southern Africa as well as in Kenya. They do well in areas with a marginal rainfall (200-400mm) because they can tolerate a dry climate and are suitable for a variety of inter-cropping systems since they are nitrogen fixing, thus improving soil quality.

Cowpeas grow on a wide range of soils and are well-adapted to light. Well-drained sandy soils are ideal for growth. On heavy fertile soils, they show a vigorous vegetative growth. For them to do well, the land should be prepared early. It is advisable to plough immediately after harvesting the previous crop. Early planting is recommended preferably at the onset of the rains. Plant 2-3 seeds per hill and thin after emergence to one seedling per hole. Seedlings should be planted at a depth of between 4 and 5 cm.

Usually grown for their leaves and seeds, cowpeas are also nutritious food for people. Seeds can be cooked for soup, stew or boiled together with maize. The leaves may be crushed and fried or boiled and sometimes dried and stored.

Cowpeas varieties

Locally, there are four different varieties:

Machakos 66 (M66): M66 is a dual purpose type, reddish in colour and good for intercropping. It is suitable for higher altitudes of between 1200-1500 metres above sea level. It gives a yield of 5-7 bags of seed an acre.

Katumani 80 (K80): K80 is a dual purpose variety which is erect, improved and good for intercropping. It is recommended for drier areas below 1500 metres above sea level. It produces 5-7 bags an acre.

KVU 419: This variety has smaller seed than both M66 and K80 and produces more grains than leaves .It has a shorter growing period. It is recommended for planting in areas below 1200 m above sea level and receiving less than 200 mm of rainfall per season.

KVU 27-1: The variety has more vegetable than grain. It does well in the same agro-ecological zones as Machakos 66.

Farmers can buy cowpeas seeds from KARI and Kenya Seed Company. ■

Market Place

Training: Baraka Agricultural College is offering the following short courses on sustainable agriculture for interested farmers: Dairy goat keeping: April 13-19, Processing of bee products: April 20-26, ICT for rural development: May 4-10, Introduction to beekeeping: May 4-10, Poultry production: May 11-17, Sustainable agriculture: May 18- 24, Introduction to beekeeping: May 25-31, Mushroom-growing: June 8-14, Small-scale food processing: June 15-21, Bee multiplication and breeding: June 22-28. The Principal Baraka Agricultural College P.O. 52 Molo, Tel. 051 721 091, 0725 777 421. email: baraka@sustainableag.org

Training: I give training on EM technology and would like it to reach potential organic farmers in the South Rift Valley. I promote this technology in the region by demonstration, training and extension. Call Harrison K. Byegon Tel. 0722 938 423

Strawberry seeds: I would like to grow strawberry. Where can I get seeds? Wellington Njeru Tel. 0720 996 322

Breeding rabbits needed: I have more than 30 rabbits ready to be served. I am interested in buying good quality males for breeding purposes. I would prefer the following breeds: New Zealand White, California White or Flemish Giant. Please call me on Tel. 0733 719 377.

Rabbits wanted: Godfrey Gichuhi, the pioneer rabbit farmer has received export orders for rabbits from China. He would like to get in touch with all rabbit farmers in the country to buy rabbits for supply to the new market. Godfrey Gichuhi P.O. Box 137, Karatina Tel. 0720 406 195

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 35 April 2008

Doubts about feed quality

The composition of many dairy meals farmers are buying does not meet the required standards.

The Organic Farmer

In the last few months we have been getting some letters from farmers complaining about the low quality of animal feeds (dairy meal) they were buying. That 's why *TOF* decided to undertake some research of the available feeds in the market. We bought six samples of various types of feeds in different agrovet shops, from each feed we took ½ kg for analysis. We gave each sample a code number (DM 1 to DM 6) and sent them to KARI Naivasha; for each of the samples we paid Ksh 1,000 as laboratory fee. KARI Naivasha is the National Animal Husbandry Research Centre. This institution is specialized on animal nutrition and has modern facilities to test all kinds of feeds.

With this Infra-Red test machine, experts at KARI Naivasha can test feed quality.

Big differences

According to the results we got from Naivasha we have to state:

- Some samples contain too much fibre which the dairy cows are getting anyway through the fodder the farmer is provided on the farm.
- Some samples do not have the required amount of the nutrients they should have.
- Some feed manufacturers after failing to get required raw materials for feed formulation simply add normal fodder to the feed, a reason why many feeds have a high crude fibre content. This is mainly done for the feed to attain the required weight, but this is a loss to the farmer.

Planting sufficient fodder

We advise the farmers to do two things:

1. If you buy dairy meal, go to well known and reputable companies.
2. Plant as much valuable fodder for the dairy cows as possible: grass, legumes, fodder trees etc. This needs some planning, but at the end of the day, it pays off if the cows increase the milk yield. *See pages 3, 4 & 5*

Some feed manufacturers are cheating farmers with poor quality feeds. (*TOF*)

High fertilizers prices: Are there options?

The Organic Farmer

Many farmers are desperate because of the current hike in the prices of fertilizer. A 50 kg bag of DAP is now selling at Ksh 3'800 per bag, an amount most of the small-scale farmers cannot afford. In the last few weeks we have had at least 5 calls per day from farmers asking where they can get cheaper alternatives to chemical fertilizers. Some of the questions we got were: Are there organic fertilizers with the same immediate effect like DAP? Are there any other cheaper fertilizers that we can use to grow maize?

These are tricky questions. There is a fundamental difference between the conventional farming with the use of DAP for instance, and the organic way, where fertilizers such as DAP or Urea are not allowed in organic farming.

There is an organic alternative: TwinN. This is a selection of high yielding nitrogen fixing microbes for use as a soil improver in all crops. One portion of TwinN costs Ksh 3'500 and is enough for 2.5 acres (1 ha); for the same size of land a farmers needs 3 bags of chemical fertilizer. *See page 2.*

Dear farmers,

The devastating political violence in the country at the beginning of the year seems to be finally over; the situation is slowly going back to normal, after the government at last agreed to share power with the opposition. It is our hope that the two sides will keep to the agreement to enable the government to focus more on national reconstruction and development.

During the skirmishes, a lot of people were displaced, houses and business premises burnt. This violence has left the poor people even poorer. The only way they can regain their livelihoods is to get compensation or be resettled either in their original homes or elsewhere to start rebuilding their shattered lives.

Kenya has thousands of square kilometres of land owned by the rich including the past and present ruling class, most of which was illegally acquired and is still unused to date. Up to now we are yet to hear one of the big landowners say this: "Okay, as a sign of solidarity with the landless, I now donate some of my land to them", or "I will sell a part of my land to the Government at a fair price for the resettlement of the displaced." One of the issues that has fuelled the conflict in January and February is the unjust distribution of land, especially if we take into consideration the high population growth witnessed in Kenya.

Consequently thus, a total overhaul of the country's land policy cannot wait any longer, if we are to avoid future conflicts of this nature with even more disastrous consequences. On the contrary, resettling the landless in forests is no solution as this would be a step backwards. In the past, previous governments hived off huge chunks of gazetted forest land and water catchments to undeserving individuals in order to solicit for votes ahead of general elections. Consequently, trees were cut down for timber, firewood, charcoal production and the result is the bare land now used for farming.

The result now is an environmental disaster in many parts of the country. Rivers emanating from these forests have dried up are choked with silt while the rainfall patterns have changed. We can reverse this environmental decline, at least to some extent, if urgent measures were taken to reclaim the grabbed land and ensure that genuine, landless people are resettled elsewhere. It is only through proper and careful utilisation of our resources that we can reduce poverty and achieve sustainable development.

New organic soil improver

The Organic Farmer

There is a new organic soil conditioner in the market. TwinN is actually a soil improver that can be used in place of chemical nitrogen fertilizer such as CAN or Urea for top dressing of all types of crops (maize, beans, sukumawiki, cabbages, potatoes, fruit trees etc.) It is approved as organic soil conditioner by the UK-based Soil Association and by the International Federation of Organic Agriculture Movements (IFOAM). TwinN provides the crops with all their nitrogen requirements throughout the growing period when applied only once, at the usual time farmers apply CAN or Urea.

In a tiny bottle, smaller than a matchbox, are microbes; they look like little white blocks. These microbes are frozen in dry form. They come back to life, as soon they are dissolved in water, they are poured into the bigger container that holds their food. After standing for three to four hours at room temperature it can be used immediately or kept in the refrigerator for up to three months .

When sprayed, the microbes can help the plants to produce nitrogen equivalent to three bags of CAN or Urea. Not many farmers can believe this. But according to Gitau Macharia, the Managing Director of Lachlan Ltd., the company selling TwinN, the soil conditioner has been tried in more than 40,000 acres of land planted with different crops in various parts of Kenya with very good results.

Unlike chemical fertilizer, TwinN supplies nitrogen in a form that plants can easily break down and use. In normal fertilizer application, a large percentage of chemical fertilizer never ends up in the plant; this is because nitrogen fertilizers are prone to leaching or escape back into the atmosphere as nitrogen gas or nitrous oxide.

TwinN is available in packets enough to spray 1, 5 and 10 hectares and can be bought in the agrovet shops. The one for 1 hectare (2 ½ acres) costs Ksh 3'500. Interested? Contact the company Lachlan Kenya Ltd, P.O Box 494, Nairobi, 00100, Tel. 020 207 39 12/3/4 or 0722 209 474. email. Lachlan@agriculture.co.ke

In this tiny bottle, smaller than a match box are the microbes (white cubes). The bigger bottle contains the microbe food.

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org, website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Advisory Board Bernhard Loehr, icipe, Nguya Maniania, icipe, Fritz Schulthess, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, Deputy Director, KARI

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

Layout In-A-Vision Systems, 0720 419 584

Organic fertilizers can cut costs

Building soil fertility through organic farming can save farmers the extra cost of buying chemical fertilizers.

The Organic Farmer

With the current high fertilizer prices, farmers who took our advice and started building their soil fertility some years ago through organic farming are happy now that they do not have to buy fertilizer. Since they have used compost for several years now, they have already enriched their soils to a level that can now support the various crops they intend to grow. This is the most important quality of organic compost; unlike chemical fertilizer, compost releases essential nutrients needed by plants slowly and retains some nutrients even after feeding the plant. Chemical fertilizers on the other hand go directly into the roots of the plants without feeding the soil.

Good compost needs some work: Charles Munyari turns compost.

Some little fertilizer helps

Several times now, we have explained to farmers how to prepare good compost. The best way to make compost is to mix the manure with organic matter such as crop residue or kitchen waste. If you add some EM1, the organic matter decomposes fast, producing quality compost in a period of three weeks.

For those farmers who are still practising conventional farming, one way to cut costs is to use compost but in this case add a small amount of fertilizer over the compost heap and mix it properly. This method has a double effect: It helps to decompose the organic matter fast and second, the chemical fertilizer goes to the roots of the plant immediately, the compost releases the nutrients slowly into the soil in this way feeding the plants. Farmers can buy small quantities of chemical fertilizer – although it is not organic. ■

You need more milk? Feed the cows well!

Many farmers do not take dairy cows keeping as a serious business.They thus do not feed their animals well.

The Organic Farmer

A short while ago, farmer Joseph Macharia from Karatina sent us a letter. "I have a Friesian cow. I know that in Europe cows of this type produce 25 to 30 litres milk a day. I hardly get 9 litres of milk from my cow. What is wrong with my cow?" he asks.

We would say that there is nothing wrong with Macharia's cow. Like many other farmers in the country, Macharia does not feed his animal well. In other words, the cow is not well-nourished to be able to produce an appropriate amount of milk. "Proper feeding of dairy cows is the greatest challenge facing most of the small-scale farmers in Kenya today. They do not know what it takes to maintain a dairy cow so that it gives the desired quantity of milk", says Dr. John Kariuki, an animal nutritionist and the Centre Director at the National Animal Husbandry Research Centre, KARI Naivasha. Dr. Kariuki says that most farmers do not feed enough fodder to the animals, and if they do, it is often not of the right quality.

Feed requirements

An experienced farmer ensures that their animals have the right feed and in the right proportion. A balanced diet will keep an animal healthy and productive. There is a direct link between the quantity and composition of the feed and the health status of the animals. And there is a direct link between proper feeding and milk production. A cow without good and balanced fodder will never give the farmer a good milk yield. It is important that dairy cows get suitable feed in sufficient quantities.

Fresh grass is good for cows

A dairy cow requires a basic diet. Basic diet consists of pasture grasses and fodder (see box on page 5). A mature Friesean cow weighing about 450 kg will consume about 80 to 100 kg of fresh green roughage a day. The fodder contains roughage which provides the animal with its daily energy requirements for body maintenance, milk production, growth, weight gain and reproduction. An animal can get extra energy sources from mollases, maize and wheat germ.

Protein in feeds

In addition to this, a dairy animal requires adequate protein in the diet to help microorganisms in the rumen (stomach) to convert the roughage into nutrients. Dr. Kariuki says protein deficiency in the animal diet is a big problem among small-scale farmers. "We are always trying to train them to ensure that they supplement the forage diet with legumes which are a good source of proteins," he says. Lack of protein in the animal diet results in poor growth, reduced milk production, loss of weight and late maturity.

Good protein sources include legumes such as Lucerne, white clover, and bean straw. Fodder trees such as calliandra, sesbania and leucaenia are good source of protein for animals. Farmers should dry calliandra before feeding the animals as it causes the milk to smell when given fresh to the animals. Research has shown that 3 kg of tree fodder and other legumes such as sweet potato vines give the same milk yield as 1 kg of dairy meal. A cow should also be provided with mineral licks. Some of the minerals present in the licks are calcium and phosphorus which are very important to animals when given in the right proportion. Pregnant cows especially require adequate amounts minerals to help in bone and tissue development of the calf. Never give cows the ordinary table salt as it has none of these minerals! Dr. Kariuki says that more than 80% of locally made mineral licks are of poor quality. Farmers have to be careful when purchasing these licks.

Filling the cow's stomach

For dairy cows, goats or sheep, roughage forms the bulk component of the animals daily ration. The expected daily consumption of roughage will depend on the quality of the roughage, the size of the animal , level of milk production , quantity of supplements given and dry matter content of the feed material. The cow needs enough basic diet (rhoughage) to fill the stomach. Dr. Kariuki says that

Continued on page 4

Total mixed rations (TMR) for a dairy cow.

Milk yield target (kg)	Live body weight (kg)	Maize silage (kg)	Lucerne Hay (kg)	Napier Fresh (Kg)	Rhodes Grass (kg)	Concentrates (kg)	Total Dry Matter Intake(kg)	Forage Concentrate Ratio (Kg)	Calculated Cost per kg of milk
30-35	600	14	3	3	2	15.2	21.3	1: 1.5	8
20-25	550	14	3	3	2	10.4	16.8	1: 1.1	15.9
10-15	550	16	-	4	6	6	15.6	1: 1.5	15.9

- For every 5 kg of milk produced above the target, add 0.5 of each individual ingredient.
- Production system is semi-intensive. (Source: KARI, Naivasha).

> > > from page 3: feed the cows

supplementary feeds such as concentrates cannot replace basic diet.

In the dry season most of the cows do not get enough fodder. Many small-scale farmers try to balance the deficit by feeding the animal with more dairy meal. Farmers become disappointed if the milk production does not increase. Most of them blame the animal feed companies for producing poor quality feed – or their cows. "What they do not take into consideration is the fact that without a properly filled stomach, even the correct portion of the best quality dairy meal cannot help the animal increase milk production", says Dr. Kariuki. When not given sufficient basic fodder, the cow uses the dairy meal to maintain its body and cannot increase milk production. Very often, the farmers feed their animals with whatever feed they can get, even rotten maize. Feeding rotten maize to animals is dangerous as such maize contains aflatoxins. The aflatoxin ends up in the milk which is dangerous for the cows as well as for people who finally consume the milk. ■

Well kept animals are healthier

Disease causing germs and parasites are present almost everywhere. Animals have an immune system which is usually able to cope with these germs. The efficiency of the immune system will be disturbed if animals are not properly fed or can not practice their natural behaviour (free movement).

Organic animal husbandry puts its focus on improving the living conditions of animals and on strengthening their immune systems. Of course, if an animal gets sick it must be treated.

Prevention better than cure

Just as in plant health, organic animal husbandry puts the main emphasis on preventive measures in order to keep animals healthy, rather than on curative methods. This starts from keeping robust breeds rather than high performing but very susceptible ones. Next, the conditions in which the animals are kept should be optimal ones. Sufficient space, light and air, dry and clean bedding, frequent exercise (e.g. grazing) and proper hygiene as well as the quality and quantity of fodder is of crucial importance for the health of the animal. (*TOF*)

Good planning, more income

Keeping dairy cows is first of all a question of knowledge and planning. Any serious farmers should be able to sit down and make a business plan. They should be able to tell if the land available is big enough to keep the number of animals they wish to keep and if so, what type of fodder, legumes , or grasses can be planted. They should ask themselves the following questions:

- Do I know how much each animal will require in a day?
- Do I have enough to feed the animals during the dry season?
- How will I conserve the excess fodder during the rainy season so that I can feed it to the animals during the dry season?
- Do I have have enough money to buy concentrates, mineral licks and drugs to keep the animals healthy in order to produce adequate milk for sale?

If farmers took time to ask themselves these questions, then they can arrive at a good decision on whether or not they are able to run a dairy farm and make profit from their operations.

Water and licks

And one essential challenge they should not forget: Dairy cows need a lot of water. Water should be available all day. Farmers do not give cows enough water. An exotic cow producing 30 litres milk will have to drink at least 60 litres of water in a day. Milk production is very dependant on the amount of water drank by the animal, same with good mineral salts. In the dry season there is low mineral content in the dry grasses cows feed on. They therefore always require more salt licks in the dry season.

Dairy farming is business

Dr. John Kariuki (KARI Naivasha) regrets that most farmers do not see dairy cattle farming as a serious business. "For example, we are often surprised to see a farmer investing a lot of money in a horticulture business. If you look at the same farmer's animals, they are neglected and do not even have enough feed – even if the farmers know that they

Cows need space for movement and access to clean water (see photo below).

can make good profits from milk since the demand for milk and price are currently high and increasing," Dr. Kairuki says. Most small-scale farmers know (or have at least heard of) methods of feed conservation such as silage, hay or use of polythene cubes. KARI has a lot of useful and well-done brochures about silage or hay-production, which farmers caan buy. *The Organic Farmer* has featured articles on how to make hay and silage (*TOF* issue No. 19). But very few farmers try out these methods. "It is so frustrating to see farmers ignore useful advice that can help improve their income and standard of living." adds Dr. Kariuki.

Cows need space for movement

In organic farming feeding should be mainly based on the fodder produced on the farm itself. Furthermore, organic dairy farming management demands that the animals have sufficient freedom to move around and perform their natural behaviour. That is why landless animal husbandry, where animals do not have enough space for movement and rest, is not permitted in organic farming. To keep the cows in the boma day and night is against the nature of the animal and affects the animal's health and creates stress. We should never forget that a dairy cow is an animal with its own needs. It is not just a milk-producing machine! ■

Some feeds do not have any value for cows

After receiving many complaints from farmers about the quality of dairy meal we got curious. This curiosity generated in us some questions: Why are the farmers not happy with the feeds in the market? Are these farmers only grumblers or do they have good reason to complain? To find out, we went out and bought six samples of dairy meal from agro-veterinary shops in Nakuru, Naivasha and Thika and sent them for testing at the National Animal Husbandry Research Centre KARI, Naivasha. The results we obtained are shown on the table below. Unfortunately we cannot mention the names of the manufacturers, otherwise we will face a chain of legal suits. Farmers interested in the full information can get in touch with *TOF*. We also tested concentrates for pigs and chicken; these results shall be published in another *TOF*-issue.

The Organic Farmer

		Dry matter (%)	Crude protein (%)	Energy Kcal/kg (%)	Crude Fibre (%)
KARI-recommended standards		**90 %**	**15 – 18 %**	**12 %**	**Less than 16 %**
Prices at Agrovet shops	Sample Code				
Ksh 1'000/ 70 kg	DM1	90.96	19.42	9.6	8.39
Ksh 1'100/ 70 kg	DM2	92.52	17.37	11.1	12.77
Ksh 1'030/ 70 kg	DM3	97.05	9.25	8.5	26.14
Ksh 300/ 20 kg	DM4	95.63	4.05	5.3	29.07
Ksh 1'200/ 70 kg	DM5	94.55	11.09	14.5	7.03
Ksh 1'030/ 70 kg	DM6	96.74	11.19	10.6	16.43

These are the analysed feed samples from six feed manufacturers in Kenya. Although the prices of the different types of feeds given above is more or less the same, some of the animal feed manufacturers make very poor quality feed. The crude fibre content in DM3 and DM4 is too high and does not add any nutritional value to the concentrate since the animals already get crude fibre from the fodder provided on the farm. *Source: The Organic Farmer*

Home-made concentrates? Quite a task!

Many farmers want to know if they can make their own concentrates at home. They can, but it is a difficult task. One has to mix the different ingredients and in the right proportion; otherwise the results would be similar to those of a sick person taking various drugs without matching them properly. That means that concentrates need to have the correct mixture of the ingredients. They need to have energy-boosters, protein, the right balance between calcium and phosphorus etc. It should be done under the supervision of an extension officer or at least an experienced farmer. Never use rotten materials such as maize (maozo) or affected wheat as both contain aflatoxins.

In every case it is advisable to have the concentrate tested. KARI Naivasha has modern testing equipment. It takes 24 hours to analyse one sample and it costs Ksh 1,000 per sample. When you send a sample to KARI, ensure that it is a well-mixed sample, around a 1/2 kg. *Send to: KARI Naivasha, P.O.Box 25, Tel 050 504 82; Cell 0722 336 589*.

No authority to regulate feed manufacture

The increase in demand for milk has encouraged many farmers to engage in dairy farming. Consequently many local companies have ventured into the animal feed manufacturing business to cash in on the increasing demand for animal feeds. The sourcing of raw materials for the manufacturing of animal feed coupled with lack of experience in animal feed formulation is a big challenge to the new feed manufacturers. Lack of a regulatory authority to control the quality of these feeds is however the major problem.

The Kenya Bureau of Standards (Kebs) has not set standards that animal feed manufacturers can follow. A bill to regulate the industry is however in the pipeline. Farmers in doubt about the quality of feeds that they regularly use are advised to test the feeds from time to time at KARI, Naivasha.

Feeding cows is not a Sunday's walk

It should be the target of each farmer to produce as much fresh fodder of high quality as possible on their own shamba. Cows need not only a full stomach, they grow healthier if they are fed on a variety of foods. Before stocking, a farmer has to remember that the economic benefits shall be more if they only kept the number of animals that they can feed well. It is not only the amount of feed that matters, but also the quality of the available feed must be taken into consideration. – If concentrates or supplements are used, they should not contain growth promoters (for instance hormones) and other synthetic substances.

Roughage

The majority of the fodder should consist of roughages:

Pasture: Grasses (kikuyu, Rhodes, star grass)
Fodders: Napier, green maize, sorghum, sweet potato vines, sesbania, callliandra, leucaena
Legumes: Lucerne, desmodium,
Hays: Rhodes, lucerne
Silage: Napier, maize, sorghum,
Straws: Wheat
Stalks: Maize, sorghum ■

A hanging garden

It is simple and labour free and attractive to the eyes. Portable kitchen gardens can be erected around our houses. Mobilizing local resources such as top fertile soil, manure, compost, empty sugar bags, gravel, small stones and empty Kasuku oil tins with top and bottom sides open, farmers are now able to grow vegetables, organically for their kitchen needs. Spinach, sukumawiki and tomatoes intercropped with pests repellant plants can do well using this method.

How to make it

Identify leveled sites around the house where roof water falls into the bags directly. Mix the top fertile soil well with well-prepared compost. At the centre of an open bag, place the Kasuku tin upside down with an open narrower bottom up. Fill the Kasuku tin with stones .Around the tin and inside the bag, carefully fill the mixed soil to the height of the tin. Slowly and gently pull up the tin to the level of the soil in the bag. Fill the tin with stones and repeat the same with soil. The upright standing bag is now full to the top. Pour water gently on the stones and soil is made wet from top to the bottom. Using a sharpened stick the size of your thumb, pierce well-spaced holes all round the bag from top to bottom. Into these holes, gently plant your vegetables and add water. A three to six month's sustainable kitchen garden is ready. It requires less water, no cultivation and no labour. To scare birds and chicken from eating leaves and fruits; slurry from cows, goats and sheep can be applied on the open top of the bag and outside.

J. G.Njoroge, 3N Africa, Sabasaba

farmers forum

I want to train farmers in organic farming

I work with the Ministry of Agriculture in Nandi district. I have great interest in organic farming. I practice it on a very low level on my kitchen garden and try to educate fellow women to try it on their gardens. We have a farm that we want to convert to organic farming in order to create awareness to the surrounding community, through training, visits and demonstrations. I am writing to ask for more information on how I can go about setting it up and the requirements. I would also like to know if you offer any kind of financial support. I can get someone to train farmers and occasionally supervise the work. He has done a course on organic farming.

Eliseba Lelei, P.O Box 180, Kapsabet

You have a good idea aimed at helping farmers, however the only way we can assist you is to provide you with additional information to educate them on organic farming. We are a small organisation with limited resources, we are therefore unable to offer any kind of financial support to farmers' groups.

We can share experience

We acknowledge the receipt of 30 copies of *TOF* magazine for the month of January. We are grateful that you honoured our request in December 2007 to have some more copies. We have already distributed all the copies to farmers and they are pleased by the amazing farmer innovations and experiences in the field of organic farming. You will be receiving our Mbeere experience on dry land farming.

Peter Mbogo, P.O Box 202, KADI Embu Tel.

TOF good for my school

I am an agricultural teacher in St. Mukasa school. I have been reading *The Organic Farmer* magazine from a friend and have found it very useful for teaching agriculture in school. Please if possible, send us some copies. They will assist our students to improve in agriculture.

C. W. Wamalwa, P.O Box 1123, Webuye

Saving on input costs

We have found your organic magazine very beneficial. Most farmers who read *TOF* spend less in input costs in farming. To reach more farmers, we have decided to introduce one more information desk in our division. We therefore request for more copies.

John Sprite, Nyasi Unit, P.O Box 1781, Kitale

We require past issues

I would like a copy of the plant extracts special and all the past issues. I sincerely like to thank you in for supplying me regularly. I hope you will continue sending the magazines.

Mafuta Farm, P.O Box 79, Moiben

I need to learn more

I write to sincerely thank you for putting me on the mailing list of farmers who receive the *TOF* magazine. I am happy to inform you that I am now more knowledgeable than I was before reading the magazine. The magazine is indeed a blessing to farmers. If it is possible, please send me special issues on the following: Pests, diseases and deficiencies in plants, plant extracts, ecological methods for the control of pests and parasite infestations of plants, humans and animals. I would also like to know the full address of KIOF.

William Tiyoy, P.O Box 2540, Kitale

Write to KIOF P.O. Box 34972, 00100 Nairobi Tel.0733 799 072

More on poultry keeping

Thank you for the good work you are doing. Actually, the magazine has taught me a lot. I came across a copy of September 2007 from a distant friend and just wish that you include me in the mailing list. I would be very grateful if you consider me as I want to start poultry keeping and zero grazing. Inform me on how to construct the poultry house of 100 chicken layers and the requirement.

Irungu M Murimi, P.O Box 1713, Thika

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

So many problems with tomatoes!

Rain. I have a problem with tomato growing here in Kenana farm, Njoro. I think that's because of heavy rains. Please assist.

Tomato plants do not like a lot of water. Once established, tomato plants can be watered twice a week and preferably at the soil level, using jerry cans or drip irrigation. Sprinklers splashing on plants also allow for the dispersal of pests and disease. Our soils also harbour soil-borne diseases that affect our tomatoes and can be spread by too much water. Tomato seedlings in particular do not like to be crowded or narrow, and suffer from dampening off which is noticeable when entire lines of seedlings start to collapse.

Check with your agronomist to ensure you have the best suited tomato variety for your area, and ensure to provide the plants with a lot of nutritious compost during the growing period.

Spider mite. Help! I am facing a spider mite problem in tomatoes. Tel.0710 671 228

For spider mite problems, a good solution is to use an organic insecticide like pyrethrum extract. Make sure you spray early in the morning or late evening to avoid killing beneficial insects. Spider mites love thick bushy humid and hot conditions. Allow for optimum aeration around your plants to avoid these conditions. Prune lower aging leaves from tomato bushes often, make sure to identify the spidermite problem early and deal with it before it becomes a bigger problem. Plant hygiene is important, mites can be spread on clothing, tools, and pets that are used on the plants or simply brush against the plants.

Bacterial wilt. I grow tomatoes in a green house and they suffer from bacterial wilt. Please help. Ogal Opiyo

Unfortunately bacterial wilt is soil borne and extremely difficult to remove. It is advisable for you to rotate the growing in your greenhouse for the next three years before returning to planting any of the same family type i.e. potato, egg plant, pepper. Bacterial wilt can be spread through infected seedlings, contaminated machinery, contaminated water sources, infested soils taken with seedlings from field to field.

To check for Bacterial wilt, slice through the stem of the plant and submerse the cut end in a glass of clear water. If you see white liquid streaming in strands into the water, then this is confirmation of infection.

Su Kahumbu

Protect your chicken against disease outbreak

How often should chicken be immunised? Tel.0728 426 351

It is difficult to recommend a fixed vaccination programme for chicken because different areas experience different levels of disease incidences. The seriousness of a particular disease and its status in an area will determine the type of vaccination programme a poultry farmer can put in place. However, we can give you information on a range of chicken diseases common in Kenya and the recommended vaccinations:

Marek: An vaccination against this disease is administered at the hatchery before you take the chicks for rearing. The vaccine is given only once.

Newcastle: The vaccination is internasal drops applied to the eyes at 2 or 3 weeks and repeated at 18 weeks and thereafter every 6 months.

Fowl typhoid: The vaccination against fowl typhoid is given at 8 weeks and later after 6 months. It administered through drinking water or an injection in the bird's muscle. One vaccination is adequate for entire life of the chickens.

Fowl pox: This is applied to the wings at 8 weeks in high risk areas (e.g. Coast Province and Kisumu) and at 18 weeks in less risky areas.

Gumboro: It is dissolved into drinking water at the 4th and 14th day. Gumboro can be repeated whenever there is a threat of re-infection. (***TOF***)

Good mushrooms (above)
False mushrooms or Coprinus (below).

Mushroom need great care to grow

I have grown mushrooms but they wither immediately after germination. What could be the problem? Tel. 0723 727 885

The problem with your mushrooms is not withering. Indeed what is growing in your substrate (growing medium) is a fungus called coprinus. It starts growing in place of mushrooms when the substrate preparation process is done in the wrong way. When making the substrate you should make sure that it is well pasteurised (well boiled) for at least 6 hours to ensure that all the bacteria are destroyed. After pasteurisation, you should drain the water to ensure that the substrate is not too wet. Ideally, the conditioning of the substrate involves draining it for a period of about 12- 24 hours in a room that is well sterilised to ensure no bacteria are reintroduced into the medium. When sure that you have done all that is required, you can then introduce the spawn. The problem with your mushrooms is that they were underpasteurised and in this conditions the mushrooms cannot grow. The fungus (see picture) takes advantage to grow when the right conditions for its growth are created.

Before going into mushroom production, it is important that farmers get training before starting, to reduce any chances of failure. It appears that most farmers have already gone into mushroom production without adequate knowledge on production, processing and even marketing. (***TOF***)

tips and bits

from farmers for farmers

Farmers depend on each other

The consequences of the recent post-election violence are already being felt in the agricultural sector throughout the country. For the first time ever, many farmers are now coming to realise the interdependency between themselves and other sectors that support agriculture. Apart from the harvest that was destroyed or stolen during the violence, many farmers lost their valuable farm machinery while others were forced to transfer theirs to areas they felt were safe or at least not hostile to them. In the wheat and barley growing areas of Molo, Nakuru and Narok thousands of acres of barley now remain unharvested because most owners of farm machinery withdrew them for security purposes.

Services interrupted

Easy access to all parts of of the country ensures that cereals and other food items move from food producing areas to those with food defiency with ease. This helps to stabilise food prices and ensure availability of a variety of food items in all parts of the country. The political violence has created so much fear and suspicion that transporters are scared of going to particular parts of the country, leading to food shortage in these areas. Notably, it is not only the machinery and transport that have been affected by the violence. Many businesses supporting the agricultural sector such as the personnel offering valuable support to farmers such as veterinary services or artificial insemination have all moved to areas they consider safe.

Food security in danger

One of the most important inputs is fertilizer. The sudden increase in fertilizer prices will also make it difficult for many farmers to afford it. With traders having taken advantage of the political violence to hike fertilizer prices, the Government should have taken measures to import the commodity in time for the planting season; but if we take into account the bureaucracy involved in the Government procurement process, this means that the earliest farmers can expect to buy fertilizer at a subsidised price from the National Cereals and Produce Board (NCPB) is late May or June 2008, which will already be too late for planting.

The general outlook in the agricultural sector for the year is not very encouraging, and there is a possibility of a looming food shortage. For farmers, the clashes should be a lesson that they need to live in harmony with their neighbours as they need each other to successfully accomplish their goals. *Steven Abongo*

GM maize already in Kenya?

There is a row on GM maize following a report on the *Sunday Nation* about genetically modified maize (GM maize). According to the newspaper, the Pioneer seed company, has been selling GM maize to local farmers without them being aware of the fact that it is GM maize. The newspaper founded its report on research done by the Biodiversity Coalition (KBioC), a body that brings together 45 farmers' groups, NGOs and civil society bodies. Their tests discovered traces of MON810, a genetically modified maize variety owned and marketed by Monsanto, and US-American biotechnology company.

A few days later, the Pioneer seed company denied the claim, saying that the alleged GM Maize had undergone trials locally and met the requirements set by the Government before they released it to the farmers. Pioneer says in the advertisements in local newspapers that the maize is bred conventionally and not genetically. At the same time Pioneer concedes that there is no agricultural material that does not contain some foreign genes in its genetic make-up. (*TOF*)

Market Place

Training: Jomo Kenyatta University of Agriculture and Technology has a training programme for farmers who want to go into mushroom growing as a business. 2008 training dates: April 16-18, May 21-23, June 18-20, July 23-25, Aug 27-29, Sept 17-19, Oct 22-24, Nov 12-14, Dec.3-5. Course charges are Ksh 10,000 per participant. Call now for booking at; JKUAT Enterprises Ltd. 067-52420. 0736-524200. 0724-256696. e-mail: md@jkuates.jkaut.ac.ke bm@jkuates.jkaut.ac.ke Ask for P.K.Muchiri.

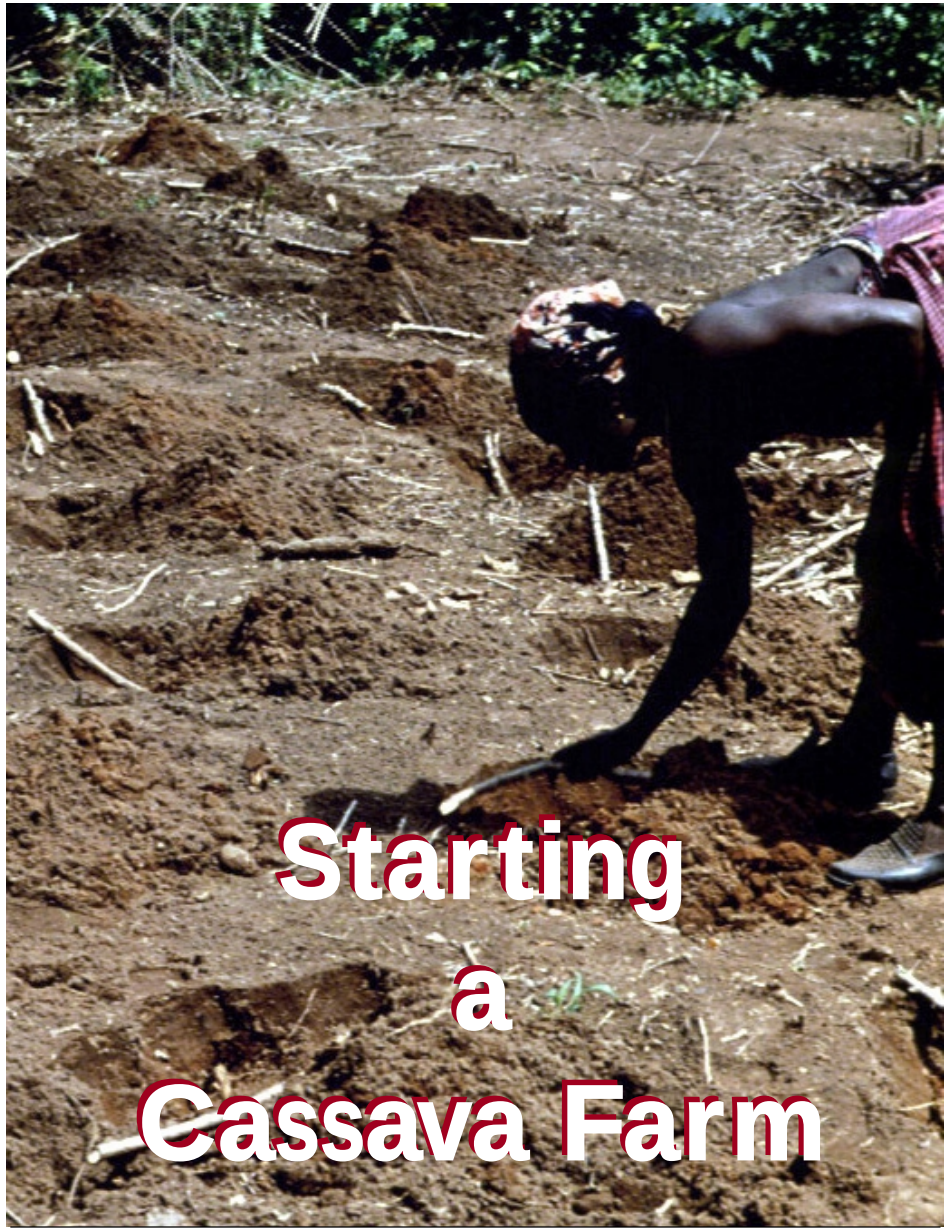
Sweet potato vines: Miritho Mirio Self-Help Group is selling sweet potatoe vine. The group has seven varieties of sweet potatoes such as orange-fleshed sweet potatoes with vitamin A from which various food products such as potato juice, baking cakes, chapati, mandazi. Other food products that can be made from these potato varieties include vegetable crisps, chips and sweet potato flour. We are selling each vine at the price of Ksh 2.Farmers interested in the vines can contact us. Call Alphaxard Kirathe Njoroge Tel. 0735 565 231.

Cocks wanted: I am an indigenous poultry farmer and would like to improve my local breed of chickens. I need a pure exotic Black Australorp and a yellow-skinned Rhode Island red cocks. Please get in touch with me if you have these breeds. Call Mbai Tel. 0724 920 184.

Amaranth for sale: I grow amaranth for grain and value addition. At the moment I have 500 kg of amaranth flour containing 6-7 % oil, 7% squalene higher than the amounts found in other vegetable oils. It has a balanced composition of carbohydrates, fats and protein and is suitable for people recovering from illness or those who are fasting. Tel. 0724 037 421.

Amaranth for sale: I have 1400 kg of amaranth grains for sale. Interested buyers can call me on Tel. 0725 292 960.

Apple mango and Rose coco beans: I would like to buy apple mango seedlings and 3 tonnes of Rose Coco beans. Sam Kinuthia Tel. 0727 000 235



Starting a Cassava Farm

**Braima James, John Yaninek, Ambe Tumanteh,
Norbert Maroya, Alfred Dixon, Rasaq Salawu, Joseph Kwarteng**

About this booklet

This booklet is one in a set of field guides prepared by the International Institute of Tropical Agriculture (IITA) to increase the technical knowledge of extension agents and enhance the integration of plant protection and plant production practices in farmers' efforts to grow a healthy crop of cassava. The booklet is based largely on the extension and farmer training experience of the regional project "Ecologically Sustainable Cassava Plant Protection" (ESCaPP), 1993–1997. ESCaPP was executed by IITA's Plant Health Management Division (PHMD), in collaboration with national agricultural research and extension systems in Bénin, Cameroon, Ghana, and Nigeria, and funded by the Division of Global and Interregional Programmes of the United Nations Development Programme (UNDP).

IITA is one of 16 nonprofit international agricultural research and training centers supported by the Consultative Group on International Agricultural Research (CGIAR). Their shared mission is the alleviation of hunger and poverty in tropical developing countries by generating appropriate plant production and protection technologies which benefit the poor and enhance agricultural production while preserving the natural resource base. At IITA, PHMD is dedicated to sustainable plant protection of primary food crops in Africa. The division's research philosophy is to identify and correct the ecological imbalances in agricultural systems causing pest problems and to provide environmentally and economically appropriate options for integrated pest management. (IPM)

For more information contact:
The Director
IITA Plant Health Management Division
Biological Control Center for Africa
08 B.P. 0932
Cotonou, Republic of Bénin
Fax: (229) 35 05 56
Tel: (229) 35 01 88
E-mail: IITA-benin@cgiar.org
Or visit IITA's website at: http://www.cgiar.org/iita

International Institute of Tropical Agriculture

Starting a Cassava Farm

IPM Field Guide for Extension Agents

Braima James
International Institute of Tropical Agriculture, Plant Health Management Division, Cotonou, Bénin

John Yaninek
International Institute of Tropical Agriculture, Plant Health Management Division, Cotonou, Bénin

Ambe Tumanteh
Institut de Recherche Agronomique et du Développement, Ekona, Cameroon

Norbert Maroya
Institut National des Recherches Agricoles du Bénin, Niaouli, Bénin

Rasaq Salawu
Ogun State Agricultural Development Project, Ogun State, Abeokuta, Nigeria

Alfred Dixon
International Institute of Tropical Agriculture, Crop Improvement Division, Ibadan, Nigeria

Joseph A. Kwarteng
Department of Agricultural Economics and Extension, University of Cape Coast, Cape Coast, Ghana

ISBN 978-131-173-8
Printed in Nigeria by Wordsmithes Printers, Lagos

Contents

What are the objectives of this guide?

This field guide has been prepared to help you to:

- select good sites for cassava farms,
- improve soils for good cassava growth,
- select suitable cassava varieties for planting, and
- select, prepare, and plant healthy cassava stem cuttings.

Introduction

Cassava is one of the most common food crops grown and consumed in many parts of Africa. The crop grows well in various soil types and ecologies. It can be planted alone or in association with many other crops, like maize, groundnuts, vegetables, and rice. Growing cassava is not very labor intensive and usually requires 75–125 person-days per hectare from land preparation to harvesting. The storage roots can be harvested 9–18 months after planting. Under traditional farming practices, one can expect between 8 and 15 tonnes of storage roots per hectare of land planted only with cassava. Even under harsh environmental conditions cassava will provide some food when other crops fail. In most places there is a good market for cassava. The storage roots can be processed into various food products (Figures 1 and 2), and starch for domestic consumption, local, and/or export markets. Cassava leaves are nutritious vegetables (Figure 3). The leaves and storage roots can also be used as animal feed. The stems can be sold as planting material.

In order to grow a healthy crop of cassava you will need to combine plant production and plant protection practices. These include site selection, soil improvement, variety and planting material selection, and planting and post-planting measures against weeds, pests, and diseases. The companion field guides on "Weed Control in Cassava Farms", "Pest Control in Cassava Farms", and "Disease Control in Cassava Farms" cover specific details of weeds, pests and diseases.

Figure 1: Assorted cassava products

Figure 2: *Gari* preparation

Figure 3: Good cassava leaf harvest

How do I select a good site for planting cassava?

Cassava grows best in areas with deep and well-drained loamy soils, adequate rainfall, and warm and moist climatic conditions. The factors which guide you to determine if an area will be suitable for growing cassava include vegetation cover, soil texture and fertility, topography of land, and the field history of the area.

Look for an area with thick vegetation cover: Sites with dense vegetation cover are likely to have fertile soils. The dense vegetation shades the soil from direct sunlight, reduces the amount of moisture that is lost from the soil through evaporation, and minimizes run-off water which may otherwise cause soil erosion. The dense vegetation also drops a lot of leaves which rot and add nutrients to the soil. In addition, decaying leaves encourage an increase in the number of earthworms and other small invertebrates in the soil, which in turn help to increase the air in the soil and make it better for growing cassava.

Look for an area with good soil texture: The best soil for growing cassava is deep, loamy soil. Such soils are rich in nutrients, low in gravel, hold water well, and are easy to work or till. The way to tell if the soil is loamy is to moisten a small amount of it and try to shape it into a ball (Figure 4). If you press the ball and it falls apart, then your soil is loamy. If it feels gritty and you are not able to shape the moistened soil into a ball, then the soil is sandy. If you shape the soil into a ball, and the soil does not fall apart when pressed, then the soil contains a lot of clay and is a clayey soil. Sandy and clayey soils are not the most suitable soils for growing cassava.

Look for an area with fertile soil: Fertile soils usually have a dark color, for example, dark red or dark brown. The dark color shows that the soil has a lot of organic matter. If the soil looks gray and sometimes contains green or blue spots, it means that there is poor drainage and waterlogging. Do not grow cassava on soils that get waterlogged.

Look for an area with flat or gently sloping land: The best farmland for cassava is flat or gently sloping. Steep slopes are easily eroded and are therefore not very good areas for growing cassava. Valleys and depression areas are also not very suitable because they usually get waterlogged and do not allow cassava roots to develop well. You may, however, plant early maturing cassava varieties on mounds or ridges in inland valleys during the dry season.

Know the history of the site: Information such as how the land was previously used, and the types of weeds, diseases, and pests in the area, can help you in selecting a site for your cassava farm. Such information can help you to avoid a site with problems or make good plans for plant protection. Table 1 can be used to summarize the agronomic and cassava plant protection history of a site.

Figure 4: Testing soil texture by the "feel" method

Table 1: Site description and history

Site description	Pests, diseases, and weeds
Vegetation cover ☐ Scanty ☐ Dense natural fallow ☐ Dense improved fallow **Soil texture** ☐ Sandy ☐ Loamy ☐ Clayey **Soil fertility** ☐ Poor ☐ Good **Topography** ☐ Flat ☐ Hilly/steep slopes ☐ Depression area **Previous crop** ☐ Cassava ☐ Yam ☐ Sweetpotato ☐ Rice ☐ Maize ☐ Sorghum ☐ Cowpea/legumes ☐ Other (specify)	**Cassava pests in the locality** ☐☐☐ Cassava green mite ☐☐☐ Cassava mealybug ☐☐☐ Variegated grasshopper ☐☐☐ Spiraling whitefly ☐☐☐ Cassava root scale ☐☐☐ Termites ☐☐☐ White scale insects ☐☐☐ Vertebrates ☐☐☐ Other (specify) **Cassava diseases in the locality** ☐☐☐ Cassava mosaic disease ☐☐☐ Cassava bacterial blight ☐☐☐ Cassava anthracnose disease ☐☐☐ Cassava bud necrosis ☐☐☐ Root rots ☐☐☐ Leaf spots ☐☐☐ Other (specify) **Common weeds in the locality** ☐☐☐ Spear grass ☐☐☐ Bermuda grass ☐☐☐ Guinea grass ☐☐☐ Feathery pennisetum ☐☐☐ Sedges ☐☐☐ Siam weed ☐☐☐ Giant sensitive weed ☐☐☐ Wild poinsettia ☐☐☐ Tridax ☐☐☐ Goat weed ☐☐☐ Parasitic weeds ☐☐☐ Other (specify)

For site description, tick (+) appropriate boxes.
For pests, diseases and weeds, indicate importance of the problem as:
+ = not serious
++ = serious
+++ = very serious

How do I improve the soil for planting cassava?

If you do not select a good site for growing cassava you may have to spend a lot of time and materials to improve the soil. Cassava plants on good soils grow vigorously and are able to withstand some damage by pests and diseases. The following are examples of cultural practices you can use to improve soil properties.

Manure your farm: At land preparation, you can add organic manure to the soil to increase soil nutrients, improve soil structure, and improve the ability of the soil to hold water. Organic manure can be in the form of green manure or other dead plant or animal manure. In green manuring, plant foliage (fresh leaves and young green stems) is ploughed into the soil. Green manure improves soil properties as the foliage rots. *Egusi* melon and leguminous crops, for example, groundnuts and beans, make good green manure. Inorganic fertilizers can also be applied to increase soil fertility. For example, in southeast Nigeria, the recommended rate for NPK application is 400 kg. per hectare of land.

Prepare suitable seedbeds: Cassava fields on hilly sites with steep slopes are frequently eroded. The erosion will be severe if the leaf canopy of cassava plants is not thick enough to cover the ground against rain splashes. This happens in young cassava farms and if the varieties have a tall and less branching habit (Figure 5). If you cannot avoid growing cassava on steep slopes you can grow cassava varieties with early, low, and much branching habit (Figure 6) to cover the ground quickly and properly against rain erosion. You can also make ridges across the slopes and mulch the ridges to reduce erosion.

Mulch cassava seedbeds: Mulching involves covering the soil surface with plant materials. Mulching improves the fertility of the soil, increases the ability of the soil to hold sufficient water for plant growth, and reduces erosion and weed problems. Mulching cassava seedbeds is especially valuable when growing cassava in dry areas and on slopes.

Mulching requires very large amounts of plant foliage. Dead plant foliage can be used as "dead mulch". Sources of good dead mulch are foliage from alley crops, leguminous plants, rice husk, coffee hull and general crop and weed residues. Avoid using weed residues containing weed seeds, rhizomes, stolons, or tubers as mulch because these can increase weed problems on your farm. Straws of maize and guinea grass (Figure 7) are bad mulch materials because they take too long to rot and use up soil nitrogen as they do so.

You can grow plants as "live mulches". For example, *egusi* melon (a food crop) planted at very close spacing on cassava seedbeds is a good live mulch. Nonfood crops can also be used as live mulches, but these are normally grown as improved fallow plants. For example, during fallow periods you can grow *Mucuna pruriens* var. *utilis* on land you have selected for growing cassava in the next season (Figure 8). *Mucuna pruriens* var. *utilis* is, however, a fire hazard in the dry season when its foliage dries.

Plant cassava in association with other crops: Appropriate intercrops improve soil properties in a manner similar to live mulches. Crops that are commonly intercropped with cassava are maize, rice, legumes, and vegetables. Legumes, for example, cowpea and groundnuts, are a particularly good intercrop because these plants make and release nutrients into the soil.

Figure 5: Cassava variety with late, high, and less branching habit

Figure 6: Cassava variety with early, low, and much branching habit

Figure 7: Shoots of guinea grass, *Panicum maximum*

Figure 8: Live mulch of *Mucuna* on fallow land

How do I select the best cassava varieties to plant?

The best cassava varieties are those that are liked by consumers, grow fast, give good yields, store well in the soil and are tolerant to major pests, and diseases. The particular variety chosen by a farmer depends on her/his objectives for planting the crop, and the factors looked for in selecting cassava varieties usually include the following.

Look for varieties with high dry matter and good food quality: Cassava storage roots consist mainly of water and dry matter. The dry matter is mainly starch and a little bit of fiber. The percentage of dry matter in the roots determines the quantity and quality of the products obtained after the roots are processed. Cassava varieties whose storage roots have 30% or more dry matter are said to have high dry matter content. Such varieties produce good quality products and are profitable for growers and market women.

Look for varieties with good mealiness: Mealiness refers to the cooking ability of cassava storage roots without processing. Mealy varieties are commonly called "sweet" cassava whilst non-mealy varieties are called "bitter" cassava. Bitter cassava requires processing before consumption and this is related to the total cyanide content (referred to as cyanogenic potential, CNP) in the storage roots. The higher the CNP of a variety, the greater the need to process its storage roots for safe consumption. If cassava leaves will be eaten, you can also consider the cooking quality of the leaves.

Look for varieties that bulk early: Bulking refers to the swelling of the storage roots as they are filled with stored food. Varieties that bulk early are better able to offset losses in storage root yield caused by weed competition, leaf-feeding pests, and disease than late maturing varieties.

Look for varieties with good ground storability: Ground storability is the ability of the mature cassava storage roots to stay in the ground for a long time without getting spoiled. Good ground storability prolongs the period over which the crop can be harvested. This reduces the duration of postharvest storage problems of fresh roots.

Look for varieties that are tolerant to weeds, pests, and diseases: Some cassava varieties tolerate weeds, pests, and diseases better than others. In selecting a variety to grow, it is advisable to consider how well the variety can compete with weeds, and resist pests and diseases. For example, if weeds are a problem you can look for adapted varieties which branch early, low, and often (Figure 6). Such varieties are able to develop a lot of branches and leaves quickly to shade the ground and prevent weeds from growing vigorously and becoming a problem. You can also find out if the variety has other features you may want.

Table 2 lists some features of cassava varieties commonly grown in West and Central Africa. Scientists and extension agents can prepare a list similar to Table 2 for the cassava varieties growing in the locality.

Table 2: Some features of common cassava varieties in West and Central Africa

Variety	Expression of selected features								
	Yield potential	% dry matter	Cyanogenic potential	Ground storability	Weed suppression	Tolerance to CGM	Tolerance to CMD	Tolerance to CBB
IITA								
TMS 4(2)1425	High	High	Low	Good	Good	Moderate	Moderate	Good
TMS 30572	High	High	Moderate	Moderate	Good	Moderate	Good	Good
Benin								
BEN 86052	High	High	Low	Poor	Moderate	Good	Good	Poor
RB 89509	Moderate	Moderate	Low	Good	Poor	Poor	Good	Moderate
Cameroon								
8017	High	High	Moderate	Poor	Good	Moderate	Moderate	Moderate
8034	High	High	Moderate	Poor	Good	Moderate	Moderate	Moderate
Ghana								
"Afisiafi"	High	High	Moderate	Moderate	Good	Moderate	Good	Good
"Abasa fitaa"	High	High	Low	Good	Good	Moderate	Moderate	Good
Nigeria								
MS 6	High	High	Low	Poor	Poor	Good	Good	Moderate
NR 8082	High	High	High	Moderate	Good	Good	Good	Good

CGM = Cassava green mite
CMD = Cassava mosaic disease
CBB = Cassava bacterial blight
Source: IITA, INRAB-Benin, MoFA-CSD Ghana, IRAD-Cameroon, and NRCRI-Nigeria

How do I select healthy cassava stem cuttings?

The most common sources of cassava stem planting material are farmers' own farms. Occasionally, cassava stem cuttings are sold at village and town markets. Researchers and extension agents sometimes provide their contact farmers with cassava stem cuttings. Many cassava pests and diseases are stem-borne and spread by distribution, sale, and planting of infested or diseased stem cuttings. By planting healthy stem cuttings, you can greatly reduce the spread and damage caused by these cassava pests and diseases. The following guidelines will assist you to avoid unhealthy stem cuttings and to select healthy planting material for a healthy crop of cassava.

Look for healthy cassava plants: Select healthy cassava plants in the farm. Healthy cassava plants have robust stems and branches, lush foliage, and minimal stem and leaf damage by pests and diseases. From each plant select the middle brown-skinned portions of stems as stem cuttings. These parts sprout and ensure plant vigor better than the top green stem portions. Stem cuttings taken from the top green portions of stems or extreme top and bottom of stored stems are unsuitable. They will dehydrate quickly, produce unhealthy sprouts, and are easily damaged by pests and diseases.

Avoid plants with pests and diseases: In selecting cassava plants as sources of stem cuttings, you should avoid those infected with these pests and diseases. The common stem-borne cassava pests and diseases are cassava mealybug, cassava green mite, spiraling whitefly, white scale insect, cassava mosaic disease, cassava bacterial blight, cassava anthracnose disease, and cassava bud necrosis.

The cassava mealybug, *Phenacoccus manihoti*, occurs on cassava leaves, shoot tips, petioles, and stems. The mealybugs are covered with white waxy secretions. Cassava mealybug damage symptoms include shortened internode lengths, compression of terminal leaves together into "bunchy tops" (Figure 9), distortion of stem portions, defoliation, and "candlestick" appearance of shoot tip. The insects survive on cassava stems and leaves and are easily carried to new fields in this way.

The cassava green mite, *Mononychellus tanajoa*, occurs on the undersurfaces of young leaves, green stems, and axilliary buds of cassava. The mites appear as yellowish green specks to the naked eye. Mites survive on cassava stems and leaves and are easily carried to new fields in this way. Cassava green mite damage symptoms include yellow chlorotic leaf spots (like pin pricks) on the upper leaf surfaces, narrowed and smaller leaves (Figure 10), "candlestick" appearance of the shoot tip, and stunted cassava plants.

The spiraling whitefly, *Aleurodicus dispersus*, damages cassava by sucking sap from the leaves. Colonies of the insect occur on the undersurfaces of cassava leaves and are covered with white waxy secretions similar to those of the cassava mealybug. Spiraling whitefly eggs occur in spiral patterns of wax tracks, mostly on the undersurfaces of leaves. Symptoms of whitefly damage are black sooty mold on the upper leaf surfaces, petioles, and stems (Figure 11), and premature leaf fall of older leaves. The insects survive on cassava leaves and stems and are easily carried to new fields in this way.

Figure 9: Cassava shoot tip with "bunchy top" caused by cassava mealybug

Figure 10: Cassava shoot tip with small and narrow leaves caused by cassava green mite

Figure 11: Cassava stem and leaves blackened under attack by spiraling whitefly

Figure 12: Cassava white scale on cassava stem

The white scale, *Aonidomytilus albus*, covers cassava stem surfaces with conspicuous white waxy secretions (Figure 12). The insect sucks sap from the stem and dehydrates it. Stem cuttings derived from affected stem portions normally do not sprout. The insects survive on cassava stems and leaf petioles and are easily carried to new fields in this way.

Cassava mosaic disease is caused by a virus which occurs inside cassava stems. Symptoms of cassava mosaic disease damage are patches of normal green leaf color mixed with light green and yellow chlorotic areas in a mosaic pattern (Figure 13). Generally, plants with these symptoms should be avoided as sources of stem planting material. However, the disease is very common in Africa and it is sometimes difficult to find cassava plants that are completely free from the disease. You can, however, reduce cassava mosaic disease problems by selecting stem cuttings from cassava stem branches and not from the main stems. Stem cuttings from the branches are more likely to sprout into disease-free plants than stem cuttings from the main stems.

Cassava bacterial blight is caused by a bacterium which occurs inside cassava stems. The disease damage symptoms are angular leaf spots on the under leaf surfaces, leaf blighting and wilting (Figure 14), gum exudate on the stems, and shoot tip die-back. Avoid selecting stem cuttings from plants with these symptoms.

Cassava anthracnose disease is caused by a fungus which occurs on the surface of cassava stems. The disease damage symptoms are cankers ("sores") on the stem and bases of leaf petioles (Figure 15). The disease reduces the sprouting ability of stem cuttings.

Cassava bud necrosis is caused by a fungus which grows on the surface of cassava stems covering the axilliary buds or the "eyes" of stem cuttings (Figure 16). The affected buds die, and the sprouting ability of stem cuttings is reduced.

Figure 13: Cassava plant with cassava mosaic disease

Figure 14: Leaf blighting and wilting caused by cassava bacterial blight

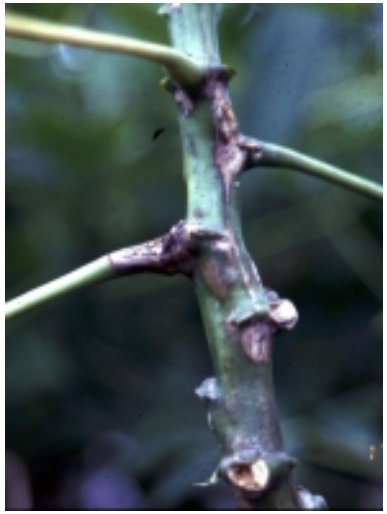


Figure 15: Cankers of cassava anthracnose disease on stem

Figure 16: Fungal patch (arrow) of bud necrosis disease

How do I best plant cassava?

The important factors to consider when planting cassava are time of year, land tillage methods, seedbed type and preparation, and preparation, handling, and planting mode of stem cuttings.

Select suitable planting dates: You should try to plant cassava early, at the beginning of the rainy season. This ensures healthy sprouting and good crop establishment which helps the plant to better withstand damage by dry season pests like the cassava green mite, cassava mealybug, and termites. Late planting at the end of wet season exposes the crop to severe damage by these pests as the dry season progresses. However, planting date recommendations should fit within local farming calendars and farmers' choice of crops to enhance their adoption.

Use suitable land and seedbed preparation methods: In cassava cultivation, land is usually tilled to loosen up the soil, improve soil drainage, make it easy for roots to develop, and promote healthier storage root development. Mounds and ridges are commonly made to gather top soil material for cassava root development, limit prolonged contact between the storage roots and stagnant water, and protect storage roots from rodent and bird pests.

The soil texture at the site you select for cassava cultivation will be an important factor in determining the level of tillage and type of seedbeds required for your cassava farm. In deep loamy soils, tillage may be essential but it does not matter which seedbed type is adopted and cassava can be planted on the flat (Figure 17), mounds (Figure 18), or ridges (Figure 19).

However, if the loamy soil is shallow and cassava is planted on the flat, the storage roots will quickly reach hard ground or rocks giving poor yields. In sandy soils, minimum tillage and planting cassava on the flat are appropriate because the soil is sufficiently loose to allow for faster drainage and normal storage root development. At sites where the sandy soil gets waterlogged, it is however better to make ridges or mounds than to plant on the flat. In clayey and poorly drained soils, tillage and planting of cassava on mounds or ridges are also essential to limit the effects of waterlogging.

Prepare and handle stem cuttings properly: When cutting up cassava stems into stem cuttings for planting, make sure each cutting is at least 20–25 cm long and has about 5–8 nodes. You should handle cuttings carefully during transportation to prevent bruises and damage to the nodes. This can be done by packing them on cushions of dry leaves.

Sometimes, when planting material is slightly infested with cassava green mites, cassava mealybugs, and other stem-borne pests, the stem cuttings can be treated by immersing them in heated water for 5–10 minutes just before planting. This treatment will kill pests on the surface of the cuttings. You can prepare the heated water by mixing equal volumes of boiling and cold water. Alternatively, you can dip the stem cuttings into a dilute pesticide solution (for example, 1% Rogor solution) to kill stem-borne pests. You can also reduce the incidence of cassava anthracnose and other

Figure 17: Planting cassava on the flat

Figure 18: Cassava growing on mounds

Figure 19: Cassava growing on ridges

stem-borne fungal diseases if a solution of pesticide (for example, Décis) and fungicide (for example, Benlate) is used. If pesticides are to be used, you should consult the label for guidelines on their application methods and how to avoid personal and environmental hazards associated with their use.

Adopt suitable planting mode: In order to get the best sprouting and growth from cassava stem cuttings, it is important to plant them properly. Cassava stem cuttings may be planted vertically, at an angle, or horizontally. When planted vertically, the storage roots develop deeper in the soil, more closely together, and are more difficult to harvest by pulling. Vertical planting is best in sandy soils. In such soils, plant stem cuttings vertically with 2/3 of the length of the cutting below the soil. When planted horizontally, the storage roots develop more closely to the surface and are more likely to be exposed and attacked by rodent and birds. Also, in horizontal planting several weak stems develop from the stem cutting. Horizontal planting, however, has the advantage of killing insect and mite pests which occur on the surface of stem cuttings. In loamy soil it is probably best to plant at an angle.

The spacing between plants will depend on whether you are growing cassava alone (sole crop) or with other crops (intercropping). If cassava is being grown alone, plant 1 meter apart from each other. If cassava is being grown as an intercrop, consider the branching habit of both the cassava and the other crops and make sure there is enough space for the plants. You should also make sure there is enough space for you to work between the plants during weeding and other activities.

Summary

- To select a good site for a cassava farm, look for an area with dense vegetation cover, good soil texture, fertile soils, and flat or gently sloping land; also examine the field history to plan for plant protection measures.
- Improve the soil by manuring, mulching, and intercropping to encourage cassava plants to grow vigorously and offset damage by cassava diseases.
- To select good cassava varieties for planting, look for varieties with high dry matter, good mealiness, good ground storability and which are well adapted to your area; the variety should also bulk early and be easy to process.
- To select healthy cassava stem cuttings, choose healthy cassava plants as sources of planting materials; use stem cuttings taken from the middle, brown portions of the stem and free of stem-borne pests and diseases.
- To prepare cassava stem cuttings for planting, cut each stem cutting to a length of at least 20–25 cm; use stem cuttings with about 5–8 nodes; treat stem cuttings slightly infested with stem-borne pests by immersing them in heated water for 5–10 minutes, dipping them into a dilute pesticide solution, or by planting them horizontally.
- To plant cassava stem cuttings properly consider the type of soil; prepare ridges and mounds in areas where soil gets waterlogged; use minimum tillage in sandy soil; plant cassava stem cuttings vertically in sandy soil; plant cassava stem cuttings at an angle in loamy soil; plant cassava stem cuttings 1 meter apart from each other in sole cropping; and in cassava intercrops make sure there is enough space for the plants.

Acknowledgements

Special thanks to the United Nations Development Programme and the Austrian government which provided funds, and to the following institutions which provided materials, information and services for the production of the set of cassava IPM field guides:

- Agricultural Development Programmes (ADPs) in Abia, Akwa Ibom, Anambra, Benue, Cross Rivers, Rivers, Delta, Edo, Enugu, Imo, Kogi, Kwara, Ogun, Ondo, Osun, Oyo, and Plateau State Governments, Nigeria
- Centre d'Action Régionale pour le Développement Rural (CARDER), Bénin
- Centro International de Agricultura Tropical (CIAT), Cali, Colombia
- Crop Services Department (CSD), Department of Agricultural Extension Services (DAES), and Plant Protection and Regulatory Services Department (PPRSD), Ministry of Food and Agriculture, Ghana
- Federal University of Technology, Owerri, Nigeria
- Fourah Bay College, University of Sierra Leone, Freetown, Sierra Leone
- IITA Eastern and Southern African Regional Centre (ESARC), Uganda
- Institut de Recherche Agronomique et du Développement (IRAD), Cameroon
- Institut National de Recherche Agronomique du Bénin (INRAB), Bénin
- National Root Crops Research Institute (NRCRI), Umudike, Nigeria,
- Rural Training Centre (RTC, Presbyterian Church) in Fonta and Kumba, Cameroon
- Sasakawa Global 2000, Bénin
- Service de Protection des Végétaux et du Contrôle Phytosanitaire (SPVC), Bénin
- Southern African Root Crops Research network (SARRNET), Malawi
- University of Agriculture, Abeokuta, Nigeria
- University of Buea, Buea, Cameroon
- University of Cape Coast, Cape Coast, Ghana

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 37 June 2008

Take care of that calf

Of all the domestic animals, newly-born calves are the most neglected by most farmers. They are not only poorly fed but most farmers do not house them properly. This neglect is to blame for the poor health of calves and even increased incidence of deaths due to disease and poor nutrition. New research now shows that taking care of calves and feeding them well enables them grow into healthy dairy cows whose milk production is higher than the average dairy cow. It is a common belief among farmers that a calf can only be fed on milk. On the contrary, research shows that when solids such as high quality forage are introduced at an early stage, the development of the calf's stomach is better than when it is fed on milk alone. Calves can even be weaned at 10 weeks of age without compromising their health. (*TOF*)

Page 5: Calves need more than milk

Farmers and pastoralist misusing Furadan

The increase in use of the poison Furadan by Kenyan farmers and pastoralists poses a great threat to the country's wildlife. This action will have severe consequences to the ecosystem in the long term, wildlife conservationists have warned that farmers and pastoralists are also causing a great damage to the country's most lucrative source of income: wildlife-tourism.

The two groups use Furadan to kill lions, guinea fowl, rats and other pests that pose threats to their crops and animals. According to a study conducted by the National Museums of Kenya on the impact of the use of Furadan on birds and other wildlife in Kenya, the practice is rampant especially in the country's major national parks where there is a constant human-wildlife conflict.

In these parks pastoralists, long used to killing lions with spears, have found an easier way to contain the beasts by baiting carcasses of domestic animals with Furadan. Apart from killing the lions, all other animals in the food chain such as hyenas, wild dogs, vultures and other birds of prey which come into contact with the poisoned carcasses also die. (TOF)

Hard work pays for Meru farmers

For many small-scale organic farmers in Kenya, it appears very difficult to sell their produce locally, let alone in the export market. Although the potential exists, many do not know where to start. However, a group of farmers from Meru has shown the way. Meru Herbs has managed to produce and process a variety of products including herbs, spices, jam and fruits, much of which they sell in the export market. Meru Herbs has shown that everything is possible. In this way they have contributed a lot to rural development. *See page 4*

Dear farmers,

Many of our small-scale farmers now find themselves in a very difficult situation. Previously they could not afford to buy fertilizer during the planting season in March and April this year because of the high cost of this item. They either planted their maize without fertilizer or used very little quantities that might not have been able to meet the nutritional requirements of their crops. Many more opted to use farmyard manure or compost in place of fertilizer although they could not get enough quantities.

The results of inadequate nourishment is now evident in various crops. Many of them are not as healthy as they should be. Unless measures are taken to correct the nutritional deficiencies, the yield from these crops is expected to be very poor at the end of the year. But all is not lost. At least, to some extent, farmers can address the problem of nutritional deficiency by top dressing (foliar feeds) using plants such as tithonia or comfrey, among others. These plants contain important nutrients which can boost growth and provide nutrients that the plants badly need at this time. Plant teas and liquid manures are easy to prepare, cheap and work efficiently: Plants can take in nutrients 20 times faster through the leaves than through the soil.

This problem has shown the consequences of the fertilizer dependency – and emphasizes the need for farmers to build soil fertility through compost, green manure (legumes) and crop rotation. These long-term perspectives are in fact the starting points in organic agriculture. Farmers, especially small-scale farmers, need to rethink over their traditional reliance on chemical fertilizers. We do not believe that fertilizer prizes will come down soon – at least not to the same level as it was in 2007.

Farming is becoming more and more challenging. Food prices are rising. Some farmers may benefit from increased prices; but a large majority of small scale farmers is not able to produce enough food to feed their families. They have to buy it. We know that this is a difficult situation. We would encourage small-scale farmers to become a bit more creative in order to increase production. By adopting sustainable agricultural methods, they will at least spend less in buying inputs and still get good yields.

Your crops need the right nutrients

Farmers should be able to identify missing nutrients in their crops and to correct these deficiencies.

The Organic Farmer

Even for the most careful farmer, it is sometimes very difficult to know if their crops suffer from mineral deficiencies or from diseases. The signs for these two may be confusing. However, through proper observation a farmer can tell whether a plant is either lacking a particular nutrient or is attacked by a disease.

A lot of problems could be avoided if our plants would grow in a healthy soil rich in organic matter. Organic matter is provided by dead or living plants and animal residues. It is a major source of plant nutrients such as nitrogen, phosphorus and sulphur. Organic matter protects the soil from erosion and therefore loss of essential nutrients, it holds the soil together while allowing free air and water movement. The major source of organic material are crop residues, weeds and animal manures. Any soil with organic matter of between 3.5 and 7 percent is good for plant growth.

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org, website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Bernhard Loehr, icipe, Nguya Maniania, icipe, Fritz Schulthess, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, Deputy Director, KARI

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

Nitrogen

helps to promote the growth of plant leaves and shoots. It is the most important nutrient for plant growth and it forms part of the many

essential compounds such as proteins and chlorophyll; chlorophyll gives plants their green colour and plays an essential role in manufacturing food for the plant from sunlight and carbon dioxide.

Nitrogen deficiency symptoms: A low supply results in yellowing of the leaves but the green colour of the leaves darkens once the nitrogen supply is increased.

Prevention: Build up organic matter levels in the soil. Grow nitrogen fixing green manures (legumes) or use nitrogen-rich organic fertilizers. – Excessive nitrogen on the other hand results in large leaves that are very soft and which are prone to insect attacks, fungal infections and other disease-causing agents. Excessive nitrogen supply increases the growing period of cereals and delays maturity. In root crops, too much nitrogen results in large leaves and small tubers.

Phosphorus

is the second most important nutrient that is mainly required for the

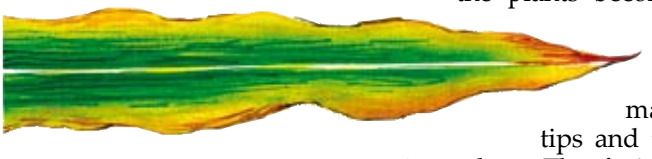
growth and development of the plant's shoots and roots, especially in early stages of growth. Young plants absorb phosphorus rapidly and a crop like maize has peak demand for phosphorus at just three weeks of growth. Lack of phosphorus at this stage may cause problems that are difficult to correct later in the season.

Phosphorus deficiency symptoms: Plants without adequate phosphorus show stunted root systems, stunted leaves and stem, a dull greyish-green leaf colour and purple colouration especially of the cereal leaves.

Prevention: Apply mijingu rock phosphate or plant teas from tithonia.

Potassium

is the third most important nutrient in plant growth. It helps manufacture plant food that



promotes the growth of shoots and roots. It also facilitates the movement of manufactured plant food from the leaves to the other parts of the plant. Potassium strengthens the plant to resist diseases. It is particularly important in regulating water in the plants.

Potassium deficiency symptoms: When potassium is in short supply, the plants become stunted; develop small leaves which are pale in colour. The leaves dry prematurely, first at the tips and then along the outer edges. The fruits and seeds become small in size and less in weight.

Prevention: Improve soil structure. Use plant-based potash e.g. comfrey leaves or comfrey liquid. Add wood ash to compost heap and apply to the soil.

Trace elements

include a number of heavy metals like iron, zinc, copper, molybdenum and two non-metals, boron and chlorine. These are called trace elements because they are needed in very small quantities. For example a maize crop yielding 6.3 tonnes of total dry matter per hectare removes only 70 grams of copper from the soil. However they are important because plants lacking one of these elements may show yellowing of the leaves, death of growing points and even a change in the growing patterns of the plant.

Field observation

Yield can often be reduced 10-30% by deficiencies of major nutrients before any clear symptoms of deficiency are observed in the field. That is why farmers have to be sharp observers. Field observations, calculations and soil analysis can indicate nutrient deficiencies. ■

Liquid manures are helpful and effective

As we have noted in the Editorial on page 1, farmers have varied ways of improving the growth of their crops with liquid feeds. Although organic agriculture promotes the principle of feeding the soil, there are times when a liquid feed can be necessary in an organic shamba. Suitable liquid feeds are made from manures, plants, animal wastes and rock minerals. These are basically the same materials that are used in feeding the soil, but in a different form. Plants can absorb nutrients about 20 times faster through the leaves than if they are applied through the soil. However, it is important to note that organic liquid feeds should never be used as an alternative to good soil care and management.

We should not forget: These foliar feeds or top dressings do not act like a chemical hammer! You have to spray 2 to 3 times a week. The best practice is to spray early in the morning or late in the afternoon, when the good guys, the predators of the pests, are not yet around.

Comfrey is a wonderful plant.

It sends down long tap roots, enabling it to accumulate minerals in its leaves. It can be used as mulch or compost activator. Comfrey leaves decay rapidly, releasing the goodness they contain, enriching the soil in the process, and all these elements are made available to other plants. Since comfrey leaves are rich in plant food, they are ideal for making plant teas. The liquid is high in minerals such as potassium, calcium, magnesium, iron and phosphorus along with several vitamins. The leaves contain a lot of protein. In general, it is an excellent fertilizer for many plants, especially for tomato, pepper, cucumber and potato plants.

Recipe

- Dip 3 kg of comfrey leaves in 45 litres of water.
- Cover with a lid and let it stand.
- Use undiluted after 4 weeks.

Nettles

Nettles make a good general liquid feed. Nettles are a little low on phosphate, but supply magnesium, sulphur, and iron. Young nettles contain the highest levels of major nutrients.

Recipe

- Put 1 kg of leaves in 10 litres of water.
- Cover with a lid and let it stand.
- Use after two weeks, diluted 1 part nettle liquid in 10 parts water.
- Add EM1 to improve it.

Tithonia has a huge potential

Most farmers know Tithonia with its yellow flowers. But many farmers see the plant as a weed and as a menace and would clear it from their farms before the planting season. They are unaware of Tithonia's potential as an organical fertilizer to enhance soil fertility. Tithonia can change the lives of many farmers: It contains 80 percent more phosphorus than legumes, it has enough nitrogen and potassium to promote crop growth. It adds nutrients and routinely doubles maize yield as at rates used by farmers without the addition of fertilizer.

Tithonia's ability to decompose quickly makes it an excellent means to replenish soil fertility, whereby the concentration of nutrients in tithonia is highest in young plants and before the plant flowers. Slashed young plants can be incorporated into the soil, they can be added to the compost or they can be used as a high value tea fertilizer for top-dressing crops.

Recipe

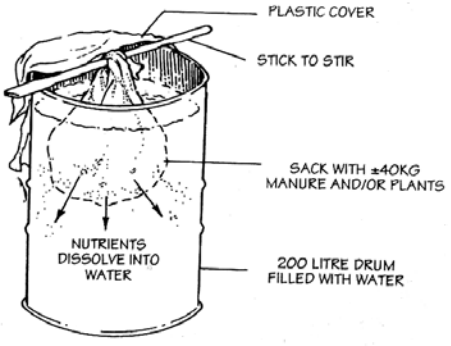
- Chop tithonia leaves, stems and flowers
- Add water at a ratio of 1 part in four parts of water.
- Let it stand in a tightly covered container for at least 7 days.
- Use it within 5 days, diluting it with equal amounts of water
- Test the dilution at one plant and wait a day. If the plant shows signs of scorching, add some more water.

Liquid manure has many advantages

In liquid manure, the dissolved nutrients are usualy in a more concentrated form than in a similar volume of composted materials. Any manure is suitable for use. If manure is scarce, one can use various plants (see on this page). To prepare liquid manure is the most efficient way of applying nutrients and especially of manure, if the quantities available are limited.

Recipe

1. Put well ripe compost (a mixture of manure and organic matter) in a strong sack (10 kg of compost for one drum of 100 litres).
2. Tie the bag, fix it on a pole and suspend it in a drum with 100 litres of clean water (see illustration).
3. Leave the bag in the water for 15 days, cover the drum.
4. After three days and every other day thereafter, stir the drum by lifting the bag several times using the pole.
5. After 15 days, when the water has turned blackish, remove the bag, sieve the liquid manure. It should have the colour of weak tea.
6. Try it out first on one plant. If you see that in the follwing day that it has burned the leaves, it then needs to be diluted to the ratio of 1:2 (to 1 part of liquid manure add 2 parts of clean water).
7. Spray the crop on the stem and at the leaves.
8. Spray early in the morning or in the late afternoon! Spray twice a week.



Even small herbs generate good income

Meru Herbs Company has made a name for itself. It is a good example of rural development.

Felix Mbitu Murimi

Meru, a little town on the North-Eastern edge of Mount Kenya is very well known in many European countries and also in Japan through the products of Meru Herbs Company. The company is in fact a farmers' association with 430 members, which manufactures various types of herbal teas from carcade, lemon grass, chamomille, some varieties of fruit jams and a very tasty sugo for cooking spaghetti. All the herbs and fruits from these products are grown organically, supplying an economically valuable niche market abroad. Meru Herbs operates through Fair Trade distribution channels and generates 95 percent of its business through exports.

Workers at a tea-bag filling machine

The starting point for this successful enterprise was the setting up of the Ng'uuru Gakirwe Water Project in the late 1980's in Tharaka district, a two-hour drive from Meru town. It was financed by the Italian government through the Catholic Diocese of Meru at a cost of Ksh 45 million and designed by local engineers. The irrigation scheme, which covers 60 km², started with about 500 farming families, which have now increased to 1000 families.

"When the water started flowing to their shambas, many farmers could not afford to pay the annual Ksh 200 water fee charged per year for maintenance of the water system", says Andrew Botta, the coordinator of he project. "As they had no money, they would pay with fruits or a chicken or vegetables, which had to be sold to raise money for the fee" says Botta. "This brought to us the idea of buying products from the farmers, process them and sell. This way, they would get some income, improve their food security and contribute to the development of the project". Today, the farmers can afford to contribute Ksh 2,000 per year for the maintenance of the water system.

Niche market abroad

When Meru Herbs was started in 1991, the project's management team made an important decision which ensured its success as an income generating enterprise: They realised that selling fresh produce was out of the question since the road network was in poor condition and Nairobi, which was the main market, was very far.

Woman sorting carcade, used for preparation of herbal tea (Photos MH)

They therefore decided that all their produce would be processed and packed locally to create jobs for the local population.

90 tonnes of carcade per year

That's why they decided to concentrate on the production of high value herbs and fruits, which can be processed using a simple processing system that enabled the local people to handle the factory production by themselves. Today, about 2,300 families in this semi-arid zone are involved in the activities of Meru Herbs. Their great advantage is the availability of water throughout the year and the support from the sponsor, the Catholic Diocese, which facilitates the marketing and export of the products.

They began with carcade (*Hibiscus sabdarifla*), a popular herbal tea in West Africa, then they went into chamomille and lemon grass production and processing. In 2007, Meru Herbs bought 90 tonnes of carcade, 6.5 tonnes of chamomille and 8 tonnes of lemon grass from the farmers, and transformed these mountains of herbs into herbal teas; in the same period, nearly 100,000 jars were filled with fruit jam. Meru Herbs has 43 permanent employees. During the harvesting and processing, they hire more than 50 casual labourers. The shelling, drying and selection of the plants is done by hand; apart from the mills and one grinder, two tea-bags filling machines are used to prepare various sizes of herbal teas. It is by far the

Continued on page 6

Taxation is a big burden to Meru Herbs

Companies such as Meru Herbs do not get any support from the Government, even though it is a farmers' association whose main aim is to uplift a wide section of the population from grinding poverty. They also contribute a lot to rural development. To the contrary, they are treated like any other company by the government.

The company is heavily taxed. They have to pay high taxes for the imported packaging materials. In January 2008 Meru Herbs bought a container of glass Jars for Jam, which are not produced in Kenya. The glass containers, including transport from Italy to Nairobi, cost Ksh 770,105, for payment of duty and the clearing fees cost Ksh 459,648. For 500 kg filter paper for tea bags Meru Herbs paid Ksh 678,101, and the clearing fee plus taxes were Ksh 345,969. "These taxes are a big burden to us", says Andrew Botta. "Without these taxes we would have a higher profit and could pay higher salaries and even pay more to the farmers for their produce."

In 2006, Meru Herbs had to undergo the required inspection by the Kenya Environmental Management Authority (NEMA). For the inspection, Meru Herb had to pay Ksh 398,135. One year later they were told to pay a further Ksh 30,000 to finance the printing of the inspection report. But the big shocker is yet to come: If the regional water board makes good their threat to start charging for the use of the water for irrigation, the Ng'uuru Gakirwe Water Project will have to pay KSh 10,000 to the water board – not per year, but daily! (*TOF*)

A healthy calf needs more than just milk

The common belief that calves can only be fed with milk is wrong. Calves also need nutritious forage.

The Organic farmer,

Immediately a dairy cow produces a calf, farmers tend to pay more attention to the cow, forgetting the calf. This is very wrong because the calf is the future dairy cow. Due to the high demand for milk, both for domestic consumption and for sale, most farmers find it difficult to provide their newly-born calves with adequate milk for healthy growth. Resultant of poor feeding, the calves are malnourished, weak and prone to diseases.

Research now shows that apart from providing adequate milk for calf-feeding, farmers should maintain the health of their newly-born calves through appropriate supplementary feeding. The common belief that calves can only be fed with milk is being challenged by new research findings. They show that calves fed with well-balanced and nutritious supplements such as sweet potato vines and even feed concentrates, grow healthy and have a well-developed rumen (first stomach of a cow). These calves are better of than those that are fed on milk only. A heifer with a well-developed rumen will grow into a healthy dairy cow whose milk production is certainly higher than other dairy cows which were not taken well care of when young.

Sweet potato vines are good

Judith Kiragu, an animal nutritionist at National Animal Husbandry Centre, Naivasha, says that in the early stages of the growth of a calf, a farmer should be able to feed the calf well. He should provide it with sufficient milk and supplementing this with solids such as quality concentrates and forage. Sweet potato vines have proved to be the best forage for calves, as they are palatable and easy to digest. Sweet potato vines give a very high dry matter yield of up to 24.7 tonnes per hectare. Their crude protein content ranges from 18 to 30 percent while the crude fibre-content is 15 percent with a digestibility of 70 percent.

In a study she conducted at KARI Naivasha, Kiragu says 7 calf groups consisting of 5 female calves to determine growth performance and 2 male calves for study of rumen development were selected for an experiment. The scientists tried to find out the effects of Napier grass and sweet potatoes forages to the development of a calf. Apart from the milk which was fed at 10 percent of their body weight, some of the calves were fed with mixed Napier grass and sweet potato vines at various percentages over a period of ten weeks. Other calves were fed on either sweet potato vines or Napier grass alone.

A well developed rumen

At the end of the experiment it was found that although all the calves benefited from getting supplementation from these two forages. Sweet potato vines had a higher protein content than Napier grass. Dry matter intake for calves fed with sweet potato vines was relatively higher than those fed with Napier grass. Sweet potatoes were also easier to digest than Napier grass. Calves fed with sweet potatoes had more weight than those that were only fed with milk. But the most significant result of the study was that all the calves had well-developed rumen at 10 weeks which meant that they could be weaned (stopped from being fed with milk) and put on normal diet. The study shows that rumen development is very rapid when the calves start receiving solid feeds such as sweet potatoes.

Supplementary feeding

Prof. Jud Heinrich and Keith Lesmeister, two leading animal nutritionists from Penn state University (USA), support these findings in an article published in the *Farmers Weekly* magazine, South Africa (January 5- 12 - 2007). They explain that changes in the physical size of the rumen are affected by the animal's diet. The rumen of a calf fed only on milk or milk replacement, they say, "remains small even if they are fed with increasing amounts of liquid feeds". While the abomasum (the animal's true stomach) will grow, the rumen remains proportionally small. They argue that as long as the calf is fed only with liquid feed, growth and development of the rumen wall and papillae (the towel-like lining of the rumen) will be underdeveloped. They note that calves fed with underdeveloped rumens struggle to digest grains and forages after weaning, and in the process delaying their growth for between 2 to 4 weeks.

Prof. David Beever, another animal nutritionist, says in the same magazine that cows should last longer than two to three milking cycles before being replaced. "Good nutrition can increase the number of milking cycles per cow", says Beever. A common problem he has found with cow nutrition is rumen acidosis; this occurs when the pH-level of the animals stomach is low (a high acid level in the stomach). A cow's rumen should have a pH of 6.0 to 6.8. .

The research above was conducted by Judith Kiragu as part of her PhD thesis which will be published soon. It will be titled "Effect of diet on growth rate and historical development of ruminant stomach of early and late weaned Friesian calves". ■

Tips for good management of calves

- Calves should be well-housed. They should not be exposed to muddy conditions, wind or too much cold.
- Ensure the calf do not suck milk through the nose. The milk can go to the lungs and cause foreign body pneumonia. Farmers are advised to use nipples for feeding.
- Like other animals, calves should be provided with adequate space for movement.
- Dairy cows fed on low-energy and high fibre ration have easier calving, fewer cases of retained placenta and low milk fever incidences.


Carcade plant

> > > from page 4: Meru Herbs

biggest employer in Meru and has a very positive impact on poverty alleviation in a famine-prone region.

The expenses for wages and production went up from Ksh 1.9 million in the year 2000 to KSh 7.1 million in 2007. Last year Meru Herbs had an income of Ksh 22.5 million and expenses amounting to Ksh 19.7 million. The net profit was Ksh 2.7 Million. All net profits are re-invested back into the two production facilities in Meru.

Success with organic farming

A forward-jump step for Meru Herbs was the decision to go organic. Organically grown products are highly valued and fetch a better price in Europe and Japan. The buyers appreciate the healthy character of these products and are willing to pay more for them. In 2002 Meru Herbs got certification from the UK-based Soil Association; it was quite expensive. Solely, the renewal of the certificate last year cost Ksh 243,492. In 2002, 43 farmers were certified as organic farmers, in 2005 196 and 268 this year.

The farmers are free to convert to organic or produce conventionally. But all products which are sold to Meru Herbs have to be organically produced. On the other parts of their shambas, farmers can produce conventionally – on condition that they do not mix the two farming systems and that they have some kind of buffer zone between the organic and the conventional part of the land.

The story of Meru Herbs is a real success story. According to Andrew Botta, there are various reasons for this success: The farmers were involved from the beginning; they were therefore highly motivated; they had a ready market for their products within the production area without having to seek for markets far way or relying on middlemen who would exploit them. Meru Herbs concentrated on a special product that benefited from the help of the Catholic Diocese in search of an export market for the product. "But without our hard working personnel", says Andrew Botta, "we would not have gone this far". ■

farmers forum

Farmers should act on fake feeds

Your article about faked feeds was really interesting. It seems that we have a culture of cheating in Kenya. It is all the same, in politics as in business. Why can't farmers' groups come together and send 2 or 3 samples of animal feeds to KARI Laboratories in Naivasha, and have them tested. They can easily tell if they are buying the right feeds? It would costs each farmer about Ksh 200, but this is money well spent. We farmers are not smart enough, that's why it is so easy to get cheated; it is the same with seeds or the chemicals we buy in agrovet shops. If we were more serious in farming, we would share our experience, and if we would act like-self confident people, it would not be easy to be conned by these fake manufacturers. Someone should take action.
John Kibet, Eldama Ravine

Quality control needed

According to your April-issue about feeds I asked myself: Do we not have the Kenya Bureau of Standards which should control all the products sold in our shops? If I steal Ksh1, 000 Shilling from my neighbour, they will put me in the cells. But if a company is stealing the money from thousands of farmers by selling fake feeds, nothing happens. It is just business as usual.
Paul Otieno, Kericho

More on beekeeping

I would like to get a copy of TOF magazine featuring fodder crops and also to be included in your mailing list. I also would like to be assisted with information on bee keeping. I started beekeeping last year; unfortunately those who helped me were displaced. I must thank you for this magazine. It is updating farmers with skills and knowledge on modern farming methods. Thank you
Doris A Nyanjong', P.O Box 549, Oyugis

It will reduce poverty

I happened to come across *The Organic Farmer* magazine and I found a lot of information which when put into practice, can help alleviate poverty among small-scale farmers across the country. I am very interested in improving the quality of my dairy cows as I have the problem of poor quality breeds. Please put me on your mailing list. I don't want to lose the opportunity to read it as it will improve my life and that of other farmers in our village. Joseph K Chepkwony, P.O Box 149, Longisa

Training farmers

We would like to be supplied with 17 copies of *The Organic Farmer*. We are carrying out training of farmers in Kabuyefwe location with emphasis on sustainable agriculture. Please consider including us in your mailing list. Thomas Khaemba, P.O Box 127, Naitiri

It has enlightened us

I came across this magazine through a friend. Our group has 30 members and has already been registered under Koisegut Dairy Farmers' Group. I found it necessary for it gives guidance on access to specialized breeders. Practising organic farming improves the soil, human and animals health. It also teaches the minimal use of artificial fertilizers thus reducing input cost. Peter Langat, Ainamoi Primary. School, P.O Box 249, Olenguruone

More on rabbits

I have been a very keen reader of your good magazine titled *The Organic Farmer* from a friend. I would be interested in keeping rabbits in my small farm. Could you advise me on how to take care of them? I would be interested to know what they feed and their sicknesses so that I can organize myself. I will soon be able to communicate with you via e-mail. Hammerton Kahindi, P.O Box 715, Kilifi Tel. 0733 544770.

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

Onions are tricky to grow

I have been planting red onions but the yields are not so good. I have started doubting that may be using the wrong fertilizers, or I may be applying the fertilizers at the wrong time. In my shamba I rely mainly on the December rainfall but I still do have small-scale irrigation. Please send me information. I am a student who mainly relies on farming for my school upkeep.

First I am very happy to hear that we have some young farmers. Student farmers! Many people have asked me how agriculture can survive in Kenya as most of the youth go to the cities leaving an ageing population to grow our country's food. This sadly is the problem in all developing countries. So I am very proud to know that this answer is directed to one of our youth. Congratulations and best of luck with your farming.

Onions are tricky. My first crop of onions was incredible, both white and red varieties. They were huge, and I still remember how shocked I was to see the bulbs sitting above the ground!

They do not like it cold

The subsequent crop we grew was abysmal. So I was asking myself the same questions as you are asking.

Onions do not like cold wet weather but they do need watering. Growing them through the rainy season should not be a problem unless you are in a very cold area. Watering onions at a late stage will delay the maturation process. Onions like healthy soils so make sure the soil has a lot of well rotted compost. They do not like hard or stony soil.

You can plant onions from seed transplanting when they are 5 inches high and planting at 5 inch spacing in the bed that has been prepared with lots of well matured compost.

Use enriched compost

You did not mention what you used to feed your onions on, or at what stage. Onions feed best through their roots, as opposed to through their leaves. Too much nitrogen as a fertilizer will create a lot of leaf growth but that is all. Onions like phosphorus thus minjingu rock phosphate should be used as your organic equivalent and incorporated into your compost.

It is also very important that you use healthy fresh onion seed. If you are not sure, find out what seed a successful onion farmer in your area may be using, or if this is not possible and you can experiment with a few small packets of different varieties. You did not mention what area you are in, perhaps if you did, other farmers could write in and tell us which are the most suitable seeds for the area. Lastly, if you are planting beans in the same area as your onions this could be the problem. These two vegetables types do not like to grow together. We shall write more on companion planting in the future.

With this answer we also give some tips to Vincent Mbura, Box 39, Kebirigo Tel. 0724 501 790, who wanted to know more about bulb onion growing.

Su Kahumbu

Carrots also need well- composited manure

Why is it not advisable to go organic in carrot production?Tel. 0711 387 128

I am assuming that this question is asking why we do not use manure when planting carrots. Carrots do need feeding and the best way to do this is to put well rotted compost in the soil before you sow the seeds. If the previous crop before planting the carrots was beans, this is not necessary. Do not add manure to soil when planting carrots as manure is rich in nitrogen thus will produce a lot of leafy growth and hairy root growth. Adding a little wood ash to the soil when planting carrots will result in sweeter carrots due to the potassium. **Su Kahumbu**

Where is the CD you promised?

In your magazine you promised a CD that was to be in the market by December 2007. Can we know what happened? Willis, Rafiki Self Help Group Tel. 0727 555 541.

You are right, we promised that the CD will be out in December 2007. You may have a look at it at our site **www.infonet-biovision.org** But it takes a lot of time to put together all the information about crops, pests and diseases. The outcome of this effort will be a wonderful source of information for farmers. We already have a test version of the CD and are happy to say that it contains a wealth of information it contains. A final edition will be ready soon and will be launched at a big event end of August this year. We kindly request your group to be patient until then. (**TOF**)

Questions?

Go to Infonet!

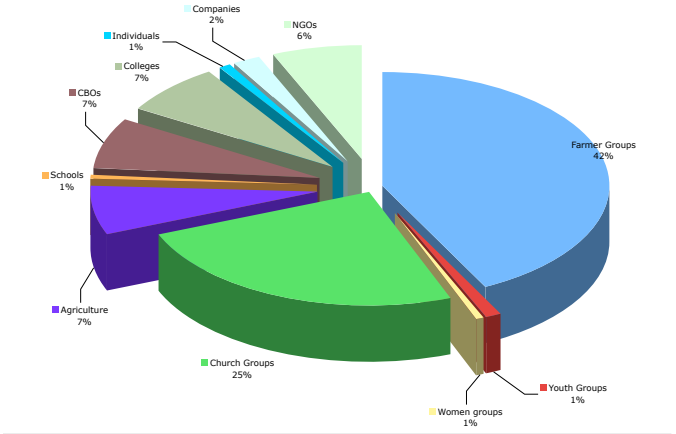
Tithonia does not cause bitter taste

If you incorporate tithonia intensely on a maize plot, the maize at maturity will taste bitter like tithonia. Is this true? I have not tried it myself. If it is so, how and why does it happen? Mildred Tel. 0735 380 442

Wild sunflower, as it is called, is rich in nutrients for plants (*see page 3*). It has a characteristic taste of bitterness, that's why farmers in Western Kenya are using Tithonia-tea together with the leaves of other trees in fighting termites. For it to release the nutrients, it has to decompose first. Tithonia should not be grown together with any crop for purposes of releasing its nutrients to the other plants. It is one of the most popular shrubs in the world and is used as an organic fertilizer for vegetable crops, either mixed with compost or farmyard manure. It can also be dug directly into the soil or used as a plant tea. We have enquired from so many people and specialists in organic farming, but none of them has heard other plants developing a bitter taste when sprayed with tithonia teas. To the contrary, all were full of praise for this plant. If any farmer has any other experiences about tithonia, please let us know. We would be grateful to write about it. (**TOF**)

Our magazine is growing strong

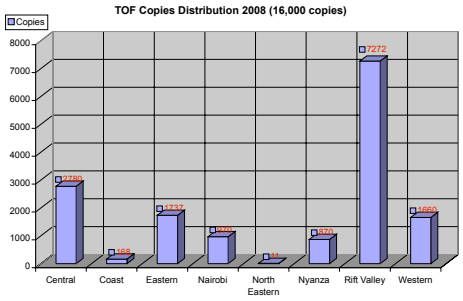
The Organic Farmer magazine which is published by ICIPE, is now three years old. We started in April 2005 with a print run of 10,000 copies, then increased the number to 12,000 copies a few months later. By January this year we had to print 16,000 *TOF*s to meet the increasing demand for the magazine by Kenyan farmers. We will raise the circulation to 18,000 copies in August.



TOF mainly targets farmer groups, each copy is read by about 7 farmers

Every month, we get around 25 applications from Kenyan farmers' groups. On average, we can say, each issue of *TOF* is read by around 100'000 people. Who are the readers? Where do they work? And where do they live? That is the reason why we have done some analytical work on the distribution of the magazine in the country (see graphics on the right). Apart from helping us in future planning, this information is also interesting for our readers. By the way: Since one can read *The Organic Farmer* in the Internet (www.organicfarmermagazine.org), we are getting more and more applications from Uganda, Tanzania, Ghana, Nigeria, Zambia, we also have contacts in Australia, Bangladesh, Mexico and even Guatemala.

We are still convinced that the free distribution of *TOF* within the farming



community is important, a benefit to the small-scale farmers and a boost to sustainable agriculture in Kenya and beyond. To subsidize on the ever rising costs of production and especially distribution, we have just launched an advertising section in the magazine. *TOF* is a medium and a forum for people who want to sell products and services; they will find a large scope of clients: The farmers.

Investing in agriculture

The latest World Development Report advocates for more investment in agriculture in developing countries. The report warns that the sector must be placed at the center of the development agenda if the goals of halving extreme poverty and hunger by 2015 are to be realised.

Titled 'Agriculture for Development', the report states that the agricultural and rural sectors have suffered from neglect and under-investment over the past 20 years. While 75 percent of the world's poor live in rural areas, a mere 4 percent of official development assistance goes to agriculture in developing countries. In Sub-Saharan Africa, a region heavily reliant on agriculture for overall growth, public spending for agricultural activities is only 4 percent of total government spending, and the sector is still taxed at relatively high rates. The World Bank Group is advocating a new 'agriculture for development' agenda. The bank agues: the growth of the Gross Domestic Product (GDP) originating in agriculture is about four times more effective in reducing poverty than GDP growth originating outside the sector. (AP)

Small- scale farmers to get low-interest loans

The rising food prices have not only alarmed the media worldwide. It is also a wake-up call to all African countries. They have discovered that they should do more for the farmers to improve the continent's food security. In Kenya it is the Alliance for a Green Revolution in Africa (AGRA) which has taken the initiative to improve agriculture. The AGRA has entered into a broad-based partnership with one Kenya's fastest growing microfinance institution- the Equity Bank to work with the International Fund for Agriculture Development and the Kenyan Ministry of Agriculture to help farmers with farm inputs.

The initiative is aimed at boosting agriculture through credit to small-scale farmers. The loan facility from Equity Bank, amounting to Ksh 3 billion will provide credit to 2.5 million small-scale farmers (those with as little as I acre of land) and 15,000 members in the agricultural value chain such as rural agricultural input shops, Agrovet shops, wholesalers and importers of agricultural inputs, grain traders and food processors. The objective of this initiative is important and simple: It will boost agricultural productivity, create employment through the involvement of the small agricultural business players and improve the whole of Kenya's agricultural sector.

Conditions

The lending condition will be very friendly to farmers: At 10 percent interest rate per year. Equity Bank will give out the loans with a cash guarantee fund of Ksh 30 million from AGRA and the International Fund for Agricultural Development to insure it against the risks of lending such as crop failure or defaulting by farmers.

Credit for farm inputs

The loans to farmers will include farm inputs; organic farmers can use the loan facility to buy organic fertilizer such as Mijingu rock phosphate, EM, Neem-products or diatomite for use to control pests and diseases, alternatively, they can invest the money to buy more efficient low-technology farm implements.

The loans can also be used as cash advances that will enable farmers to meet urgent financial needs (school fees or medical bills). For the small agricultural businesses, these loans are a welcome boosts to traders as it allows them increase their working capital. (TOF)

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 36 May 2008

Proper management increases potato yield

Lack of seeds and poor management of diseases is to blame for the low potato yields.

The Organic Farmer

Despite the increasing demand for potatoes in the country, production of this commodity is still low. At the moment potato prices are at an all time high. This means that farmers need to put more effort to increase production. To increase the yields, they have to adopt the right methods of production including pest and disease control.

One of the biggest threats to potato production is the spread of bacterial wilt. There are two reasons why this dangerous disease is spreading so fast. One of them is that farmers do not practise crop rotation (see box below).

The second reason for the decline in potato yields is lack of clean seeds. Many farmers just take potatoes they harvested the previous season and use them as seed. If such potatoes are affected, then the disease spreads to other parts of the farm previously not affected. Farmers should take the trouble to find out if there are genuine seed producers in their area. Alternatively, they can seek advice on where to buy potato seeds from agricultural extension officials or KARI stations near them. To get good potato yields, farmers should also be able to control other potato diseases such as Early and Late blight.

All about potatoes on page 4 & 5

Controlling bacterial wilt

Bacterial wilt can be very destructive at the lower altitude, but it has spread to all high altitude areas in Kenya. This disease causes rapid wilting and death of the entire plant without any yellowing or spotting of leaves. The pathogen is transmitted through tuber seed into the soil. Also infested soil can be important source of the disease. To a certain degree, crop rotation can help to fight bacterial wilt.

- Potatoes should never be planted in the same field for two seasons. They should be rotated with either maize or beans but not any other crop in the potato family such as tomatoes, peppers or bananas.
- If a field is affected, do not plant potatoes for several years. Farmers can plant maize, beans, cabbages or sukumawiki which are not prone to the disease.
- Potatoes should never be planted in low-lying or water-logged areas.
- Potatoes from the previous harvest which grow on their own should be uprooted, burned or buried.
- Check the potato shamba regularly, remove all infected plants and tubers with the surrounding soil and put them in a 2 ft deep pit and cover with clean soil, or burn them.
- Do not put diseased tubers in your compost heap.

This potato plant is affected by bacterial wilt (Photo courtesy: Infonet)

Pineapple as an alternative

Many young farmers are asking us about new ways to boost their income from agriculture. They are eager to try new methods of farming and new crops which can fetch a good price in the market. In this issue we answer some farmers: Read more on page 2 about a new crop, pineapples. (*TOF*)

Do you need *TOF*?

Would you like to read/print your own copy of *The Organic Farmer*? Then go to our new website.

www.organicfarmermagazine.org

Why are food prices rising?

Food prices are on the increase worldwide: People have to dig deeper into their pockets to buy maize, rice and wheat, the staple food in most countries. The poor in cities who do not farm are especially affected.

The reason is the increasing demand: Apart from human consumption, more and more cereals are being processed as animal feed or biofuels. On page 6, we will explain what makes food more expensive. (*TOF*)

Dear farmers,

Once more, we bring you additional information on potato production. The reason as to why we put so much emphasis on potatoes is simple; they occupy an important place in Kenya's food security. Indeed, they are the second most important crop in the country after maize. 2008 is the International year of the potato - this should remind all farmers in the country to think more about this important crop.

Although the overall annual potato production has increased due to more land being put under production, the yield per unit area has decreased due to poor methods of potato management, lack of quality seeds and the spread of potato bacterial wilt disease. Local farmers get an average of 30 bags an acre, yet with good management, a farmer should be able to harvest up to 120 bags per acre. Demand for potatoes is on the rise especially in the urban areas where potato chips are the staple food for the urban population. A number of factories have also been set up to process various products from potatoes, for both local and the export market.

What we are saying here makes economic sense. The increasing demand for potatoes should be an opportunity for any smart farmer to produce more and sell it to boost their income. One way they can do this is to adopt the right production methods including the control of pests and diseases, as we write on pages 4 and 5. Nobody is too old to learn new things!

Diversify by growing pineapples

Except for big companies, very few local farmers grow pineapples, yet they can make good money from this fruit crop.

Ben Kariuki, Thika

A farmer who grows a variety of crops always finds himself with a steady source of income. When the price of one crop goes down, the price of the other may remain stable or shoot up, therefore cushioning the farmer against loss of income. Pineapples are one such crop. Farmers growing pineapples are very few in the country. Most farmers do not know the value of this fruit crop, let alone how to grow it. The price for one piece ranges between Ksh 40 and Ksh 80 depending on the size. In Kenya, pineapples are grown commercially in Thika.

Varieties: There are two main varieties, wild and smooth cayenne.

Production requirements

Pineapples grow well in all altitudes, from sea-level to an altitude of 1800 metres above sea level (masl). But the fruit tends to differ in taste, size and disease tolerance. At the coast, the fruit is larger and sweeter; with a large core and less disease incidence. Above an altitude of 1,750 metres the fruit is very acidic.

Rainfall: Pineapples can do well in areas with as little as 750 mm of well-distributed rainfall. They can also be grown under irrigation.

Soils: Soils must be well-drained. The crop does well on an optimum pH of 4.5 to 5.5. Black cotton soil, low-lying areas and red loams that are likely to flood and should thus be avoided.

Land preparation: The land should be well prepared before planting. Poor land preparation tends to reduce yields and quality of the pineapples. Plough to a depth of 45 cm. When using hand labour, dig as deep as possible using a forked jembe. After digging, the soil should be broken down further into a fine texture.

Soil fertility: It is important to do a soil analysis in order to determine the soil nutrient level.

Crop rotation and land fallow: Farmers should leave the land fallow for up to 6 months. Crop rotation is also important in order to eradicate root-knot nematodes which can cause great damage and loss of pineapple crop.

Mulching: Use of black polythene paper of 150 gauge is recommended, this helps to maintain high soil temperature, retain moisture and even control weeds. In areas with high temperature use of mulch may not be necessary. Avoid use of grass mulch as it has been found to reduce yields.

Fertilizer application: Apply 5 to 10 tonnes of manure before mulching; this helps to give high yields.

Planting: Planting should be done at the beginning of the long rains. To get a good crop with a uniform growth, selection of size of planting material is important. There are three parts of the plant that can be used as planting material: the crowns (the leaves on top of the fruit), the suckers (shoots produced from the stem leaf buds, and the slips (shoots that grow from the fruit stalk). If the planting material arrives earlier than planting time, stack them upside down and cover with grass.

Spacing: When growing pineapples under natural rainfall conditions, a spacing of double rows 60 cm apart, and 90 cm between the double rows is recommended. Plants should be 30 cm apart in the rows. One hectare (2.4 acres) can hold about 43,000 plants.

The colour is important

Pinapples are ready for harvest when they snap off at the bending of the fruit. Fresh fruits destined for the local market are plucked when almost ripe.

Fruits can then be cool-stored for up to 4 weeks (storage temperature around 7°C). Because of their low sugar-content, pineapples harvested too early are unpopular amongst consumers (unripe pineapples do not ripen after harvest). The colour of the skin is an important criteria in determining the ripeness of the fruit. Fruits destined for the European market are often classified according to the extent to which an orange-yellow colouring has spread up from the base of the fruit:

- Ripeness-colour 1: Only the base is orange-yellow.
- Ripeness-colour 2: The orange-yellow colour covers half of the fruit.
- Ripeness-colour 3: The orange-yellow colour reaches three quarter up the fruit.
- Ripeness-colour 4: The whole fruit is yellow.

Only ripeness-colour 1 can be exported.

(*Source: Infonet-BioVision*) ■

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org, website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Bernhard Loehr, icipe, Nguya Maniania, icipe, Fritz Schulthess, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, Deputy Director, KARI

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

Use natural methods to control pests

The better you know the pests, the easier it is to control them effectively, the less the cost.

The Organic Farmer

Many farmers use chemicals to protect their crops. These chemicals are not only expensive but they also kill beneficial insects and other organisms that play an important role in the ecosystem. Besides, many pests have developed resistance to chemicals used to control them; that means that they may not eradicate the pests and diseases as desired.

One important practice in organic farming is to try as much as possible to maintain the natural balance. In the ecosystem each organism including pests has a particular role to play. A few pests in a crop for example are important because natural enemies which feed on these pests cannot survive if all the pests are eradicated. The natural enemies therefore manage to control pests biologically often without the need for the farmer to use chemicals.

However, it is important that farmers understand the various pests in order to control them effectively. The following are some of the major pests that farmers may encounter during the rainy seasons.

Diamondback moth larvae feeding on kales (top), an adult moth (below)

Diamondback moth

Diamondback moth (DBM) is a dangerous pest that attacks all plants in the vegetable family. It has a diamond pattern on its back where it derives its name from. In hot climates the pest breeds up to 15 times in a year. The Diamondback Moth larvae causes' damage to the leaves. Newly-hatched larvae feed on the underside of the leaf penetrating the epidermis and drilling holes as they feed. DBM infestations are more serious during cool dry months, but the pest is less likely to be a problem.

Control Method: Chemical control of DBM is becoming ineffective due to development of resistance. Neem-based extracts give good control of DBM-They are also harmless to natural enemies of the pest and are non-toxic to warm blooded animals. Widespread release of a parasitic wasp (*Diadegma semiclausum*) that feed on the pest larvae has been carried by ICIPE in almost all farming areas of the country. The wasp stings the Diamondback moth larvae, depositing an egg, which hatches into larvae that feed on the internal organs of the moth, causing death. Farmers are therefore advised not to use chemicals in DBM control as the chemicals tend to kill this important natural enemy of DBM.

Thrips

Thrips (inset), damage on a tomato leaf

Thrips attack onions, tomato, beans, passion fruits and many other plants. They prefer a warm climate and greenhouses in colder areas. Thrips usually feed on the lower surface of the leaves. Plant damage results from both larvae and adults puncturing the leaves and sucking the sap that comes out. Affected leaves have silvery colour with dark spots of waste matter from the pest.

When they are many, thrips cause premature wilting, retardation of leave development and distortion of young shoots. Onion thrips transmit tomato spotted wilt virus disease in both green houses and field-grown tomatoes, but their damage is more evident in on seedlings making it an important nursery pest.

Control measures: Ploughing and harrowing can be useful in reducing subsequent thrips populations because it helps to kill thrips pupae in the soil. Overhead and surface irrigation has also been found to reduce thrips population. Intercropping onion and garlic helps decrease the level of thrips infestation. Repeated use of pyrethrum extracts can also control thrips. ■

Aphids

Aphids are a major pest in all farming systems. They usually feed by sucking the sap of a plant through the plant veins. All parts of a plant are vulnerable to aphid infestation. If their numbers are high, they can even kill the plant. They also transmit viral diseases as they move from plant to plant. Viral diseases of importance include potato leaf roll virus (PLRV), potato X potexvirus (PVX), potato virus Y potyvirus (PVY) and potato spindle tuber viroid (PSTVd). Aphids often cause the leaves of the plant to curl, lose colour or appear stunted.

Control method: Aphids are naturally controlled by parasitic wasps, ladybird beetles and lacewings among others. Intercropping cabbages with other crops such as spinach, beans and grasses can help in the control of aphids. Aphids can also be effectively controlled by extracts made from pyrethrum. Neem oil and neem seed extracts have also given effective control to the aphid species. Early detection and monitoring of initial aphid build-up is important. Spraying should only be done when the aphid population is heavy (e.g. hot spots to keep the aphids from spreading), since the natural enemies especially parasitic wasps and ladybird beetles usually offer effective control.

Cabbage aphid (top), ant feeding on black aphids (below). (Photos courtesy: Infonet)

A little more care boosts potato yields

Compared to the demand potato production is too low. How can it be improved?

The Organic Farmer


Tigoni


Asante


Dutch Robyjn


Roslin Tana

In Kenya, potatoes are successfully grown at altitudes above 1500 m. They are tolerant to a wide variety of soils, except heavy, waterlogged clays. Good drainage is of great importance. Deep soils with good water retention and aeration offer best growth and yields.

Many farmers are complaining in letters to *TOF* about bacterial wilt, a devastating disease. When we ask them: Do you use the same site for planting potatoes? The say: Yes. This is very wrong. The selection of the right site is important: Potatoes should NOT be grown in an area where potatoes and other crops of the same family (tomatoes, capsicums, egg plant bananas etc.) have been grown in the previous year. They should wait for at least three or four seasons (about 2 years). This delay is necessary in reducing the level of soil infestation by diseases once the soil has been contaminated, and to avoid volunteers. (These are potatoes which grow on their own and which usually harbour various diseases and pests.)

Maize and legumes are recommended for crop rotation practices. Brassicas (or crops in the vegetable family) such as cabbage, sukumawiki, spinach, and mustard plants are beneficial if planted before the potato crop. This will reduce incidence of bacterial wilt and nematodes.

Use disease free seeds

The lack of clean seeds remains a big problem (see page 1). Try by all means to get disease-free seed or certified seed tubers of about the size of a chicken egg. Sprouting tubers should be placed in indirect sunlight to obtain short and strong sprouts that will not break easily during planting.

Land preparation: The land should be ploughed at least 20 cm deep or dug by hands to a depth of 15 cm. The soil should be well broken to avoid large clods and to allow soil aeration, and it should be weed-free. In murram and poorly drained soils potatoes do not perform well.

Variety*	Suitable growing areas	Strengths	Weaknesses
Tigoni (30%) ↗	Kiambu,Nakuru, Uasin Gishu, Narok	High yielding, resistant to late blight, big tubers	Sensitive to bacterial wilt
Nyayo (25 %) ↘	Nyandarua, Nakuru, Mbooni, Uasin Gishu, Narok, Nyeri, Machakos, Kathiani,Laikipia, Molo	Early maturing, tasty	Sensitive to late blight
Tana Kimande (7 %) ↗	Nyandarua	Big tubers, good price	Low yields, late maturing
Asante, (6%) ↗	Meru, Mt Elgon, Nyeri,Mbooni,Ndeiya, Machakos, Laikipia, Taita Taveta	high yielding, resistant to late blight, big tubers	Not good for mashing
Dutch Robyjn (5 %) ↗	Mt Elgon, Bomet	Storage, crisping	Sensitive to late blight
Kerr's Pink (3%) ↘	Meru	High price, early maturing, tasty	Sensitive to late blight
Roslin Tana (2 %) ↘	Nyandarua, Nakuru	Good for chips	Low yields, sensitive to late blight

*Estimated area harvested in %; the arrows indicate the trend in the area, ↗ means increasing, ↘ means declining trend. *Source: Infonet*

Fertilizer: Potatoes are heavy feeders. Plow-under or incorporate available compost or organic manures in the soil before planting. This enhances the water-holding capacity and provides enough nutrients for a healthy crop. Potatoes respond well to large amounts of compost or well decomposed animal manures. If you use fertilizer it is advised to ask for assistance from the local agriculturist office for soil sampling and soil analysis. In any case avoid direct contact of the tubers with the fertilizer as this may have a burning effect on the tubers.

Planting & Spacing: In regions with a critical dry season, planting early in the rainy season is best. If the rainy season is long and the rain excessive, it is advisable to plant towards the end of the rainy season. Planting potatoes during the period of excess rainfall exposes the crop to more diseases, which are very difficult to control. The spacing should be 75 cm between the rows. Tubers are placed in the furrows at a distance of 30 cm from each other with the side having more sprouts facing up. Potatoes are planted at a depth of 5-15 cm (measured from the top of the tuber). Shallow plantings should be avoided. Earthing-up or making hills (ridges) soon after emergence helps to control weeds, prevents greening of developing tubers as well as spores of late blight fungus and the tuber moth from reaching the tubers.

Weeding & Ridging: Weeds compete with the potato crop for moisture, light, nutrients and space, thereby reducing yields. Begin weeding after the potatoes have germinated to avoid uprooting the seed-tubers. Earth-up along the rows as the potatoes grow. The final ridge should be about 25 cm high (see illustration on page 6). Weeding should be repeated. Well covered tubers cannot be attacked by the tuber moth (see page 5). Do not work when the soil is too wet since you spread fungal diseases such as Late blight.

Continued on page 6

These terrible blights!

Fungal diseases such as Early blight (*Alternaria solani*) and Late blight (*Phytophthora infestans*) are the major problems in potato production. Early blight is favoured by cool, cloudy, wet conditions and is more severe when plants are stressed by poor nutrition, drought or nematode attacks. Late blight thrives best under warm and wet conditions.

Controlling blight once it has established itself on potato plants is very difficult. The most important way of controlling blight is attempting to prevent its establishment and further spread.

Prevention methods

• Use clean seed; if you can see lesions (wounds) on the seed tubers, don't use them for propagation.

• Use tolerant or resistant varieties (see table on page 4).

• Use plenty of compost or well decomposed animal manures. Nitrogen and phosphorus deficiency can increase susceptibility to Early blight.

• Destroy crop debris after harvest as these may be contaminated with disease causing pathogens.

• Crop rotation: Fields should not be planted with tomato, potato, or eggplant for at least 4 cropping seasons if Early or Late blight are present. Rotations with small grains, maize or legumes are preferable.

• Take care of tubers: Avoid injury to potato tubers during harvesting and handling

• Clean the tools to stop the disease from spreading

How to control Early blight

Botanicals

• Fermented Marigold extract: Fill-in drum with ½ - ¾ full of flowering plants. Leave to stand for 5-10 days. Stir occasionally. Strain before use. Dilute the filtrate with water at a ratio of 1:2. Add 1 tablespoon of soap to every litre of the extract.

• Onion bulb extract: Finely chop 50 g of bulb onion, add to 1 litre distilled water, mix well, strain. Spray thoroughly on the infested plant, preferably early in the morning or late afternoon.

Fungicides

• Sulphur: Sulphur is permitted as preventive fungicide in organic farming. The commercial product 'Thiovit' has been reported by some farmers to have preventive effect on Early blight.

• Copper: Most copper products are either based on copper oxychloride or copper hydroxide and are readily available in the market. Also recommended is the Bordeaux mix which is a combination of copper sulphate and hydrated lime.

How to control Late blight

Botanicals

- Chop and mix Mexican marigold with water, nettle and *Piectranthus barbatus* (beautiful blue flowered shrub, commonly used for hedging and said to have particular fungicidal properties) (kikuyu name: *Maigoya*) to prevent outbreaks of late blight.
- It is also good to try EM1 or BM as they have preventive properties where other fungal diseases are concerned.

Fungicides

- Copper: (*see Early blight*).

Tuber moth is a threat

The potato tuber moth is the most dangerous potato pest in the region. Female moths lay eggs on sheltered places of the leaf and stems and near the eye buds on exposed tubers through cracks in the soil or in the store. The caterpillars drill into the tuber and make long irregular black tunnels which provide an entry point for various plant pathogens: Such potatoes become unfit for human consumption. The pest is transferred with the harvested tubers to the potato store, where it can reproduce and infest other tubers. This may lead to total destruction of the stored crop.

Preventive methods

• Use healthy, clean seed, since infested seed tubers are the main cause of re-infestation in the field.

• Avoid planting in rough soil.

• Plant as deeply as possible (10 cm deep) and ridge at least three times during the growing season. Compact hilling is very important to prevent moths from reaching the tubers to lay eggs.

• At harvest, ensure that the tubers are not exposed to moths before they are properly protected in the store.

• Destroy all infested potatoes immediately, remove all plant residues from the field and destroy all volunteer potato plants before planting new potato crops.

Take care of the "good guys"

Natural enemies such as ladybird and lacewing are important for natural control of the potato tuber moth, and several native parasitic wasps (e.g. *Diadegma mollipla, Chelonus spp*.) attack this pest.

Protection

Use alternative natural pesticides to protect potatoes in store.

Lantana: Research done by the Central Potato Research Station, Shillong indicated that from all plants providing protection to the tubers, the leaves of *Lantana aculeata* were best, followed by *Eucalyptus globulus*.

Neem: Spray neem seed extracts and place the tubers in jute sacks.

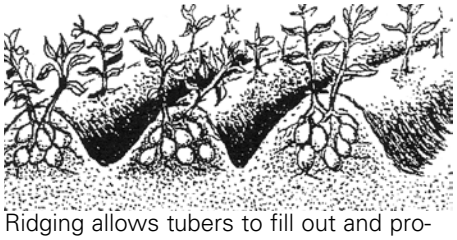
Mpilipili: Tuber infestation can also be reduced by bedding the potatoes in the leaves of the Peruvian pepper tree (Schinus molle), also known as *mpilipili* in Swahili.

Diatomite: Application of plenty of diatomite earth prevents rapid build up of tuber moth.

Infested tubers

> > > from page 3: potato yield

Harvesting: When the leaves turn yellow, take about 10 - 20 plants at random and check whether the tubers are 35 - 45 mm in length. The stems should then be cut at ground level.



Ridging allows tubers to fill out and protects the tubers against the tuber moth

This activity (also called dehaulming) enables the skin of the tubers to harden and it reduces the spread of viruses. Avoid injuring the tubers. Harvested tubers should be stored in well-ventilated crates and should not be exposed to direct sunlight but kept in the shade. Before storage, remove diseased, damaged or misshaped potatoes.

Five reasons for increasing food prices

Energy: High prices for oil and gas make the production, processing and transport of food more expensive.

Appetite: In China, India and other fast-developing countries with a high economic growth, eating habits change. The higher the demand for meat, the more grains are fed to animals. For the production of 100 calories of beef, for example, 700 calories of food are spend.

Urbanisation: Since cities are growing worldwide, the available farm land decreases, and the number of urban consumers is on the rise. According to the United Nations, by the end of 2008, for the first time in history more than half of the world's population will live in cities.

Biofuels: Industrial nations promote the production of biofuels to reduce their dependence on petroleum. Therefore, on more and more farms grows produce to be processed to fuel than food.

Weather: Hurricanes, floods and droughts are causes for crop failure or the fact that farmers are not able to farm their land. (***TOF***)

farmers forum

Name these feed companies

Your article on feeds (*TOF* April 2008) was quite an eye opener for farmers who buy poor quality animal feeds without knowing it. We incur huge losses as the so called feed manufacturers laugh all the way to the bank. However, your article does not solve farmers' problem because you do not give us the names of the companies selling the sub-standard feeds. It would really help farmers if you had included the names of the companies. This way, we would be able to know where to purchase quality feeds.
John Mugambi P.O. Box 99 Meru

Dear Mr. Mugambi,
Thank you for your observation, the omission of the names of the companies from which we got the samples was deliberate on our part. If we were to name the companies, no farmer would buy their products. They would then go to court seeking damages for loss of business. What we would advise farmers to do is to ensure they buy animal feeds from reputable and well known companies which sell quality feeds. Fortunately many farmers around you already know these companies and should be able to help you.

We require more copies

Congratulations for an informative magazine. It encourages the use of natural inputs which is very healthy for our current generation. Be kind enough to put us on your mailing list for the benefit of our members.
Redeemed Gospel Church, P.O Box 1493, Kitale

Supporting rural development

I am a student at Egerton University Njoro pursuing a course in agricultural education and extension. I have over the last few years been reading your copies of *The Organic Farmer* and I am greatly impressed by its wonderful contribution to the agricultural development especially organic farming, which is a pillar and the key to attaining sustainable agriculture in our agriculture-based economy. I hereby request for a supply of a copy of the same so as to continue propagating the principals of organic farming both in education and extension. Once again I commend you and the entire team for the good work you are doing.
Julius Muteti, P.O Box 2748, Nakuru

Soil tests too expensive for farmers

Agricultural institutions should help farmers by taking soil samples to test in order to know the type of crop recommended. The soil laboratory tests are too expensive and even most farmers do not know about it.
Tel. 0720 063 460

I have learnt a lot

I am a field officer working for a Government parastatal in Nakuru and do interact with many farmers. Your magazine has taught me a lot and I usually share these with farmers. The only obstacle is that I get your magazine through someone who I have to keep on reminding every month. I am kindly requesting you to mail me directly so that I can distribute to farmers on my field trips. Please consider my request.
Antonina L. Keya, P.O Box 13104, Nakuru

Organic farming is the future

I have come across your magazine which I found very interesting. Considering the cost of farm inputs and most of their side effect both on us and our environment, I support you that the future is in organic farming. In my area, no one practises organic farming and I think it is the high time we started it. Can you kindly put us in your mailing list? Nelson M Maina, P.O Box 285, Karatina

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

Fungus causes pumpkin rot

My pumpkins usually rot at maturity stage, what is the cause? Jonathan Omusikali, Tel. 0723 398 376

Jonathan, it sounds as though your pumpkins have anthracnose. At such a late stage it is almost impossible to save them. Anthracnose, caused by the fungus *Colletotrichum lagenarium*, is a devastating fungal disease. It causes defoliation and lesions on the fruits. Anthracnose disease attacks all parts of the plant at any stage of growth. The symptoms are most visible on leaves and ripe fruits.

Copper oxychloride can be used to control it, if it is detected early.

Anthracnose on a cucumber leaf

Read and follow instructions on the label carefully. Monitor plants regularly and spray only when necessary as copper can accumulate in the soil. Spray in the early morning or late afternoon. Wear protective clothing when handling, and wash your hands after handling.

Field sanitation

As a future remedy, do not grow pumpkins or any of the same family group (melons, cucumbers, squash, butternut) in the affected field for at least two growing seasons.

Field sanitation is an important and highly effective farm practice to keep most pests under control.

- Properly select healthy plants for transplanting.
- Keep weeds under control at all times.
- Observe personal hygiene. Always bear in mind that you might be the carrier of the pests while you move from one plant to another
- Pull plants that are heavily infected with insect pests and those that are showing heavy symptoms of disease infection.
- Prune the plant parts where insect pests are found congregating and those that show heavy symptoms of disease infection.
- Properly dispose of all the infested plants. Do not put them on the compost pile.
- Pick rotten fruits and collect those that have dropped. Diseased and pest infested fruits must be properly disposed off. Do not dump them in the compost pile.
- If possible, remove all the crop residues after harvest. Add these to your compost pile, except if they are diseased or pest infected.
- Clean your farm tools.

Su Kahumbu/TOF

Strawberry seeds?

I would like to grow strawberry. Where can I get seeds? Wellington Njeru Tel. 0720 996 322

You can get strawberry runners from Mr Wilfred Ngure (Tel.0723 260 233) and his group of strawberry growers in Tigoni. He has two types, Shadra and Pajero both originally from the U.S. Each runner costs Ksh 25.00

A runner grows directly from the mother plant as opposed to a seedling that grows from seed. Strawberry propagation from seed is quite difficult. (SK)

Questions? Go to Infonet!

Infonet is an information platform for organic farmers. Whatever you would like to know about the ecological methods for the control of pests and parasite infestations of plants, humans and animals – Infonet will have an answer. You just go to the Internet, either at home or at a cybercafe and type in:
www.infonet-biovision.org

Coffee disease problem

My coffee bushes are dying mysteriously, please advice. Tel. 0721 839 816

Unfortunately I do not have much experience with coffee. I would like to suggest the following. Before any action is taken, you must identify what is causing the problem. Is it a pest, or a disease? To do this you really need to inspect the plants, those that are dying as well as those that are dead. Check every part of the coffee bush, the berries, the leaves, the stem etc and note down any abnormalities. Uproot the dead tree and look beneath the roots. Take samples of the dead plant, including all the parts you found 'suspect' during your examination, to your nearest agricultural extension office. Please contact us and let us know what you did and what you discovered so that we may share this with other readers.

Su Kahumbu

Deformed water melons

How can I prevent deformation of melon fruits? Tel. 0727 731 647

Deformation in melons can either be attributed to insect damage or viral damage. It is good to know the cause. Viral damage would be evident in the leaves, they would show mixed colours, stunted and deformed. In this case the solution is to burn the entire plant. Do not grow the same family of crops in the same area for at least two growing seasons. Virus is spread via insects, so it is good to spray for insects too if your other plants in the same area are not affected.

If the leaves are healthy and the fruits deformed, it is probably insect damage. Spray the plants with a biopesticide (spray in the early morning or late afternoon). I recommend Flower DS which is pyrethrum-based, every second day for at least a week, then spray once a week with neem. Make sure to harvest all edible parts of the plant before spraying.

Su Kahumbu

tips and bits

from farmers for farmers

Fighting stemborer naturally

Apart from controlling the stemborer, the Push-pull method provides fodder and boosts soil fertility.

The Organic Farmer

Friday April 11 was a special day for members of Kihiga Women's Group of Kagunduini location of Thika District. Early in the morning, the women lined up along the road to welcome a Swiss delegation who were coming to visit a demonstration plot run by the group. Early this year, the women's group became one of the beneficiaries of a Push-pull project that is aimed at controlling the stemborer. The project is funded by BioVision, the Swiss-based foundation that also sponsors *The Organic Farmer* magazine. The project is jointly being implemented by KARI, ICIPE, *The Organic Farmer* and the Ministry of Agriculture.

Impressed by project

Kihiga Women Group is one of the most active in Kagunduini location. Started in 1999, the 26- member group has been engaged in a number of income generating activities. Through a revolving fund, they have built water tanks, managed to acquire dairy goats and ventured in poultry and rabbit keeping.

The group members took the BioVision delegation through their Push-pull demonstration plot, planted with neat rows of maize intercropped with beans and lines of desmodium legume. Around the edges of the plot was a healthy stand of Napier grass. The group has made very good utilisation of space to grow all the crops. "I am really impressed by the work of this group. We hope that this technology can spread faster within the region to help farmers maximise their yields", said Verena Albertin, the BioVision Projects Coordinator.

Apart from Kihiga Women group, the BioVision delegation also visited Mugari Self Help Group in Saba Saba Division of Maragua District which has also adopted the Push-pull technology.

What is Push-pull technology?

Push-pull is a simple method of controlling the stemborer. In this method, maize, beans and desmodium, a legume that is also a nutritious fodder, are planted in alternating rows. Napier grass is then planted around the three crops. The stemborer does not like desmodium smell, so the desmodium pushes it away from the maize. Since Napier is attractive to the female stemborer moths, it pulls the moths to lay their eggs on it.

KARI supplies Desmodium and Napier grass seedlings to Kihiga group members

But Napier grass does not allow stemborer larvae to develop on it. When the stemborer eggs hatch and their larvae enter the Napier grass stem, the plant produces a sticky substance like glue which traps them and they die. So very few stemborer larvae survive and the maize is saved. The Push-pull method has been shown to increase maize yields by between 25 and 30 percent in areas where the stemborer is a problem.

More farmers will benefit

The push-pull project is being implemented in three Central Province districts of Maragua, Muranga and Kirinyaga. The training of farmers groups is being done through participatory practical lessons through the Farmer Field School (FFS) concept. The project has trained 6 Farmer Field Schools in the three districts. Each of the Farmers Field School is expected to train about 100 other farmers in their locality, in the end benefitting more than 600 farmers throughout the project area. Samuel Njihia, a researcher from KARI Muguga is heading the training team composed of researchers from KARI and the Ministry of Agriculture. *The Organic Farmer* will help in dissemination of information on the results of the project including lessons learnt to other farmers in the country.

Market Place

Training: Jomo Kenyatta University of Agriculture and Technology has a training programme for farmers who want to go into mushroom growing as a business. 2008 training dates May 21-23, June 18-20, July 23-25, Aug 27-29, Sept 17-19, Oct 22-24, Nov 12-14, Dec.3-5. Course charges are Ksh 10,000 per participant. Call now for booking at; JKUAT Enterprises Ltd. 067-52420. 0736-524200. 0724-256696. e-mail:md@jkuates.jkuat.ac.ke, bm@jkuates.jkuat.ac.ke Ask for P.K.Muchiri.

Training: Baraka Agricultural College is offering the following short courses on sustainable agriculture for interested farmers: ICT for rural development May 4-10, Introduction to beekeeping May 4-10, Poultry production May 11-17, Sustainable agriculture May 18- 24, Introduction to beekeeping May 25-31, Mushroom-growing June 8-14, Small-scale food processing June 15-21, Bee multiplication and breeding June 22-28. Participatory Action Research July 6-12, Animal health July 13-19, Sustainable livelihood approaches July 27- August 2, August 3- 9, Vegetable production August 10-16, Bee equipment making August 17- 23,Training of trainers August 24- 30, Fruit production August 31- September 6. Farmers interested in pursuing these courses can contact the college at the following address: The Principal Baraka Agricultural College P.O. 52 Molo, Tel. 051 721 091, Tel 0725 777 421. email:baraka@sustainableag.org

Amaranth seeds wanted: I need amaranth seeds. If you have any for sale please call Roslin Tel. 0734 994 111

Turkey chicks: I need turkey chicks. If you have any for sale please call Tel.0721 155 169.

Tree tomato seeds: I need to buy tree tomato seeds. Please call Emmanuel Sirengo Tel. 0729 750 707.

Lettuce for sale: I have organic lettuce for sale. Interested buyers can call me on Tel. 0735 651 639.

Dairy goats for sale: I have 5 female dairy goats and 1 male for sale. Interested farmers can call Tabitha Tel. 0725 72 42 39, Ruai.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 38 July 2008

TOF put to task on feeds

Farmers are pressing TOF to mention the companies making poor quality animal feeds so that they can choose the right ones.

The Organic Farmer

Since *The Organic Farmer* in the April 2008 issue highlighted the problem of animal feeds in the country, we have received numerous calls from farmers wanting to

know where they can buy quality feeds. Many of them are not happy with the quality of most feeds in the market. They want us to name the companies that produce low quality feeds. "If you do not name these companies, then you are party to the exploitation of the farmers", they say.

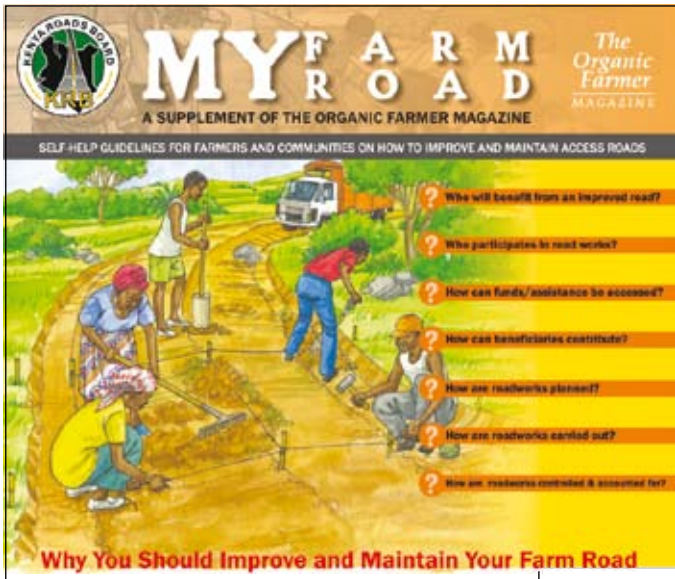
For us this is a difficult siruation. As we told you in our April issue, naming these companies will invite a string of legal suits against *The Organic Farmer* magazine for tarnishing their names. It is very unfortunate that Kenya does not have strong consumer organisations that can speak on behalf of farmers. During our survey well-known companies such as Unga feeds and Sigma Feeds were found to have feeds that met all the requirements. But most farmers prefer buying cheaper feeds, therefore compromising on quality.

Sugar syrup as poultry feed

With the current scarcity of cereals, their prices and that of their by-products, which are used in the manufacture of animal feeds is set to go up. Farmers will therefore be forced to pay more for animal feeds. Many small-scale farmers will find it difficult to buy supplementary feed for their livestock due to the increased prices. At least for poultry, there is a cheaper alternative – in sugar syrup. One reason is that chickens can easily digest it and get more energy to increase their egg and meat production than from cereals. Local feed manufacturers can explore the possibility of using it to make poultry and pig feed. *See page 4*

Do not neglect your animals

Despite relying on animals for food, labour and various other products, many farmers neglect them through poor feeding, shelter and general care. This is not only unfair, it is not wise to neglect the source of your income. Pg 2 & 3



Dear farmers,

Most of the roads in farming areas of the country are in a pathetic condition. Transportation of farm produce to the market is very difficult, especially during the rainy season. Cars and trucks using these roads break down quite often, forcing transporters to spend so much money on repairs. They in turn hike transportation charges so as to equalize on maintenance costs and maximise on profits, eventually passing on these costs to the farmers.

A good road network is very important for any developing economy such as Kenya's. Why should farmers work so hard to produce food if a large portion of their earnings only ends up in paying for transport?

A lot of money is now being disbursed to all parts of the country through the Constituency Development Fund and the Local Authority Transfer Fund. A large proportion of this money is set aside for construction and maintenance of rural access roads. Farmers should ensure that this money is properly utilised for the improvement of the roads in their areas. Even without these funds, they can still come together and repair bad sections of the road which become impassable, sometimes only due to a blocked drainage system or even a pothole that needs refilling. Inside this issue, The Organic Farmer, *together with the Kenya Roads Board, has brought you a very practical guide on how to construct and maintain your rural access roads. We are thankful to the Roads Board who financed this insert.*

The problem with the Kenyan roads is, we emphasise, poor maintenance. Farmers should not sit back and wait for the government to repair the roads. They should take the initiative and repair the roads themselves, because it is them that suffer when these roads are bad.

Donkeys, a valuable asset on the farm

Despite their use for transport and work on the farm, donkey are often neglected and mistreated.

Anja Bengelstorff

If you are a farmer who owns one or more donkeys for work, make sure you treat them well. Because if you do not, you not only harm the animals, but you also lose a lot. Your donkeys are assets: The great wealth of the Egyptians, for example, was due to the precious metals carried from Africa by donkeys.

600,000 donkeys

The Kenya Network for Dissemination of Agricultural Technologies (KENDAT) estimates that there are more than 600,000 donkeys in Kenya. About half of them are used for work in transport and tillage. The organisation believes that around 210,000 donkeys are in a poor condition due to human abuse and misuse, based on myths, in-humane traditional practises, and malnutrition. They are whipped profusely, denied food, water and shelter, have to carry heavy loads and pull overloaded carts.

In pastoralist areas, donkeys may not undergo major and typical suffering, but abuse from traditional practices like branding, ear notching and nose piercing, poor watering and feeding are common. In addition, many donkeys in drought-prone areas of Northern and Eastern Provinces and the coastal region starve to death due to lack of water and pasture. In times of flooding, donkeys may suffer from disease outbreaks such as Rift Valley Fever.

Abusing and misusing your donkey is an offense of cruelty under "The Prevention of Cruelty to Animals Act" of Kenya. In part VIII, this legal document describes precisely how, according to the law, donkeys used for various purposes should be treated. Violation of this Act is subject to prosecution.

From an economic point of view, well-treated and cared for donkeys are able to work more efficiently. This includes proper treatment for diseases and, if possible, a regular check-up by a veterinarian to maintain animal health.

As human beings, we should express basic principles of compassion and humane practice towards animals, and particularly those which work for us. Improving the welfare of working donkey calls for a behaviour and attitude change among animal owners and users.

How to take care of your donkeys

- Provide adequate feed for the animal, especially grass, grains and grain by-products, as well as adequate water and salt. Draught animals (animals that carry heavy loads) need to replace water and minerals lost through sweating during work.
- Allow it adequate rest. Work the donkey in the morning, let it rest for at least 4 hours and feed it during midday, then it can work again in the afternoon for 3 more hours. Do not overwork the animal, it may kick or become stubborn.
- Provide adequate shelter, keep it well groomed in a healthy and clean environment.
- Trim the hooves regularly (at least twice during rainy season). Do not trim during dry season!
- Treat diseases and wounds promptly. Deworm the donkey regularly every 3 months.
- Ensure proper harnessing to avoid health problems such as galls, wounds and burns which can reduce the donkey's performance. Do not mistreat it when harnessing, it needs to feel comfortable if it has to perform its duties well.
- Use a cart rather than transporting loads on the donkey's back. This can harm the animal.
- Do not work pregnant donkeys for 3 months before and 3 months after they have given birth. This "maternity leave" allows proper nutrition for the foal (a young donkey).

Kwaheri...

We would like to inform our dear readers that Dr. Fritz Schulthess and Dr. Bernard Loehr have left ICIPE and are no longer members of The Organic Farmer *Advisory Board. We are grateful to both scientists for their kind contribution to the magazine since it was initiated in April 2005. Whenever we sought answers to various scientific questions they would offer solutions promply. We wish them all the best in their future endeavours. Asanteni sana!*

...karibuni

At the same time, we would like to welcome the new members to the board, Dr. Henry Kiara, a livestock expert at the International Livestock Research Institute (ILRI), Dr. Sunday Ekesi, a plant pathologist at ICIPE, and Prof. Christian Borgemeister, Scientist and Director-General ICIPE. Karibuni sana!

The Organic Farmer is an independent magazine for the Kenya farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org, website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

All animals need tender, loving care

If animals' needs are not met, their development, health and productivity declines.

Michael Waweru

Farmers should strive to have as many types of livestock in their holdings as each type furnishes different benefits at the household level. Special attention should be accorded to poultry and rabbits as the cash they generate goes directly to women and children. Their droppings are also used to make nitrogen-rich liquid manure that increases vegetable production in the kitchen gardens thus improving the family diet. The donkey is very useful in easing the labour burden on women especially, in carrying heavy loads.

Respect the nature

Animals, just like human beings, have their needs. If these needs are not met, then their development, health and productivity declines. Only by paying close attention to little details and lovingly sorting out problems and challenges can productivity be increased. Exploitation and mistreatment of animals never pays.

Farm animals should be kept according to their nature and therefore allowed to express their basic behavioral needs.

Chickens for example like perching at night therefore perching rails should be provided in the chicken house. They also naturally like scratching in search for ants and worms. They therefore should have access to an open ground, which also encourages dust-bathing. Ready compost can also be provided for their scratching needs. Green vegetables should be hanged 0.5 m off the ground so that chicken can exercise as they jump to reach the vegetables. Dark secluded nests should be provided for laying.

Clean and healthy animals are the pride of any farmer Photos TOF

Pigs like rooting and so they should have access to an open ground. A heap of ready compost can be provided. Hanging chains or tyres act as good playing gadgets.

Goats, being browsers, like their fodder suspended high enough so that they can attain an upright posture.

Poor living conditions

Although animals are an important asset in many Kenyan households, their living conditions including feeding, housing and general care is very poor. When visiting farmers, we get surprised. We find nice planted fields, and the area between the houses is as clean as a bald head.

This ideal pictures changes when we are invited to see the cattle shed. It is common to find more than 5 cows cramped in a small muddy zero-grazing unit with little or no space for movement, rest or even play. Most dairy cows, goats and even pigs are forced to lie on a bed of their own droppings, urine and mud. Animals kept in such condition are susceptible to all kind of diseases. - It is more economical to remove the manure and change the beddings daily. These can later be made into good compost for use on the farm as fertilizer.

Housing of animals is a big challenge to many farmers. The housing environment should have:

- Space enough for sufficient free movement
- Sufficient fresh air and day-light
- Enough lying and/or resting area according to the size of the animal
- Natural bedding material for large animals (cattle, sheep, goats and pigs)
- Fresh water and feed should always be provided ■

The problem with zero-grazing

Due to the small land sizes as a result of subdivision, farmers are forced to practise zero-grazing. No doubt, it has its advantages: Less energy is spent looking for food; grasses, legumes and by-products in the farm are more efficiently used. The grass is not trampled upon by cows. Manure can be collected easily and there is decreased risk of diseases, tick infestation and even theft.

However, zero-grazing means that animals have to be kept in small spaces where movement is restricted. This is totally against the natural behaviour of cattle. Zero-grazing without adequate space for cattle to move around does not take care of the animal. It is therefore unwise: Confinement of animals without adequate space creates stress and discomfort and reduces milk production, and less milk means less income.

In so many nice shambas, the structures for cows are dark, dirty makeshift holes, a lovely home for flies and insects – and a breeding place for diseases. The cows are covered with mud all over the body, which attract flies and even contaminates milk. How can milk from such a farmer be clean? A responsible and a focused farmer provides their cattle with good shelter and with adequate space where they can rest at night and continue feeding, watering and licking mineral salts. The zero-grazing structure should have sufficient space for air-circulation and natural daylight. The unit should protect the animals against excessive sunlight, heat, rain and wind. The structure should be able to house all the animals without crowding. The floor should be made of rough surface and slanted to allow for drainage of rainwater or urine. A slippery floor is dangerous for animals as it may cause injury. (*mw*)

Badly fed animals in a poor shelter

Sugar syrup: A nutritious feed for poultry

The increase in prices of cereal grains may force farmers to look for alternative feeds, like sugar syrup.

William Ayako

Sugar syrup is a good alternative to grains (Photos P Luthi)

Due to the recent global increase in price of cereal grains, poultry and pig farmers are faced with a serious feeding challenge, in Kenya as well as in other countries. Feed quality deterioration due to lack of quality control standards is another impediment to growth and development of the industry. Feed manufacturers depend mainly on locally grown grain cereals whose production is often affected by changing weather. Imported raw material may not meet the required nutritional standards, which in the process affects the quality of animal feeds. The recent pronouncement by the government of Kenya that there is looming hunger due to maize shortage meant that the available maize would be used for human consumption and not for animal feed manufacture.

In the Middle East where the cost of grain is continuously hiking, the prospects of sugar syrup as energy feed for poultry feed manufacturing is being adopted. Kenya is endowed with more than six sugar processing companies: Mumias, Muhoroni, Chemelil, Nzoia, and Sony-Awendo being the major processors. These factories can venture into processing of sugar syrup purposely for feeding of livestock. Until recently, the use of molasses as energy source in animal feed was not considered, although as a binder, dust reducer and sweetener at low inclusion rate. Mollases is highly viscous syrup with 48% sugar and 20 % ash. Sugar syrup is a high quality molasses with 70% sugar and 6 % ash.

Comparative analysis

Analysis of corn and sugar syrup based on set parameters:

Particulars	Corn	Sugar syrup
Dry matter (%)	89	80
Crude protein (%)	9.6	4.6
Fibre (%)	2.5	0
Fat (%)	4.1	0.2
Ash (%)	1.5	6
Starch (%)	75	0
Sugars (%)	0	70
Metabolisable energy MJ/kg	13	14
Calcium (%)	0.1	0.92
Phosphorous (%)	0.3	0.2
Magnesium (%)	0.1	0.17
Potassium (%)	0.4	0.85
Sodium (%)	0.1	0.1
Lysine (%)	0.8	0.02
Glucose+Fructose	0	65

Easy to digest

Sugar syrup is easily absorbed by the enzymes in the digestive tract of chickens. The digestion of most carbohydrates takes place in the small intestine of chickens; the end products are mainly, glucose and galactose (both being forms of sugar). The digestion is enhanced by enzymes. Sugars have been accepted as better energy givers than starch in the animal system. The energy a chicken manages to extract from sugar syrup is often higher (98 %) than that of starch from cereals (78- 90%).

Sucrose is converted into glucose and galactose which are essential energy units in poultry digestion. Birds require significant levels of glucose in the diet for growth, egg production and maintenance: 2 kg feed cater for 1 kg meat (or 2 grams feed for 1 gram meat) and 4 kg feed cater for a dozen eggs or 105 grams of feed for 1 egg of 52 grams.

Grains are expensive

In commercial poultry feed formulation, grains constitute nearly 80 percent by weight of the compounded feed. 1 kilogram of grain (maize) is currently costing Ksh 20-30. The factory price of 1 litre of molasses is between Ksh 5-10, the middlemen charge Ksh 30-50 per litre. In absolute terms and based on the dry matter, grain can be substituted by same proportion of sugar syrup. This means that to formulate 1 kg of feed, one requires about 800 grams of sugar syrup and 200 grams of other protein rich ingredients. Therefore for one layer bird, 1 kg of compounded feed is enough for 9 to 10 days and this feed can produce up to 10 eggs. For a farmer to feed 50 chickens for 30 days, they require 126 kg of sugar syrup and 32 kg of protein rich ingredients to formulate 158 kg feed.

Advantages of sugar syrup

Based on the above measures and other observations, use of sugar syrup in poultry feed has many advantages. One of these is that it is easy for chicken to feed on sugar syrup. The syrup helps improve the digestion of dry matter in the chicken's stomach. As a result of its sticky nature, sugar syrup reduces dustiness of feed as the dust particles get stuck on the feed. Unlike cereals, it is difficult for mould to form on sugar syrup; therefore there is no danger of the feed being contaminated by aflatoxins.

It is also not prone to insect infestation during storage. Sugar syrup is used as a binder in feed pelleting. Its taste makes it possible for the chickens to feed on ingredients that are less appealing due to their taste. Sugar syrup improves digestion when added to other feed formulars and facilitates the gradual movement of digested feed through the intestines of the chickens to allow for absorption of the nutrients. Although the use of sugar syrup as an alternative to grain in poultry feed formulation is suitable, the technology require the right advice on how to make the correct formulation for specific birds before farmers can use it. ■

The protein that kills dangerous worms

Bacillus thuringiensis (Bt) is a proven remedy against a number of insect pests, especially worms.

Paul Gitau


Cutworm


Bean pod borer


Cabbage looper

Whenever my neighbour Maina detected some armyworms or any types of loopers attacking his crops, he went for marigold and garlic. He cut them into small pieces, put them in 20 litres of water, added some soap and sprayed nearly every day. However two years ago, he heard of a product made from *Bacillus thuringiensis* (*Bt*). When he tried it, all the pests were gone. To him and his neighbours, the marigold and garlic are things of the past. Whenever they have a pest problem, in order to share the costs, they often buy the *Bt* together in wholesale. "All of us rely on this effective remedy for pest control", he says.

Bt is a naturally occurring soil bacterium whose mode of action is to causes disease on insect pests. It is accepted as an alternative in organic farming and is considered ideal for pest management because of the following qualities:

- It is host specific (it only kills target pests)
- It is high virulent and very efficient,
- It is easy to apply, and
- *Bt* is environmentally friendly with no toxic effects on natural enemies and humans.

Bt is commercially available in most agro-veterinary shops. It is sold in various formulations (spray, dust, and granule) and brands (*Bt* tenebrionis, *Bt* kurstaki, *Bt* israelensis etc.). The products have an excellent safety record and can be used on the crop until the when it is about to be harvested. *Bt* products in Kenya are sold under the following commercial names: Dipel, Javelin, Thuricide and Xentari. Unfortunately, the use of *Bt* is not very well known in Kenya, and TOF-research in various agrovet shops has shown that the personnel in these shops is ill-informed about the product.

How does Bt work?

Bt can be applied using conventional spray equipment. Good spray coverage is essential, since the bacteria must be eaten by the insect pest to be effective. When insect larvae feed on leaves sprayed with *Bt*, it produces a protein in the stomach of the pest. The proteins poison and paralyze the insect's digestive system; the insects stops feeding within hours. The *Bt*-infested insect will live for several days but will cause no further damage to the plant. They will eventually die from starvation.

Various *Bt* formulations target different types of pests. Buy the right *Bt* strain for the insect pest you want to control. Some commercial products may even mix varieties or contain additional varieties. Read the label and follow the instructions carefully. Ask for advice from your local agricultural officer or the shop where you buy the product when using *Bt* for the first time.

Bt kurstaki is used for the control of many caterpillar pests including imported cabbageworm, cabbage looper, hornworms, European corn borer, cutworms, some armyworms, diamondback moth, spruce budworm, bagworms, tent caterpillars, gypsy moth caterpillars and other forest caterpillars.

Bt israelensis is used for control of mosquitoes. It is probably more effective to eliminate mosquito larvae in standing water.

Bt tenebrionis controls beetles.

Effective against tuber moth

In TOF Nr. 36 of May 2008 we reported about the potato tuber moth and the damages this insect can have in stored potatoes. More than 10 years ago, the German Scientist and potato-specialist Juergen Kroschel researched on various methods of keeping stored potatoes healthy. He compared the use of Neem, Garlic and *Bt*. The best protection was the mixture of the product Dipel, which contains *Bt* kurstaki, with fine sand, and spread over the stored potatoes. 40 g of *Bt* plus 960 g sand (well mixed) and spread over 1,000 kg potatoes was a 100 percent effective control method.

How to spray *Bt*

Successful use of Bt formulations requires application to the correct target species at the right stage of development, in the right concentration and at the correct temperature (warm enough for the insects to be actively feeding). Application is effective before the insect pests drill their way into the crop plant or fruit from which they are protected. Young larvae are usually most susceptible. Caterpillar growth may be retarded even if a small dose is given. Determining when most of the pest population is at a susceptible stage is key to optimizing the use of this microbial insecticide.

1. Spray thoroughly, covering all the plant surfaces.
2. Apply when larvae are less than 5 mm long or when the eggs begin to hatch. *Bt* works best on young larvae.
3. In the hot tropics, it is more effective to spray *Bt* in the late afternoon as there are longer and cooler hours ahead. This enables *Bt* to remain longer on the leaves' surfaces. Bt survives better in cooler temperature. Spraying in the morning provides for a shorter and hotter environment. Do not spray *Bt* on wet days or when rain is expected.

Other methods for caterpillar worm control

Apart from using *Bacillus thuringiensis* (Bt, see on this page), there are other methods to fight the damaging worms:

Neem

- Grind 500 grams (g) of neem seed kernels in a mill or pound in a mortar.
- Mix crushed neem seed with 10 litres of water. It is necessary to use a lot of water because the active ingredients do not dissolve easily. Stir the mixture well. Leave it to stand for at least 5 hours in a shady area.
- Spray the neem water directly onto vegetables.

About 20 to 30 kg of neem seed (an average yield from 2 trees), prepared as neem water can treat one hectare of crop.

Pyrethrum powder

Grind dried pyrethrum flowers to a dust. Sprinkle over infested plants.

Pyrethrum liquid

Mix 20 g of Pyrethrum powder with 10 of litres of water. Soap can be added to make the substance more effective; apply immediately as a spray.

Good market for leeks

Farmers looking out for new crops should think about leeks.

Leeks is a hardy bulb of the onion family which can be grown twice a year. The lower portion of the leaves is used as a flavouring in soups and stews or as a raw vegetable. Leeks are tolerant to many diseases.

Climatic requirements
The crop is grown in a wide range of climatic conditions and fertile soils. It is a cool season crop and grows well at an altitude of 1500 m and above.
Varieties: There are three varieties which currently include broad flat, Italian giant and Mussel burg.
Propagation: The young seedlings are grown on nursery beds or seed boxes. Nursery management is similar to that of onions.
The seedlings are transplanted in trenches or raised seedbeds of any length which should be about 1 m wide. On trenches the plants are spaced 20 cm apart. On raised seedbeds, they should be transplanted in rows at spacing of 30-38 cm apart and 15-23 cm between the plants. Planting should be done in holes that are 15 cm deep and watered after planting.

Fertilizer requirements: Well-composted manure should be applied at land preparation stage.
Weed control: The plants should be kept weed-free. Watering is essential during dry weather. The bulb should be well covered with soil.
Harvesting: The plants mature in 16-20 weeks after planting. Harvesting should be done after the shoots are well-developed and have attained a diameter of 5 cms and are 25-30 cm long. The whole plant is lifted and the soil washed off. The roots and the upper leaves are trimmed and the crop tied in bunches for marketing. Leeks can be sold to top hotels, urban markets and can even be exported.
Nutritional value: The leaves contain 85 percent water, 2 percent protein, 11 percent carbohydrates, 1-2 percent fibre, and 50 mg calcium and a little fat. (*TOF*) ■

farmers forum

Magazine helping us improve farming

We are a group of farmers called Karanya Farmers Self-Help Group. We came across *The Organic Farmer* magazine and learnt a lot on organic farming. We learnt a lot about sweet potatoes, damage caused by nematodes, rules for better soil, beekeeping and other issues. We have already introduced a bee keeping project in our group and we are practicing organic farming in our area. We are thankful to you and we shall be grateful if you would send us past and future copies of the magazine to help us improve our knowledge and skills in organic farming.
John Kiruka Njau, P.O Box 453, Naivasha

Information will reduce poverty

I happen to come across *The Organic Farmer* magazine and I found a lot of information which when put into practice, can help alleviate poverty among small-scale farmers across the country. I am very interested in improving the quality of my dairy cows as I have the problem of poor quality breeds. Please put me on your mailing list. I don't want to lose the opportunity to read it as it will improve my life and that of other farmers in our village. Joseph K Chepkwony, P.O Box 149, Longisa

Helpful to small-scale farmers

We are a farmers' group in Timau. We are interested in small-scale farming. We discovered that your magazine, *The Organic Farmer* has a lot of useful information to enable small-scale farmers like us to get maximum production by using the latest information you provide in your articles. We would be very glad f you could send us copies so as to update us with the new trends in farming otherwise we have been borrowing a copy each month from friends. Thanking you in advance. James Mwaura, Kuramata Group, P.O Box 202, Timau

Send us magazine

I hereby request kindly for *The Organic Farmer* magazine. I have other farmers who are also interested in reading it. Please kindly be sending us 6 copies monthly. Jacob Nyongesa, Kisabo Retirees CBO, P.O Box 79 30209, Kiminini

Impressed by magazine

Having read TOF Nr. 33, I was much impressed with the information. Therefore, I would like you to send me 4 copies every end of the month. Kindly send me issue Nr. 32, 31 and 30. Thank you. Jonathan Khayumbi, P.O Box 3293, Kitale

The future is organic

Thank you very much for your magazine. I am the chairman of Kibaranyaki Fruit Growers. I have come across your magazine and read it. I have discovered our future in farming especially organic farming, which was proved to be of good potential in food production as well as money generating enterprises. I kindly request for monthly issues for my members. I am a farmer in Githongo location, Central Imenti Division in Central Meru district. We shall be very grateful if you grant. Ashton Mwongera Magiri, P.O Box 62 60205, Githongo Meru

Issue was very useful

I represent a registered group of farmers in Kangundo district. We are engaged mainly in dairy and poultry farming. We also deal in coffee farming. We came across your magazine *The Organic Farmer* and we would like to continue to receive copies every month. Sabina M Mulwa, Tisa Tisa Self-Help Group, P.O Box 1268, Kangundo

It is simple to understand

I am a small- scale farmer and I would like to be on the mailing list. The magazine is self explanatory to whoever reads it. I have seen two copies of your magazine and have found it to be very useful for me and other farmers. Also please you can supply me with the former copy of blight resistant tomato which is suitable for organic farming. Christopher C.G.Kariuki, Mirangine F.C Scheme, P.O Box 8, Mirangine

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you!
SMS ONLY

Tuma maoni yako! Asante.

Prepare your land well before planting

Please advice me on which steps to follow in order to produce 15 bags of maize from a half acre of land. James Kinyua Tel. 0728 212 261

To attain good yield from your maize crop, you need to prepare your land early enough before the onset of the rains, preferably when the soil is still moist. Good land preparation ensures the soil is fine enough and all the weeds allowed to die on the surface under dry conditions. Seed selection is also very important. You should buy the seed variety suitable for your area. You are advised to buy seeds only from established seed companies or their approved agents. If you are growing maize organically, ensure you use well-composited manure, a half an acre of land requires 2.5 tonnes of manure . For best results it is advisable to build soil fertility first by applying the manure one year before the planting season to ensure the nutrients are broken down

Healthy soil produces good harvest

and readily made available to your maize when you plant. Ensure no weeds grow because these will take away essential nutrients. A handful of compost can be added in each hole at planting time. Planting early before the rains start ensures good germination and vigorous growth. Do not plant closely; correct spacing should be 2 ft between one hole and the next. Rows should be 75 cm apart. Ensure two seeds are planted in each hole. You can top dress the maize with plant teas from tithonia, comfrey or any organic fertilizers available in your area. Ensure weeds are controlled throughout the season and you will get the desired yield – or even more. **(TOF)**

Good compost boosts yield

Thanks for your frequent educative magazine you have send to our epanja wakulima youth group. How can we make organic manure using EM? How long will it take? 0721 908 675

The requirement for composting is organic material such as animal manure, crop remains, kitchen and household waste and hedge cuttings, but not seeding weeds. It is useful to include some plants with a lot of nutrients. All kinds of legume leaves (for example crotolaria, desmodium, soybean, lablab etc.) add lots of nitrogen to the compost. Coffee husks, banana stalks, sweet potato vines, etc. are important as sources of potassium. Excellent ingredients for the compost are leaves of tithonia and comfrey, since they add not only nitrogen and potassium but also help speed up the process of breaking down organic materials of plant and animal origin to produce humus

After making each layer of compost with the required material, you can sprinkle 2 kg of rock phosphate and spray with a diluted solution of Effective Microorganisms (EM1) mixed with molasses (follow the prescription on the EM-bottle). The addition of rock phosphate is helpful because most organic material has only small quantities of phosphates. The EM solution has many beneficial microorganisms that help break down the compost faster. When EM is used, the compost will be ready for use after four to five weeks.

One should make a compost pile every week so that eventually you will have a continuous supply of this nutritious mix full of microorganisms to feed your soil. Compost must be turned to aerate, mix the materials at least three times over a period of 6 weeks. High temperatures in your compost heap will help to kill pathogens and weed seeds. After the third week your compost will progressively cool down over time until it is completely cool and ready to use. Make sure to moisten the pile during each turning, y can add more EM1. **(TOF)**

There are alternatives to DAP/Urea

Can I use TwinN on my sugarcane farm instead of DAP/ UREA? What quantity can I use? Tel. 0712 490 869

Yes, TwinN can be used in place of nitrogen fertilizers, such as CAN or Urea for top dressing of all types of crops (maize, beans, tea, sukumawiki, fruit trees etc.). TwinN provides the plant with all their nitrogen requirements throughout the growing period, when applied only once at the usual time farmers apply CAN or Urea. Sugarcane takes up to 18 months to matures, so you can spray TwinN when the crop is 1 ft high and then after every six months. To get better crop yields, farmers can mix the TwinN with Turbo Top, another new foliar spray containing phosphorus (39%) Potassium (25%) Zinc (1%) copper (0.75%) and Manganese (0.5%); Turbo Top can be applied at the rate of 5 kg per hectare (2.5 acres).

The application rate is 100g TwinN pack for every 2.5 acres. Farmers can ask for both TwinN and Turbo Top directly by calling Lachlan Ltd. on Tel. 020 2073912/3/4, 0722 209 474. The company has agents who sell their products in agrovet shops all over the country. **(TOF)**

Can Jatropha bring solutions?

The seeds of the Jatropha tree could be used for the diesel-production and fuel for your stove.

The Organic Farmer

Jatropha is a hardy, fast growing shrub or tree. Because of its high levels of oil in the seeds, many countries are planning to explore the seeds for production of biofuels. This gives Jatropha the nickname "biodiesel tree". Some countries in Africa including Zimbabwe, Zambia and Mozambique are already developing projects for large-scale production of Jatropha as an alternative renewable source of energy and income source for the rural poor. But very little is known about the risks that Jatropha could pose when put under cultivation.

Many uses

Jatropha curca, also known as 'Physic nut' or "Purging nut", has many uses. The plant grows wild in areas with poor soils to a height of 5 to 10 metres under favourable conditions. The plant is easy to establish as it does not require fertile soils, extensive irrigation or much fertilisation. It is not susceptible to frost and takes about 2 years to bear fruit. Research has shown that some plants can produce fruits even after 18 months.

Biodiesel producers prefer Jatropha because it has a higher oil yield compared to such plants as sunflower, soya, peanut or even rapeseed. It can be harvested up to three times in a year, giving more than 1600 litres of non-edible oil per hectare every year. Since the oil from Jatropha-seeds is a non-edible oil, planting these trees will not affect food security. Diesel produced from Jatropha-oil emits about 70 percent less carbon dioxide than normal fossil fuel, lower sulphur dioxide and reduced exhaust smoke. From the processing of Jatropha-seeds result numerous by-products, such as nitrogen-rich press cakes and glycerol for fertilizer, soap and cosmetic production. However, the seed cake cannot be used for animal feeds as it contains poisonous chemicals.

Jatropha plant in fruit

Many questions

A lot about Jatropha curcas is not yet known. Farmers therefore need to be careful before they go into large scale commercial production of this crop. According to the experience with coffee or tea, jatropha as a new cash crop would be in the hands of the big biodiesel-producer companies. What would be its benefit to the small-scale farmers?

On the other hand, Jatropha raises some hope for wananchi as an alternative to firewood and kerosene. At the German Hohenheim University a new pressure cooking stove was developed, which can be operated on different pure plant oils like Jatropha oil or Canola oil. This was also quite succesful in Mali. According to the chemical, physical and combustion properties of plant oils, a new vaporizer, a new burner head and a new tank as well as a novel start-up device were designed. Jatropha – the new energy-source for small scale farmers?

A desert landscape before and after introduction of Jatropha crop (below).

Food miles debate unfair to Africa

Kenya's horticultural producers and exporters have strongly voiced their concern over the food miles debate that seeks to ban airfreighting of organic produce from Africa to European markets to reduce carbon emissions. The debate, they claimed, was initiated by interest groups in Europe which want to protect European farmers who are facing competition from producers in developing countries.

"No facts"

"The contradictions in this debate shows that it is not based on any facts other than to exclude producers in developing countries from accessing the European markets", said Dr. Stephen Mbithi, the chief Executive of Fresh Produce Exporters Association.

He was speaking during a consultative meeting between the Soil Association and local organic producers and exporters which was held in Nairobi last month. He said that at the height of the food miles debate, consumption of local horticultural products in the European markets increased by more than 20 percent despite the labeling of all airfreighted products, which clearly showed that the pressure for a ban did not come from consumers but groups with vested interest in protecting their share of the organic market.

New markets

If effected, the ban would deny local small-scale producers from future access to the European export market. This would go against the stated policy of helping to fight poverty in developing countries. Mr. Tiku Shah, the Interim chairman of the Kenya Horticultural Council said local producers were already exporting organic produce to emerging markets in South Africa, the Middle East and Russia. Participants complained that the many certification schemes were costly and out of reach of local farmers'.

Anna Bradley, a standards expert at the Soil association said the food miles debate was initiated by European consumers who were becoming increasingly concerned with the source of organic food in the market and how it was produced. There was need for regular consultations between local producers and consumers in UK to create awareness of the importance of trade in organic produce between Europe and Africa, she added. ■

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 39 August 2008

Care for your goats – and get more milk

Dairy goats are now popular across the country. However, most farmers breed them in very unhygienic conditions and in small compartments without adequate space for movement and play. They are also poorly fed. All this negligence causes discomfort, stress and poor health. On pages 5 & 6 we have lots of advice by Valerie Corr, an experienced goat-keeper in Naivasha. (Photo TOF)

More shops for organic inputs

One of the big challenges for organic farmers is the supply of organic fertilizer and biological products.

Many farmers are willing to change from conventional to organic agriculture. But practising organic farming in many parts of the country is not easy. The problem is that most of the organic inputs are not available in our agrovet shops. Conventional farmers are happy because they can buy all chemicals and fertilizers, even at the local kiosk.

For organic farmers, farming is really tough business. You need diatomite for preserving stored maize against the Larger Grain Borer (Osama)? It is not available, unless you travel all the way to the factory in Gilgil. You need Mijingu rock phosphate? Or neem-products? You rarely get it. Some weeks ago, we tried to buy a neem product in the agrovet shops in Thika. It was frustrating and a waste of time: We did not find anything. If you want to buy environmentally friendly products such as *Bacillus thuringiensis* (Bt) for pest control, you might find them in stock; but the sales people cannot even tell the differences between the different varieties of Bt products they sell.

About 70 percent of all telephone calls or SMSs we get from farmers are inquiries on where they can get this or that organic product we have written about in *The Organic Farmer*. The ideal solution would be something like a general shop in villages, where farmers can find all biological products, organic fertilizers, some books, *TOF* copies and other information. It would be desirable if farmers' groups, institutions and, of course, the manufacturers would pick up this idea. (TOF)

TOF*Radio*

We are back on air!

From Thursday August 28, 2008, you can listen to the TOF radio programme again on the KBC Kiswahili service every Thursday from 8.30 to 8.45 pm. In the programme, we will give you useful tips on organic farming. You can also get your questions answered and even win prizes. Listen to TOF on radio, join us for the first programme on August 28!

Dear farmers,

Knowledge is power! Since we started publishing The Organic Farmer *magazine, we have tried to provide farmers with as much information as possible. To reciprocate this, farmers should therefore try by all means to work as professionals in order to increase production, and to do this in a sustainable way. Our overall target is to sustain the livelihood of farmers, help them to get better income and consequently have a better life. The overwhelming response from farmers who have been making telephone calls, sending us SMSs or letters and e-mails, has continued to motivate us – not only to go ahead, but to intensify our commitment to forge ahead publishing this magazine.*

This month we have taken another big step forward. First, we have increased the circulation from the current 16,000 to 18,000 copies. Secondly, we now can inform you that the Internet service, Infonet-Biovision, is now fully updated especially the part on crops and crop protection. This is a comprehensive information platform, which provides organic farmers (and even conventional farmers!) with a bulk of very valuable information on crop production. Extension workers and farmers can visit the site at www.infonet-biovision.org. If you would like to order for the first edition of the CD, contact TOF office.

Thirdly, we have relaunched the radio programme that we had started in May last year for a couple of months. The programme will now be aired, as usual, on Thursdays every week, at 8.30 pm on KBC Kiswahili service. We intend to provide you with lots of advice in all areas of farming, answer your questions and give important tips that will help you solve the day to day farming problems. Listen in, we shall have competitions with attractive prizes.

Farming is a challenging profession. Rain, weather or markets – all contribute to farmers' headache. The supply of environmentally friendly products remains a big problem, as you can read on this page. But at least one challenge we have managed to solve for you is lack of information. With TOF, Infonet-Biovision and the radio programme, farmers are well served. Whoever has knowledge can use it to better his or her life, for without knowledge – and the will to use it! – there is no real development that can take place.

Pyrethrum is a powerful, natural pesticide

Although pyrethrum is environmental friendly, farmers should be careful when using it.

The Organic Farmer

Every week, we receive calls from farmers asking us to advice them on where they can buy an environmentally friendly pesticide. This is interesting since Kenya is the largest producer of Pyrethrum in the world, one of the most effective and widely used natural insecticides. Farmers can make their own pyrethrum pesticides - if they can do it correctly. All parts of the plant (*Chrysanthemum cinerariaefolium*) can be used - flowers, leaves, and roots. Its mode of action is insecticidal, repellent, fungicidal and nematicidal.

Pyrethrum knocks down

Most insects are highly susceptible to pyrethrum at low concentrations. Pyrethrum works very fast on insects, causing an immediate "knockdown" effect. Insects are left paralyzed by its toxic nature. The normal function of their nervous system is affected. The pesticide kills on direct contact with the insect. Flying insects drop almost immediately upon exposure however many of them recover after the initial knockdown phase. In the second round, you can use a stronger solution; or you can use pyrethrum mixed with other compounds such as sesam oil or piperonyl butoxide. These compounds enhance the utilizaton of the toxic substances in pyrethrum either by increasing or prolonging their effect.

Not toxic to humans

Compared to many other insecticides, pyrethrum is biodegradable. It degenerates very fast. That is good for the environment. But if you make your own insecticide, you have to keep it in a dark place. Use it immediately you prepare the extract. Pyrethrum is relatively non-toxic to humans. The most common problem to people is its allergic properties. Pyrethrum can produce skin irritation, itching, pricking sensations and local burning sensations. These symptoms may last for up to two days. Pyrethrum is also non-toxic to most mammals, making it the safest among the insecticides in the market today. Other than the synthetic pyrethroids, pyrethrum is not so much dangerous to the beneficial insects. But you should spray early in the morning or in the late afternoon. **Caution**: Pyrethrum is highly toxic to bees.

Work carefully

• Store only properly dried flowers, use an airy container (never use plastic container), keep it away from direct sunlight and moisture.

•Make sure that they are free from moulds before using them.

• For the extract preparation, use utensils that are not used for your food preparation, drinking and cooking water containers. Clean them after use.

• Avoid direct contact with the crude extract while making the preparation and during application. Ensure that you place the plant extract out of reach of children and house pets while leaving it overnight.

• Always test the plant extract formulation on a few infested plants first, before going into large scale spraying. When adding soap as an emulsifier (mixer), use a potash-based one.

• Wash your hands after handling the plant extract and wear protective clothing while applying the extract.

Pyrethroids

Pyrethroids are synthetic compounds whose structure and mode of action are similar to pyrethrins but they are not approved for use in organic production. There are many pyrethroids including Ambush®, Ammo®, Aztec®, Pounce® and Warrior ®.

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org, website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

Home-made pyrethrum-pesticide

Pyrethrum alcohol extract

Preparation: 500 g of fresh pyrethrum daisy flower heads are put into 4 litres of kerosene for half a day. Stir well, strain it, and the solution is ready for use. Kerosene mixes very well: It dissolves about 70 percent of the pyrethrin.

Target pests: Aphids, cabbage loopers, codling moths, Mexican bean beetles, spider mites, Stink bugs, thrips, tomato pinworms and whiteflies.

Pyrethrum water extract

Preparation: Mix 1 to 1.5 kg of finely shredded dried pyrethrum into a drum of 100 litres water, stir vigorously, add 3 kg of liquid soap (which increases the toxicity).Spray in the evening.

Target pests: Aphid, bean fly, cabbage white butterfly, coffee bugs, colorado beetle, diamondback moth, eggplant fruit and shoot borer, flea beetle, gall midge, grasshopper, green leafhopper, locust, mites, thrips

Powder extract

Preparation: Mix 30 g of pyrethrum powder with 10 litres of water and 1 teaspoon of soap, stir well and apply immediately on infested plants, preferably in the evening.

Target Pests: Flea beetles

Powder or dust

You can make a powder or dust of dried pyrethrum flowers. As a dust it can be used either pure or mixed with a carrier such as lime or diatomite.

Farmers can benefit from micro-insurance

Affordable insurance schemes reduce the risk of losing money should farming activities fail.

Anja Bengelstorff

On a daily basis, subsistence farmers around the world face many risks that threaten to derail any progress they have made to work their way into a successful farming business and out of poverty. The death of a family member, loss of property and livestock, illness, and natural disasters each pose unique dangers. Protecting people against these losses is an important step towards alleviating global poverty.

Micro insurance - the protection of low-income people against specific risks in exchange for regular payments (premiums) proportionate to the likelihood of occurence and cost of the risk involved – seeks to manage these risks. "Micro" refers to the small financial transactions that each insurance policy generates.

It is estimated that only 80 million out of the world's 2.5 billion poor are currently covered by some form of micro-insurance. Most remain without access to this critical financial service. In India and China, where organizations are estimated to serve nearly 30 million micro-insurance clients each, the percentage of the poor insured is below 3%. In Africa this figure is much lower – just 0.3% of the continent's poor are insured. In 23 of the poorest 100 countries in the world, there is currently no micro-insurance activity, representing an unserved population of 370 million.

Insurance schemes for the poor

However, micro-insurance schemes are a growing market world wide. The Swiss Zurich Financial Services Group sold its first micro insurance in Bolivia in 1999. It has become a familiar practice in countries like India and Indonesia. More and more insurance companies recognize the need to provide a safety net for the poor, particularly in Africa. In Malawi, the Micro Insurance Agency (MIA), an international organisation, developed together with the World Bank a weather-indexed crop insurance to decrease the risk of drought and its negative effect on crop yields. This way, farmers in Malawi can access credit for seeds and fertilizer without the danger of defaulting. Other insurance schemes might cover excessive rainfall, livestock, property, but also life and health as well as funeral expenses. With average premiums of as low as $1.00 a month (KSh 60/=) for a family of five, the Micro Insurance Agency is making insurance affordable.

Crop losses due to bad weather can be disastrous for small-scale farmers with no other source of income . Insurance can compensate such losses. (Photo TOF)

Micro-insurance in Kenya

In Kenya, insurance schemes that are favourable for small-scale farmers are hard to find. Equity Bank claims to have introduced a micro-insurance scheme for its farmer clients, but no details on this were available.

Blue Shield Insurance offers poultry, livestock and crop insurances. Both the poultry and livestock insurances cover the death of insured birds and animals due to uncontrollable diseases, accidents and illness; the livestock insurance also includes epidemics and emergency slaughter. The minimum premium rate for the poultry insurance is Kshs 1,500, for the livestock insurance Kshs 1,200.

The crop insurance scheme can either be comprehensive which covers the physical loss or damage to a growing crop caused by natural disasters and others. It can also cover fire and lightening for selected crops. The premium rate depends on the type of crop and level of risk involved. It ranges between 1 and 2% for the fire and lightening policy. For the comprehensive coverage, usually a premium of between 2.5 and 3% of the expected crop's value is charged; for example one 80 kg bag of barley can insure one acre of the expected harvest of barley. ■

Micro insurance can alleviate poverty

In developed countries insurance is common in all sectors of the economy. The agricultural sector is not an exception. Farmers are insured against all forms of damages that may affect their crops, animals and machinery.

Unfortunately, in the poor countries of the 3rd world it is not like that, as you can read on this page. Here, it is even more important that small-scale farmers can rely on an insurance: If they lose their crops or livestock, they lose everything. Most of them do not have any cash in reserve; after a disaster, they have to start all over again.

It shows that governments lack concern for farmers. International insurance companies now start to discover the poor as a new market and introduce the so-called micro-insurance schemes with very low premium rates.

But even here, Kenya is lagging behind. Agricultural insurances exist, but small-scale farmers still lose out since the premiums are not low enough. If some of the funds allocated to the agricultural sector by governments and development agencies were set aside for micro-insurance schemes, farmers would be able to protect themselves from the mentioned risks. That would make them more sustainable and would, in this way, contribute to the development of agriculture - and the country. (*TOF*)

Right varieties and care give more beans

If you fulfill some conditions, you can get much more yield from your bean crop than usual.

The Organic Farmer

Beans are quite valuable to Kenyan farmers. They provide the much needed proteins to Kenyan families, especially in rural areas where income is low and many people cannot afford to eat a balanced diet. Being a legume crop, they also fix nitrogen into the soil thus improving it. Intercropping or rotating beans with maize and other crops has benefits because the crops gain from nitrogen fixation and essential elements such as lysine which is found in less quantities in maize and related cereal crops. Local farmers however, harvest an average of 1 or 2 bags of beans per acre. Experienced bean farmers in developed countries get up to 11 bags or more of beans per acre through proper growing and management methods. To get good yield, farmers have to grow varieties that are suitable to their areas and adopt good management practices. Beans can grow well under the following conditions:

Altitude: Beans can do well in both high and low altitude areas as long as there is adequate rainfall. They tend to grow and mature faster in lower altitude zones.

Rainfall: The best growth for beans is in medium to high rainfall areas with an average of 750-2000 mm annually. Too much rain and long spells of drought are not good for beans and reduce their yield.

Soils: Beans thrive well on well-drained soils which are high in organic matter and with a pH of between 6 and 7. Their growth is poor in water logged soils.

Land preparation: Land preparation should be done early enough so that the field is free of weeds and ready for planting at the onset of the rains. The seed bed should be composed of fine soil.

Seed quality: Farmers are advised to buy certified seeds. However local farmers prefer using seed from their own stock; while this is allowed because beans are self-pollinated, farmers should be careful when selecting seeds for planting. Ensure all wrinkled, damaged or diseased seeds are removed. Seeds when planted are prone to fungal diseases and pest damage before they germinate. To prevent these, all seeds must be treated with organic fungicides and pesticides, a range of which is available in the market.

Inoculation: Inoculation of beans before planting is very important. Inoculation is the process of mixing bean seeds with nitrogen-fixing bacteria called rhizobium, which enables the bean plant to take in more nitrogen during the growth cycle. Inoculated beans yield more than those that are not. Farmers can buy rhizobium from seed companies or enquire from agricultural research institutions near them. Taking soil from a field previously planted with beans and mixing it with your seed beans also inoculates the seeds.

Planting: Beans should be planted at the onset of the rains. Delay in planting may cause a reduction in yields or even crop failure.

Spacing: Where beans are planted alone, planting should be done in rows at 50 cm by 10 cm (one seed per hill) if weeding is done using animal drawn implements or tractors, then spacing can be done according to the implement to be used for weeding. Beans should ideally be planted in furrows- this protects the bean pods from contamination because the leaves hang over the edge of the furrow. For farmers who want to intercrop beans with maize, two rows of beans 15 cm apart can be planted between the rows of maize. Plant one bean seed per hole when using this spacing pattern. The alternative is to plant one bean row and then two seeds per hole. The depth of the plant is not a problem in bean growing and can be done by eye estimation.

Seed rates: The amount of seeds required for a given area varies from variety to variety and the size of the seed. The bigger the size of seed, the more the quantity of seed required. Beans grown as pure stands take up more seed than when intercropped with maize.

Fertilizer application: The use of farmyard manure or well decomposed compost is highly recommended for bean growing especially in areas where soils are low in organic matter content. The manure should be applied at least 1 week before planting. Apply 7- 10 tons of farm yard manure for every 1 acre of land.

Weeding: Weeding should be done continuously to ensure all the weeds are controlled. Farmers are advised to weed the crop 2-3 weeks after emergence followed by second weeding 3 weeks later (before flowering) when beans are planted alone. Avoid cultivation at flowering time when the field is wet as this can spread diseases.

Harvesting: This should be done immediately the pods turn brown and hard before they start shattering.

Bean varieties and suitable growing areas.

Bean variety	Maturity (Days)	Suitable growing areas	Remarks
Rose coco	90	Trans-Nzoia, Uasin Gishu, Kiambu,, Meru, Nyandarua, West Pokot, Keiyo, Marakwet, Nakuru, Laikipia etc	
Canadian Wonder	95	"	
Mwitemania	99	"	
Red Haricot (*Wairimu*)	88	"	
Mwezi moja	85	"	Can also do well in low potential areas with between 500 and 750 mm of rainfall
Katumani bean 1	60-65	Kitui, Makueni, Baringo	Perform well in areas between 900- 1600 m above sea-level.
Katumani bean 2	60-65	"	Affected by leaf spot and halo blight in areas 1200 m above sea level

Issue 2, August 2008

The Farmers Classified

NEW - August 2008
Dedicated for your adverts

Advertise contact: James Wathuge on +254 720 419 584 or 020 356 4106, 020 252589 Email: thefarmersclassified@mailnew.com

JOB OFFER

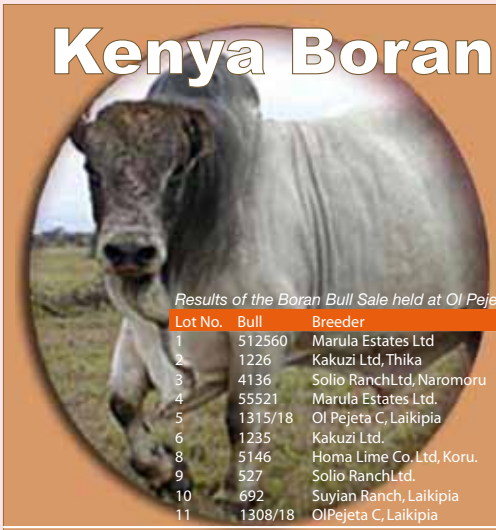
A well established Gardening and Landscaping Company in Nairobi (Gigiri) is seeking :

Mature, experienced senior HORTICULTURALIST with University degree and good organisatorial, management and communication skills, dynamic, Computer literate and ready to take over a team of workers in the field.

If you know of somebody who is interested or whom you would like to recommend, please let us have his/her application with CV to:

ammando42@yahoo.de
or
To the Manager
P.O. Box 38378
00623 Nairobi

Kenya Boran Bull Sale



Results of the Boran Bull Sale held at Ol Pejeta Conservancy on 7th. June 2008:

Lot No.	Bull	Breeder	Buyer	KShs
1	512560	Marula Estates Ltd	El Karama Sahiwals, Laikipia	95,000
2	1226	Kakuzi Ltd, Thika	Ol Maisor Ranch, Laikipia	85,000
3	4136	Solio RanchLtd, Naromoru	Marula Estates, Naivasha	145,000
4	55521	Marula Estates Ltd.	Suyian Ranch, Laikipia	80,000
5	1315/18	Ol Pejeta C, Laikipia	Ruhombe Borans, Uganda	150,000
6	1235	Kakuzi Ltd.	Ol Maisor Ranch, Laikipia	75,000
8	5146	Homa Lime Co. Ltd, Koru.	Ruhombe Borans, Uganda	175,000
9	527	Solio RanchLtd.	Ol Donyo Farm (Timau) Ltd	193,000
10	692	Suyian Ranch, Laikipia	Mpala Ranch, Laikipia	70,000
11	1308/18	OlPejeta C, Laikipia	David Kamukama, Uganda	215,000

Source: Giles Prettejohn, Livestock Manager, Ol Pejeta Conservancy, + 254 (0) 20 203 3239, + 254 (0) 733 299592, gilespj@olpejetaconservancy.org

Following the postponement of the Brookside 2008 Livestock Breeders Show & Sale, The Boran Cattle Breeders Society organised a Kenya Boran Sale at Ol Pejeta Conservancy. This confirms that animals can fetch better prices as well.

Wake-up ...farming is a business not just a hobby

Farmer's Diary

Conferences

25 - 28 August: Biovision will launch Infonet 2012 with the aim of Co-creating a farming information hub for the next decade in Kenya.

05 - 09 Oct: International Institute of Tropical Agriculture (IITA) invites you to the International Banana Conference 2008. Target: scientist, policy maker, government, NGO, donor, importer, exporter, trade, private business, tissue culture firm, farmer group, farmer cooperative. For more see, www.banana2008.com

Courses & Training

07 - 08 August: Dairy farmers field day at Mrs Nevill's farm in, Opp Kentmere, Tigoni, Limuru.

Shows & Exhibitions

14th Aug: AgMark Farmers Exhibition Day. At Tala Market, Machakos.

19 - 21 Sep: Kenya Trade Fair and Conference, Sandton Convention Centre, South Africa. email: ktrade@mweb.co.za or judy@kenyatradefair.com or info@kenya.org.za

General

Oct 15 - 18: Global Expo Botswana. Agribusiness, leather manuf., Power & Renewable energy and others. At Gabarone, Botswana. tel: +2673181931, fax:+267 3170423 globalexpobotswana@bedia.bw

Organic Mark

Kenya produces Organic meat and a variety of other products. But are our products certified to access and compete in the international market and fetch our farmers premium prices. The answer is NO, but who is responsible? Shoppers should remain warned to look out for Certification Marks on all "Organic" Products, otherwise you are exposed to very high risk of paying premium prices for products grown using conventional methods which are not necessarily organic.

TFC

Entries to the *Farmer's Diary* should be submitted at least a month prior to the event date to In-A-Vision systems (k) PO Box 29268, email: thefarmersclassified@mailnew.com attn: James Wathuge

Training in Organic Farming

Do you want training in organic farming as a group or individual?

a) Farmers course – 1 week organized at your own location.
b) School leavers – 1 ½ year or 2 years residential.
c) Distance learning programme available.

Apply for Diploma in Organic Agriculture or Certificate course to Kenya Institute of Organic Farming (KIOF). The course is fully residential at KIOF, Juja town. Fees are reasonable. Mean grade D+ or C-. Intake for the September/October 2008 is now in progress.

KIOF

Write immediately to Director,
P. O Box 34972 – 00100 Nairobi.
kiof@iconnect.co.ke or Tel: 0733 799072

TERMS & CONDITIONS

1. The rates quoted are exclusive of taxes.
2. All advertising material must be availabe to *The Farmers' Classified* atleast 1 week before the publication goes to press.
3. Clearly labelled digital adverts will be supplied in the following format:
   - Adobe Illustrator eps,
   - Adobe Photoshop eps,
   - All Fonts must converted to outlines for adverts in Illustrator.
4. All color ads,images and pictures should be saved in tiff, jpeg or eps format.
5. Clients discs maybe collected after use if so desired.
6. Every care will be taken of clients m aterial and discs,but we will not accept responsibility for loss or damage.
7. To guarantee a position will attract an extra charge.
8. We accept no responsibility for quality of goods advertised. We merely bring buyers and sellers into contact and we are not responsible for any transactions resulting from the adverts.
9. We reserve the right to refuse placement or to place advertisement's as we see fit.
10. Acceptance of all advertising is subject to publishers' approval and agreement by the advertiser to indemnify and protect the publisher from loss or expense on claims or suits based upon contents of such advertisement. This includes suits for libel, plagiarism, copyright infringement and unauthorised use of a persons' name or photograph.
11. The publishers do not assume liability for errors in any advertisement beyond the cost of space occupied by the individual item in which the error appeared. All claims must be made within one week of publication.
12. No rebates allowed for errors in key numbers or other typeset by publisher.
13. All agreements are subject to labour disputes,accidents, fires, acts of God, or other contingencies beyond publishers' control.
14. Advertiser is ultimately responsible and liable for payment for advertisements placed by agency in the event the agency defaults payment to publishers.
15. Adverts designed by publisher are products of the publisher and may not be reproduced without written permission by the publisher.

Home Made

Toothpaste

2 Table spoon Baking Soda
1 tea spoon salt

Mix with water to form a paste.

Soap

3 litres melted fat, 1 can lye
1.5 litres water

Instructions/Caution

•**Lye** is very irritating to the skin and can do severe damage to eyes and throats.
•Use extreme caution when using lye, aways keep it away from children. You **should use rubber gloves and saftey glasses when using lye**. Follow the directions on the back of the lye box on how to handle lye.
•You can also make your own lye by pouring water over wood ashes and saving the byproduct--lye water. The lye water is then added to fat to make soap.
•Although lard is the main ingredient in soap, one can successfully substitute with other oils to use in its place. Possible substitutions for lard can be sunflower, canola, or just vegetable oil.(I have found that soap made from oil is greasier than that made of lard.) Lard can be purchased at a grocery store or a butcher shop.
• **The utensils you use in soapmaking should be saved for soapmaking use only and should not be use thereafter for food purposes.**
• **You must not use metal pans and utensils, like aluminum, iron, tin, or teflon for soap making.** You can use cast iron (as in a kettle, if you are making it outside over a fire) or enamelware, stoneware,wood, glass or plastic and (nyungu) earthenware pot.
• **Always add lye to cold water.** Not viseversa. Remember to stir slowly to avoid splashes. The water will start heating up once the lye is added, due to a chemical reaction. Afterwards, pour the lye solution into the fat, once again stirring slowly.
• Chunks in your bar soap is caused by the separation of the lye and the lard. The chunks are the fat. If this happens, melt the mixture and add a cup of water at a time, until the mixture is thick and syrupy again.
• You can make your own soap molds out of a rag-lined box or glass cake pans or casseroles. Simply slice the bars with a knife after the soap has cured for a week.

Steps to follow:

1. Add lye to water and dissolve.
2. When container which holds the lye water is warm, add the fat and stir until cool. 3.
3. Pour into a cloth lined box or mould, or a box that has been dipped in cold water, and then cover.
4. Leave for 7 days until ready cut soap into squares.

Source: farmgal.tripod.com

Nature's most perfect food may also help smokers quit

Milk does your body good in many ways, but what you may not know is it can also help you quit smoking.

Researchers from Duke University Medical Center in Durham, North Carolina report consuming milk, water, fruits and vegetables make cigarettes taste bad.

The findings could lead to a quit-smoking diet that would make cigarettes less palatable, says lead study researcher Dr. Joseph McClernon, an assistant research professor of medical psychiatry at the Duke Center for Nicotine and Smoking Cessation Research.

"With a few modifications to their diet—consuming items that make cigarettes taste bad, such as a cold glass of milk, and avoiding items that make cigarettes taste good, like a pint of beer—smokers can make quitting easier," McClernon said.

The researchers asked smokers to name items that improve or diminish the taste of cigarettes.

The findings appear in the *Nicotine and Tobacco Research Journal*, funded by the National Institute on Drug Abuse.

Source: Duke University Medical Center

HOW TO ADVERTISE

If you wish to share in the success of Africa's Agriculture revolution, The Farmers' Classified, offers you the ideal media to do so. Distributed free of charge in East Africa, and other parts of the world via the internet every month, the magazine is the first publication to educate farmers on sustainable agriculture. Advertisers have a unique opportunity to unlock the untapped potential.

To Advertise contact:
James Wathuge
thefarmersclassified@mailnew.com
+254 0720 419 584, 0733 893 300
+254 020 356 4106

KILIMOHAI ORGANIC

EnCert ORGANIC APPROVED AND CERTIFIED

MAKE THE JUMP! GO ORGANIC

KALIMONI GREENS provides safe food of high quality and in sufficient quantities to the health conscious consumer from our FULLY CERTIFIED organic farms. We supply a wide variety of fresh vegetables, seasonal fruits and organic honey reliably, at the best quality and with the highest possible standards of service.

Products available at Kalimoni Greens:

- Organic fruits & vegetables
- Organic honey
- Effective Microorganisms products: **EM -1** & **EM-X**
- Organic juices – carrots, beetroot, mango,
- Organic Soya Milk, Organic Aloe Vera Juices
- Organic Yellow yolk eggs *(Kienyeji eggs)*
- Mazao Bora Organic Fertilizer
- EM treated life rejuvenating water
- Organic Cereals and healthy related dry processed products: e.g. *Natrodale* & *Naturalli* products; Organix baby food; Twinings herbal teas and Vital food supplements.
- Herbal Soaps

For a healthy alternative to the myriad of processed foods and products, try **KALIMONI GREENS Organic Products.**

KALIMONI GREENS ORGANIC PRODUCE SHOP
Life rejuvenating products

BASKET DELIVERIES NOW AVAILABLE!

Contact:
TEL: 020 884802 | 020 2361188
kalimonigreens@gmail.com

@ Karen Park, opp. St. Christopher's Secondary School, Ngong Rd.

A good farmer knows the needs of a goat

Dairy goats are easy to keep and can supply you with milk if you care for them well.

Val Corr *

There is an old saying: 'The eye of the farmer fattens the beast'. In our experience, with varied species of livestock, this saying is very true. It simply means that a good farmer, by watching his stock, will know what it needs to thrive.

Zero grazing and fodder

Zero grazing, as we know, applies to a huge percentage of Kenya's livestock, particularly in the case of small-scale farmers. Dairy goats are an ideal animal for the small-holder farmer as they are relatively cheap to keep, take up very little space, are easy to feed and produce more milk than a cow, which takes up more room, eats more food and costs more to keep.

It has been our experience that goats kept on zero grazing are fed mainly on Napier grass. Other green matter is only fed when available. Although the food is sufficient, especially if it is subsidized with a small amount of concentrate feed (i.e., dairy meal), there is total lack of 'herbage'. The goat is, therefore, being fed more like a rabbit. This can only be remedied if the goats are left to graze free range or, alternatively, if herbage can be cut and put into the stalls.

In some instances it is necessary to tether goats. This should never be done by attaching a rope to the leg. Not only is this cruel, it can also result in serious injury. Goats should always be tethered by the neck and, preferably, with a rope tied to a collar. It must be ensured that whatever the rope is tied to allow the goat to move freely round the stake as, otherwise, you will find that the goat finds itself on a rope so short that it cannot move and, more dangerously, it may strangle itself.

Exercise and playing

Young kids will show a natural ability to jump up and down from as early as 2 days. They will instinctively look for places to play by jumping on and off anything that is higher than the ground. It would seem that this is a crucial part of their growth and, in our opinion, it is essential that goats should be allowed to jump on an off things, and be able to play freely.

If left to their own devices it is apparent that they are happy to interact with each other; energetic games will become part of their daily pattern. This exercise ensures the growth of strong bones and muscles. It is possible, even in the zero grazing situation, to rig up things for the goats to play on, for instance old car tyres, stones etc.

Careful eaters

If you are able to free range your dairy goats, you will observe that they are very discerning eaters. In other words, they tend not to destroy the environment in the same way as the Masai goats do. They will eat at

Continued on page 6

**Val Corr, Lake Breeze Farm & Toggenburg Dairy Goats, Naivasha. If you wish to contact her for further advice, please call her on Tel. 0734 913 049.*

In the next TOF-issue: Birth weight, weaning, feed and bucks.

Goats require good shelter and enough space!

It is essential to house your dairy goats off the ground. The floor of the pen should be slatted (with gaps for the droppings to fall through), but the gaps between the slats must be small enough to stop the feet from slipping through. This is very important as their feet very easily get lodged, and this can cause serious injury). The reason for housing off the ground is to ensure that the goat is not lying on wet bedding which can result in coughs and will certainly 'taint' the milk.

Goats don't like rain

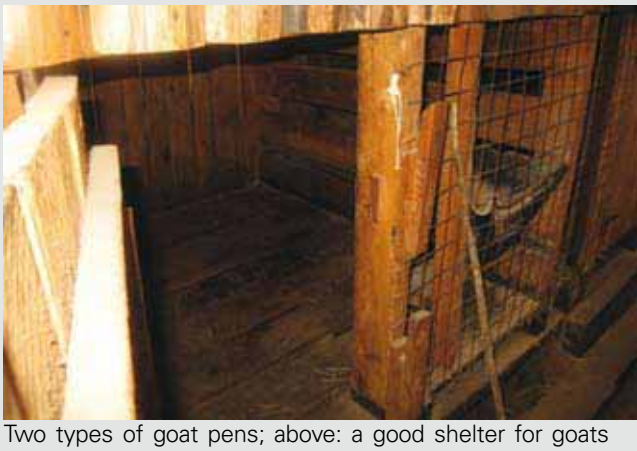
The pens must be well-ventilated, but covered against direct winds, for goats will quickly develop coughs and colds if they are housed in damp or drafty pens.

Even more importantly dairy goats should never be allowed to get wet (i.e., left out in the rain). We have observed that, at the first hint of rain, they will all try to get inside the stalls. It is essential that the floor of the pen is covered with a thin layer of hay. The goat will eat most of this during the night which is necessary for its intake of roughage.

The droppings and urine, which fall through the slats, can be raked up two or three times a week and made into compost by placing it in neat piles and allowing it to rot down. This can be used on the shamba or sold as a by product. I can assure you that it is a very sought after commodity!

Goats are not prisoners!

Goats kept on zero-grazing generally have very little room outside their stall in which to exercise. Some goats we have seen do not even have a pen to roam in; they spend their entire life in a stall. This, without doubt, severely restricts their growth and is extremely detrimental to their well-being. It is, therefore, very important that, no matter how small the farm is, goats have access to at least a small pen during the day.



Two types of goat pens; above: a good shelter for goats to stay at night, during daytime the goats are out grazing. Below: a good pen, but the goats have no space for movement; a poor feeding system, as the goats are walking on their feed leading to more wastage. (Photos TOF)

> > > from page 5: Dairy goats

one type of herbage for a while and then all change to a different type of food. It is in this way that they pick up naturally produced vitamins and minerals from the surrounding herbage, even if this only consists of grass and 'weeds'.

They will, however, require an addition of concentrates, such as dairy meal, bran (fibre) and molasses, if they are expected to produce a good supply of milk. A good milker will give anything from 3 – 7 litres per day if looked after and fed properly.

Vaccinations

It is in the interest of the owner that the goats are inoculated (vaccinated) appropriately. Vaccination against foot and mouth disease is a must, especially where there are lots of livestock kept in one area. They should be vaccinated annually for Pasteurella, which is a killer disease in goats (viral pneumonia) and also for Clostridium. This is a highly infectious bacteria that lives in much of the soil in this country. Seek the advice of your local veterinary officer. None of the above inoculations are expensive, but nevertheless they will save you a lot of money and heartache in the long run.

De-worming

It is essential that you de-worm goats every three to four months. Vary the type of worm treatments to avoid immunity to a certain brand. It is important that they are de-wormed at least once a year with a treatment that covers nasal bot and at least once a year with a treatment that covers lung worm. Owners often mistake snotty noses for a cold when it is, in fact, caused by flies which lay their eggs in the nostrils, causing nasal bot.

Healthy milk

It is becoming obvious that more and more farmers are looking at the dairy goat as the preferred animal for milk production. Goat milk is easily digestible and is tolerated by people who cannot tolerate other dairy products. It is low in fat and cholesterol and is known to be beneficial to children who suffer from asthma and skin complications. ■

farmers forum

Letters to the Editor: an abused section

"Bravo, hurray, TOF *tosha*, we need more copies of your magazine". These are the slogans that have dominated this section of the letters to the editor for the four months I have read the magazine. As far as these bags of praise and prayers for more copies are justified, I have been asking myself if farmers should not begin to discuss on this page with the name "forum" their real problems of their day-today-life.

Let me give you an example. In the last issue, in the article on Meru Herbs, the government's proposal to charge horrid amounts of money for using water from rivers or lakes was reported. How can the government on one hand assure the farming community that it is interested in improving the livelihoods of small-scale farmers while on the other hand it is actually oppressing them? Where are the farmers to fight against these policies that are pushing the small-scale farmers to the wall? Should an important magazine like TOF not be full of letters of farmers who complain about this kind of contradictory behaviour?

Of course, one of my fellow farmers may say: "Me, I do not use water from a river, I am not affected." Maybe it's true! But if we only cry foul when we are affected personally, then we will never change anything. We have, with TOF, the opportunity to mobilize the farming community in accordance with the saying: together we are strong! All what we do, my colleague farmers, is to wait and sit. Prices are going up? We wait. The roads are a disaster? We wait. The power supply? We wait!

TOF is a forum for exchange of ideas, not just a prayer breakfast for more copies. This part of our magazine is boring! I believe that we, the farmers, hold the key to the betterment of this section of letters to the editor only if we wrote about real issues such as infrastructure, agricultural services, farming experiences, health and wealth etc, etc, world without end... will you say yes!?

Philipp Ng'aa, frustrated farmer, Machakos

Where is TOF?

A monthly magazine should appear monthly and TOF has been quite faithful in producing monthly copies. However, the pains and frustrations of a delayed magazine are similar to a delayed salary at the end of the month. With delayed salary one cannot be able to pay house rent and the landlord comes knocking at the door. Likewise, with a delayed magazine the monthly mental bills for the quest of knowledge are also delayed leading to a host of problems invading the farms of TOF addicts. The TOF team should thus wake up and improve on the logistics for circulation of this magazine! Thank you!

Paul Kimani, Nyeri

Dear Paul,

Sorry Paul, and other affected farmers for getting your TOF copy late or even getting nothing at all. The reason for this, however, is not that we are asleep. All TOFs are dispatched the same day through Securicor and the Post office. In many cases the owners of shared Post Office Boxes do not hand over the magazine to the addressee in time, or they keep the magazine, or their box rentals are not renewed. So the Postal Corporation sends the letters back to us. Often the chairpersons of farmers' groups hold copies in their houses for whatever reason, or give them out to friends or even family members instead of fellow farmers. We are getting so many similar complaints from farmers like you, Paul. Few weeks ago we visited some distributors in western Kenya and found an NGO keeping hundreds of TOFs in a cupboard instead of distributing them.

We have good eyes, but we cannot see in all offices of the group-chairpersons or the NGO's! So Paul, and all you farmers, if you do not get the magazine in time, send us a letter, sms or call us. We will help you to get it! If possible, you should try to get your personal post office box to solve this problem. (TOF)

I got turkeys through your magazine

I congratulate you for your magazine and also wish to thank you for publishing my request for turkeys. Right now I got turkeys through your advertisement. I distribute your magazine to farmers groups near me.

Peter M Kibara, P.O Box 336, Nyeri
Tel. 0721 155169

Questions? Ideas?
Complaints?
SMS us, and we shall get back to you.
0721 541 590 / 0738 390 715

Many ways of controlling moles

Moles are destroying my cassava; and can beans be planted in sandy soil? Dennis Matungu, 0726 730 203

Moles are indeed a problem to many of us farmers. We have tried various methods but the best seems to be to find a mole catcher: the guy who ties a tin to a stick with a noose and baits it underground. It really seems to be an art. Mole catchers seem to know the habits of moles better than most of the farmers.

A second method we tried was to smoke the moles, by blocking up all of their holes and blowing smoke down one. The smoke will travel down their tunnels and eventually suffocate them. This needs a lot of patience, matches and dry grass. Take care not to set your farm on fire!!

Once we had a guy who put a tuber down the end of a mole hole and sure enough there was a dead mole the following day with a mouth full of the tuber. I do not know what the plant was though I somehow think it was a simple potato. I have often seen big birds of prey catching moles, so encourage them into your property by planting some tall trees around your boundary. Another easy method of controlling moles is by using the castor oil plant especially of the red variety. Cut the leaves and the ripening fruit into small pieces and plug them into both sides of the mole tunnels, moles do not like the smell of castor oil plant and will move away immediately they sense the smell. A mole's skin is very sensitive to some plants such as stinging nettles. All a farmer needs to do is to cut the nettles and plug them into the tunnels used by the moles in the same way as the castor oil plants. When the moles come into contact with the nettles, they cannot withstand the stings and will immediately move away.

Of course it is not wise to kill the moles, the tunnels they dig allow air to go into the soil, which in turn sustains soil organisms that support plant life.

Beans in sandy soils?

Yes, beans can be planted in sandy soil as long as it has enough nutrients. However, ensure that they do not dry out as these soils tend to drain and dry quickly. **Su Kahumbu**

Capsicums require warm temperatures

Hi TOF, I am planning to put up a greenhouse for growing capsicum in Eldoret. What is the ideal temperatures to maintain it? Tel. 0721 856 519

Capsicums love high temperatures. Germination temperatures can be as high as 28 °C, though optimum production temperatures range between 21-25° C. Night temperatures are best at around 20 ° C.

If you have an expensive temperature controlled green house this is easy enough to maintain, however if it is not very high tech, you will have to make some of the following adjustments: Try to construct your green house taking into account the natural air flow around the building. I had the rear of mine facing the on coming wind flow with no ventilation on that side. This meant, the airflow would come up and over the structure but could come on the sides to displace the hot air. My greenhouse was about 4 metres high on the front and 3 metres high at the back. The front side had a half a metre ventilation window at the top running its entire width. The sides were covered but also had a slight slanting ventilation gap. One side had a door. If you find you are loosing too much heat at night, attach polythylene flaps to cover the ventilation windows. **Su Kahumbu**

Which plants repel worms?

Can I intercrop tomatoes to control worms? Are there any plant extracts that can eradicate blight? Maurice Juma, P.O Box 111, 50212 Ndalu, Tel.0734 607 294.

Plants that repel soil born insects when planted are onions, leeks and especially African marigold.

Blight is very difficult to eradicate. Copper oxychloride is allowed in organic production but in limited quantities. Where there is blight in the soil, it is best to rotate your crops to another family group for a few growing seasons. **TOF**

A cook wants to become a farmer

I have a ¼ acre of land just near the river. I am a cook, but I would like to be a farmer. I would like to plant different types of crops like potatoes, tomatoes and cabbages, and I also have a cow. Please assist because I don't know how to start. Wafula, Tel.0721 731 233

Hi Wafula, you have a wonderful combination! A cow will give you the manure you need to feed your crops. Make sure you grow some crops to feed your cow!

Start preparing a small area of land to start a seed bed and sow a couple of beds. Keep the soil moist as the seeds germinate. Meanwhile, start making a compost pile, by staking out a 1 metre by 2 metre area. Start layering biodegradable dry materials such as maize stalks, grass, leaves, cleared plants etc with green material and manure until you have a pile one meter high. Soak the entire compost pile with water and cover it with banana leaves or a sheet of plastic and leave it for 3 weeks. During this time check to ensure it does not dry out, add water if necessary.

After three weeks, turn the compost pile until the materials are well mixed. Stack it again. It will decrease in size as it rots down. After another three weeks your pile should be ready, and your seedlings will also be more than ready for transplant.

Seedlings are ready to plant at 4 weeks, so start your compost preparation two weeks before you plant your seed beds. Prepare your growing area and when transplanting, add good two handfuls of compost into the planting holes. Mix in a little soil and then plant your seedlings. Water straight away and thereafter every 3 days or so depending on your soil type. Tend your plants and watch out for insects and signs of disease.

Su Kahumbu

Organic fertilizer is just as good

Can the organic fertilizer that KFA is selling be used to plant groundnuts or peas? Francis Kimani 0710 968 554

Any organic fertilizer will do well with groundnuts or peas. But we would recommend that – instead of buying organic fertilizer – you produce your own healthy compost. Whenever you want to plant any crop you can be able to reduce your expenses by using your own compost which is cheap; it will require some bit of extra labour, but you can save a lot of money. T**OF**

The value of organic manure

Organic manure is not taken seriously by most farmers as a fertilizer that can help improve soil fertility on the farm, but according to research conducted by various institutions, it was found that the use of farmyard manure can boost crop yields significantly. New findings now indicate that farmers can increase their crops yields by between 10 to 15 percent after reducing the use of chemical fertilizers in crop production. The use of increasing amounts of organic fertilizers has been found to increase soil fertility and its nutritional value.

Manure and foliar feeds

Preliminary results of the ongoing push-pull project in parts of Central province which is being implemented by KARI and funded by BioVision Foundation support this view. Small-scale farmers who used well-composted organic manures in their demonstration plots at the start of the season have healthier crops than those who did not. The crops were even better where the farmers used foliar feeds from plant teas made from tithonia.

Samuel Njihia, the project leader says that farmers participating in the project are only allowed to use organic inputs on the push-pull sites. "From mere observation, the difference in crop health between the organically grown crops and conventional ones is very clear. In the second season we expected to have even better results because the farmers will have mastered adequate skills in preparation of compost," he says. We will give you the full report on the importance of manure in one of the coming issues of *The Organic Farmer*. (TOF)

Right: A healthy intercrop of maize and beans grown using organic manure. Below: Farmers scout for stem borer infestation in a push-pull demonstration plot at Kagunduini, Thika. (Photos KARI)

New market for organic produce

The marketing of organic produce from small- scale farmers in East Africa will now be easier following the establishment of a streamlined supply system that has been set up by two marketing outlets in Kenya and UK. The outlets will enable farmers to sell organic produce locally and abroad. Organic farmers in any part of East Africa will get orders for supply of various organic products and also alert the buyers of the type of produce they want to sell through a computerised information system that will be linked to their mobile phones.

Su Kahumbu of Green Dreams' Organic Shop has teamed up with a UK-based organic food marketing chain to form the Food Network of East Africa (FNEA) that will train local farmers on the requirements of production, packaging and marketing of the various organic products that are produced in the three East African countries for both local and the export market. They will buy the products.

Hurdles: Standards and Credit

"Our intention is to consolidate the organic produce from various parts of East Africa and sell these products in the region and also in the export market. To do this successfully, we have to train them on supply of the required volumes and quality", says Kahumbu. "The main problem that faces local organic farmers is the inconsistency in supply of organic products including overproduction or underproduction," she added. Organic farmers will be trained on quality assurance systems to ensure that the produce they supply is of highest quality. The training on quality will reduce rejection of produce for failure to meet the set organic standards.

Another hurdle that faces local small-scale farmers has been lack of credit. To overcome this problem, Kahumbu says FNEA is also networking with a number of microfinance institutions to train farmers on where they could source credit to overcome their cash flow problems. Farmers will also be trained on local and export certification requirements, and introduced to organic input providers. Organic farmers interested in joining the organic supply chain can contact Su Kahumbu for details, call Tel. 0721 100 001. ■

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 40 September 2008

To plough or not to plough?

Conservation agriculture aims at producing high crop yields while reducing production costs, maintaining soil fertility and conserving water. It is a way of achieving sustainable agriculture and improving livelihoods. *See page 4 & 5* (Photo TOF)

Long wait for promised inputs

Urgent measures are needed to cope with the expected food shortage.

The Organic Farmer

At the moment, Kenya's food security situation is critical. From the many calls we are receiving from farmers, it appears very little is being done to help them. A large proportion of farmers was displaced and farming operations disrupted when violence hit the country at the beginning of the year. The most affected were the country's major food producing zones.

The government, through the ongoing resettlement programme, had pledged to support displaced farmers. They were promised agricultural inputs such as seeds and fertilizer. But the inputs are inadequate, and as we hear, much of the aid is being diverted by corrupt provincial administrators and sold in black market. Although fertilizer prices have gone down, most farmers still lack adequate resources to buy it.

The situation for many farmers is thus desperate. The long rains, which would have corrected the food deficit have not been enough in most of the farming areas. With the recent upward surge in food prices, the general outlook is very scaring. Importing food is not a solution because many people may not be able to buy it. What is required are urgent measures to help farmers with affordable inputs to enable them utilise the current short rains to produce adequate quality food. This should be done urgently. (*See page 6*)

TOF*Radio*

Listen to KBC Kiswahili service every Thursday from 8.30 to 8.45 pm.

You want to improve your knowledge on farming? Buy a copy of the Infonet-BioVision CD. For details, *see page 8*.

More about dairy goats

Do we need to separate the male goat (buck) from the herd?

See page 3

Dear farmers,

Agricultural practices are on the change every day. The benefits of some of the technologies being developed are debatable because of their impact on the environment; others have immediate benefits for farmers. They therefore need to know these new methods of farming, and be able to adopt them if they are sustainable, environmental friendly, and if they help boost their crop yields, including improving their income.

The increase in demand for food has led to a sudden hike in food prices worldwide. In Africa, the situation is critical given our low capacity for food production. This state of affairs, in future, will affect mostly the poor because, if the trend continues, they may not be able to afford food that is costly. Farmers have to find a way out of this vicious cycle; new research findings now show that there are many ways in which farmers can produce more food without the use of expensive inputs. Across the world, research is coming up with new technologies that are cost effective and which – if practiced by farmers – could double or even triple their average yields. Of course, we have to be careful not to believe in all that we are told; but we should at least have a look at all these options and carefully evaluate them with an open mind.

One method that is dominating debate in agriculture and that is of interest to us is minimum or zero tillage, which many farmers in Latin America and Asia are using with very good results. In this method, the soil is regarded as a living entity that should not be disturbed so much through ploughing, harrowing or hand hoeing. This practice ensures that the living organisms living on the surface of the soil and which help promote growth are protected. Furthermore, important nutrients that sustain plant life are also preserved and by the way, you save a lot of money since you reduce the costs for land preparation.

Some farmers may find it difficult to believe this, because they have adored ploughing as the only way to prepare land for growing crops. The call "do not disturb the soil!" may sound strange and a challenge to many farmers. But they should remember: It is not how hard you work in your shamba, that assures you of a good harvest. It depends on how smart – or wise – you do it!

Couch grass is difficult to remove

Controlling couch grass is not an easy job. You may dig it out or use chemicals.

The Organic Farmer

Many farmers find it hard to control couch grass. They are fed up with this monster that is a problem to their crops. Of course, one can understand their complaints.

Couch Grass (*Elymus repens*) is a very common species of grass. Its other names include twitch, quick grass, quitch grass, dog grass, and quackgrass. As these names may suggest, couch grass has been used in herbal medicine since the classical Greek period. Sick dogs are known to dig up and eat the root. A hundred years ago, herbalists used it to treat inflamed bladders, painful urination and for water retention.

A fast growing weed

Couch grass is a common and invasive garden weed. It rapidly spreads by rhizomes (underground stems) and grows extremely quickly. From the tips of the rhizomes, new shoots are produced that quickly produce tufts of leaves and more rhizomes. These become entangled in clumps of herbaceous perennials, among shrubs and fruit bushes causing great problems.

The roots of couch grass are dense and bind even the lightest soil. Once these roots intermingle with ornamental plants they can smother the plants and become difficult to remove and to eradicate.

Digging out couch grass is possible, but this is likely to leave behind small sections of rhizomes in the soil. These quickly re-grow and need to be removed before they form a new network of underground stems and therefore perpetuating the problem.

Chemical control

An easier way of removal is chemical control. Do not remove couch grass with chemicals in the dry season. Weedkillers such as Round-up are quite effective and, if correctly applied, should kill out even heavy infestations of couch grass in one application. But as these products are not selective, care is needed to prevent spray landing or drifting on to other cultivated plants and causing damage. Protect them with polythene while spraying and remove only once it has dried. The grass should die within three weeks; but treat any re-growth as soon as possible. Do not cultivate the soil until the grass has been completely eradicated. ■

Stubborn grass: If a small piece of the grass remains in the soil during weeding, it will grow again. Underground stems (below).

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org, website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

My struggle with couch grass

Couch grass is perhaps one of the most stubborn grass weeds I have had to deal with on my tea farm. Wherever I noticed a patch of couch grass in the tea bushes, my first instinct was to work on it there and then and ensure every piece of the grass was removed however deep it had dug its way into the soil. I only stopped digging after turning the soil over and over again and satisfied myself that the offending grass was done away with.

But you can imagine my frustration whenever I came back after only a few weeks to find the grass I had weeded out shooting out again! Finally it dawned on me that I was fighting a losing battle. However careful one is in removing couch grass, an odd piece of the grass that remains in the soil will sprout especially during the wet season and re-establish itself spreading like a bushfire fanned by strong winds. But what really shocked me most is the extent to which this weed can go to nourish itself. I had uprooted a tea seedling that had dried up. What I found out stopped me in my tracks: Right inside the stem was a piece of couch grass, that had worked its way right through the root system into the stem! The grass had taken away most of the nutrients that were fed to the plant, and in the process interfered with its normal growth.

A colleague then advised me that the best way to reduce the couch grass menace was to weed it out during the dry season, then use a paint brush to apply the Round-Up herbicide on the few patches that regenerated. Somehow, it worked. **Peter Kamau**

With enough milk, young goats grow fast

The first months are important for young goats. They do better if allowed to suckle milk from their mothers.

Val Corr *

In my last article (TOF Nr. 39, August 08) I talked about the feeding and proper housing of goats, which are some of the conditions for healthy animals; in this article we are going to look at how to deal with the young ones. According to our experience, birth weight is insignificant. Small kids (the young one of a goat), if fed properly and allowed to exercise freely will, almost certainly, catch up with their siblings by the age of three months, be of a generally uniform size and weight. The average birth weight of our kids is 3.5 Kg in the case of twins although we have had twins weighing 5 kg each!

Feed the kids

We consider a 2 kg birth weight a very small animal but, we have always found that these small kids soon catch up if looked after properly. In September last year we had two sets of triplets (our first experience of this) in 10 days! The first set were all of average weight and two of the second set were also average but the third one of this set only weighed 900 g at birth. We fed her every two hours for the first 10 days and then every four hours (last feed at 9 p.m.) and, by two months she was almost as big as her siblings.

Weaning

From experience we have noted that it is of long term benefit to young stock that they should be allowed to get milk from their mothers by suckling for the first month. At the end of this month, they should be separated at night in a pen close to their mothers. At the end of two months they can be separated completely. This practice is especially beneficial to small kids. If they are bucket-fed they will almost certainly not do as well and may not catch up with their siblings.

Although this might mean less milk is available to the 'household' in that first month, it will mean a much stronger, healthier kid. We have proved this ourselves when we have reared orphans – they did not thrive in the same way that kids left with their mothers did. By leaving them with their mother, you not only ensure a much better healthy kid, you will also find that it is a less stressed animal and the mother, at the end of the second month is very happy to wean her offspring whereas, if you separate them after a few days, the mother is very stressed by losing her kid and will not eat properly, often for several days, because she spends all day making noise to get the kid back.

Molasses

Molasses is a cheap source of vitamins and minerals and goats love it. It can be added to the concentrated feed to add flavour and/or be mixed with water in a drum and the goats allowed to drink it freely once a day.

Molasses is especially beneficial to ruminants as it causes fermentation in the rumen. About 75 percent of a goat's weight is concentrated in the stomach region, and fermentation helps to keep the animal warm. This is vital as dairy goats have very little body fat.

Hay is needed

Hay is a very important part of a ruminant's diet, especially in a zero grazing situation, as it would be the only source of roughage available in the diet. Without hay your goats will tend to become either have indigestion or suffer from bloat. ■

**Val Corr, Lake Breeze Farm & Toggenburg Dairy Goats, Naivasha. If you wish to contact her for further advice, please call her on Tel. 0734 913 049.*

Do not separate bucks

It is very possible to keep a buck (male goat) with the herd. If you plan your breeding, which you should, then fasten an 'apron' to the buck prior to running him with the does. It is important to lodge a piece of sheepskin under the tie on top of his back as, otherwise, a sore will develop and these are very difficult to clear up.

We have proved that the buck is a much happier, healthier animal when run with the herd. It was our experience that, when the buck was tethered, he spent most of his day calling for the herd and not grazing which had a very obviously damaging effect on his general condition.

House the buck alone

There is a myth that if you allow the buck to stay with the herd that this will cause the milk to be tainted. We have proved that this is not true. What is true is that bucks have a very strong smell – we have solved this problem by housing the buck separately from the does. What certainly does taint the milk is if the does are not housed off the ground which means that they are lying in their own dirt. This means that the udders become dirty which in turn taints the milk. You must maintain hygiene.

Soil fertility is the starting point in farming

A healthy soil should contain all essential nutrients. Organic and conservation agriculture are sound foundations towards achieving this goal.

The Organic Farmer

A recent report on the Rice-Wheat Consortium for the Indo-Gangetic Plains, a joint program involving Bangladesh, India, Nepal, and Pakistan as well as the international agricultural research centres, states as follows: "Results of on-farm trials show that reduced or zero tillage generally results in wheat yields that are higher than, or at least equal to, yields obtained using conventional practices. The simplest approach is surface seeding, already common in parts of eastern India and Bangladesh, where farmers broadcast wheat seed in the rice fields before the mature rice crop is harvested."

These farmers in Asia are not unique. Hundreds of thousands small scale-farmers in Latin America and even big farmers in the US are practising reduced or zero tillage, which aims at enhancing and sustaining farm production by conserving and improving soil, water and biological resources. Agriculture can become much more efficient, ecologically sound and sustainable if farmers adopted minimum tillage.

New ways

It is not so easy to adapt new methods of farming. When it comes to land preparation, we are so much fixated at the idea of ploughing or digging. Leaving a protective blanket of leaves, stems and stalks from the previous crop on the surface is, in the eyes of many farmers, a sign of a laziness. On the contrary zero or minimum tillage is very important for conserving soil moisture, retaining essential plant nutrients and preventing loss of top soil through water and wind erosion. Moreover, farmers ask if they can practise the simple technique of drilling seeds into the soil with little or no prior land preparation. This is possible, as one can read on these two pages. It is always challenging to try new production methods, especially in agriculture, where farmers are wary of losing their precious crops. Nevertheless it is a worthwhile try.

Farmers need to overcome another hurdle. Most of them take fertilizers as the final solution to solve soil fertility problems. That is why they spend a lot of money to buy fertilizers with nitrogen (N), phosphorus (P) and potassium (K) to feed their crops. Nitrogen in particular is highly valued as it shows immediate results with healthy leaves and rapid crop development. But farmers do not realize that too much nitrogen can interfere with fruit formation in a plant; it also pulls water into the plant diluting plant sugars and making the plants "soft" and hence vulnerable to diseases and pests.

Manure retains soil nutrients

To some extent, the promotion of NPK is done by scientists who concentrated on the NPK category of soil nutrients at the expense of other essential soil nutrients. They assumed that the other soil nutrients were already there in sufficient quantities. However, prolonged use of land for farming, poor fertilizer usage and even rainfall has been found to reduce other important nutrients in the soil. This causes an imbalance that locks up many micronutrients, making then unavailable to plants. Organic manure and compost help bind together all these micronutrients namely phosphate, sulphur and boron in the soil.

Conservation agriculture is a good solution to the problem of declining soil fertility as it creates the right balance in soil nutrients. By conserving organic matter content in the soil, this method improves the condition of the soil. However as mentioned earlier, all this depends on the willingness of farmers to change and to use any methods that improve their soil fertility while at the same time increasing their crop yields and income. Already many farmers across the country are slowly abandoning ploughing of land. Instead, they have opted to use 'Round Up' herbicide to eradicate weeds after which they dig holes and plant maize and other crops. This is a good beginning that may lead to eventual adoption of minimum tillage.

Disturb the soil as little as possible

In conservation agriculture, tillage is reduced to rippling planting lines or making holes for planting with a hoe. The ideal is to plant direct into the soil, without ploughing. This protects the soil structure.

In conventional farming, farmers plough and hoe to improve the soil structure and control weeds. But in the long term, they actually destroy the soil structure and contribute to declining soil fertility.

Keep the soil covered as much as possible

In conservation agriculture, crop residues left on the field, mulch and special cover crops protect the soil from erosion and limit weed growth throughout the year.

In conventional farming, farmers remove or burn the crop residues or mix them into the soil with a plough or hoe. The soil is left bare, so it is easily washed away by rain.

Mix and rotate crops to improve soil fertility

In conservation agriculture, this is minimized by planting the right mix of crops in the same field, and rotating crops from season to season. This also helps to maintain soil fertility.

In conventional farming, the same crop is sometimes planted each season. That allows certain pests, diseases and weeds to survive and multiply, resulting in lower yields in the next harvest season.

Issue 3, September 2008

The Farmers Classified

NEW-September 2008
Dedicated for your adverts

Farmers in Kenya spend 80% of their time in the shamba and 20% reading *The Organic Farmer* magazine

Incentives lacking for farmers

Take your children to the farm when they are young and you can be sure that your farm will be preserved and improved. Send all your children to city schools and talk ill of farming, forgetting that you use your farming income to send them to school; and you can be sure that the first chance your family gets to sell their family farm land they will do it.

Let us encourage our children to venture into farming and we can be sure to have a future generation of farmers. We call upon organizations involved in agriculture to develope incentive schemes to nurture our energetic youth. "A bad example" ..energy used to fight and destroy property during the post-election period could have helped till over 20,000 hectares of farmland, plant and weed and half of it used to harvest using manual labour or even build over 200 km of roads that we dearly need in our country. Just imagine. TFC

Farmer's Diary

Conferences

05 - 09 Oct: International Institute of Tropical Agriculture (IITA) invites you to the International Banana Conference 2008. Target: scientist, policy maker, government, NGO, donor, importer, exporter, trade, private business, tissue culture firm, farmer group, farmer cooperative. For more see, www.banana2008.com

Courses & Training

....

Shows & Exhibitions

19 - 21 Sep: Kenya Trade Fair and Conference, Sandton Convention Centre, South Africa. email: ktrade@mweb.co.za or judy@kenyatradefair.com or info@kenya.org.za

General

Oct 15 - 18: Global Expo Botswana. Agribusiness, leather manuf., Power & Renewable energy and others. At Gabarone, Botswana. tel: +2673181931, fax:+267 3170423 globalexpobotswana@bedia.bw

INFONET-BIOVISION CD: Do you want to improve your knowledge on farming? Buy a copy of the Infonet-BioVision CD. For details on how to order *see page 8 for instructions*.

WANTED

Fresian Bull & Dorpers: Contact Winnie, Subukia, 0724 638 454
Rabbits: Contact Charles Gichohi, Murang'a, 0722875441
Harmshire Doe: Contact 0722 636 581

TERMS & CONDITIONS

1. The rates quoted are exclusive of taxes.
2. All advertising material must be availabe to *The Farmers' Classified* atleast 1 week before the publication goes to press.
3. Clearly labelled digital adverts will be supplied in the following format:
   - Adobe Illustrator eps,
   - Adobe Photoshop eps,
   - All Fonts must converted to outlines for adverts in Illustrator.
4. All color ads, images and pictures should be saved in tiff, jpeg or eps format.
5. Clients discs maybe collected after use if so desired.
6. Every care will be taken of clients m aterial and discs, but we will not accept responsibility for loss or damage.
7. To guarantee a position will attract an extra charge.
8. We accept no responsibility for quality of goods advertised. We merely bring buyers and sellers into contact and we are not responsible for any transactions resulting from the adverts.
9. We reserve the right to refuse placement or to place advertisement's as we see fit.
10. Acceptance of all advertising is subject to publishers' approval and agreement by the advertiser to indemnify and protect the publisher from loss or expense on claims or suits based upon contents of such advertisement. This includes suits for libel, plagiarism, copyright infringement and unauthorised use of a persons' name or photograph.
11. The publishers do not assume liability for errors in any advertisement beyond the cost of space occupied by the individual item in which the error appeared. All claims must be made within one week of publication.
12. No rebates allowed for errors in key numbers or other typeset by publisher.
13. All agreements are subject to labour disputes, accidents, fires, acts of God, or other contingencies beyond publishers' control.
14. Advertiser is ultimately responsible and liable for payment for advertisements placed by agency in the event the agency defaults payment to publishers.
15. Adverts designed by publisher are products of the publisher and may not be reproduced without written permission by the publisher.

Home Made

Historical use of herbs

Alfalfa - Pituitary gland, arthritis, chlorophyll, nutritive, alkalizes body rapidly, detoxifies body and liver.
Aloe Vera - Heals digestive tract, offsets excess acidity, hiatal hernia, ulcers, gout. (Juice or capsules)
Capsicum- Catalyst for all herbs, stops internal/external bleeding. Increases circulation, colds, chills, stops shock. (Capsules or extract).
Garlic - Used to emulsify cholesterol and loosen it from arterial walls. High blood pressure, yeast problems infection, blood thinner. (Capsules, gel tab, & H.P. odor-controlled).
Ginger - Menstrual cramps, prevents gas, indigestion, nausea, motion sickness, morning sickness.
www.a-renewedhealth.com

Warts

Apple Cider Vinegar for warts! Wow! I had a wart on my thumb knuckle and a big one next to the thumb nail. The one near my nail was starting to spread under the nail. I read about the ACV treatment on this site and it works!

How to do it:

Soak coton in ACV and tape over wart with bandage. After about 20 minutes it will throb like crazy. Kept it on overnight, the next morning, the thumb will be throbbing but the two warts will be black. Let the air get to them, they form a scab like top. Yeah, it's gross looking, but after 7 hours they will be already black.Reapply the next day for a couple of hours. Then three days later the scabs will come off with a little prying. There's just a 'hole' where the wart was. Cover it now with disinfectant and band-aid.

1. It does throb a lot. It's worth it.
2. Don't get nervous about the black color, the wart has to die first.
3. Keep at it! Don't worry about the skin around the wart. It'll be fine. It may get all wrinkly and pruney but it'll be fine!

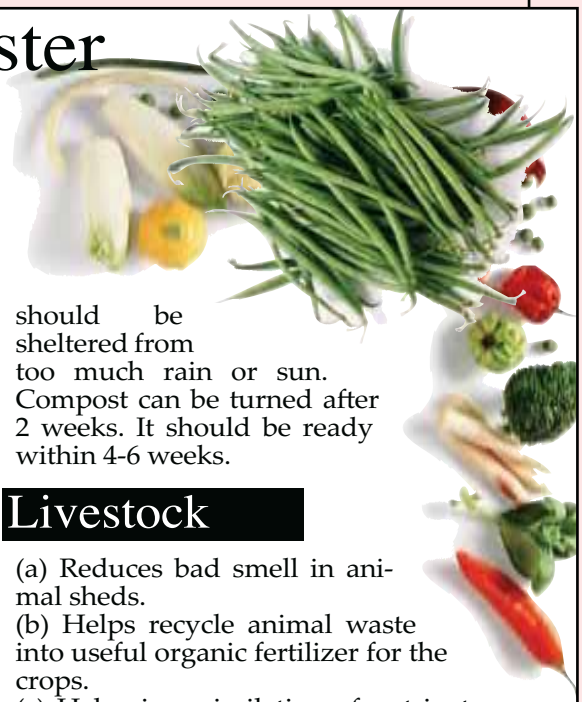
Other Methods

- Apply fresh cut pineapple to affected areas several times daily.
- For planter's warts cover in duct tape until gone.

CAUTION: Never use any home remedy or other self treatment without being advised to do so by a physician.

www.myhomeremedies.com

BM Organic Booster



BM stands for Bio-active Microbes. It comprises of selected species of naturally occurring microbes which are useful for plant growth and environmental management. The product is produced naturally by controlling the PH to the level where only beneficial microbes can survive. As a result no synthetic chemicals or genetic modification of the organism is done, hence the product can fit the description of an organic product. The main microbe in this product is *Bacillus Subtilis* which is very good in converting the nitrates to nitrites hence making nutrients available to the plant. BM organic booster can be used in:-

Agriculture

BM can be used as folia spray or can be drenched as a fumigant.

ADVANTAGES OF BM

- Helps in germination, growth, flowering, fruiting and ripening of the fruits.
- It increases the quality and quantity of produce
- It increases the self -life of perishable, palatability as well as taste of the produce.
- It promotes multiplication of beneficial micro-organisms in the soil.
- Reduces nutrients immobility and increases mineralization.
- It de-ionizes hazardous substances such as heavy metals while decomposing residual agrochemicals.
- It creates an ideal environment for the roots to absorb nutrients from the soil.
- It inhibits abortion of flowers e.g in coffee if sprayed before flowering.
- It facilitates decomposition of organic m a t - ter (hence ideal for compost making).
- It improves the soil structure.

COMPOST

Dilute 200mls:20L water and apply in layers. Take care not to exceed moisture content of 40%. After treatment the compost should be sheltered from too much rain or sun. Compost can be turned after 2 weeks. It should be ready within 4-6 weeks.

Livestock

(a) Reduces bad smell in animal sheds.
(b) Helps recycle animal waste into useful organic fertilizer for the crops.
(c) Helps in assimilation of nutrients when given in drinking water thus increasing productivity.
(d) Helps to reduce stress in livestock especially in poultry and pigs when applied on their beddings.
(e) It is used in making silage, where it accelerates fermentation.

Sanitation

1. TOILETS AND PIT LATRINES

BM suppresses bad smell in both toilets and latrines. It is also very good for keeping flies away.

OTHER PRODUCTS AVAILABLE

1. BM organic fertilizer.
2. BM probiotic health supplement.
3. BM Bokashi.
4. A variety of herbal teas and healthy foods.

FOR MORE DETALS CONTACT
PETER CHANDI
0722599478
0733546491
Email organicafrik@yahoo.com

TOFSUBSCRIPTION FORM

Return this completed form to TOF. PO Box 14352 00800 Nairobi or info@organickenya.com

Name: _____
Postal Address: _____ Code: _____
Town: District _____
Province: _____
Registration No.: _____
Number of active Members: _____
Chairpersons Name _____
Chairpersons Tel.: _____
Areas of interest: _____
_____

Registration type:

- Individual farmer ☐
- Farmer Group ☐
- Women Group ☐
- Youth Group ☐
- College ☐
- School ☐
- Church Group ☐
- Extension Officer ☐
- NGO ☐
- CBO ☐

Other _____
_____

HOW TO ADVERTISE

If you wish to share in the success of Africa's Agriculture revolution, The Farmers' Classified, offers you the ideal media to do so. Distributed free of charge in East Africa, and other parts of the world via the internet every month, the magazine is the first publication to educate farmers on sustainable agriculture. Advertisers have a unique opportunity to unlock the untapped potential.

To Advertise contact:
James Wathuge
thefarmersclassified@mailnew.com
+254 0720 419 584, 0733 893 300
+254 020 356 4106

KILIMOHAI ORGANIC

EnCert ORGANIC APPROVED AND CERTIFIED

MAKE THE JUMP! GO ORGANIC

KALIMONI GREENS provides safe food of high quality and in sufficient quantities to the health conscious consumer from our FULLY CERTIFIED organic farms. We supply a wide variety of fresh vegetables, seasonal fruits and organic honey reliably, at the best quality and with the highest possible standards of service.

Products available at Kalimoni Greens:

- Organic fruits & vegetables
- Organic honey
- Effective Microorganisms products: **EM -1** & **EM-X**
- Organic juices – carrots, beetroot, mango,
- Organic Soya Milk, Organic Aloe Vera Juices
- Organic Yellow yolk eggs *(Kienyeji eggs)*
- Mazao Bora Organic Fertilizer
- EM treated life rejuvenating water
- Organic Cereals and healthy related dry processed products: e.g. *Natrodale* & *Naturalli* products; Organix baby food; Twinings herbal teas and Vital food supplements.
- Herbal Soaps

For a healthy alternative to the myriad of processed foods and products, try **KALIMONI GREENS Organic Products.**

Life rejuvenating products

BASKET DELIVERIES NOW AVAILABLE!
Contact:
TEL: 020 884802 | 020 2361188
kalimonigreens@gmail.com

@ Karen Park, opp. St. Christopher's Secondary School, Ngong Rd.

Organic Seaweed Extract

- *Certified for organic Farming*
- *Patented Seaweed Cell-Burst Process*
- *Enhances Root Development*
- *Easy To Apply*
- *Increases Crop Yields*
- *For use on Vegetables, Flowers, Forestry & Gardens*
- *Non-toxic, Environment Friendly & Ecologically Safe*

READ THE LABEL CAREFULLY BEFORE USING.

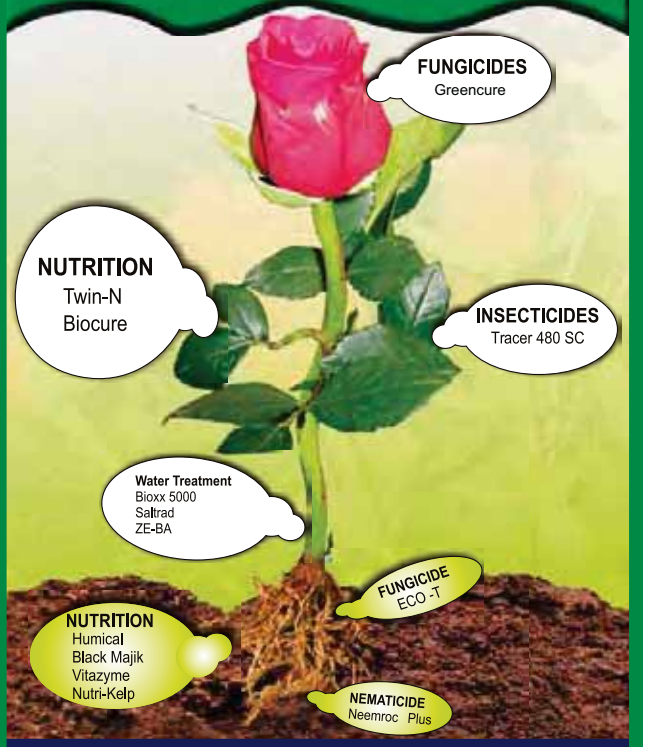
Distributed by:

Organix Limited

The Farmer's Environmental Friend

P.O. Box 14494
Nairobi 00800 Kenya
Fax: +254 20 3742605
Tel: +254 20 3741482 / 3566241/2
Cell: +254 735 712090 / 720 937535
enquiries@organix-agro.com www.organix-agro.com

Innovative Organic Farming Technologies from Lachlan Kenya Limited



LACHLAN KENYA LIMITED, P.O Box 49470, NRB,00100 Tel: +254 20 2073912/3/4
Fax: +254 20 2060260 Email: lachlan@griculture.co.ke website: www.griculture.co.ke

www.organicfarmermagazine.org

Reach over 100,000 readers and sell:

High breed bulls & heifers
Sheep for meat and production
Goats for milk and meat
Pets and hunters

You can do it in this space call: james wathuge on
0720 419 584
020 356 4106

STUDY
Certificate in Graphics Design
Certificate in Web Design
Certificate in Multimedia Authoring
Certificate in 3D Animation
Diploma in Multimedia

AT

ARENA
arts multimedia college

Why Arena Arts Multimedia College.
1. Qualified & Skilled Lecturers.
2. Small classes max. 9 Students.
3. Ample computer Practice (all day).
4. One Computer one student.
5. Real Job Exposure (studio works).

Clean Affordable Hostels available at request for Boys and Girls.

call 0726 310076 or 020 2053434
email: info@arenamultimedia.co.ke
website: www.arenamultimedia.co.ke

A challenge for farmers

As we have see on page 4, conservation agriculture has three basic principles: disturb the soil as little as possible, keep the soil covered as much as possible, mix and rotate the crops. To gain the full benefit of conservation agriculture, all the three principles have to be applied at the same time. This is the case with ideal practice: direct planting through a soil cover.

This ideal is not possible everywhere. But farmers should try to go in that direction as far as possible. Because each farmer faces a different situation, this may mean different things. Some farmers may find it best to introduce a cover crop first. Others might gain by reducing their tillage to "ripping" (using a narrow plough-like implement that creates a small furrow without turning the soil over) or "pitting"(digging planting holes with a hoe) as a first step towards conservation agriculture. In a second step, these farmers can leave crop residues in the field and start planting cover crops.

Practicing conservation agriculture can be a challenge. It means a different way of farming. Farmers may be reluctant to make the switch, and they need to learn new skills. It also means a new mindset: for example, they have to learn that a "clean" field is not the best.

But the benefits are real. Farmers quickly find that by applying these principles, they can save labour, reduce costs, and improve their soil's fertility and ability to hold water. That means higher crop yields. They can use the time they have saved to expand the area they cultivate, or even to start other enterprises that earn more money. Conservation agriculture may at last give them a chance to break out of the vicious circle that binds them in poverty.

Ref: Conservation Agriculture - A manual for farmers and extension workers in Africa (IIRR)

Farmer uses 75 percent less diesel

Su Kahumbu

A few weeks ago I visited a farm in Thika which is owned by PierLuigi Maggioni. The farm produces three main crops for export: Baby corn, French beans and Baby courgettes. Production is along conventional lines, following the European requirements.

PierLuigi is the chief agronomist in the farm, Italian by birth but pretty Kenyan now after residing here for the last twenty years. His interests span beyond conventional methods of production, and he has been at the forefront of Integrated Pest Management (IPM) of production locally. He is ever experimenting in new systems, a firm believer in trial and error and has more patience than I will ever have. Of late, he has been doing trials on 'Zero Tillage' on maize and has managed to produce three crops with astonishing results!

The big change ...

French beans are first grown using fertilizers which, after harvest, are dried by use of chemical Roundup(1) . The bean waste is left in the field and maize is planted directly into the same area, using a seeder(2). The maize does not get any additional fertilizer(3). After the baby corn harvest, this maize crop (4) is chopped above the ground level and beans are planted once more, this time also with fertilizer(5).

Considering this process to be one cycle, after three cycles, the soil is aerated from beneath using a special implement. As shown in the photos, the top soil is covered with maize and bean mulch, which improves the soil condition and quality over time. Also shown in the photos is the uniformity of the growing blocks.

... saves a lot of money

The savings realised from this system are incredible. According to PierLuigi's calculations, he uses 75 per cent less diesel, since he simply does not use his tractors as much. Considering that he used to spend 1000 litres with the system there before, this is an incredible saving. Most surprisingly, he has brought his pesticide use to zero. He no longer uses any pesticides on the crops, as pest damage is at negligible levels. Equally important, he has increased his yields by up to 70 percent. This, PierLuigi says, is due to better germination realised by this new planting method – minimal tillage.

"This is a huge eye opener for me. Why aren't other exporters and small-scale farmers doing the same? " quizzes PierLuigi. He is now experimenting with zero tillage on other crops. "I'm fascinated and would love to see this approach adopted by more and more large-scale exporters," he concludes.


1


2


3


4


5

Food prices widen rich-poor gap

They poor can no longer afford the increasing food prices.

For the first time since 1973, the world has been hit by a combination of a record high food and fuel prices. The price of oilseeds and grains, such as wheat and maize, has doubled since January 2006, with over 60 percent of the hike taking place since January 2008, according to aWorld Bank report. The cost of rice more than tripled between January and May 2008.

Africa is becoming poorer

Since 2001, oil has gone up from US$ 20 a barrel to an unprecedented $140. Oil prices are now higher than any time in the last century, not only pushing up the price of food in poor countries importing staple grains and fuel, but also eroding their capacity to buy food. According to a recent World Bank study, at least another 105 million people across the world will become poor. Simulations in this study suggest that in Africa alone, nearly another 30 million people will fall into poverty

Last year, the global grain harvest was a record 2.3 billion tonnes, 4 percent more than in 2006. Since 1961 the worldwide production of cereals has tripled, but the world population has also doubled. It is absurd because even if the production goes up, around one billion people cannot afford to pay for their food. At the same time about a half of the grains produced in the world are used for feeding cattle and for producing fuel.

Who benefits?

Logically, small-scale farmers should benefit. But very few subsistence farmers in Africa produce surplus food, and are mostly net buyers. The World Bank has also found that although farmers who produce surplus food might be better protected, they might not benefit from the better food prices because the cost of agricultural inputs such as fuel, fertilizer and transportation is much higher than the prices offered in the market.

The big winners are the grain trading companies. The profit of the world's biggest trading company, Cargill, went up by 86 percent in the first three months of this year. Last year, the trading companies made record profits: Cargill's profit went up by 36 percent to 2.34 billion US dollars. ADM upped theirs by 67 percent to 2.2 billion US Dollars while Conagra's rose by 30 percent to 754 million US dollars. (TOF) ■

farmers forum

More information on drip irrigation

Thank you very much for your dedication to organic farmers in our country through *The Organic Farmer* magazine. We have been receiving these magazines through Kaimbaga Dairy Self-Help Group and we have benefited a lot through it. I would like to know more about drip irrigation farming that could benefit me especially during the dry season, where to buy these accessories and how much it would cost for an acre of land. I would also request to know about vanilla crop farming; where to get seeds, how to grow them and their market.

Peter Mwangi, P.O Box 162, Homa-Bay

We will send you a copy of TOF that has details on drip irrigation. To buy drip irrigation pipes you can get in touch with the following institutions for advice: Call Esther Muriuki (KARI-NARL) Tel. 0722 397 750. KARI has drip irrigation kits that cater for various land sizes and requirements. They can distribute the kits to farmers through their stations in various parts of the country. Alternatively you can get in touch with the manufacturers, Shade Nets Ltd, P.O. Box 2127, Thika Tel. 067 31051/6 or email: shadenet@wananchi.com

New tool that improves soil

I have been developing a copper alloy coating for farming tools (grub hoe) which act as a "slow release fertilizer" when worked in the soil. I believe this technology has the promise to provide an inexpensive solution to improving poor soil for African farmers. Please see my website http://www.kopperking.com for more information. I am looking for funding to start a research garden using this technology.

Regards, David Prokop

We want it in Zambia

I received several nice copies of *The Organic Farmer* magazine Nos 33, 34 and 35, sent to me by my Kenyan pen friend that I read with much interest. I wish to receive these helpful and educative magazines on regular basis because I am also an organic farmer, here in Mpika Zambia. I would be very appreciative if you could add my name and address to your mailing list. Once again I am very thankful to you for printing such a wonderful magazine.

Fort Hares' Flori-Organic Gardens, P.O Box 450114, Mpika – Zambia, Andrew Bwalya

My employees need it

I have seen a copy of The Organic Farmer magazine. I understand that it is given free to farmers and I hereby ask you to send me back copies and to include me in your mailing list. I ask for four copies as some of our employees have their own small holdings and would benefit from it. We have small farms and we mostly grow mangoes, apples, guavas, pomegranates, coconuts and we also have a casuarina tree plantation. We expect to hear from you.

Foster partner, Sand Island beach, P.O Box 5516, Diani Beach Tel. 040 3300042, 0721 425 716

Dear Farmers,

As we have mentioned many times, *The Organic Farmer* magazine is distributed free of charge, but only to farmers' groups. Why? For two reasons. First, our objective is that as many farmers as possible get access to the magazine. This means that if we sent the magazine to a farmers' group, we can be sure that one copy will be read by other farmers in the group. And what we have also seen is that when farmers share TOF, they always discuss the articles and share their experiences. Secondly, for us, it is much cheaper to send to groups than individuals. To send one copy of the magazine to every farmer would cost Ksh 30.Now we pay only Ksh 5 when we post the magazines to groups. So if you would like to be in our mailing list, please form a group of about 10 people and write to us. You will get a copy of TOF every month!

Questions? Ideas?
Complaints?
SMS us, and we shall get back to you.
0721 541 590 / 0738 390 715

Hot water treatment of seeds

How can I treat my farm stored seeds to control seed-borne diseases?

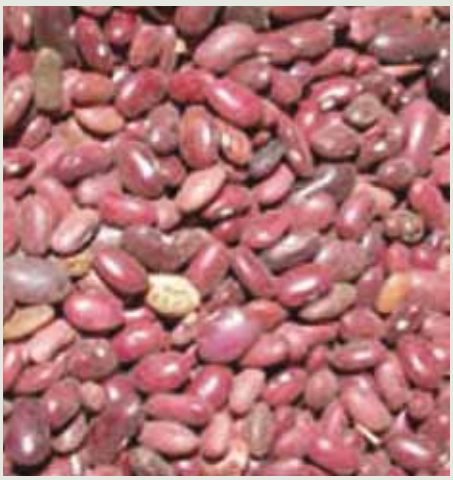
Many farmers are using their own seeds in their shambas. This makes sense, but it would be good to treat the seeds with hot water to prevent seed borne diseases such as black rot, black leg, black spot and ring spot. This treatment helps reduce the seedborne pathogens (a bacterium or a virus, or other microorganism that can cause disease).

But you have to be careful. Specified temperature and time interval must be strictly followed in order to maintain seed viability. What you need is a good thermometer. A thermometre for this purpose costs Ksh 800.

How to treat the seeds

1. In a large pot put plenty of water, heat the water following the required temperature.
2. Place the seeds in a loose cotton bag and submerge it in water. Strictly follow the recommended temperature and the time required (See box below!). It is important that the water is maintained at a uniform temperature throuhgout the container. Constantly stir the water while soaking the bag. Suspend the bag and do not let it touch the bottom of the pot.
3. Remove the bag after the indicated time and cool it in clean water to stop the heating.
4. Spread the seeds on a clean dry paper to cool and dry.
5. Preferably do not store treated seeds. Sow them immediately on well-prepared seedbeds.

Heat treatment recommendations
Spinach, cabbage, pepper, tomato, eggplant: 50°C: 30 minutes
Broccoli, cauliflower, carrot, kale, kohlrabi, turnip: 50°C: 20 minutes
Mustard, cress, radish: 50°C: 15 minutes
Lettuce, celery: 47°C: 30 minutes



Storing seeds:

If treated seeds cannot be sown immediately, store them carefully. Use a totally dry jar, pot or bottle and close it properly. Spread about 2 mm layer of grease or vaseline over the plastic or cork so that the edges are covered to prevent moisture getting into the container. Check regularly if mould has formed on the seeds. If the seeds were dried well, the chance that mould would develop is very small. However, should you see mould, dry them again.

(In non-organic culture it is advisable that dry seeds be additionally treated with a mixture of fungicide and insecticide before storage. In this case use only registered products and duly comply with the instructions on the label) **(TOF)**

With proper care, carrots grow well

What diseases affect carrots?
0725 652290

Carrots suffer from a few diseases when growing under the right conditions. Most diseases are of bacterial and fungal nature, resulting in rotting of the carrot roots (bacterial), or infection of the green leafy carrot tops (fungal). Canker and sclerotinia rot affect carrots mostly after harvest, causing sunken wet spots as well as white fungal growth on the roots. To avoid these diseases, it is imperative to lift mature carrots and store in cool dry condition. Remove any roots with disease as they will cause a spread of the same.

Fungal diseases affect the green leafy growth of the carrots, and can cause stunting of the roots. Carrot diseases can be avoided with good rotation, healthy soils and proper storage of the roots. Other problems to look out for in carrots are root splitting, caused by sudden onset of too much rain after a long dry spell, forked carrots, caused by growing carrots in soil that has not been well prepared and is stony and hard, nematodes, These cause damage and stunting to the root resulting in small cysts attached to the carrot hairs. If nematodes are present, rotation is recommended, as well as a growing (even intercropping) of African marigold in the effected areas. **Su Kahumbu**

The correct size of a chicken house

I would like to rear 100 chicken. What is the measurement of the chicken house? 0724 104326

On the model poultry house in TOF Nr. 31, how many chicks are supposed to be raised on that house? Thank you 0723 866274

The brooding house for 100 chickens can start off 1.5m by 1m as the chicks are very small. As they grow the spacing needs to be increased to accommodate their increasing size. It is wise to start off with a room that is over sized and contain the chicks in a small area with partitions which can easily be removed and resized as the chicks grow.

When the 100 birds are adult size they will require a laying and roosting house of approximately 5m x 2.5m, on condition that they have ample outdoor access during the day time. **Su Kahumbu**

Information on beekeeping

I need more information on beekeeping, where can I get the right training material? Maina, Nyeri

Many farmers have sent various questions on beekeeping. We cannot be able to answer all the questions on this subject due to lack of space. However we would request any farmer interested in getting information on beekeeping to send us their full address. We will send them past issues of *The Organic Farmer* which they can use for reference on this subject. Alternatively, there is a very useful book on beekeeping titled: A Beginner's Guide to Beekeeping in Kenya by Thomas Carroll. It is available at Legacy Bookshop, Yaya Centre Nairobi.
(www.legacybookshop.com)

Soil fertility: The bottom line for better yield

Interesting comparative results of long-term farming systems in Thika and Chuka.

The Organic Farmer

"How can I earn a better living as a small scale farmer, with organic or conventional agriculture?" This is a question that we hear very often when visiting farmers' groups throughout the country. It is not so easy to give a definite answer, since there are many elements that have to be taken into consideration: The soil for instance, or the weather, or the seed, or the availability of credit. This explains why field trials, which compare the yields of organic and conventional agriculture over a long period of time, are of great importance. For a year now, various institutions have been working together in field trials (see TOF No. 30 of November 2007). The trials on two sites, in Thika and in Chuka, have now delivered their first results.

Diverse trial sites

At the trial site in Chuka (Meru South District), which is located in a high potential area, the organic maize yields of the long rainy season 2007 were the same as the yields of the conventional maize. Maize yields of both the conventional and the organic systems could have been increased if the amounts of organic manures and fertilizers were doubled.

Long-term comparative farming systems in Kenya are being researched on by the following institutions:

FiBL	Research Institute of Organic Agriculture, Switzerland
icipe	African Insect Science for Food and Health
KARI	Kenyan Agricultural Research Institute
KU	Kenyatta University
TSBF-CIAT	Tropical Soil Biology and Fertility Institute of the International Centre of Tropical Agriculture

In contrast, at the trial site in Thika (Maragua District), which lies in a zone with medium to marginal potential, organic maize yields were less than half of the conventional maize yields. Doubling of the organic manure and fertilizer amounts did not result in higher yields, neither in the conventional nor in the organic system.

Martha Musyoka (trial coordinator, icipe) discusses with a field assistant in Chuka. (Photo: Christine Zundel, FiBL)

What then is the reason for this difference? It is assumed that, on the rich soils of Chuka, the crop from the organic system benefited from nutrients that were readily available in the soil. The soil in Thika, on the other hand, is much less fertile. On these poorer soils the crop had to depend on the easily soluble fertilizers that were applied only in the conventional system.

Fertilizers not a cure for poor soils

This first year's example also showed that high levels of fertilizers only pay under ideal conditions. Under less favourable conditions, high doses of fertilizers may not generate higher yields, and the farmers risk losing the money so invested. Can higher doses of compost, tithonia mulch and rock phosphate, together with mucuna as an intercrop, increase soil fertility and thus maize yields of marginal sites in the long term?

This is one of the objectives of this study. The partner institutions intend to continue these trials over the next ten years. Only then will it be possible to make a conclusion on the performance of organic farming compared to conventional agriculture, since it takes time for the soils to build fertility in the organic system.

Trials in India and Bolivia

Similar trials were also carried out in India and Bolivia. In India, where a crop rotation with cotton, soya and wheat was studied, the organic yields of the first year were considerably lower in cotton and wheat. Due to lower production costs and the price premium for organic cotton, the gross margin for organic cotton reached the level of the gross margin for conventional cotton. In wheat, where no price premium is paid, the gross margin for the organic crop remained low, despite the lower production costs. Yields and gross margins of conventional and organic soya were similar. This was expected, since soya is a leguminous crop that can fix its own nitrogen without need for the use of any fertilizer. ■

How to order Infonet-Biovision CD

Do you have a problem with pests in your shamba? Would you like to know how to fight spidermite? Then you should order the Infonet-Biovision CD which we have talked much about. The CD contains all the information that a farmer may need. However, information on human and animal health requires much more work, it will included when the final CD is ready early next year. We are offering the CD for Ksh 200. This amount caters for both the package and the postage charges.Farmers who buy the

first edition of the CD will get the final version free of charge. Using the CD is simple, all you need is a computer, when you insert it into the computer, you will read it like a book.

Farmers interested in buying the CD only need to send us airtime worth Ksh 200 through either our CELTEL (now Zain) or SAFARICOM lines (see page 7). After sending this airtime, please send us an SMS detailing your full name and correct address. We shall send you the CD by registered mail. Many farmers have requested for the CD, order your copy immediately before the copies run out.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 41 October 2008

New tricks by feed makers

Feed manufacturers are now trying to cheat farmers with faked labels; farmers beware

In April this year, *The Organic Farmer* highlighted the problem of poor quality feeds being made by some of the local feed manufacturers. Many farmers wanted us to name the companies involved. But as we explained we could not do so because we risked having legal action being taken against us. We however advised farmers to buy their feeds from established companies with a reputation for maintaining high standards in feed quality. Following pressure from the farmers, we mentioned Unga and Sigma Feed companies as some of those selling quality feeds. Although we thought that we had helped the farmers, we have since established that the companies with low quality feeds have devised new ways in order to keep their products in the market.

One of the many tricks they are using is to use the same packaging and brand names of Unga and Sigma Feeds in order to sell their feeds. According to Robert Muriithi, the sales and marketing manager at Sigma feeds, the problem is so widespread in some regions that the company has been forced to stop distribution in these parts of the country. He advises farmers to check the packaging bags carefully to ensure they are buying genuine feeds from the company. "They can for example check the way our feed packages are sealed to be able to distinguish the difference with the fake products," Muriithi says.

As we explained in our July issue, farmers should buy their animal feeds from reputable stockists. Established stockists get their feeds directly from these companies and are less likely to sell poor feeds. (TOF)

Mineral supplements

There are some plants with high mineral content for instance Amaranthus, comfrey or spider weed (pictured). Farmers can easily use them for the required home-made mineral supplements. *See page 5*

TOF*Radio*

Listen to KBC Kiswahili service every Thursday from 8.15 to 8.30 pm.

Growing interest in eucalyptus trees

Kenyan forests are under pressure as deforestation has been accelerated. Wood for firewood and for construction is becoming rare and expensive. This explains to some extent the increasing interest in growing the eucalyptus tree. Notably, 70 percent of the new tree plantations are eucalyptus. In terms of efficiency, eucalyptus is a good choice since it grows fast. The concentration on eucalyptus, on the other hand, impoverishes the biodiversity in our forests. The biggest problems still linger: the inefficient consumption of energy, especially firewood and charcoal, and the lack of a long-term policy on energy. *Pages 2 & 3*

Dear farmers,

In the last few months, wananchi have had to bear the burden of rising fuel prices. Families are spending a good part of their income on the purchase of kerosene, gas, charcoal and firewood. Recently electricity charges went up! Evidently, even if one has to pay more for firewood than ever before, it still remains cheaper than other sources of energy. Consequently the pressure on our forests is growing. We can see it whenever we are traveling by the countryside: Along our major highways and roads, mountains of charcoal bags are stacked by the roadside, ready for the market, even in areas with a fragile environment such as Baringo, Laikipia or even Northern Kenya. We use more than two million tonnes of charcoal a year – and the figure is on the rise. One can then imagine the pressure and threat on our remaining forest cover!

We are slowly destroying our own future. In the last two decades, Kenya has lost nearly 90% of its forest cover, as we have mentioned on page 3. We know that forests are water reservoirs. Many parts of the country are facing water shortages because all the forests that helped conserve water have been destroyed. Mt Kenya and Aberdares are the best examples of these. Now the Mau forest is threatened by human settlement.

Reasons for forest depletion are well known. They are rapid population growth rate, and lack of a long term, clear and sustainable energy policy on the part of the government.

There are technologies developed to enable us use energy much more efficiently. For the last two decades, the government has not undertaken a single afforestation programme in the country.

Unless urgent action is taken, our remaining forests will disappear. We cannot wait for the government or the NGO's to save us. We, the wananchi have to act. Our country has vast chunks of idle land that could be put to good use by planting trees; moreover, agroforestry is part and parcel of organic farming. Normally, in an emergency everybody has to act pretty fast; degradation of our forests is an emergency!

Eucalyptus: the tree of choice

Despite complaints about it, the eucalyptus tree can meet the ever increasing demand for wood.

Peter Kamau

When it was first introduced into the country, the now popular eucalyptus tree was then used in the fueling of steam engines belonging to the Kenya-Uganda railway. Nobody at the time ever imagined that the tree would later on become a major source of firewood, building material, fencing posts as well as providing poles for power transmission and telephone lines.

Destruction of our existing forests due to encroachment by the expanding population has led to an acute shortage of trees for both domestic and industrial use. Reports indicate that Kenya faces a wood deficit of seven million cubic metres. The country boasts of huge chunks of land with potential for tree production but this is underutilised. Trees need a long time to mature and therefore any tree that takes a shorter period and meets the increasing demand would naturally attract the interest of farmers and even the timber industry; eucalyptus fits the bill.

Eucalyptus is the tree of choice for many farmers who want to diversify their farming activities and earn an extra income from agroforestry. Thousands of eucalyptus trees have been planted by farmers. In the last planting season alone, more than 70 percent of the trees planted in the country were eucalyptus. One of the reasons why farmers prefer the tree is that it matures fast and does not require a lot of care in terms of management.

However, there are some fears about the negative effects of the tree. One of the objections against eucalyptus is that it takes up a lot of water, depleting water sources and depriving other plants of essential nutrients. Some people demand that the eucaplyptus trees should only be grown in swampy areas where they can help to drain water.

More water, more wood

Jason Kariuki, a senior researcher at the Kenya Forestry Research Institute (KEFRI) says some of the fears about the eucalyptus tree are unfounded. Studies show that the eucalyptus hybrid has the highest productivity per litre of water consumed (2.06 g) compared to most trees planted by farmers. This is a clear indication that the trees are more efficient in water utilisation. Eucalyptus spp. is the most efficient user of water for maximum biomass production in arid areas. More to that, eucalyptus has the added advantage of being a good coppicing tree, ensuring 4 to 5 cuttings without replanting.

Besides, the tree has the highest carbon conversion rate among the local tree species, therefore reducing carbon in the atmosphere. Farmers with large eucalyptus plantations may in future benefit from carbon credit payments like those in other developing countries (Tanzania for instance).

By planting eucalyptus, farmers could help increase the forest cover that currently stands at 3.4 % of the total Kenyan land area. However, Kariuki advises farmers planning to set up eucalyptus plantations to isolate a portion of their land for this purpose. They should be planted away from buildings, boundaries or crops to prevent its vigorous roots from interfering with them. No other tree can grow in an eucalyptus plantation.

Choose the right varieties

There are three improved varieties of the eucalyptus tree that are now common in Kenya; eucalyptus grandis, eucalyptus camaldulensis and eucalyptus saligna. At the moment more than 40 clones of the eucalyptus tree are being developed at the Kenya Forestry Research Institute for planting in different agro-ecological zones in the country. Before growing eucalyptus trees, farmers must know the growth characteristics of each variety, straightness and suitability. Eucalyptus grandis and eucalyptus saligna grow well in high potential areas such as Muguga, Londiani, Turbo, Nyeri, Kitale, Eldoret, Nandi hills; eucalyptus camaldulensis is good for low potential areas, e.g Makueni, Kibwezi, Mweiga and Isiolo. The eucalyptus seedlings should be bought only from certified seed producers or the forestry depart-

continued on page 3

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org,
website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

Charcoal is finishing our remaining forests

Since our forests are becoming smaller and smaller, we should seriously think of other sources of energy.

John Cheburet

Like most african countries, Kenya is faced with a serious energy problem. Increasing oil prices have made it difficult for the poor to afford oil products such as kerosene for cooking and lighting. What this means is that more and more people will continue to rely on firewood and charcoal for their energy requirements. This, in turn, will continue to put pressure on our diminishing forest resources. Already the environment has paid the price: Our forest cover has been reduced to less than 2 percent, way below the 10 percent recommended by the United Nations.

Every year Kenyans consume between 2 and 2.5 million tonnes of charcoal. According to Stephen Mutimba, the managing director of Energy for Sustainable Development Africa (ESDA),

charcoal caters for the huge demand for energy in Kenya's urban areas; it is used in 4 out of every 5 households, while almost all rural households use either charcoal or firewood. Charcoal is one of the leading causes of deforestation in Kenya, together with the clearing of forests for cultivation and illegal logging activities.

Mass wastage

The charcoal makers use traditional earth kilns that waste close to 90 percent of the would be charcoal produced; the traditional earth kilns need 1 hectare of woodland to produce 10 tonnes of charcoal compared to a half hectare in efficient kilns.

Heating the air

What makes the situation even worse is that the biggest part of this high valuable energy is wasted: On a charcoal jiko, only one third of the energy is actually used, the rest disappears into the air; in the traditional metal stoves, 80 percent of the heat vanishes.

The Kenyan Government does not have a policy on sustainable charcoal production or energy in general. The Forest Bill of the year 2000 states: "Forests are the main source of domestic fuelwood for the Kenyan people." But this reliance on forests has to change. There is need for developing energy saving ovens such as are used in cold Europe. Sustainable energy sources, for example wind, solar and of course biogas should be subsidised to make them affordable for wananchi.

> > > from page 2: Eucalyptus

ment. William Mucheke, a senior tree breeder at KEFRI says farmers should seek advice from the forestry department before buying any eucalyptus seedlings.

Planting guidelines

Site selection: Select a portion of your land that is not very productive e.g. a swampy ground or far away from where you grow maize, beans or vegetables.

Land preparation: Prepare enough compost three months before planting the trees, prepare seed bed using sand instead of the soil. The seedbed should be 1m wide and the desired length. Broadcast the seeds and constanlty remove any weeds from the young eucalyptus seedlings. Transfer the seedlings into 4 cm by 6 cm polythene bags in a second seedbed.

Planting: Transfer the seedlings into the selected portion of land after 3 or 4 months.

Weeding: Young eucalyptus trees are very vulnerable to weeds especially grasses, which cause diseases such as Amillaria and root rot. These diseases can wipe out a whole plantation if weeds are not controlled. It is recommended that farmers do spot weeding that involves removing any weeds growing around the young eucalyptus tree.

Harvesting: Harvesting of the eucalyptus tree can be done after 3 - 5 years, but they can be left to grow to the desired size depending on their intended use. Farmers who want to use the trees for poles can cut them when they attain 6 to 7 years. Trees for use in power lines should be allowed between 8 and 10 years. After cutting, the tree takes a short time to grow again. Farmers are advised to prune the tree when the tree stump starts sprouting; they can leave two stems to allow the tree to grow again. This means (in theory) that if the farmer harvested 1,000 trees during the first harvest, they can get up to 2000 trees in the next harvest.

Diseases and pests: Although resistant to most diseases, a new pest, the bluegum chalcid has recently invaded eucalyptus plantations in most parts of the country. Scientists are working on various methods to control the pest biologically.

Agroforestry improves biodiversity

No doubt, the eucalyptus is a very fast growing tree. When wood production is the major objective of the landowner, he will thus choose eucalyptus.

On the other hand, planting only eucalyptus trees means impoverishment of our nature. We should not forget that planting different varieties of trees in our farms has many benefits to the farmer. One of them is that various trees attract different other living organisms such as beneficial insects and bees that provide honey and help in pollination. It also provides a habitat for predator birds. And by the way, we should not forget the beauty of big indigenous trees on the landscape! ■

Improve your soil with mustard green manure

Mustard as a cover crop, can control pests and diseases while improving soil texture and fertility.

The Organic Farmer

Many times, this magazine has advised farmers on the value of planting green manures or cover crops in order to improve the quality of our soils and to increase their productivity. At the same time, green manures provide fodder for animals. Some of the well known green manure crops are lablab, mucuna, desmodium and purple vetch. In this issue, we introduce to you another very important cover crop, the mustard. For centuries, mustard has been used by farmers across the world to improve their soils and to replenish their fertility and productivity.

The application of mustard as green manure can increase the physical, chemical and biological properties of the soil. Mustard controls pests such as nematodes, a fungal disease such as blight, a stubborn weed, and at the same time it improves the texture of the soil.

Mustard protects the soil …

Mustard supports farmers who want to improve the physical structure of their soil such as infiltration and water holding capacity. It can also help to ensure that more air goes into the soil to increase the population of important soil micro-organisms such as mycorrhizae bacteria that promote plant health. Like any other cover crop, mustard can control wind and water erosion and therefore protect the soil.

… and fixes nitrogen

Apart from the physical properties of the soil, mustard can also improve the soil by correcting its chemical properties. It fixes nitrogen and reduces leaching of essential nutrients and weathering of soil mineral components. Mustard speeds up these processes by activation of soil microorganisms. These microorganisms support the release of essential nutrients for plants while suppressing the disease-causing agents in the soil. The result is that the soil's biology is changed in a way that makes it difficult for the fungi, bacteria and nematodes to survive.

Additional benefits.

Crop rotation, as we know, can reduce pest problems by altering the environmental conditions under which particular pests thrive. When these conditions change, the pest cannot survive and therefore ceases to be a problem to your crops. The application of mustard reduces the influence of some of the pests that pose a problem to the crops. Why? Like other crops in the brassica family, such as cabbage, broccoli or rapeseed, mustard produces, in its roots and shoots, a compound called glucosinolates. It also produces an enzyme called myrosinase. When the mustard is chopped and incorporated into the soil, the glucosinolates and myrosinase combine, in the process producing a mixture of other substances. Some of them are toxic to soil fungi, nematodes and even weed seeds.

These substances help to fumigate the soil in a process called bio-fumigation. Farmers are advised to chop the mustard when it is still green and working it immediately into the soil. This enhances the effects of biofumigation especially when the mustard is cut while still young, preferably when it is flowering or just before it sets seed.

It controls diseases

Some of the diseases that mustard green manure can help control are outlined here:

a) Verticilium wilt, silver scurf and sclerotinia in potato production.

b) Reduction in nematode population which cause root lesion, hapla and chit wood in potato production.

c) Suppress root rot (pythion, fusarium, and rhizoctonia) and sclerotonia in bean production.

d) Suppresses pink rot and sclerotonia in onion production.

e) It reduces disease pressure from aphamyces, pythium, rhizoctonia, fusarium and sclerotinia in pea production.

f) It controls cavity spot, root rot, fusarium and sclerotinia in carrot production.

g) It is highly effective on most diseases that affect wheat.

How to plant mustard

Mustard should be planted at the rate of 10-15 kg per hectare at a depth of 10-15 mm in soil that has adequate moisture. The soil needs compacting so that the seed comes into contact with the soil for good germination. Soil moisture should be maintained to ensure adequate plant growth and good weed competition. Well prepared compost can provide the crop's nitrogen requirements. Sulphur can be added if the soil is deficient because mustard requires 5:1 nitrogen to sulphur ratio. Farmers without machinery can plant mustard by simply broadcasting it over the prepared land. For good germination there must be good seed to soil contact.

For good results, farmers are advised to wait for 14 days after chopping and incorporating mustard seed into the soil before planting the desired crop such as beans, potatoes or even wheat.

Interested in buying mustard seed:
HYGROTECH (E.A) Ltd
P.O. Box 41446,00100, Nairobi,
Tel 066 73 567 /8/9, 0733 896 092.

Mineral salts are essential for animals

There are alternative sources of essential minerals that are not found in feed concentrates and fodder.

Michael Waweru

Salts provide essential minerals such as calcium and phosphorus. Both of these are vital for livestock. They are needed in the body for bone and eggshell formation, for muscle contractions that result in movements, hormone and enzyme, etc. When animals do not get salts, the following conditions are observed:

- Reduced growth.
- Rickets or bent bones.
- Osteomalacia (soft bones that fracture easily).
- Reduced egg production with eggshells that break easily.
- In cattle that are high milk producers, milk fever, difficult birth and retained placenta after births are observed.

When no salts are given, animals develop strange dietary habits such as feeding on clothes, rags, bones, soap etc. This is usually a sign that the body is lacking minerals but the habit stops when minerals are provided. Salt should not be put in drinking water as in this case animals shall be forced to take salt when they drink water, regardless of whether they need it or not. Ordinary table salt (sodium chloride) used in the kitchen is not appropriate for livestock, as it does not have the types of minerals that are much

continued on page 6

Simple and basic feeding tips

To avoid spoilage: Supply only fresh or processed feeds to the animals
To meet nutritional needs: Offer a wide variety of feed daily
To increase production: Provide forage and water at all times
To encourage intake: Ensure easy access to feed and clean water always
To prevent disease: Limit intake of concentrates
To provide minerals and vitamins: Supplement the animal diet regularly

Amaranthus

Spider weed

Cong'e

Stinging nettle

Black night shade

Comfrey

Make your own mineral supplement for livestock

Farmers can do much more to provide their cattle and other farm animals with important and necessary mineral supplements. Some plants with high mineral content can easily be used for home-made mineral supplements:

Amaranths and **comfrey** are good sources of calcium for poultry and pigs.

Spider weed (*Gynadropsis Gynandra*) is a good source of calcium for lactating animals. The plant can be fed to increase milk production in cows. It can also be mixed with other fodder and given to the animals.

Pumpkins (and the leaves of other plants of Curcubitae family) are very rich in phosphorus, which is essential for boosting immune systems in all animals. Pumpkin leaves can be fed green to the young animals; they can also be cooked and mashed for young piglets.

Amaranthus (Pigweed) is very rich in calcium and carbohydrates; it can be fed to the animals; green or as flour. It is a very good source of carbohydrates and calcium for fattening animals and good masculinity for draught power.

Oxygonium Sinnathuum (Kikuyu: *Cong'e*) contains calcium which is essential for egg formation. Leaves of this plant can be hang in the house for the birds to eat; apart from providing them with nutrients they are good for exercise as the chicken jump up and down to peck on them.

Stinging Nettle (*Urtica Dioica*) is very rich in calcium and iron. In case of milk fever it can be fed as powder (crushed after drying) or as concentrate by boiling the whole plant. Stinging nettle tea or powder is a good source of iron for poultry and piglets.

Black night shade (*Solanum nigrum*) is very rich in calcium and can be fed to all types of animals to reduce chances of milk fever after giving birth. This is very common in cows.

Dry and feed them!

All these plants can also be dried in the sun, ground to a smooth powder and add one tablespoon full of salt to encourage intake. The powder should be availed throughout in a mineral box. It is also important that the farmers take care when sourcing for these plants to avoid contamination, especially in areas where lots of herbicides are used. If possible, the farmers can grow their own herbs as opposed to harvesting them by the roadside or in other peoples' farms.

Variety of fodder

It is important that farmers use different types of plants mixed together, since different plants have different types and quantities of minerals. It is also advisable to use young and tender plants just before flowering; at this stage they are known to contain a lot of nutrients and minerals.

Mineral deficiencies are not common in free-range animals. Thus a farmer should provide the widest variety of fodder in the diet of farm animals to create a balance and reduce the chances of mineral deficiencies.

> > > from page 5: Mineral salts

needed by animals. Eggshells, when boiled to kill germs, then ground, are a good source of calcium for piglets.

Tread carefully on licks

Salt blocks are important in supporting the home made mineral supplements, especially in the arid areas where some of these plants are not available (see box). It is important to note that many of the salt licks available in the market are natural in the sense that very few artificial ingredients are added. Also it

is important to appreciate that in every community in Kenya there are natural mineral lick areas where farmers take their animals to lick the minerals. In Makueni district for example natural salt licks, along dry river beds and areas with sedimentary rocks, are a common occurence. ■

Salt blocks are often of poor quality

Be careful with commercial salt blocks. Avoid those ones with hormones as they might compromise organic animal production. In the market one can get a wide range of salt blocks from different companies. According to Dr. James Kariuki, the KARI National Animal Husbandry Centre Director Naivasha, more than 80 percent of the mineral licks in the market are of poor quality. He says that the manufacturers of the mineral blocks do not formulate the minerals in the right quotients. Cows are especially very sensitive to calcium and phosphorus if the two minerals are not given in the right balance. Different parts of the country have different mineral deficiencies. (TOF)

farmers forum

Where can we buy an oil press?

In the July-issue you had a nice article on Jatropha and other plants such as Sunflower, soya, peanuts, sesame etc, whose seeds could be used by farmers to produce oil for their own consumption. Unfortunately you did not mention the most important thing: where to get an oil-press at an affordable price. If a group of farmers would jointly buy an oil-press, they could save a lot of money in producing their own cooking oil instead of buying it from the shops. If you have some ideas where we could get an oil-press cheaply, please let us know, we will appreciate.

Henry Kamau, Athi River

Dear Henry,

Your concern is genuine. The problem is that it is not easy to get small oil-presses. This is the same with small cookers for cooking with the oil out of Jatropha. The

German university of Hohenheim is developing a pressure oven; we shall inform you in the coming issues about this oven. We really regret the lack of small-scale technology, which would allow small-scale farmers to improve their livelihood through appropriate technology.

Magazine is full of knowledge

I would like to be receiving copies or even photocopies of the monthly edition of The Organic Farmer magazine at my own cost in both postage and photocopies. The magazine is full of knowledge for some of us who want to take agriculture a notch higher. Besides there is need for new and sustainable agricultural practices, which the magazine addresses, not to mention the agri-business angle of farming that I find most encouraging in the few editions I have received. Kindly advise me on how I can realize this. Currently we are involved in horticultural farming and are in the process of registering a community based organization whose agenda is to emancipate the rural folks from poverty through sustainable and modern farming methods. Thank you.

Joseph Douglas Adera, P.O Box 3505 Kisumu

Thanks to the support of the Swiss foundation BioVision, our magazine is available free of charge to all farmers. However, those who need to get past issues are requested to send us stamps worth Ksh 350 in an envelope. These stamps are like money; we use them to send letters and other materials to farmers.

It's time to go organic

I have come across your magazine which I found very interesting and informative. The cost of farm inputs and most of their side effects, both on us and our environment is devastating. In my area, no one practices organic farming and I think it is time we started it.

Keter DK, FADC Chairman, P.O Box 29, Sotik

More please on dairy cows

After reading your magazine, I can confidently say that I am now empowered by the information it contained. I am a small-scale farmer with 1 hectare of land. In my farm I have six dairy cattle which give up to 20 litres of milk everyday. Thank you. Benson Karanja Matoro, P.O Box 560, Olkalou

Useful information

This is to acknowledge with thanks the regular receipt of five copies of *The Organic Farmer* magazine. The information contained is very useful to staff and farmers.

Wafula Mutoro, DAO, P.O Box 104, Kapsowar

Questions? Ideas?
Complaints?
SMS us, and we shall get back to you.
0721 541 590 / 0738 390 715

Apple vinegar against warts

Is apple cider vinegar a single product or a concoction in warts treatment? Imboba, Naro Moru. 0721 621 764

No, you can use apple cider vinegar just like it is, without any other ingredients; it is an inexpensive, homeopathic treatment for the removal of warts. There are two ways to use apple cider vinegar:

- You mix warm water with a cup of vinegar and soak the affected area for 20 minutes a day until the wart disappears. This method takes longer than the second method, but it is not apt to cause as much irritation to the surrounding skin.
- A quicker way is to soak a piece of cotton in the vinegar, place it on the wart, and secure it in place with a band-aid and then wear it over night. You should do this each night until the wart and its core is gone. Your wart should be covered with cotton that is soaked with apple cider vinegar at all times. The easiest way for treatment is during the night while you are sleeping.

You can buy apple cider vinegar in the shop, or you can make it yourself. What you need to make apple vinegar: in a wide mouth glass container, cheesecloth, ripe apples and yeast (for brewing wine or beer, not baker's yeast).

How to produce it:

1. Press clean, washed, ripe apples. Strain to make a clean juice. Pour it into a sterilized container and cover with cheesecloth. Add yeast and leave the liquid to ferment.
2. Keep the liquid between 15°C and 25°C during the fermentation process. Stir the liquid daily to introduce adequate amounts of oxygen, which is necessary for fermentation.
3. After three to four weeks, the bacteria will have converted most of the alcohol, and the mixture will begin to smell like vinegar. When the vinegar is ready, there should be no more flavor of alcohol.
4. Strain the liquid through a cloth or filter several times to remove the cloudy substance. Otherwise the fermentation process will continue and eventually spoil your vinegar.

Your vinegar is now ready for use. Keep it in a capped bottle in a cool place. Good luck!

Do you have any experinece with this wart-removing-method? Please write to us and share your knowledge with your fellow farmers! **J.C**

Diverse methods of organic topdressing

We are a home based support group in Bungoma. We would like to know which organic topdressing fertilizer can be used on kitchen crops like carrots. (0735 273 976)

When using organic fertilizers as top dressing you should remember that, unlike the salts used in chemical fertilizers, the organic fertilizers require more than just water to dissipate. They need the help of micro organisms, which in turn demand optimum conditions to survive. It is therefore logical that if you are irrigating with over head irrigation, you can top dress with compost and perhaps mulch the compost to protect the micro organisms from the drying effects of sunlight. Alternatively, it may be better to use bio-liquid feeds as a spray on a weekly or fortnightly basis depending on your crops. Crops that are heavy feeders like broccoli and cauliflower require more feeding than lettuce, carrots etc.

There are many different liquid feeds that can be made. Fermented Plant Extracts (FPE) can be made using a variety of plants that are decomposed in water for 7 days to release their nutrients. Compost tea can be made by submerging a bag of well matured compost into a drum of water for a day and using the liquid collected to feed the plants.

Vermiculture is another perfect way of using nature; in this case earthworms are used to produce liquid worm juice which is a great organic fertilizer.

Su Kahumbu

Why are my passion fruits dying?

I am a farmer from Gatundu South and I grow passion fruits. Unfortunately my crop has started dying; from the tips downwards. Is there any remedy for this misfortune or should I just abandon this project? (Tel 0720 443 248).

Passion fruit production is a profitable farming activity, but farmers are finding a host of problems when it comes to disease control. Passion fruits are prone to a number of fungal diseases and pests. Unless a farmer manages to control them, he/she may find growing these fruits quite a challenge.

One of the ways of avoiding these diseases is to ensure that your passion fruit crop is not planted on the same plot of land for more than three years; this is to avoid the build up of soil-borne diseases. You should practise strict crop rotation. We may not be sure which of the above diseases your crop is suffering from but we have downloaded all details about each of the possible diseases including pictures from the Infonet/Biovision website at www.infonet-biovision.org. We will send these details to you to enable you identify the particular diseases and take the necessary remedial measures. We advise other farmers with access to the internet to do the same. Alternatively, and more easily, they can order the Infonet-BioVision CD (which is now available) to get any information they need on plant health (*To order the CD, see page 8*). **TOF**

NOTE: Farmers send us questions that we find extremely hard to understand. We kindly request you to explain your problems in a clear way and to the point. It is easier for us to give the relevant answers if the questions are clear.

tips and bits

from farmers for farmers

Adapt to changing weather

Every farmer in the country must have felt the effect of climate change.We had been used to a very predictable rainfall pattern. The long rains would start in mid-March and end in August-September while the short rains would take us through the September- December period. Now all this has changed with rains starting sometimes late in April and disappearing in June a time when the crops are in dire need of moisture. Meteorological Department forecasts are no longer reliable because only a few of their predictions come to pass.

Do we then give up on unpredictable weather? No, farming gives us an income, and the country relies on us for food. Instead we should adapt to the changing weather patterns. One strategy that farmers can use is to divide their land into different portions says three portions. What they can do then, is to plant one portion at the beginning of the rainy season say mid-March, another portion can then be planted in May and the third in July or even September. This way the farmer will have reduced the risk of having to lose the whole crop if they planted once. This strategy is already being used by some farmers and it has considerately reduced their losses.

Order Infonet-Biovision CD

Do you have a problem with pests in your shamba? Would you like to know how to fight spidermite? Then you should order the Infonet-Biovision CD which we have talked much about. The CD contains all the information that a farmer may need. However, information on human and animal health requires much more work, it will included when the final CD is ready early next year. We are offering the CD for Ksh 200. This amount caters for both the package and the postage charges.Farmers who buy the first edition of the CD will get the final version free of charge. Using the CD is simple, all you need is a computer, when you insert it into the computer, you will read it like a book.

Farmers interested in buying the CD only need to send us airtime worth Ksh 200 through either our numbers 0721 514 590 or 0738 390 715). After sending this airtime, please send us an SMS detailing your full name and correct address. We shall send you the CD by registered mail.

Issue 4, October 2008

The Farmers Classified

To advertiser contact: James Wathuge 020 356 4106, 0720 419 584, 0733 893 300, email: thefarmersclassified@organickenya.com

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 42 November 2008

Demand for rabbits growing

Every week we get a number of calls from farmers asking if they can find market if they went into rabbit keeping. The worry from the farmers is understandable: Rabbits reproduce very fast. Farmers would have problems disposing the rabbits if there was no ready market.

In Nairobi, there are many hotels and restaurants serving rabbit meat. A spot check in a number of butcheries in Nairobi showed many of them stock rabbit meat; one kilogramme goes for between Ksh 250-400. However, most of the butchery owners complained that although demand for the meat was rising, there was need to create more awareness to consumers on the benefits of rabbit meat compared to other meats in the market.

A good example for a successful farmer, who has never had any problems in marketing of rabbits, is Godfrey Gichuhi (see TOF No. 26, July 2007). The only problem for him is how to meet the increasing demand. "Every month, I sell between 400 and 500 rabbits. In fact, my main problem is where to find the rabbits whenever I get more orders than I can be able to supply", he says. Gichuhi supplies hotels in Karatina, Nyeri and even Nairobi. He sells rabbits for between Ksh 400- 500. Recently he got orders to supply rabbit meat and skins to buyers in China, but he cannot meet the required order for at least 200 rabbits per week. Farmers with rabbits for sale can contact Godfrey Gichuhi at P.O Box 137, Karatina Tel 0720 406 195 email: godfreygichuhi@yahoo.com

See Pages 4 & 5

TOF*Radio*

Listen to KBC Kiswahili service every Thursday from 8.15 to 8.30 pm.

Harvest and store grains well

Timely harvesting and proper storage of cereals is of great importance to farmers. A lot of maize is lost due to poor timing and lack of proper storage facilities. Mycotoxins (aflatoxins) develop when maize is poorly stored.

See pages 2 & 3

Earthworms improve soils

To farmers, earthworms are just like any other creatures in the soil. But they convert organic material into very rich plant food while improving the soil fertility. They produce essential plant nutrients.

See page 7

Dear farmers,

Concerned about the future of his students, a primary school teacher in Nairobi set out to offer career guidance and counseling services to his class eight pupils. First of all he sought to establish the career preferences of these young learners.

The teacher was shocked to learn that out of the 44 pupils in his class, only a miserable 3 wished to, in future, take technical courses such as carpentry, masonry or tailoring. The rest preferred courses tailored for white-collar jobs such as secretarial training, engineering, marketing, accounting, medicine and law. Of course, apart from the so-called better salaries associated with these professions, office jobs are also prestigious to those who hold them, their families and the general public. The low figure of pupils willing to pursue technical education featured earlier in this statistics is a sign of the bad and sorrowful reputation of skilled labour. Our country badly needs good auto mechanics, carpenters tailors, masons etc. Unfortunately, our school and college curricula have completely neglected technical education and majored in cognitive skills.

Take agriculture for example. Although it is said to be the backbone of Kenya's economy with more than 80 percent of our population engaged in it, the same is not reflected in our education system. At the primary school the subject is inexistent while in secondary schools, it is offered as an optional subject. Consequently, students are not prepared to appreciate the importance of agriculture and the varied opportunities that it offers.

Since we have very few people trained in technical skills in agriculture, our agro-based industries that specialise in value addition and marketing are dominated by foreigners. Our farmers and even traders are confined to being primary producers of agricultural products, which fetch very low prices in the market. If this country is to say good bye to massive unemployment, our education system must emphasize on technical skills especially in agriculture with special emphasis on value addition.

How to protect cereals after harvest

If they can observe simple storage tips, farmers can save their stored maize from pests and spoilage.

The Organic Farmer

Farmers incur heavy losses during storage; the United Nations Food and Agricultural Organisation (FAO) says farmers in Africa lose between 15 and 40 percent of their harvest due to poor storage facilities. This loss can be prevented if the farmers can take a few simple measures to reduce the losses. If they had good storage facilities, farmers could withhold their maize stock and sell when prices improve.

Wrong timing

Most farmers leave the crop in the field for too long after it matures. Some maize varieties open their sheath (maize cob covers) too early exposing the grains to water and pests while the maize is still in the field. Maize should be harvested immediately it matures; for example, most varieties grown in mid- March and April are ready for harvest between October and November. Maize not harvested early is prone to pest damage and rotting especially

when wet conditions persist. Loss from maize that is harvested at maturity is less than that of maize that overstays in the field after maturity.

Construction of stores: A good store should be well constructed. It should have enough space for air circulation at the base and the upper section; pests prefer a warm environment and will keep away if the store is not comfortable for their stay. A good store should have 40-50 percent open space for the stored grain to dry properly. The store's platform should be 60-90 cm above the ground to allow for air circulation. Iron sheet roofs do not harbor pests. Wood and grass used in building stores encourages breeding of the larger grain borer.

Cleaning: Weevils can live in cracks in the wood of the store, they can remain there until the next harvest. Thorough cleaning of the store is therefore necessary before fresh grain is stored to reduce infestation during storage. All equipment used for storage including earthenware, plastics, synthetic or sisal sacks should be disinfected preferably in hot water to kill any pests or their eggs. Cow dung may be used to plaster granary floors and walls. Fresh eucalyptus tree leaves can be burnt to repel any pests in the store before storage.

Sorting and shelling: Before storage, the maize should be sorted to remove rotten grains that may have been damaged by insects and mildew (mould). Research shows that sorting maize before storage can reduce loss by up to 36 percent. Shelling helps to check pest damage because most pests prefer maize when it is still on the cob for easy movement.

Drying: The maize should be dried a few days before storage. Drying gets rid of excess moisture which is responsible for decay and development of mould (aflatoxins) during storage. Direct sunlight kills pests that have not gained entry into maize and beans. The maize should be turned and stirred to ensure it dries evenly. Drying also helps to bring down the moisture level. Grains should be dried to a moisture level of 13 percent which is ideal for long term storage.

Control methods

Ash/chilli mixture: Ash/chilli mixture and a thick layer of rice husks covering stored grains is said to be effective in preventing the larger grain borer attack. The chilli should be dried and pounded into fine powder. Sieve cold wood ash from the fireplace. Mix 2 kg of wood ash with 1 teaspoon of chilli powder. Mix them thoroughly. Add 1 part ash/chilli mixture to 4 parts of dried maize grain.

Red soil

The common red soil has been used to protect stored grains against pests. The soil should be crushed into fine powder and dusted on stored maize and beans. The dust prevents the pests from drilling holes or even laying their eggs on the dusted grains. The laterite in the soil rubs off the waxy coating on the insect's body dehydrating and killing them. In sealed storage pots, insects suffocate because enough dust is poured in with grain to exclude air. Trapped insects dehydrate and die as their outer covering is damaged by abrasion (rubbing).

Air tight container

Air-tight container can protect stored grains from infestation by pests. The containers are useful for small-scale farmers with a few bags of maize and beans or traders who sell seeds and grains. The grain should be harvested, shelled, winnowed and cleaned of all

continued on page 6

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, e-mail: icipe@icipe.org,
website: www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

The unseen poison in animal feeds

Be careful with grain that appears mouldy; it may be infested with mycotoxin which is poisonous.

William Ayako

Mycotoxins are the most significant threat in grains (maize, wheat, barley etc.) that form the bulk of human and livestock feed in feed manufacturing. There are two types of mycotoxins, those that develop in the field prior to harvesting (arising from field moulds) and those that develop after harvesting during storage (caused by storage moulds).

Over three hundred strains of mycotoxins, among them aflatoxin in maize, have been identified and new strains are still being discovered. As moulds grow, they use the nutrients in the grain and therefore reduce their nutritive value. If they continue to grow further, they produce the toxins (Mycotoxins). Unless the growth of moulds is effectively controlled they cause serious damage to the grain.

The occurrence of mycotoxins in both grains and feed can adversely affect productivity and profitability of poultry and pig flocks. Even though there are recommended agricultural practices to reduce the formation of mycotoxin during crop growth, harvesting and storage, significant feed contamination still exists whereby poultry and pig farmers continue to incur losses. There is also a serious growing concern over contamination of human foods by mycotoxin.

Prevention is important

The occurrence of mycotoxins happens when favourable conditions for their development are created. Specific mycotoxins appear to be limited to certain environmental conditions and specific crops. Regional and geographical distribution of different fungi and their toxins may be the cause of different crops being affected. Prevention of formation of mycotoxins in feed is the most appropriate strategy and economic approach in their control in feedstuff.

It has been widely known that moisture, temperature and aeration are primarily the environmental factors controlling fungal growth. However, moisture is the single most important factor. So if commodities are dried to less than 14 % moisture, minimal fungal development can occur.

Farmers can easily achieve the recommended moisture content by sun-drying grain to a level that is easy to grind or mill into flour as in this case the moisture content should be below 14 %. In addition moisture metre (moisture detector) can be used to determine moisture level in the grain.

Moisture in maize causes the growth of mould (afflatoxins) Photo TOF

Practical control measures

An important first step in controlling mycotoxins is preventing mould growth. There are several strategies for doing this:

Moisture control: This is the cheapest and the easiest way of ensuring safe storage. To minimize the potential for 15 cm mould growth and mycotoxin production, grain moisture content should be reduced to below 15 % within 48 hours after harvesting.

Aeration and temperature control: The interaction between moisture level and temperature is the most important factor affecting grain preservation during storage hence; both should be kept as low as possible. Temperature can be achieved by regular aeration. Aeration is effective for the control of fungal and insect infestations.

Moving or turning: Regular turning of grain in storage facilities is a good control of temperature, moisture level and insect infestation. In a way, this is a form of aeration. It also enables detection of any developing insect infestations.

Minimizing mechanical damage: Although most mould pathogens can directly penetrate plant tissues, mechanical damage provides additional entry point and therefore should be minimized.

Selection of resistant cultivars: Selection of cereal cultivars resistant to Fusarium and other mycotoxin-producing fungi is currently viewed as a possible option for reducing mycotoxin contamination in grains and feeds. **W. A.**

Expensive analysis

It is simple to detect grain that is infested with mycotoxin. Any grain that is visually mouldy is obviously infested with some strain of mycotoxin. However laboratory analysis of grain for mycotoxin is quite expensive. In Kenya, this analysis can only be done at the University of Nairobi and costs more than Ksh 3,000 per sample.

Reducing risks

It has been proved that the risk associated with mycotoxin contamination of feed can be reduced through implementation of different approaches:

Dilution: Animal feeds severely contaminated with mycotoxins can be diluted with non-contaminated feed to achieve final concentration of mycotoxin that does not affect the performance of the animal.

Diversion: Some species of animals are more tolerant to a particular mycotoxin than others. This fact can be used to divert the mycotoxin contaminated grains to less susceptible species. The best example is diversion of contaminated grains from pigs to dairy cows.

Physical methods: Many physical methods such as cleaning and segregation of mould-damaged grains from the intact grain, milling, thermal

continued on page 6

Rabbits can support your whole family

Rabbits are easy to keep, provide you with healthy meat and can give you a good income.

Val Corr*

Many Kenyans, especially the men, would not contemplate eating rabbit meat. However, I have always been of the opinion that if every Kenyan family kept a few rabbits, their children, at least, would eat meat every day. Rabbit meat is totally fat and cholesterol free and has the highest protein of all domestic livestock.

Rabbits are easy to keep, cheap to feed, breed quickly and are ready for slaughter within four months. They carry much more meat than a chicken of the same weight and are very easy to cook.

Enough feed and water

Rabbits need to feed on rabbit pellets or rabbit ration sufficient to last them through the day. Green fodder is essential but can be fed in relatively small quantities. There is very little that rabbits will not eat – including potato peelings, carrot peelings and other vegetable scrap. They thrive on weeds (especially chick weed and thistles). Lucerne and Napier grass ('thara'), if it is available.

- It is essential that they receive plenty of clean water. It is a fallacy that rabbits obtain sufficient water from their food. It is surprising just how much water they drink in 24 hours.
- Earthen ware bowls with a small lip seem to be the best for water and food, as they are too heavy for the rabbits to turn over.
- It is always a good idea to put minerals in the feed (Coopers Maclick powder is a good one).
- We place a square of sacking under the feed bowls to prevent food being dug out of the bowl and spilt onto the floor which is waste.

Enough meat

If you decide to keep rabbits I am sure you will find it very rewarding and it is an excellent opportunity to teach children about responsibility and the care of animals – and you may be lucky enough to be able to produce enough meat to sell to your neighbours!

**Val Corr, Lake Breeze Farm, Eburru, Naivasha. If you wish to contact her for further advice, please call 0734 913 049.*

Housing and bedding

To grow healthy, rabbits must be fed properly, housed properly and kept clean. It is best to house them off the ground as follows:

- The house should be 90 cm off the ground, be 90 cm high and 90 cm square. Because mabati comes in 2.5 meter lengths, it makes sense to build blocks of houses 1.80 meter wide so that one sheet can be used to cover the two houses.
- The floors should be of chicken wire so that droppings and urine fall through to the ground. This can then be swept up daily and used as compost (see end of the article).
- The house should have a layer of hay as bedding. This is a very important part of the rabbits' diet; they will eat a lot of this bedding during the night.
- Rabbits must not be in windy conditions, so it is advisable to cover the ends of the building with shade nets and to have 'roll down' shade netting curtains at night.

Rabbits need clean house with adequate space, light and comfortable bedding

- Their houses should be cleaned daily. Wet bedding should be removed and put on the compost, dry hay can be returned and some more added. If rabbits are left on soiled bedding, it is not only uncomfortable but it will encourage flies which will, in turn, cause disease. ■

How to slaughter a rabbit

It is important that the rabbit is killed very quickly. The quickest and kindest way to do this is:

- Hold the rabbit in your left hand by its back legs. With your right hand hold the rabbit between your index and middle fingers, under the chin and against the base of the skull. Lift your right hand to shoulder height, stretching the rabbit, and pull the head quickly and sharply. If you try to do this any other way it will not work.
- The rabbit should then be hung by one back leg. The head is removed. The rabbit is gutted and entrails removed. The feet are clipped off. A small slit should be made on the inside of the back leg that is not attached to the slaughter post. The skin is peeled off this leg. The skin is then gently loosened round the body and front legs. You will then be able to take the skin off the remaining back leg, and by pulling down, so that the skin is now inside out, you will be able to peel the skin off like a sock.
- The heads, spleens and heart make excellent dog food. The liver is a delicious delicacy and highly nutritious – your rabbit is now ready to eat.

Plan the breeding and care for the young

The doe (female rabbit) is a spontaneous ovulator; it is receptive to the buck as soon as she is introduced. The doe is ready to breed at 5 months. She should be placed with the buck and mating will usually take place within minutes. When she has been mated properly, the buck will twist and fall over to one side. The doe can then be returned to her pen. It is not advisable to leave a doe with the buck for longer than 15 minutes as they will both get bored. If she is not mated in that time, return her later in the day.

We have had instances of 'miracle births' which are recorded in some veterinary journals. We have also found that some does, who will not accept the buck, are already pregnant even though they have not been with a buck.

Important: a warm nest

Gestation is exactly one month and a doe will produce anything up to 10 kits (young rabbits). Eight is a perfect number as she has eight teats; but if well fed, they seem to manage more with no difficulty. Obviously, smaller litters thrive better than large ones.

Does tend to feed their young once a day, and usually at night. A couple of days prior to birth you will notice that she will start collecting hay in her mouth to make a nest. She will then pull hair from her chest and under her neck to line the nest. She will pull out more hair after the birth and cover the babies.

Take care of young ones

This is the time that the young have to be watched carefully:

• It is essential that the babies are not allowed to get cold, especially in the first few days after birth. The nests need to be checked to ensure that babies are not carried out of the nest by the mother when she stops feeding. It is quite safe to handle the young and replace them in the nest.

• The young should be weaned when a month old. Sexing baby rabbits is not that easy, but once you have got the hang of it, it gets easier: Hold the baby upside down in your hand and gently blow on the hair round the genital area and, with two fingers, gently separate the genitalia towards the head and tail. The males will show a small upward protrusion, whilst the females will only show a small opening. This is easier done with two people, one holding the baby and the other doing the sexing.

• The males and females should be separated at this stage as they can start breeding when they are very young.

• They should then be put in separate weaning houses. A pen 90 cm x 180 cm can comfortably house 6 young rabbits. Remember that there are now more growing rabbits in one cage, so they must be fed adequate quantities of food and water if they are to grow satisfactorily.

• At weaning, it is advisable to routinely treat the weanlings with Coccidian powder (all animal pharmacies stock this for chickens). 1 ml per litre once a day for 3 days should be sufficient to protect your rabbits).

• It is also advisable to deworm them at this stage. Quarter ml of Albendazol administered orally with a small syringe is sufficient for each rabbit. Be careful, not to put the syringe (nozzle) too far into the mouth or you may damage the throat.

• They should be ready to slaughter at 4 – 5 months.

Plan the breeding

Three or four does to one buck would be more than sufficient to keep a household supplied with meat all year round. You would therefore need:

• A pen for the buck
• A pen for each doe
• At least two weaning pens – one for males and one for females

If each doe is bred to the buck at intervals of, say, one month or longer, you would have a continuous supply of meat. Depending on how many does you keep, you can work this out:

- Gestation is one month
- One month with the mother
- Three months to slaughter

It is important that you plan your breeding – you could otherwise end up with more weanlings than you can comfortably cope with! It is very easy to get over crowded very quickly as rabbits are very prolific breeders. – A breeding doe, if looked after and fed properly, will serve you well for approximately 4 – 5 years. A buck if fed and looked after properly could last you longer.

It is advisable to keep a breeding sheet on the door of every doe pen. This should record her age, the date she is covered, date of birth, number of kits, any deaths, date of weaning, number of kits reared. *Valerie Corr* ■

Valuable compost

Sweep all the droppings and soiled bedding into a neat, square heap every day. If possible sprinkle with water or, better still, with EM1. After two weeks turn it over and keep moist until you have a lovely dark compost. If you keep other livestock (cattle, sheep, goats, donkeys and chickens) their droppings can be added to this compost for an even better end product. This would give you an endless supply of good compost for your shamba or, alternatively, a by product that you can sell.

> > > from page 2: ## Storage

residues. It should then be dried until it rattles when shaken. The farmer should inspect the grain and ensure there are no weevils. The containers should be clean and dry. Load the grains into the container until it is full to the brim and close tightly. It should be stored in a cool dry place.

Neem and pyrethrum extracts

Neem mixed with pyrethrum (known as Nimpyr) is very effective in the control of both weevils and the larger grain borer in stored maize. However larger quantities are needed (2 to 3 kg/100 kg of grain). Pyrethrum has an unpleasant ordour while neem has a bitter taste. This can be eliminated by soaking the grain in water for sometime and later washing the grains. Neem oil is especially effective when applied to stored beans, cowpeas and other legumes. ■

> > > from page 3 ## Mycotoxins

activation, and irradiation have been used to minimize the adverse effects of mycotoxins in animal industry. Some of these methods have some limitations and so are not widely employed in the feed industry.

Organic absorbents

Adsorbents are substances which, when added to feed, are capable of forming other irreversible substances with mycotoxin in the intestine of farm animals. These substances are not digestible and hence they pass down the digestive tract and are excreted in the faeces. Their net effect is to reduce the amount of toxin absorbed in the blood of animals to the point that is not harmful to allow contaminated feed to be fed with minimal losses in performance.

Legal limits and regulation

It is important to note that the enforcement of legal limits for mycotoxins in animal feed is not only for protection of the health of animals. It is even more important for the protection of the consumers of any edible animal products that may be contaminated. The legal limits for mycotoxins reduce indirectly the financial losses due to the adverse effects exerted by some mycotoxins on animal productivity which is of a great economic advantage to animal keepers. ■

farmers forum

How to order your CD

The Infonet-Biovision CD contains all the information that a farmer may need. Farmers interested in buying the CD only need to send us airtime worth Ksh 200 through either our Zain line (former CELTEL) 0738 390 715, or through our SAFARICOM line, 0721 541 590. After sending this airtime, please send us an SMS detailing your full name and correct address. We shall send you the CD by registered mail.

Magazine good for reference

Recently I visited a Ministry of Agriculture office and I was impressed by what I saw. In the waiting room was a neat spring file where monthly copies of *The Organic Farmer* magazine are filed. I opened it and found almost all issues of the magazine where anybody interested on any topic regarding organic farming can make their reference. This filing system got me thinking. Every month, some of our fellow farmers are lucky to get a copy of the magazine, but after reading it, we simply throw it in the nearest table and forget about it. If we have a problem on a topic which was carried in a past issue of the magazine, then we have to wade through all the paper work in the cupboard, the bookshelf or where we stack the piles of old newspapers. Often we may not get the copy we want because it was either borrowed by a friend or even used by school children to cover their books. In other words we lose very vital information that can be used for many years not only by us, but also our children. A good filing system is important for such a publication because we know we may need it later. Right now there are very few books on agriculture in our bookshops. The few that you find on sale are not relevant to our needs as farmers. The magazine has come to fill this gap and we should treasure and keep it in safe custody for our future reference. A small library at home can go along way to meet our information needs.

John Kiarie, Kiambu

Magazine has become the farmers' bible

The Organic Farmer magazine is now being referred to as a farmer's bible. It is proving to be a very resourceful publication. Going through each copy every month, a committed and focused farmer is now able to source all the necessary information from livestock to crop husbandry. On selection of marketable agricultural projects, the magazine is informative. Congratulations and keep on educating us. What the magazine teaches guarantees self-sufficiency in food production and incomes to many rural households. Initially, labour is intensive and tiresome but the fruits are sweeter. With support from World Vision and the magazine we have done exemplary work in farming and are now influencing and converting neighbouring farmers to go into productive farming activities. I would like to urge all concerned to adopt and religiously practise what we have learned.

John G Njoroge, 3N Harvest

Questions? Ideas?
Complaints?
SMS us, and we shall get back to you.
0721 541 590 / 0738 390 715

Earthworms are good for soil fertility

Earthworms can improve the structure, increase fertility and even remove poisonous substances in the soil.

The importance of earthworms in soil fertility and structure cannot be overlooked. Without them, soil would most probably be compacted, infertile and perhaps even less stable and thus easily eroded by water and wind. So which are these little creatures and what is their role? Earth worms have been studied for many years; Charles Darwin alone studied them for 36 years and through these studies brought the importance of these wonderful creatures into the realms of science. There are thousands of types of earthworms. Different worms have different functions, some living within the top few inches of the soil strata and others living well below. Some only operate at night and are called night crawlers.

So what are the actual benefits of these worms?

Earthworms feed on bio-degradable organic matter. As the materials pass through the bodies of the worms, they change in their composition due to the action of enzymes within the worms. Worm excreta known as 'casts' are very high in plant nutrition-nitrogen, phosphorus, potassium and calcium. A word of caution here though-what goes in comes out. It has now been discovered that earth worms can also pick up soil contaminants (including toxic metals), some of which they can neutralise, others remain in the worms' bodies. Strangely enough, new findings are also showing that earthworms are one of the fastest creatures to adapt to contaminants in the environment and pollution. They actually breed better and live longer in areas that are most contaminated!

These contaminants could be from pesticide or fertilizers, hormones and antibiotics found in animal manure or other plant material. In the case of cleaning up contaminated soils, earthworms are now playing a major roll jointly with plants that have the capability of extracting soil contaminants. The worms process the contaminants in the soil and make them available for plant uptake. There is even talk of smelting these plants to extract the metals for reuse in industry! So apart

An earthworm (above) compost made using earthworms (below). (Photos TOF)

from the magic of improving the soil fertility by burrowing and creating water and air passages, breaking down bio-degradable matter into easily accessible plant nutrition and improving the soil structure, earthworms also help to clean polluted soil. They are really fantastic creatures. Here are guidelines on how farmers can make the most use of earthworms in organic agriculture:

Attract the indigenous worms into our fields

To do this we need to understand both what earthworms require and what repels them. They require damp soil with a lot of decaying plant material. I emphasise damp because worms cannot move through dry soil. They either die or tend to travel towards the damp soil. They do not like dry soil, or soil that is humus-free. They are eaten by ants (siafu)) and birds, they therefore need sheltered areas. Simply put, land that is mulched, damp and has a lot of plant material incorporated in the top 1 foot of soil will be a heaven for earthworms. Crops produced in this area should flourish. Note that earthworms do not normally feed on growing plants, seeds, seedlings etc

Create artificial wormeries

Here we create a small- scale heaven for the worms, allowing them to breed, eat and excrete safely under controlled conditions. Most wormeries are about 1-1.5 feet deep .They allow for drenching of the system with water and collection of the same water now termed as worm juice or worm tea. This juice is then diluted and used as a plant foliar feed.

Makes leaf mould

Leaf mould broken down by earth worms is extremely nutritious for plants. As you can imagine, the nutrients in leaves are collected from a soil depth most plants would be unable to reach. To produce leaf mould, simply fill a sack (gunia) with leaves, fresh as well as dry and leave in a shaded place. Make sure the leaves are damp and never dry out. Add a few earth worms and leave them to do their work. In a few months, depending on the amount of worms in the system, you will have a wonderful plant food. One thing to note: Earthworms are cold composters, do not try to add them to a compost pile that is too big and expected to heat up. However, do expect to find earthworms inhabiting a compost pile that has gone through its heating phase and is now completely cool. **Su Kahumbu**

Destructive earthworms

In the past few months, new findings are beginning to reveal the destructive nature of some earthworms. It is said that in the US, exotic earthworms are infact feeding on delicate forest mosses threatening the extinction of this moss and resulting in degradation of the top soil. It is feared this may result in the extinction of other delicate soil organisms and thus the fertility of the forest soil in the future. Note: These worms are exotic and not indigenous. So as we utilise the benefits of these worms locally, let us keep in mind the likely damage they can cause if we were to introduce exotic worms into our soils. ***SK***

tips and bits

from farmers for farmers

Save your beans from destructive pests

One of the major causes of bean loss during storage is damage by grain weevils (bruchids). Bruchids drill holes and feed within the beans, leaving them with many holes and low weight.

Control methods:

1. Mix the dry beans grain with wood ash for every 90 kg bag of beans.
2. Mix a teaspoonful of corn oil like Elianto for every 1 kg tin of beans.

Sunning and sieving

If you have 1 or 2 bags of beans and you live in an area with adequate sunlight, drying the beans and then sieving them kills the eggs and larvae and makes the adults to fly away. For this method to be effective, farmers should do the following:

- Spread out the beans in a mat under the sun for about 6 hours.
- After sun drying, sieve them using an ordinary kitchen wire sieve

During the first 3 months after harvest, sieve the beans once every 2 weeks. After 3 months, sieve the beans once every 3 weeks. The method not only saves money. The beans are not harmed or damaged and they germinate well if they are used as seed. The taste of the beans is not affected and there is no risk of poisoning from use of chemical pesticide.

Diatomite can control pests

Diatomite is white powder made up of millions of fossilised microscopic plants called diatoms, which have sharp edges that pierce insects killing them. It is one of the most effective natural pest control compounds that does not affect the quality of grains and is not harmful to both humans and animals. Diatomite is mined at Gilgil by the African Diatomite Industries. A 20 kg bag retails at Ksh 350. A ½ kg of the powder is enough to protect 1 bag of maize, wheat, oats, rice or even sorghum. It is applied directly to the grain and mixed with a shovel. Diatomite should be washed off and the grain dried before consumption. *Farmers interested can contact African Diatomite Industries P.O Box 32 Gilgil Tel. 050 401 209, 050-401 5209 Mobile Tel.0722 277 120*

The Farmers Classified

Issue 5, November 2008

To advertise contact: James Wathuge 020 356 4106, 0720 419 584, 0733 893 300, email: thefarmersclassified@mailnew.com.com

Farmer's Diary

Brookside dairy farmers training days:

Month	Date	Venue	District
October	31	Mundoro	Gatundu South
November	7	Sabatia D.F.Coop	Koibatek
November	21	Kathangariri	Embu
November	28	Tetu	Nyeri South
December	5	Sotik D.F.C.Soc	Buret

CONTACT PERSON: S.N. KARIUKI 0733 - 270986

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION Nr. 43 December 2008

Serve your cows on time

Lack of knowledge on animal breeding is to blame for the poor quality of dairy cattle in the country.

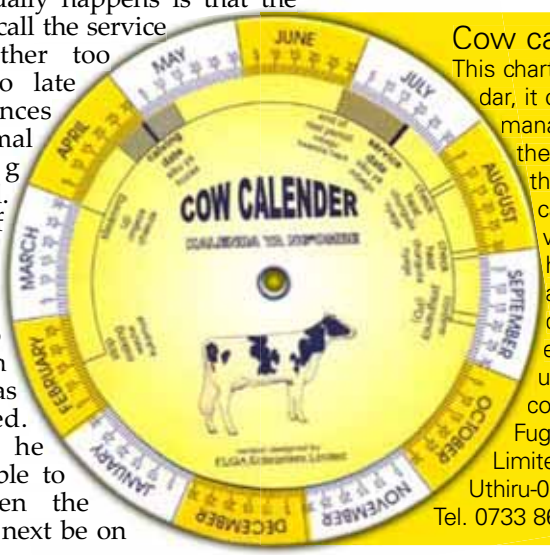
The Organic Farmer

Many farmers lack knowledge when it comes to managing the fertility of their dairy cattle. This ignorance is to blame for irregular calving, low milk production and the poor quality of dairy cattle in most farming areas in the country. In this issue of TOF, we have revisited the issue of animal breeding following enquiries from several farmers.

Too early or too late.

The quality of dairy cattle in the country started deteriorating two decades ago when the government privatised veterinary services following pressure from donors. Since then, the quality of service has considerably gone down. The private service providers do not impart any knowledge to the farmers on important aspects of breeding such as heat detection in a dairy cow.

What usually happens is that the farmer may call the service provider either too early or too late when chances of the animal conceiving are minimal. Lack of records makes it very difficult for the farmer to know when the cow was last served. Therefore he cannot be able to predict when the animal shall next be on heat. There is another and even worse problem: Without records, private artificial insemination providers may end up serving the daughter of a cow with the same semen that was taken from its father, resulting in inbreeding. In this issue we advise farmers how to detect heat in an animal and show the best time to serve it in order to increase the chances of conception. *Page 3*



Cow calendar

This chart is a Cow Calendar, it can help farmers to manage the fertility of their dairy cows. With the calendar, a farmer can tell when the cow will next come on heat, when to dry it and also the date of delivery. Those interested in buying this useful calendar can contact Fuga Enterprises Limited, P.O.Box 653, Uthiru-00605, Nairobi Tel. 0733 866 191. Price Ksh200

Sukumawiki

No other vegetable reduces better the occurence of different kinds of cancers. *Page 2*

Fish farming

If managed well, fish farming can easily improve the income of farmers. *Page 4*

Fodder

There are several ways to provide your cattle with adequate fodder during the dry season. *Page 5*

Dear farmers,

The hike in fuel prices in the recent past has demonstrated how greedy local companies can be in their bid to make profits at the expense of the common man. Although fuel prices have gone down by more than half of what it cost two months ago, oil companies are unwilling to reduce pump prices by the same margin, which has in turn raised the cost of goods and services. This is a big burden to consumers and especially the low income earners. Farmers are also hard hit by the increase in the cost of inputs. When they produce food at unimaginable high costs, it is sad to see companies, which operate like cartels, buying such produce at throw-away prices.

Yet this is what is happening when it comes to the marketing of agricultural products. If it is not the middlemen exploiting farmers, it is the millers and food processing companies. Take wheat for example. Although world prices have remained relatively high since last year, local millers still buy the commodity form farmers at very low prices. One wonders why these companies can afford to buy wheat at a price of upto Ksh 4000 in the international market but pay local farmers as low as Ksh 2400 for a 90 kg bag of wheat. The companies are quick to increase the price of wheat flour and bread to maintain and maximize their profits, but they are not ready to pass on the benefits to the farmers. One of the responsibilities of the National Cereals and Produce Board (NCPB) is to help regulate the price of cereals and store strategic food reserves for the country. Two decades ago, the board used to buy wheat from farmers and sell it to millers as is the case with maize. But individuals with vested interest stopped this, leaving the farmers at the mercy of the millers.

Price controls may appear outdated in a liberalised market such as Kenya's, but sometimes it is the only way the government can rein in unscrupulous companies out to fleece farmers. The other alternative is for farmers to form strong associations that can lobby for their interests. Such associations can exert pressure on the companies – and on the government to change its policies on marketing of agricultural produce.

Due to the current food crisis everyone now is talking about revitalising agriculture. We hope this is not just empty talk. Finally, we wish all farmers a merry Christmas and a prosperous new year 2009!

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0721 541 590, 0738 390 715, Email: info@organickenya.com

Sukumawiki keeps the doctor away

Sukumawiki is not only a cheap vegetable. It is also one of the healthiest with lots of vitamins.

John Cheburet

Kale, popularly called sukumawiki, is a staple vegetable for most Kenyan households. In recent years, many organisations pushed for the planting of traditional vegetables arguing that these are more nutritious than sukuma wiki. But only few people know the numerous benefits of kales. Some people consider this vegetable to be bitter while others treasure it because it is easy to grow and has numerous health benefits.

Rich in nutrients

Sukumawiki does well in a well manured soil and is relatively drought resistant, meaning that it can be easily grown in most homes across the country. It is a member of the brassica family of vegetables that includes cabbage, Brussels sprouts and collards (a cabbage which does not develop a heart). This family of vegetables is high in nutrients that help in fighting and reducing the occurence of different kinds of cancers. These nutrients help the liver to neutralize substances in the body that may be cancerous.

Kale is rich in plant pigments (flavonoids) called kaempferol. Research in 66,940 women enrolled in the Nurses Health Study between 1984 and 2002 revealed that women whose diets provided the most kaempferol had a 40 percent reduction in risk of ovarian cancer, compared to women eating the least kaempferol-rich foods. In addition to kale, foods richest in kaempferol include non-herbal tea (like green tea), onions, broccoli, leeks and spinach.

Sukumawiki is also good for men. Recent studies show that those eating the most cruciferous vegetables (vegetables of the brassica family) have a much lower risk of prostate, lung and other types of cancer. In a study of over 1,200 men conducted at the Fred Hutchinson Cancer Research Center in Seattle (Canada), those eating 28 servings of vegetables a week had a 35 per cent lower risk of prostate cancer, but those consuming just 3 or more servings of cruciferous vegetables each week had a 44 per cent lower prostate cancer risk.

In addition, sukumawiki is useful in keeping away other ailments. For instance, the vegetable has a nutrient called beta-carotene that helps in good vision. This nutrient reduces the growth of cataracts that lead to gradual loss of sight. Sukumawiki is a good source of the highly valued vitamin C which reduces the likelihood of developing colon cancer. Just one cup of this cooked vegetable supplies 88.8% of the daily value for vitamin C. Sukuma wiki is rich in minerals; calcium, potassium, manganese, iron, and potassium. It also contains an insoluble fiber that is associated with protection against heart disease in both men and women.

Select and cook well

Cut the lower leaves of plants for sale or your own domestic consumption. When leaves are left for too long, they become coarse and bitter. And, when buying sukumawiki ensure that you select deep coloured leaves that have moist hardy stems. Small leaves are usually tender and have a more mild flavour than larger, more mature leaves. Store sukumawiki in a cool place since warm temperatures will cause it to wilt and reduce its flavour. In addition, you can pair kale with other greens, such as collard greens, which have a sweeter flavor to reduce the strong flavor of kale.

Good for the environment

Sukumawiki is good for the environment. It needs between 5-8 minutes to cook well without losing the nutrients it is known for. This means it requires less energy to cook compared to traditional vegetables which have to be boiled before frying. It is ideal for both rural areas where there is high demand for firewood and in urban areas where there is high demand for charcoal.

Food safety

While sukumawiki has numerous health benefits, it is also important to know that a dirty environment is a major factor that affects the safety of the sukumawiki we plant or buy. In major towns, across the country, it is common to find green leafy vegetables planted near sewers.

Dirty water increases the levels of harmful bugs and bacteria that can be found in the vegetable. There is a strong link between diseases such as diarrhoea and food poisoning caused and the consumption of vegetables grown in dirty water laden with germs such salmonella, E coli and listeria. Farmers planting vegetables in dirty places risk losing customers as people will not buy vegetables with high levels of dangerous bacteria.

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

Know the best time to inseminate cows

Many farmers serve their animals when it is too early or too late. Result: Failed conception.

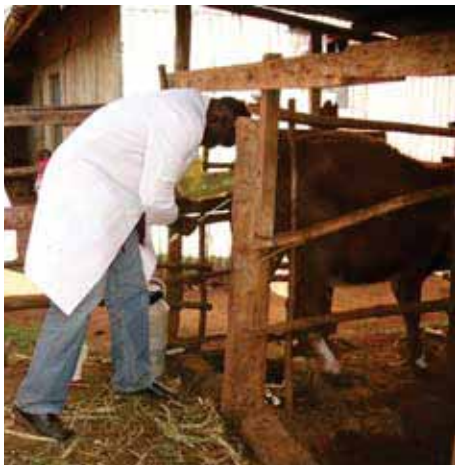
The Organic Farmer

Several Farmers have written to us requesting to know how they can be able to tell when and if their dairy cows are on heat and need to be served. To us this is an important question because good timing in serving a dairy cow will determine the success of conception. Timely service also ensures that a cow's calving cycle is attained. Most farmers serve their dairy cows too early or even too late due to lack of knowledge. Failed conceptions can be avoided if the farmers are well informed on the tell tale signs that a dairy cow shows when she is in need of service.

Cows need attention

The fertility of a dairy cow is very important. It affects the number of calves born and the total milk produced during the entire life of a cow. Good fertility improves a dairy farmer's income. A cow's fertility is determined by the number of calving intervals- this is the period between two successive calvings (births). A healthy cow should give birth after every 365 days, or every year. The calving interval is divided into two periods: The calving-conception period (the period the cow gets pregnant) and the conception-calving time. A dairy farmer, thus, should pay much attention to the cow between calving and conception period. The farmer should ensure that he serves the cow at the right time to increase the chances of the cow conceiving.

The cow should be properly fed with a balanced diet of carbohydrates, proteins and minerals. It is important to point that a poorly fed dairy cow cannot come on heat at the expected time because its body may not be in good condition for conception. Diseases associated with the animal's reproductive system may also interfere with conception.



Farmers should use semen from known service providers such as CAIS (Central Insemination Services). This helps upgrade the cows, improve their growth, milk production and health.

Short heat period

Very often only a few of the signs (on the right) are clearly visible. For instance, when the weather is warm, the cow will not be very active and there may be a secretion of mucus indicating that the animal is still on heat. At this stage it is too late to serve the animal since this may lead to failed conception. In tropical countries such as Kenya, the period during which the farmer can detect heat in a cow is very short. The visible heat period lasts only for between 11-12 hours for grade cattle. This means that the farmer has to be alert and observe their cows closely to notice any heat signs. Observing the cows in the morning milking and also in the evening can help the farmer to detect heat. A farmer who keeps good records of their animals can also predict when the animal is about to come on heat. This can help them serve the animal at the right time (*see page 1*).

If the animal bleeds from the vulva two days after the end of the heat period, then it will come on heat in the next 17 – 25 days. Normally a cow will show the first heat within 3-4 weeks after calving. If a farmer kept good records, it is always easy to predict when the animal will come on heat again. The best time to serve a cow is between 45 to 90 days after calving. Any insemination done before 45 days after calving give a lower chance of pregnancy. On the other hand any insemination given in 90 days after calving results in birth intervals of over one year. Therefore it is important that the farmer selects the best time between 45 and 90 days to service their dairy cows.

How to reduce inbreeding

- Farmers should always maintain records of each animal.
- When an animal is inseminated, do not throw away the semen straw. All straws are labelled with name and code of the bull from which the semen came from. This helps the inseminator avoid serving the daughter of the cow with semen from the same bull - its father.
- Farmers should avoid use of village bulls to stop the transmission of venereal diseases. Home-bred bulls also increase chances of inbreeding. They should therefore be separated from the rest of the animals at all times.

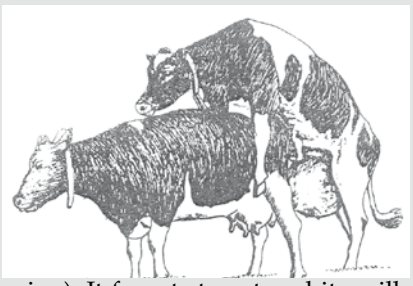
Signs of an animal on heat

The time during which a cow is on heat can be divided into three phases: The early heat, the standing heat and after heat. During each of these phases, the cow shows specific signs.

Early heat: An animal on early heat tends to sniff other animals. It is also sniffed by the other animals. It tends to mount other animals but walks away

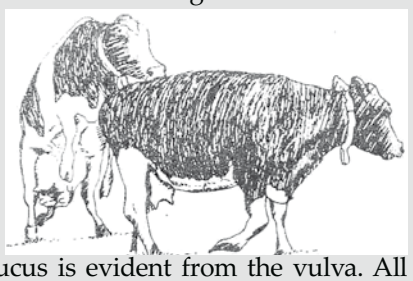
when mounted. The cow is usually restless and keeps on looking around while making noise. Its vulva (lips of vaginal opening) is slightly swollen, moist and reddish. It is also extra attentive. When the animals shows these first signs, the farmer is advised not to inseminate (serve) the cow at this stage.

Standing heat: A cow is said to have standing heat when it shows all the signs already mentioned above. At this stage however, the vulva is swollen, deep red and there is a flow of clear mucus from the vulva (vaginal



opening). It forgets to eat and its milk production goes down. The cow's tail is bent away from the vulva. The animal should be inseminated immediately it shows these signs.

After heat: At this stage the cow continues sniffing the other animals and is also sniffed at. However it refuses to stand when being mounted. A clear



mucus is evident from the vulva. All heat symptoms cool down rather suddenly. Source: *The Fertility of a Dairy Cow (Ministry of Livestock & Fisheries-Development)*

Do you have fodder for the dry season?

Feeding the cattle during the dry season requires good planning – and some additional labour.

The Organic Farmer

Meeting feed requirements for their animals during the dry season is quite challenging for farmers. During the wet season a lot of fodder is wasted in many farms simply because either the farmers do not store the fodder correctly or the modes of feeding adopted are wasteful.

A good number of farmers do not even bother collecting crop residue and storing it in good structures. They just abandon it in the field where it is exposed to wet conditions, consequently rots or becomes unpalatable for animals. Such farmers prefer grazing their animals directly in the field where lots of fodder is trampled upon and thus wasted. Once they have stepped, made droppings or urinated on the fodder, animals cannot feed on it. A good trough or feeding rack is ideal as it ensures that a large percentage of the fodder is consumed.

The feed nutrients

Only if animals are fed more than they need for basic survival, can they then produce more milk or, in case of beef production, gain weight – if all other management practices are in order. Animal feed should contain various groups of nutrients, and the composition depends on which type of animal is being fed: Proteins help to build the animal's body and its maintenance, carbohydrates provide energy while minerals help in biological regulation and growth. Vitamins regulate biological processes and provide nutrients to the milk. A dairy cow requires plenty of water for milk production, body building and for the regulation of body temperature.

Dry matter intake

The amount of fodder a dairy cow needs depends on its bodyweight. For example a Jersey (400 kg) that produces 15 kg of milk per day will require 11.5 kg of fodder but a Friesian cow (600 kg) needs 16.5 kg/day of dry matter to produce the same amount of milk. This statistics can help farmers to decide what breed of a cow they can buy for milk production.

The amount of feed also depends on the palatability of the feed being offered. Fodder should be cut in small sizes. Nutrition experts advice that fodder for dairy cows should be of the same length as the animal's muzzle (mouth); this is ideal as it allows the animal to chew it into the right quality for ease of digestion. The quality of crop residues can be improved by various methods:

A dairy cow needs adequate fodder for optimum milk production. (Photo TOF)

- Adding fodder legumes such as lablab or desmodium improves the quality of fodder as well as the supplementation of fodder with concentrates like cotton seed cake or sunflower seed cakes.
- Soaking the hard pieces of crop residues in water increases palability (this softens it).

Continued on page 6

Conserving fodder by use of polythene bags

Take care of surplus fodder. If well stored, it feeds your cow during the dry season and boosts your income. At times we are disappointed to see how careless farmers often handle the surplus fodder. It can be stored as hay (see TOF Nr 19, December 2006) or used for making silage.

There are many methods of making silage, but the use of polythene bags is one of the most suitable for small-scale dairy farmers. The following steps should be taken when making silage using polythene bags.

1. Chop the forage to the correct length using a panga or chaff-cutter. Spread a sheet (Chandarua) or canvas onto a flat surface and place 100 kg of fodder on it. Spread the material into a thin layer.
2. Dilute 3 Kasuku tins of molasses with 3 litres of water. Sprinkle the diluted molasses onto the chopped forage as evenly as possible. Turn evenly and spread it.
3. Tie one end of 2 metre long polythene bag (1.5 metres, 1000 gauge) to make a large polythene bag. Place the 100 kg of forage already mixed with molasses into the polythene bag and compact as much as possible.
4. Repeat the same process twice, each time compacting the forage thoroughly after adding forage into the polythene bag. Tie the top of the polythene bag tightly ensuring as little air as possible remains above the forage/ molasses mixture. Place some weight on the tied sack to compact the mixture further. Store the bags away from direct sunlight or rain. The silage will be ready for use after two months. It can then be stored for as long as the farmer wishes.

Cheap solution

Each time you open the silage bag, expel the air from the bag and then tie it tightly to avoid spoilage. Polythene bags cost about Ksh 110 per metre while molasses cost Ksh 300 per 20 litre jerrican. It costs Ksh 385 to make one bag of silage which can feed one dairy cow for upto 4 days. (TOF)

Done correctly, fish farming is profitable

For proper management of fish ponds, farmers should consult fisheries extension officers in their areas.

The Organic Farmer

Despite enourmous potential for fish farming in Kenya, there are very few farmers who rear fish. The main reason is that most farmers do not know that fish farming has potential to earn them a living and they also lack the knowledge on how it is done.

Fish farming, like any other economic enterprise, needs good management for it to give good returns. Besides, the fish farmer has to consider many factors before he can rear fish. One of these factors is the market. It is not wise to start any farming activity without carrying out a survey to find out if there is demand for the product you intend to produce. Many farmers have tried fish farming and ended up being frustrated after failing to find market for their fish. Others have failed due to poor management of their fish farms.

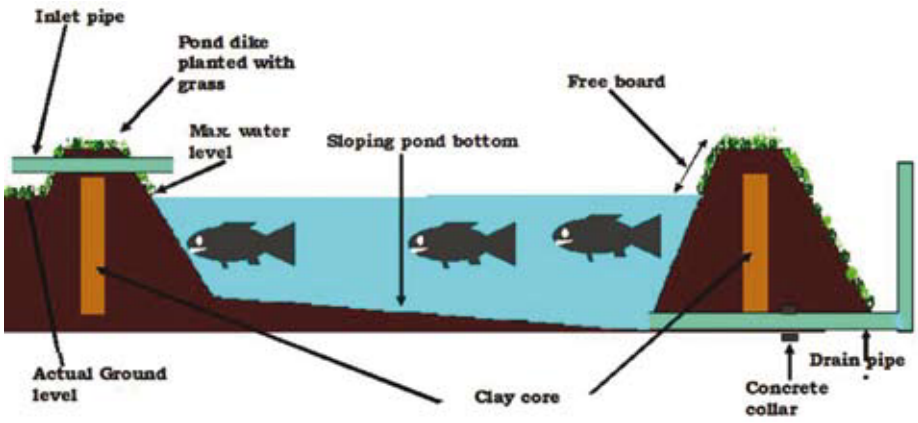
Important factors

"It is very unwise for fish farmers to produce fish first, and then look for the markes later," Says Mbugua Mwangi, a fish farming expert at the Fisheries Department in Nairobi. Apart from markets, any farmer with an interest in fish farming has to explore the suitability for fish culture in the area they intend to start fish farming. It is wise to consult fisheries extension officers in their districts at every stage of the project. Here are some of the factors potential fish farmers have to consider before making decisions:

Water: Availability of water and its quality is an important factor in fish production. Gravity flow water is cheaper for a fish farmer. Polluted water should not be used for fish farming; farmers should be assisted by extension officers to find out if the quality of the water in their area is suitable for fish farming.

Temperature: Different types of fish can only survive and reproduce well in different temperatures. In Kenya, tilapia and clarias are the two main species reared by farmers. They do well in warm waters of more than 25°C For successful tilapia farming, average temperatures of 28°C are best. In areas with temperatures less than this, the farmers are advised to increase the size of the fish pond for the water to acquire the right temperature. Adequate sunlight is required for tilapia farming under semi intensive systems. Others such as trout grow well in cool waters, 10-18°C under free flowing water systems.

Land area: Fish ponds require a larger land area with a gentle slope as compared to fish tanks and raceways. This is more cost effective if the land and water does not cost much. A larger surface area allows for a greater natural production. Pond construction is cheaper than the cost of tanks or fish cages. For tilapia production, one hectare of pond space can produce about 8 to 10 tonnes of fish every year if the pond is fertilised and the fish well fed.



"Fish farming has improved my income"

William Kiama started eating fish as a young man growing up in Mombasa where his parents worked back in 1965. Although he occasionally went for fishing in river Sagana back in his rural home, it never crossed his mind that fish farming can be a good source of income until the Department of fisheries in a project funded by USAID, trained farmers in his area on fish farming, "immediately after the training, I constructed my first fish pond," he says. An immediate increase in demand for food fish from his customers prompted him to increase the number of ponds. He abandoned growing tomatoes, French beans and cabbages and went into full time fish production. "You cannot compare the income from fish farming with crop production. Besides fish farming requires little initial capital and labour apart from pond construction," he says.

Rearing ornamental fish

A few years ago, Kiama diversified his fish farming enterprise and started rearing ornamental fish. The reason he changed is that ornamental fish fetch more money in the market. The 7 ponds on his ¼ acre fish farm are stocked with about 30,000 ornamental fish which is now the main source of his income. The market for ornamental fish is growing in East Africa. This type of fish such as goldfish, olanda and koi carp fetch between Ksh 600 and Ksh 1200 in the local market. He sells the fish to organisations, hotels and individuals with aquariums in Kenya, Tanzania and Uganda.


William Kiama

Through his project, Kiama has acquired enough experience on pond construction; many people including government institutions in the region consult him to train farmers on fish farming and pond construction. He says that any farmer can do fish

Continued on page 6

>>> from page 4: ## Fodder

• The digestability of crop residues can also be improved by sprinkling it with urea; but this technology is tricky as there is a risk of poisoning the cow if too much urea is used. (Farmers interested in urea-technology can order a leaflet from us).

Proper planning is the key

A farmer should start making fodder for the dry season when there is a lot of green forage material from maize, beans, Napier grass or other crop residue. This is when there is more fodder available than the animals can eat. A wise farmer starts much earlier by taking the following measures:

• Growing grasses and deep rooted legumes that provide high quality fodder for a longer period (leguminous forage contains protein).

• Planting fodder trees such as calliandra, mulberry, Leucaena etc. (*see TOF Nr 12, April 2006*) which provide farmers with large amounts of high-quality but low-cost fodder.

• Planting sweet potatoes since the sweet potato vines are protein boosters and can survive even during the dry season (*see TOF Nr. 31, Dec. 2007*).

- Making your own mineral salts by use of plants such as pumpkins, amaranthus etc. (*see TOF Nr .41, October 2008*). ■

>>> from page 5: ## Fish farming

farming if they have adequate water and the right soil profile. An average fish pond of 10 m by 20 m can hold up to 600 tilapia fish. From his 7 fish ponds at the fish farm, Kiama earns between Ksh30, 000 and Ksh 60,000 a month. To reduce costs, he says farm yard manure produces very good fish food compared to use of chemical fertilizer. Natural fish food is also supplemented with maize or rice bran.

The government has recognised his effort. Through the Agricultural Finance Corporation (AFC), they have pledged to advance Kiama a soft loan for the construction of additional ponds and equipment. These will enable him increase fish production. (TOF) ■

farmers forum

020 445 03 98 0721 541 590 0738 390 715

More on mushroom please

We have found *The Organic Farmer* very educative and useful to us as small-scale farmers strenuously working to realize farming as a business and therefore of benefit to us and our health. We want to contribute more towards making our environment better for ourselves and for generations to come. Your magazine is therefore doing a commendable job. Please highlight more on mushroom growing in your next issue and include us in your mailing list. And we wish you ever-greater heights in promoting agriculture in the country.

Yours truly,
Upendo Growers Self Help Group
upendomushroommolo@yahoo.com

We have already written a comprehensive article on mushroom growing (Read TOF Nr.23, April 2008). You can download the same by visiting our website at www.organicfarmermagazine.org

It is a store of knowledge

We came across your magazines and they are very resourceful to our community-based organizations who indulge in sustainable agriculture. We therefore request you to include us in your mailing list and send to us 20 copies of the magazine for the benefit of our members. I have attached an introductory page and our profile of activities. Thanks for the good work, we really appreciate.Our postal address is ECoS-GROUP, Box 777-20200, Kericho. Tel. 0734523334, Kind Regards, Sylvia Korir, EcoS

More on beekeeping

I came across this magazine two weeks ago and it impressed me a lot due to the information it contains on various aspects of agriculture. I am also very much interested in beekeeping and request for more information regarding the same. I do plant wheat, beans and maize and rear Maasai cattle. Anthony Lemein, P.O Box 52, Olololunga

Dear farmers,

Many farmers have called us in the last one month complaining that they never received their September and October 2008 issues of *The Organic Farmer.* This happened because of some interference with our computerised address list which led to omission of a number of farmers' addresses during preparations for the dispatch of the magazine. We therefore kindly request farmers who did not receive their copies during this period to contact us either through telephone, SMS or e-mail to enable us update our mailing list and resume normal delivery. Immediately we receive your complaints, we will ensure you continue receiving your copy. We regret the error.

Order your CD

The Infonet-Biovision CD contains all the information that a farmer may need. Farmers interested in buying the CD only need to send us airtime worth Ksh 200 through either our Zain line (former CELTEL) 0738 390 715, or through our SAFARICOM line, 0721 541 590. After sending this airtime, please send us an SMS detailing your full name and correct address. We shall send you the CD by registered mail.

SUBSCRIPTION FORM

Return this completed form to TOF, PO Box 14352 00800 Nairobi or info@organickenya.com

Name: _____

Postal Address: _____ Code: _____

Town: _____ District _____

Province: _____

Registration No.: _____

Number of active Members: _____

Chairpersons Name: _____

Chairpersons Tel.: _____

Areas of interest: _____

_____

Registration type:

- Individual farmer ☐
- Farmer Group ☐
- Women Group ☐
- Youth Group ☐
- College ☐
- School ☐
- Church Group ☐
- Extension Officer ☐
- NGO ☐
- CBO ☐
- Other ☐

Tissue culture and GMOs

What is the difference between tissue culture and genetically modified crop breeding? Moses Ndung'u PO Box 617, Ol kalou, 0727 902 181

Tissue culture is the growing of parts of a plant or organs in a laboratory environment, free of diseases and or pests (also called *in vitro*). The plants are provided with the necessary nutrients and conditions such as temperature and are light controlled to ensure proper growth. Through this method scientists are able to reproduce or multiply clean planting material of particular crops which would otherwise be very difficult to reproduce in a nursery or other traditional methods without the risk of diseases. Plant material under tissue culture production can be stored for a longer period of time.

GM changes genes

On the other hand, a genetically modified crop is one whose characteristics have been altered by the insertion of a gene or genes from another crop or organism to make it produce more, resist a disease or even a pest. The process is achieved using various techniques of genetic engineering.

A bunch of tissue culture bananas (above). Tissue culture bananas in a laboratory

New tomato varieties not available

What is the name of the blight resistant tomato varieties and where can one get its seeds?

Two blight resistant tomato varieties have been developed by the World Vegetable Centre (AVRDC) in Taiwan and its regional centre in Arusha Tanzania. These are the Meru and Shengena varieties. However these new varieties are still undergoing field trials before being released to private seed production companies for multiplication and sale to farmers. Although a few farmers have managed to get the seeds in Taita hills and Usambara mountains in Tanzania, the seeds are meant for trials and not for commercial production. You should wait until these seeds are released into the Kenyan market for commercial production.

Cowpeas are good fodder

At what state are cowpeas best for fodder? Green or dry? Which part of the plant is considered toxic (poisonous)? Can it be used or preserved as hay?
Anthony Muhia, fhoreal@yahoo.com

Cowpeas can be fed to animals when it is still green but it is advisable to dry it slightly in the sun until it has wilted before feeding it to the animals. Cowpeas are not poisonous. They can be dried and stored as hay like any other fodder. Make sure the fodder is cut into small pieces! In terms of the right variety for your area, get advice from your local agricultural extension officer.

Home-made feeds

How can we make home- made feeds (dairy, beef, calf, layers, broilers, chicks)? Show us because we want to do it as a business Ramadhan Odhiambo Tel. 0721 908 675.

Although it is possible to prepare home-made rations for dairy cows, beef cattle or even calves (See TOF Nr. 19 December 2006) preparing feed for layers, broilers and chicks requires more specialised equipment which most small- scale farmers may not be able to buy. Exotic chickens such as layers, broilers and even chicks require special feed formulations to grow and produce eggs and the right quality of meat.

A small-scale dairy farmer may not have the expertise and equipment needed to make such feeds. We will send you information material on how to prepare feed for indigenous chickens which you can sell to fellow farmers.

Answers in brief

Weed killer

Can I use 2-4D to weed the just germinated desmodium seedlings? 0721 322 809

The application of chemical weed killers is not recommended in organic farming unless it is absolutely necessary. The use of 2 -4D in your case may kill all your desmodium seedlings because the chemical is active on all broad leaf crops. We would recommend that you do the normal weeding to avoid losing your valuable desmodium crop.

Soil tests

I plan to start farming along the shores of river Tana in Mwingi. I have soil samples but I cannot get a place to test them in Eldoret. Please assist. 0727 746 103

Soil tests can be done at the KARI-National Agricultural Laboratories (KARI-NARL) Along Waiyaki way in Nairobi. Contact KARI-NARL P.O.Box 14733, 00800 Tel 020 444 02 29.

Tree tomatoes

How many types of tree tomato are there? Muturi, Kinangop, 0729 015 919 Please assist to get tree tomato seeds and their literature. Pareiyo, Narok 0722 967 314

Tree tomato, also known as Tamarillo (*cyphomandra.b.etaceae*) may have originated from Japan. There are three varieties: yellowish soft, brownish with strips and the pinkish variety with long thick cover.

To get tree tomato seedlings get in touch with Benjamin Lugano Tel.0733 990 574. *The Organic Farmer* has written about production of tree tomato fruits (TOF Nr. 33, February 2008). If you can send us your full address, we can send you additional material on tree tomato production.

Slurry

Is slurry from a biogas digester classified as organic fertilizer? 0722 339 178

Yes, it has high concentration of nitrogen, potassium and phosphorus which are essential for plant growth in their natural form and can be used as an organic fertilizer.

tips and bits

from farmers for farmers

Mandala: A kitchen garden for the dry season

Getting vegetables during the dry season is a big problem for farmers. This is because most farmers rely on rain to grow their food crops. Come the dry season and many rural households have no reliable source of vegetables as nothing grows at this time. For those farmers without a river frontage (a garden near the river), there are various methods they can use to grow vegetables. One of these is putting up a Mandala garden, named after a farmer in Elitrea who pioneered the first garden of this nature.

Well nourished soil

A Mandala garden is a small circular kitchen garden made close to the house where the farmer can use water from the kitchen to water the garden and grow such vegetables as sukumawiki, spinach, tomatoes, chillies or any other crops that they need. The seed bed is prepared by use of double-digging method to make sure the soil is good enough to retain water and the right texture. With a stick and rope, the farmer can make the outline of a circular garden in the seedbed. A watering hole is then made at the centre of the circle. A number of furrows and ridges 2 ft apart are then made following the circular outline. A small water channel is then made stretching from the kitchen to the watering hole at the centre of the circle. The garden is first watered and the desired vegetables planted on the ridges, all the waste water from the kitchen flows into the hole where it is used to irrigate the garden. To protect the garden from the animals, the farmer can make a hedge around it or even use a net to protect it against birds.

"Saved my family"

Stanley Mungai is a farmer at Karunga in Gilgil. Two years ago, he learned about the Mandala garden and decided to make one at his homestead. He says the garden has saved his family of 10 from the severe shortage of vegetables during the dry season which stretches from January to March, " from this garden I have been able to meet the vegetable needs of my family and even sell to my neighbours", He says. Having learnt from him, more than 22 farmers in the area have already made their own Mandala gardens. (TOF)

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 45 February 2009

A farmer feeding a polythene digester with mixture of manure and water (slurry). Our photo does not show the roof that protects the digester from sunlight. (Photo TOF)

Biogas, an alternative to firewood

Biogas is clean and relatively simple to generate, but it is an under-exploited source of energy.

The Organic Farmer

70 percent of Kenya's total energy demand is met by wood fuel and charcoal. The pressure on our forests for firewood and charcoal has speeded up severe deforestation. This will lead to the destruction of so many water catchment areas and in the long term , cause the drying- out of agricultural land, which would further diminish the country's already limited agricultural potential.

Cost effective-technology

One possible alternative to firewood especially for farmers is the installation of a biogas unit using the tubular Polythene (plastic) Biogas Digester. It is an efficient and a cost-effective technology.

The costs for a biogas digester made from polythene tube vary, but for a 2-cow unit, one can spend between Ksh 5,000 and Ksh 8,000. It lasts for about four to five years, if well maintained. Findings at KARI-Embu have shown that the Polythene Biogas Digester fed with dung from two dairy cows can supply 30 to 50% of the total energy needs of a typical rural household of about 5 to 8 people, with up to 60% saving on wood fuel, which is a substantial saving on costs. *Pages 4 & 5*

in this issue

You can save on fertilizers

The declining soil fertility, changing weather patterns and soaring prices of agricultural inputs such as fertilizers pose a serious problem to resource-poor small-scale farmers. In several issues, *The Organic Farmer* has published tips on how to build soil fertility through the use of well-prepared compost, crop rotation and planting of nitrogen fixing legumes. *Page 3*

Dear farmers,

A big hurdle facing small-scale farmers in Kenya is lack of small-scale technology that would make their work easier. Simple machines could help them save on time that in turn could be invested in efforts for adding value to farm produce. A motorised machine for example would be an ideal tool for chopping the hard maize stalks or Napier grass to make feed for livestock!

Of course, we know about the plight of low income small-holders; when they make some money, a lot of it is spent on other pressing needs such as paying school fees, medical bills, and other incidental expenses. Consequently there is not much remaining that can be ploughed back into the farm after the payment of these bills.

Apart from the high costs of transport to remote areas, small-scale farmers in rural Kenya have to cope with many other problems:

- *Lack of power: Rural electrification programme is crawling at a snail's pace. This is unfortunate, since most of the small machines that use electrical power are cheaper than those that run on fuel.*
- *Lack of appropriate technology: Compared to the technology used on big farms, develoment of small-scale technology is slow. Good looking designs is one shortfall, its applicability another.*
- *Lack of information: Extension officers know little about small-scale technology.*
- *Lack of interest in new technology: Very few farmers are unwilling to try out something new.*

However, we know that small-scale farming is a challenging business. Farmers can hardly risk losses. But if they evaluated carefully and took appropriate measures, they could, in the long term, win. Let's take the example of biogas; it could replace firewood as the only source of fuel in rural households. In this issue, we feature a simple biogas unit which costs around Ksh 5,000 and which has been used by farmers for many years in many developing countries.

There is quite a number of cheap small-scale technology equipment which farmers (or farmers' groups) could use to make work easier, to save time and money, or to expand in value addition of their products. The biogas unit we are writing about in this magazine is only one of them, others are oil presses or solar dryers. Small-scale farming is a business, and farmers should use every chance to boost their income.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0721 541 590, 0738 390 715, Email: info@organickenya.com

"For me, going organic was the best decision"

To change from conventional to organic farming is a challenge. Amos Guandaru Ng'ang'a has managed it.

Anina Bondeni

It is a great challenge to try new production methods, especially in agriculture, where farmers are always concerned about losing their precious crops if they changed. Nevertheless, it is also worthwhile to try, since the benefits can be immense, sometimes improving soil fertility as well as your harvest - and maybe even income. Amos Guandaru Ng'ang'a is a great example of a man who took this challenge and benefitted a lot from it.

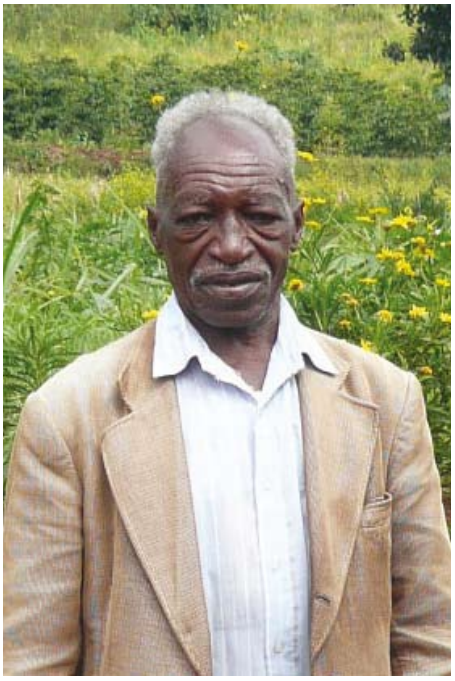
Farming with TOF in the pocket

Amos is a full-time small-scale farmer from Subukia valley. For the past sixty years he was used to farming the conventional way – with chemical fertilizers and pesticides. Then, four years ago and at the age of 66, a friend gave him an issue of *The Organic Farmer* magazine. After reading it carefully, he immediately decided to change to organic farming as he realized that it would be much healthier for him and his family. Moreover, he understood that he would save a lot of money if he used compost instead of chemical fertilizers.

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org
Editors Peter Kamau, Peter Baumgartner
Secretariat Lucy W. Macharia
Layout In-A-Vision Systems, 0720419 584
Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe
Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org



Amos Guandaru Nganga changed to organic after reading *The Organic Farmer*

In one week, he had already put together enough material to make his first heap of compost, following every step as outlined in a TOF article "How to make compost". Amos says: "I kept the article in my pocket while working on the compost heap!" When we visited Ng'ang'a and the members of his farmers' group some weeks ago, he showed us, with pride, his well-maintained compost. He had covered it carefully with a plastic sheeting to prevent sun-drying and keep it moist. He has also adopted several methods and tips he acquired from reading articles in TOF magazine. He is practising the push-pull method which is aimed at controlling stem-borer in his maize crop and providing fodder for his cows apart from fixing nitrogen in the soil. He is also rearing rabbits (see TOF No. 42 of November 2008 and No. 26 of July 2007) to provide his family with good and healthy meat.

"However, the change from conventional to organic farming comes with an increase in labour input", Amos says. "But it was the right decision. I noticed an immense increase in harvest, in addition, I save money by using compost instead of the expensive chemical fertilizers", he says.

Marketing problems

The only disadvantage is that Amos Ng'ang'a has to sell his products to the local buyers for the same price as conventionally-grown fruits and vegetables. "Mine are more nutritious, tasty and healthy", he says. "I should be selling them at a higher price. But people in the villages do not care about the nutritional value of their food; they just want something to eat", he adds.

In order to be able to sell his produce as organic and get a better price for it, since they are of higher value, Ng'ang'a would have to follow the documented Standards of Organic Production and to have his land certified as organic by a recognized certification body. For a long time all certification of produce was carried out by international certifiers only. But in July 2005, a certification company for the local market was established to provide certification to local farmers at an affordable cost. This certifying body is called "EnCert".

International statistics show that consumption of organic produce is increasing due to better consumer awareness. Organic certification could be a good investment. Both local and export markets of Kenyan organic products are yet to be tapped.

For many organic small-scale farmers however, certification is still too expensive. But costs can be greatly reduced if farmers came together and paid for certification as a group. Working in a group has other advantages: Since most of the buyers of organic food live in urban areas, the members of a group could save on transport costs (see our article about successful avocado-growers in Subukia valley in the March-2009 issue of TOF).

TOF celebrates fourth birthday

In April 2004, we launched your magazine, *The Organic Farmer*. In view of the commemoration of this event in April, we shall publish a short series on farmers' groups in Subukia valley as an example of all the farmers' groups we are dealing with. How has *TOF* influenced their farming methods and their social life? And what is the experience of Charles Munyari, a *TOF* distributor since the inception of the magazine?

In the first article on this page we shall talk about Amos Guandaru Ng'ang'a, who has changed from conventional to organic farming.

New way to reduce fertilizer costs

With a variety of organic fertilizers, farmers can replace chemical fertilizers thus improving soil quality.

Peter Kamau

Whenever we visit farmers' groups, they often ask us one question: "Do you have examples of organic fertilizers? And if yes, which one can you recommend to a farmer? From where can we get them?" Since mid-December last year we got dozens of calls and SMS from farmers, asking us the same questions. From her point of view and experience, Su Kahumbu emphasizes the sole use of compost, as she writes in the 3rd column of this page. But what can a small-scale farmer with say, 5 acres of land do when they do not have enough compost? We also have to take into consideration the fact that the majority of those who work on the farms are women who cannot afford the extra labour needed for such tasks as compost preparation.

Of course, we know that well done compost is the cheapest and best fertilizer, I fully agree with Su. TOF has always emphasised on the benefits of building soil fertility through the use of well-prepared compost and other material such as legumes. However, it takes time to attain full soil fertility with compost to a level where good crop yields can be obtained, without additional fertilizers.

We therefore have done some research on where organic farmers can buy commercial organic inputs to use on their farms. Organic fertilizers enable farmers to increase the nutrient levels in their crops while at the same time building soil fertility through use of compost. To give our readers comprehensive information, we mention here some products from a number of companies which are allowed in organic farming and also their addresses. By the way, they are even cheaper than conventional (chemical) fertilizers, as the table below shows.

Fertilizing at the right time

To understand the approach of these organic fertilizers, it is important that a farmer knows how a seed develops and what it requires at each stage of growth. Farmers assume that the

newly planted crops are able to utilise all the fertilizer that is applied at planting time. Indeed, what happens if the rains increase? Much of the fertilizer is either washed away or driven further into the ground through leaching. This happens at a time when the young maize or bean roots are not yet fully developed and not able to reach the fertilizer. The plant is starved of essential nutrients while all the fertilizer is lost. A yellow colouration on plants at this stage is a clear sign of deficiency.

To correct this situation, farmers make up for the nutrient deficiency with intensive top-dressing. But again, this may not solve the problem. When applied in dry conditions, the fertilizer granules cannot dissolve into the soil and therefore cannot be taken up by plants. In dry conditions, the soil forms a crust (hardens). This hardening makes it difficult for plant roots to reach the fertilizers.

Three stages

In the following paragraphs we provide you with an insight on the stages the plant undergoes in its growth cycle and gives you the methods of treatment required at each of the plant's

Continued on page 8

A comparison of costs between conventional and organic treatment in maize:

Conventional farmers' method

Fertilizer	Cost per ha	Cost per acre
150 kg DAP	12,500	4,500
150 kg CAN	6,900	2,700
Total	18,900	7,500

Organic farmers' method

Fertilizer	Cost per ha	Cost per acre
Vitazyme 3lt	4,950	1,980
Twin N (1vl)	3,300	1,300
Total	7,950	3,280

Compost is never enough

Su Kahumbu

Understanding the life cycle of plants helps tremendously in the decisions we make when it comes to feeding them. Organic production entails feeding the soil, where a very nutritious soil will produce healthy, problem free plants. Organic production strives to create a sustainable cycle within a farm setting with little need for external inputs, but natural composting, constant mulching, abundance of biodegraders, very little soil disturbance.

Plant health affected

Conventional farming unfortunately does a lot of the opposite. Land is ploughed up disrupting the soil structures and balance, compost is substituted with artificial fertilizers, mulching is negligible. As the soil structure changes fertility drops, as does water retention capacity and microbial life densities. The soil begins to reduce in volume too as organic matter is not replaced but removed with each successive harvest. Naturally this creates a cycle that ultimately impacts on plant health, where then pests and disease take a foothold.

You can never have enough compost. Well matured compost also has a good shelf life and if kept under optimum conditions i.e well covered and in damp condition, can last from one season to the next. As organic producers, we create compost on a weekly basis, come rain or sunshine, 52 weeks of the year. If not, we stand to run out. When this happens we are stuck as compost takes a minimum of 30 days to mature. So what do we do meanwhile?

Bridge the gap

While the organic Standards strive for a closed nutrient cycle on any farming unit there are allowances for periods where some inputs are lacking (see article on this page). The purchase of organic nutrients in the form of organic fertilizers and foliar feeds is allowed, but expected to be used as a stop gap measure until systems are built up or restored on the farm. If we were to rely on commercial organic foliar feeds and use organic fertilizers, we would be doing the same thing to our soils as in conventional farming. We would not be adding the soil building materials that are the cornerstone of organic production.

A simple method of producing biogas

Small-scale farmers with two cows can produce enough biogas to cook for a family of up to 8 people.

***The Organic Farmer** **

Biogas is a relatively cheap source of renewable energy to meet our requirements for cooking or even lighting. It is a combustible gas that is produced when organic matter such as farm yard manure is digested inside airtight containers called digesters. However, dung from cattle, sheep, goats, pigs and poultry is the most ideal since it is easily available in most rural households in the country.

The black plastic tube

There are many ways of producing biogas. A relatively easy and cost effective biogas unit is a Polythene Biogas Digester. This is a black (or white), 10 m long polythene tube (1000 mm gauge) like the one now being used by farmers to store silage. This is why this type of biogas unit is also called tubular digester. The digester is quite simple to instal because the material used is affordable and readily available in most big hardware shops. It is built within a short time. However, the design of the tunnel and the handling of the plastic tube need extra care.

The 10 metre digester is the most ideal as it produces adequate gas that can meet up to 50% of the daily energy needs for cooking for a family of 5 to 8 people. It is particularly suitable for farmers who have a zero-grazing unit with at least two cows because the collection of cow dung is easier. The digester can be directly connected to the animal shed in order to collect adequate manure, urine and water and to reduce the handling. However, farmers with free grazing systems can also adopt the digester since the daily amount of dung required to maintain gas production is low and dung can be collected from the grazing areas.

Famous in many countries

The Polythene Biogas Digester was developed in Colombia; the technology is widely used in Vietnam and Colombia as well as in other countries of Asia and Latin America. Biogas is clean and does not produce smoke; therefore it reduces respiratory diseases experienced in households which use firewood or charcoal.

After a false start in promoting this energy source in Kenya in the mid-1990s, it was successfully re-introduced by KARI-Embu in 2005. According to Erastus Kiruiro from KARI-Embu there are around 300 tubular digesters in use, mostly in Central Kenya but also around Nairobi.

**Sources: Erastus Kiruir (KARI-Embu), William Ayako (KARI Naivasha). More information you can get from the Kenyan based company JuaNguvu Ltd. in Mombasa which is specialized in the building of biogas units and solar energy systems; the company offers trainig courses for building biogas units. Contacts: http://juanguvu.com, e-mail: info@JuaNguvu.com*

"I no longer buy firewood"

An ideal biogas digester should be put up next to the zero grazing shed and in close proximity to the house and kitchen to facilitate easy flow of gas. This well done digester should also be covered against sunlight. (Photo TOF)

David Muriithi is a small-scale farmer with 1 ¼ acres of land in Kagumo village in the outskirts of Kagumo town. Due to the high population, the area suffers an acute shortage of firewood. For many years, Muriithi was forced to buy firewood for his family at the local market, where 1 cubic metre cost him between Ksh 800-1200 depending on availability.

In the year 2005, Muriithi attended a farmers' field day near Kagumo town where officials from KARI showed farmers how to produce biogas for cooking using a plastic digester. Seeing how simple it was to produce biogas, he immediately bought the necessary components and with assistance from KARI, he set up his own digester next to his zero-grazing shed with two cows. Within a short time he was already producing his own biogas which met all his family's cooking needs. The by-product is very high quality manure which he applies on crops on his farm that include tea, maize, potatoes, beans and peas.

Farmers learnt from Muriithi

"Except for some little charcoal to warm the house I no longer buy firewood because my wife now uses biogas to cook all the meals for my family of four. I save a lot of money that I would have used to buy firewood. Besides biogas is safe and clean as it does not produce smoke and we now live healthier", he says. Many other farmers in the area have learnt from Muriithi and have already set-up their own biogas units.

"Biogas is a low-cost energy source"

TOF asked Erastus Kiruiro *a few questions regarding the biogas unit:

What are the reasons for increased adoption of this biogas technology by farmers?

We use a better approach: The farmer-based technology transfer that incorporates a component of capacity building and scaling-up based on farmer-to-farmer networks.

Do the farmers share their knowledge?

Yes, they do. This is possible because of the low technical requirements on the installation and management.

Are many small-scale farmers apprehensive of the costs?

The costs are relatively low. Farmers pay about Ksh 5,000 for a Polythene Biogas Digester, but they can save money for firewood, charcoal and kerosene. In a nutshell, it is a low-cost domestic energy-source.

We understand that one of the disadvantages of this biogas models is the short lifespan of the digester tube. Is this true?

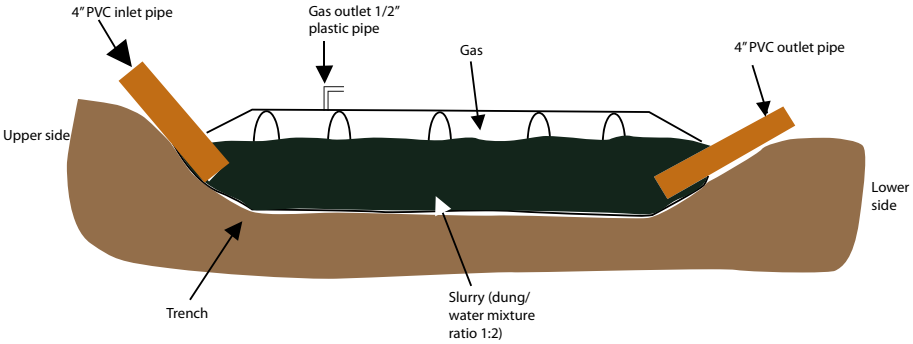
This is no doubt a critical point. We have seen that the digester material (the plastic tube) has a lifespan up to four, even five years. But this needs a good management. When farmers discover the benefits, they really do everything to protect their biogas units.

**Erastus Kiruiro works at KARI-Embu and is co-author of the KARI-brochure "Biogas production". KARI Technical Note Series No. 24, January 2003*

Erastus Kiruiro contact: 0722 30 38 81

Any farmer can afford a biogas unit

Making a plastic digester is easy. But any farmer intending to set up a unit should seek advice from technical personnel. They should explain to them the minor details to ensure the system works efficiently. The plastic digester should be handled with care.



The Organic Farmer

1. Prepare a horizontal trench on the ground in a good part of the farm preferably near the zero-grazing unit. The trench will enable the polythene tube to hold the digester in place. The trench should be trough-shaped with a top width of 65 cm, a bottom width of 50 cm, a depth of 65 cm. The length of the digester is variable depending on the number of animals but a digester measuring 8 to 10 m long is recommended for a 2-cow or 8-pig unit. The trench should have firm sides to avoid soil from collapsing, and a gentle slope on the floor (about 5 percent) to ensure outflow of exhausted slurry.

2. The two sides of the digester are fitted with the 4" PVC pipes measuring about 1 m to serve as inlet and outlet for the slurry. The PVC should be tied to the digester using rubber straps made from old vehicle tubes. Biogas cannot escape through these pipes since the pipes remain immersed in the dung inside the digester.

3. A small hole (about one centimetre in diametre) is punctured through the wall of the digester about 1 metre from the inlet end. A small piece (about 30-cm long) of the normal PVC water pipe (1.2 cm or ½" diametre) is then inserted into the digester and an air-tight joint made using rubber straps. (You can cut this small piece from the PVC pipes which will eventually be used to deliver the gas from the digester tube to the jiko (kitchen).

4. The digester is then laid horizontally into the trench with the inlet, outlet and gas tube facing upwards.

5. The cow dung accumulated over time is mixed with water at a ratio of 1:2 and the mixture poured into the digester through the inlet pipe until the digester is about three quarters full; this usually occurs when the mixture starts flowing from the outlet pipe.

6. The external end of the 30 cm-long pipe is then fitted to other PVC water pipes using elbow joints. These pipes will eventually deliver gas from the digester to the kitchen.

7. It takes two or three days for the dung in the digester to start producing gas. Once the digester starts swelling, this is an indication that it is producing biogas. To ensure continuous gas production, the system should be fed with about 1 to 2 buckets (the normal 20-lt capacity) with the same mixture of cow dung and water (ratio of 1: 2) daily.

8. The digester should be covered with light materials such as grass straw and maize stalks to protect it from direct sun rays (ultra-violet radiation). A fence of fine wire-mesh or closely spaced wooden slats should be used to protect the digester from damage by children, pets and livestock. The plastic digester should be handled with care.

Photos courtesy of JuaNguvu of their demonstration plot in Mombasa. JuaNguvu PO Box 1779 - 80100 GPO Mombasa Tel: 0722 87 37 38 email: info@juanguvu.com

Budget for a biogas unit

10 m polythene tube (1000-mm gauge), black or white, 90 – 120 cm diameter, @ Ksh 250 per meter	2,500
* Two 4"diametre PVC pipes, 1 m long(like the ones used for pit latrine ventilation but preferably of a stronger gauge)	750
3 PVC water pipes (½" diameter) for the delivery of gas (from digester to kitchen) @ Ksh 250 per piece	750
5 PVC elbows @ Ksh 25	125
Rubber straps for tying the 4" PVC pipes and the ½ inch gas pipe into the digester @ Ksh 20	100
A burner or jiko (made by *jua kali* artisan) incl. valve	1,000
****Total costs (without labour)**	**5,225**

* You can hardly get 1m-pieces of a 4" PVC inlet and outlet pipe; a full pipe costs between Ksh 600 - 1,200, depending on the quality. If three farmers come together, they can buy 1 pipe normally 6 m long (20 feet) and share the piece including transport costs.

** If the digester is protected with wire mesh then an additional Ksh 1,500 is required

Material (in Ksh; prices from Embu)

Important tips for biogas users

Careful handling: The plastc digester should be handled with care. It should be covered and protected. The inlet and outlet should be airtight as well as the gas outlet.

Regular feeding: A 5 m3 digester requires 19 kg of cow dung and 47-57 litres of water to produce enough gas for a day. Under-feeding reduces the amount of gas produced. If a green-looking slurry comes out of the digester, this is an indication that it is overloaded.

Cow dung: Cow dung is the ideal substrate for bio-digesters because it is not acidic. If livestock wastes and garbage have to be used, cow dung should be used as a starter substrate.

Effluent recycling: Recycling some of the digested slurry improves the performance of the bio-digester. This is important when the digester is still new because the used slurry contains

Continued on page 6

>>> from page 5: Biogas

more of the biogas producing bacteria.

Gas pressure: The amount of gas produced depends on the size of the bio-digester, its feeding regime, type of substrate and environmental conditions such as aerial temperature (the warmer, the better). The mean volume of a 2-cow bio-digester is about 5 m3. This will produce enough gas to cook for about 3 hours. Within this period, gas pressure drops and there is need to place an object weighing about 3-5 kg at the top the digester to increase the pressure and therefore flow of gas to the kitchen.

Temperature: Maximum gas production will occur at 35-40°C. Gas production declines as temperature drops and will cease at 10°C. ■

Worlwide use of biogas

Biogas is a well-established fuel for cooking and lighting in a number of countries. China has over 7.5 million household biogas digesters, 750 large- and medium-scale industrial biogas plants, and a network of rural 'biogas service centres' to provide the infrastructure necessary to support dissemination, financing and maintenance. India has also had a large programme, with about three million household-scale systems installed. Other countries in the South with active programmes include Nepal, Sri Lanka and several countries in Latin America.

Industrialised countries commonly use biogas digesters where animal dung, and increasingly fuel crops, are used as feedstock for large-scale biogas digesters. Brazil and the Philippines lead the world in crop-based digesters using sugar-cane residues as feedstock.

Interest and public support in biogas has been growing in most of the European countries. After a period of stagnation, caused by technical and economical difficulties, the environmental benefits and increasing price of fossil fuel have improved the competitiveness of biogas as an energy fuel. This has been seen in both small and large scale plants in Denmark, Germany and Switzerland, and as a transport fuel in Sweden. There have been interesting biogas projects in the UK, Ireland, and the Netherlands. ■

farmers forum

020 445 03 98 0721 541 590 0738 390 715

Sadness of a 'Happy New Year'

"Happy New Year!" I could not help feel the irony of this statement as friends kept on greeting me and SMS landed on my innocent mobile phone on New Year's Day.

Hey farmers! The year is indeed 'New' but is there anything jovial to make it 'happy'? Indeed as the year 2009 kicks off, over ten million Kenyans are oscillating between hunger and poverty amidst a background of political trickery and dishonesty.

Unfortunately, as I helplessly watch my once healthy maize crop of maize wither and eventually dry up, my small transistor radio emphasises to me that the food shortage that I am facing as a low income earner is indeed not really natural but man-made. Further still, as I watch my once upon a time well-fed and productive cows perish with hunger and dehydration due to lack of food and water respectively, my 14 inch television screen flashes with political statements, reactions and denials that our politicians have not actually been involved in any 'food laundering' cartels.

Amidst this political drama on food is a declaration that famine has been declared a national disaster. Unfortunately, the only disaster in the declaration of famine as a disaster could be that the allocations of relief food might go the same way the cheap maize flour for the poor went; never to reach the tables of the village and slum folks.

To me, it is surprising that an agricultural country like Kenya can declare famine within a few months of drought. This clearly shows poor planning on food security in the country. The government is not solely responsible for this mess.

As a farmer, I have recently learnt that had I embraced organic farming earlier enough, then the quality of my sandy soil would be better if not best leading to a healthy crop that perhaps would have withstood drought up to the showers that we received in mid January. This way, I would actually have harvested some crop. It is only last harvesting season that I had a bumper harvest but I sold almost everything sooner than I had harvested it. Had I not sold my grain I would not be starving.

Dear colleagues, some of these food problems are of our own making, aren't they?

Paul Kariuki, Limuru

Name firms with poor quality milk

In our January 2009 issue, we carried out a research on milk quality where we sampled milk from a number of local milk processing companies. As we did when we carried out a similar research on feed quality in April last year, we did not give out the names of companies that had poor quality or adulterated milk. The reason for this

is to avoid legal suits where the companies may sue us claiming they have made losses due to our article and then seek compensation for damages. A number of readers and milk consumers have called us requesting that we name the companies selling poor quality milk. We would like to inform our readers that doing so would invite a lot of court cases. The main purpose of this research was to highlight the extent of the problem and perhaps persuade government agencies charged with the responsibility of setting quality standards. They should ensure that consumers are protected from companies whose main objective is to make profits at the expense of consumers. (*TOF*)

Rearing chickens can be profitable, if...

With proper planning and careful investment, farmers can make good money from chicken rearing.

Su Kahumbu

I was once told that rearing less than 3,000 hens at a go was merely a hobby -an expensive hobby where the chickens would eat me out of house and home. Commercial chicken rearing is an investment of both time and money and therefore before you begin production you must be very clear as to whether you want to produce on a home-based scale, or a commercial scale.

You must also be clear on whether you would prefer to produce layers for eggs, or broilers for meat. Either way, you must do the right calculations in advance, which involves working out your costs to find out whether your business will be viable.

Example with 100 chickens

For 100 broilers the math will be as follows:

Input Costs

	No.	@	Total
Chicks*	100	72	7,200
Starter Mash**	2	2,520	5,040
Finisher Mash**	4	2,390	9,560
Electricity	1	1,500	1,500
Water	1	1,000	1,000
Labour	1	6,000	6,000
Medication	1		1,500
Total 1			**31,800**
Misc @ 10%			3,180
Total 2			**34,980**

*from Kenchic

** from Unga Feeds

The figures for power, water and labour have been approximated and will differ with regions. Feed is available in 70kg bags, therefore you will need approximately 6 bags of feed in total

Outputs and benefits

•Expected rate of mortality is 5%. Therefore one can expect 95 birds to survive to slaughter age and to reach an average dressed weight after slaughter of 1.3kg

•Cost per chicken would therefore be the input cost divided by the number of chickens. Thus Ksh 34,980 ÷ 95 = Ksh 368 plus Ksh 20 for slaughter. Thus cost per chicken: Ksh 388

•Cost per kg would therefore be cost per chicken divided by weight of chicken which should be about 1.3kg. Thus Ksh 388 ÷ 1.3 = Ksh 298.5.

Indegineous chickens are easier to keep, less affected by diseases and tasty.

•Now here follows the interesting part. You have your cost per kg. How do you decide your selling price? For starters, it would be advisable to find out what the market price for chicken is in the market that you want to sell.

•Subtract your cost of production per kg from the market price and you will end up with your profit. To find out the percentage profit, divide your profit over your cost per kg.

The calculation of profit is done as follows:

-If the market price is Ksh 325 per kg, your profit will be Ksh 325 (market price) minus Ksh 298.5 (production cost) = Ksh 26.5 per bird, or for the whole stock of chickens: Ksh 26.5 x 95 = Ksh 2,517.5

-Your profit as a percentage is: Ksh 2, 517.5 : Ksh 34,980 + 1,900 slaughter cost = 6.8 % **ONLY!!**

More chickens, more profit

This computation of profit will give you an indication of whether your money is better invested in chickens or safer in the bank.

You will realise that as you increase the number of chickens in the formulas, your cost per kg actually goes down as you use less labour and electricity per bird and thus profits go up.

At 200 birds with the same labour and little increment in power and water your profit margin is already 18%

And finally, at 3,000 birds you make an average return of 34%

Looking for market

To make a healthy return on your money it would be wise to look at 200 plus birds. Or, to receive a higher income for fewer birds, which can be achieved if you make direct sales cutting out middle men and going directly to customers.

Sadly many people start poultry production without doing the figures and end up running into financial difficulty mid way. This leads to cut backs in care for the birds, which leads to illness in the flock, increased risk and ultimate losses.

Remember the figures we are working with are not fixed. Some feeds are cheaper too, however it is imperative that the math is done and markets confirmed before production begins.

For home consumption of hybrid broilers we run into the costs of storage. Even if one were to rear 20 birds, where would one store them when slaughtered?

Breed *Kienyeji* chicken

This is where on small scale, we rely on the *Kienyeji* chicken. It breeds and cares for it's young, gives us eggs as well as meat and does not leave us bankrupt. It is more resistant to disease, depends on forage for most of its food, fends off dogs and cats and finally, it tastes better!!

How to feed chickens

Chicks need to start with Starter Mash for 3 weeks during which time they will consume approximately 900grams each. Thus total of 90 kg. Therefore you will remain with 50 kg Starter from the second sack of food.

During weeks 4-6 birds are to feed on Finisher Mash and will consume approximately 2.9 kg each thus 290 kg which will mean you will be short of 10 kg from the last bag of Finisher Mash.

In this case, feed birds a little longer, a day or two of the Starter Mash so that you do not have to buy another full bag of Finisher and remain with a left over of 60kg.

tips and bits

from farmers for farmers

A common culture of cheating

Once again there is a looming famine following the failure of the long and short rains in most parts of the country last year. But reports show that that there is only a short drop in maize production. It is not the rains that are to blame for the current shortage of maize. Rather it is the corrupt system within the government institutions charged with the responsibility of safeguarding the country's strategic food reserves and its distribution that are to blame. Whenever the country is faced with food shortage, unscrupulous cartels with links to senior people in the government go into operation, manipulating food distribution and sale.

Trouble started after when the government through the National Cereals and Produce Board (NCPB) allowed millers to buy maize from the board in order to stabilise prices. However, NCPB colluded with the fake millers and sold more than 80,000 bags of maize which has now found its way into the neighbouring countries where a bag is fetching Ksh 6000. One way to avoid scandals of this nature is to stop the government from dealing with food distribution in the country. Any food held in the strategic reserves should only be distributed to needy as relief food through NGOs and churches. The NCPB has now proved that it cannot help farmers in any way. Recently farmers were promised they would get fertilizers at subsidised prices.

But when they visit their depots, they are told the fertilizer is either out of stock or it is not adequate. There is no price in guessing where the fertilizer is going considering that a bag is going for Ksh 4000 in the agrovet shops.

The government should then allow free movement of maize to all parts of the country and stop exports to neighbouring countries. The measure will help stabilise prices and reduce hoarding. This has worked before and there is no reason why it cannot work now.

Fake seeds in the market

As we approach the planting season, one of the major problems that farmers face is affordability and availability of seed. Seed producers who are contracted by seed companies to produce seed collude with traders and sell commercial maize or condemned seed to farmers claiming it is genuine seed. Since this seed is cheaper than certified seed, most farmers fall prey to these tricksters and buy the fake seeds. The result is a poor harvest. Already reports from maize growing districts of Trans-Nzoia and Uasin Gishu show that a number of seed producers have been arrested for packaging commercial maize seed in genuine seed bags for sale to farmers. Some seed growers offer basic seed maize (from which hybrid maize is propagated) as genuine seed, this maize is weak and cannot produce healthy maize. Farmers should ensure they buy their maize seed from licenced seed stockists only. They can demand to see the licence before buying the seed. *TOF*

> > > from page 3: Planting

growth stages.

Germination stage: Once planted in moist soil, the seed breaks its dormancy and starts germinating. During this period (normally seven days), the plant gets all its nutrients from food stored within itself. Therefore it does not require any fertilizer for growth. – After the 7 days, the plant will require extra feeding and also some protection from diseases. To provide essential nutrients farmers can top-dress the seeds with 1.5g of Eco-T (Lachlan) per kilogram of seed. They can also add a diluted solution of Vitazyme (Lachlan) at the rate of 1 litre for every 50 kg of seed. Fulvic acid is also essential for the germinating seed (Lachlan, Hygrotech). The seeds should be thoroughly mixed and dried in sunlight before planting.

Vegetative stage: From the eighth to the tenth day, the plant develops two leaves and also the first roots also called the fibrous roots. At this stage the plant will have finished all the food reserves within itself but the two leaves help it to make its own food using the sun rays in a process called photosynthesis. The plant roots also start taking nutrients from the soil to feed the plant. Unless these nutrients are provided (for instance in a well composted soil), growth will be stunted and the plant is prone to diseases and even pests. For this stage, farmers can use Vitazyme at the rate of ½ litre per acre or TwinN at the rate of ½ vial for every one acre of maize (Lachlan) alternatively they can use or Synergizer or Phosgard (Juanco). Application of these foliar feeds should be done in moist conditions for proper absorption by the plant.

Fruiting stage: At this stage that the plant is in need of extra feeding to produce the required size of grain, weight and other desired qualities. It should therefore be fed with all their fertilizer requirements nutrients that will help to provide the needed nutrients. When maize is about to tassel, farmers can apply Vitazyme at the rate of ½ litre per acre (Lachlan) Synegizer (Juanco).

Do a trial

Farmers can also select a small portion of their land and try the two methods of fertilizer application. After getting the results, they can go into large scale production using the best method. Read the labels on the fertilizers and foliar feeds carefully to ensure you apply them in the correct way.

To get more detailed information, farmers can contact the companies selling the organic fertilizers and foliar feeds we have mentioned here. Their addresses are given below:

Lachlan Kenya Limited, P. O. Box 49470, Nairobi, 00100, Old Airport Rd. Tel. 020 207 3912 , Cell 0722 209474.

Hygrotech (EA) Ltd P.O Box 41446, 00100 Te. 020 205391 cell.0722 390207 (EA) P.O Box 381, 00502 Karen, Nairobi Tel. 0722 827 987.

Juanco Centre, Ngong Rd, Ngong Hills, P.O.Box 381 Karen, 00502, Tel. 254 -45-41209, 40206.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 48 May 2009

Mbaazi repels red spider mites

Did you know that a row of pigeon peas (*mbaazi*) can protect your crops from harmful pests such as spider mite? Read more about natural pest control methods on page 3

"I went home empty-handed"

For small-scale farmers, getting subsidized fertilizer can be very difficult and frustrating.

The Organic Farmer

Farmers were full of hope when the government announced the arrival of subsidised fertilizer that would cost Ksh 2,500 a bag at the National Cereals and Produce Board (NCPB), instead of paying Ksh 3,000 for the same in agrovet shops. In the last few weeks, many small-scale farmers have called the *TOF* magazine complaining about their difficulties in obtaining a bag of subsidized fertilizer. One small-scale farmer from Subukia wrote to us his frustrating experience:

"Full of hope, I went to the NCPB Depot. On arrival, I found a long queue of farmers from various parts of the district at the gate of the depot. Those in the queue told me that I could not be allowed to buy the fertilizer unless I filled in a special form from the agricultural extension officer of my home area proving that I was a farmer and detailing the size of my land. As I pondered my next course of action, including how much it would cost me to go all the way to our divisional headquarters, some farmers advised me to 'see' the security guard at the gate. The guard told me that I could get the document if I gave him some chai of Ksh 200."

"Meanwhile, as I talked with the guard, pick-up vehicles and trucks were going in and coming out of the depot laden with fertilizer. One of them belonged to a local politician and others to prominent agro-veterinary shops in the town. The queue grew longer as the day wore on. Some farmers started leaving the depot, but I decided to hang on until the closing time at 12.00 noon. Eventually, just like my colleagues, I also had to go back home without the fertilizer. The following day I decided to buy the commodity from a regular agrovet at Ksh 3,000. I felt so bitter and enraged. It is like always: People with connections make their profits, the wananchi and especially we the small-scale farmers go home empty-handed!"

See also the editorial on this page

in this issue

Geese, geese!

These birds are easy to keep, they need care and plenty of short grass to pick.

Pages 4 & 7

Dear farmers,

If you have been reading newspapers, watching television or listening to the radio in the last few months, you may have realised one thing: Well known agricultural organisations worldwide, experts in agriculture and governments have recognised the special role small-scale farmers will continue to play to ensure food security in future. Poor countries with a large population who can no longer feed themselves rely on small-scale farmers to meet their food requirements. But when we compare the nice promises with the reality, things look quite different, at least in Kenya. Let us give some examples:

- Due to corruption, small-scale farmers who have tried to get the subsidized fertilizer from The National Cereals and Produce Board have been unable to buy even a single bag of this important farm input, as you can read on this page.

- Improving farm output needs investment. Up to now there is not a single-credit scheme in the country ready to offer farmers affordable credit, likewise, there is no bank willing to give small-scale farmers loans at a low interest rate.

- What happened to the seasonal credit schemes which worked so well two decades ago?

- Why do small-scale farmers have to wait for months to get paid for the maize and wheat, which they delivered to the NCPB?

The government, no doubt, has very good policy initiatives and strategies for improving food production in the country. But all these documents have never been implemented and are gathering dust in government offices. Availability of funds may only be a part of the problem; but even worse is lack of political will or the inability to translate these strategies into concrete action. Getting things done does not require a lot of funds, but determination. Well sounding words, blueprints and promises alone cannot change anything.

The long and short rains last year were inadequate, which led to crop failure in many food producing areas. So, one would have expected that this year, we would do everything to enable farmers produce more food. Right now, hungry Kenyans have to depend on well wishers for food aid. Our farmers have proved that they have the capacity to produce food if they got the necessary support. But this is lacking.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0721 541 590, 0738 390 715, Email: info@organickenya.com

Lupins are good fodder for your livestock

Farmers have many methods to improve the livestock feed, for instance with lupin seeds.

John Cheburet

As farmers in Kenya continue to grapple with the high cost of animal feeds, a crop not yet known to most farmers is slowly taking root as a preferred protein supplement for dairy farmers. This is lupin, a leguminous plant. Like most members of this family, lupins can fix nitrogen from the atmosphere into ammonia, fertilizing the soil for other plants.

There are two types of lupin; bitter lupins and sweet lupins. Bitter lupins are used for soil regeneration and cannot be used for feeding livestock because of poisonous alkaloids found in the leaves, pods and seeds. Sweet lupins pose no dangers of poisoning livestock because of low percentage of alkaloids. Sweet lupins can be grown anywhere in the highlands where rainfall is over 900mm in a year.

There are two cultivars of the sweet lupins

• Blue lupins (*Lupinus angustofolius*). Major varieties are Uniwhite, Uniharvest and Unicrop. Unicrop is early maturing variety. It takes 3-4 months to mature. Unishite and and Uniharvest are late maturing. They take 6-7 months to mature.

White lupin beans (above); a flowering lupin plant (right) (Photos TOF)

• White lupins (*Lupinus albus*) The major variey is Ultra. It takes 4-5 months to mature. Ultra is a good seeder giving up to 6 tons of dry seeds per ha per year while Uniwhite and Uniharvest are high in herbage yields giving about 4 tons of dry matter yields per ha.

According to Frederick Wambiru of KARI Ol Kalau, the Ultra variey has been under trial and has shown satisfactory results. The centre is now in the process of bulking the seeds for farmers.

Nutritional Composition

The composition of the grain and especially the high protein content makes white lupin highly suitable for animal diets as a protein-rich product. Lupin seeds are a product of nutritional importance due to their high protein content (37%), soluble fibre (35.5%), crude fibre (13%), fats (10%) and ashes (4%) as well as acceptable levels of thiamin, riboflavin and vitamin E.

As an animal feed, Wilson Wekhulo of KARI Kitale says that lupin is used together with maize as a home made alternative to dairy meal for farmers keen on getting more milk while reducing the cost of animal feeds.

Preparation and planting

• Prepare land like for maize and beans, so as to have a uniform, firm soil that will maximize germination. The land should also be level and free of depressions to permit uniform depth of seed placement.

• Plant early to avoid heat and water stress during flowering and pod fill.

• Plant Lupin seed at a spacing of 45 cm between rows and 30 cm between plants.

• Use 1 to 2 handfuls of compost or farm yard manure per hole. Lupin can also be planted between maize rows at a spacing of 30 cm from hole to hole

• Plant 2 seeds per hole

Management and Harvest

• Keep the field free of weeds by regular weeding.

• White lupin is relatively tolerant to diseases. However, rotate lupin every 1-2 years to avoid soil borne fungal diseases.

• Start to harvest when the pods begin to change colour from green to yellow, and the lowest leaves begin falling off.

• 1/2 acre produces 4 to 6 bags of lupin seed, which will be enough to feed 1 dairy cow for 1 year.

• If lupin is intercropped with maize, 1/2 acre can produce about 2 to 3 bags of lupin seed, which with 6 to 9 bags of maize can feed a dairy cow for 3 to 4 months.

• After harvesting lupin pods should be dried and threshed like beans.

Utilization

• To prepare the animal feed, the seeds are ground with maize seed in the ratio of 1:3 (1 gorogoro of lupin seed and 3 gorogoros of maize grain). 1kg of this supplement can substitute 1kg of dairy meal.

• Feed 2 kgs of the the mixture per medium cow per milking. Fresh herbage can also be used as a livestock feed.

• Introduce the mixture gradually for cows being fed with lupin for the first time. Add a little mineral salt, molasses or other feed to the mixture to encourage the cow to start eating it.

Interested farmers can get small quantities of seeds for bulking purposes from The Officer in Charge, KARI Ol joro orok, Telkom wireless number 020 2026510

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

Go organic on pest and disease control

Farmers know the benefits of organic pest and disease control methods, but they prefer chemicals.

The Organic Farmer

The period between May and July is a very delicate time in crop production. This is the time farmers will be trying to tend their crops to protect them from diseases and pests. Pest and disease pressure tend to increase during this period especially when it is warm and wet. The farmers' first line of defence against pests and diseases is to use chemical pesticides because they are fast acting and seem to solve the problem immediately.

But as we have mentioned before, farmers are already having problems with a range of chemical pesticides that do not work against the same pests anymore. This means that the continued use of pesticides has made the pests to develop resistant traits that enable them to survive pesticide application. To go round this problem, chemical companies are being forced to develop stronger pesticides that can kill the pests; but some of the chemicals being used have serious side effects, not only to the environment but also to other beneficial insects that control these pests naturally. Most chemicals in the pesticides do not break down completely when used on target crops; chemical residues remain on the crop to the time of harvest which has dangerous side effects to people who eat food prepared from such crops. Some of the side effects include allergies, liver and kidney complications that are difficult to cure.

Chemicals are easy to use but they affect people and the environment. (Photo TOF)

There are many safe, natural and simple methods that farmers can use to protect their crops from pests. In the past issues of *The Organic Farmer*, we have explained the various methods that farmers can use to protect their crops without using chemicals. One of these is the use of plant extracts. If properly used, plant extracts cannot only prevent pest damage, they can also control common fungal and bacterial diseases while saving the farmer a lot of money they would otherwise use to buy chemicals.

Marketing of chemicals

However, there is only one problem that we have noticed with farmers: Preparing plants extracts requires some labour; the farmers have to follow the instructions carefully to ensure the biological pesticides are effective when used to fight pests. Many farmers are not ready to do the extra work required to prepare plant extracts. Farmers prefer the easier way out, to the benefit of the chemical companies. They are spending millions of shillings every month to advertise various chemical pesticides and fungicides in the local FM radio stations that are reaching many farmers in rural areas. Of course, the companies do not tell farmers the side effects of the chemicals they are selling.

It is only the wise farmer who knows the danger posed by chemicals who has adopted plant extracts and other biological methods to control pests and diseases. These organic farmers spend less money, have healthier crops and their income is also higher because they spend less in terms of inputs. Healthier crops can also withstand diseases and pests. For those farmers who find it time consuming to prepare plant extracts to control pests, local companies have started making organic pesticides some of which are given below:

Nimbecidine: This is a pesticide made from neem oil that can control a wide range of insect pests and mites and nematodes. It is safe and does not harm beneficial insects.

Thuricide HP: This is a pesticide made from *Bacillus Thurigiensis* (Bt) that effectively controls cabbage looper and other pests in tomatoes, cabbages, coffee and citrus fruits. Bt

Pyegar: This is a pesticide made from pyrethrum extract that is very effective in the control of all types of pests that attack a range of crops.

Phosphite: This is a fungicide that can be used to control a number of fungal diseases.

Natural barriers that keep pests away

Organic farming educates farmers on an integrated system of pest and disease management where the farmer, for instance, tries to restore the natural balance between pests and their predators. In this system each organism has an important part to play in the ecosystem; for example, a few pests in a farm may not be a threat to your crops if there are predators which feed on them. This helps to keep the predators alive. The predators on the other hand ensure the pest population does not increase to a level where they can be a threat to your crop.

The use of chemicals disrupts all these systems because chemicals kill the predators or beneficial insects, therefore allowing the pest population to increase to a level where they can devastate an entire crop. Disease control is also possible in this system if the farmer practices crop rotation and intercropping (some plants such as the African marigold which many farmers consider a weed can help repel many pests). Crop rotation eliminates the problem of pests or diseases that attack a particular crop.

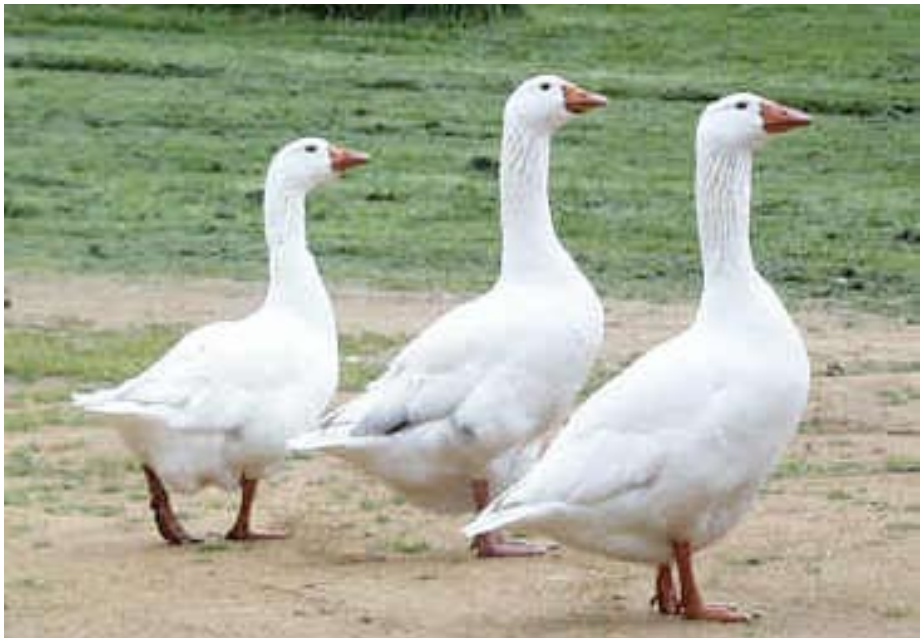
For example if maize is rotated with potatoes which are affected by bacterial wilt, the disease disappears in 3 to 4 years because the disease causing bacteria cannot survive long in a maize field. Planting hedges that separate one crop from another also helps to control pests; for example a tithonia hedge can act as a barrier to insects such as aphids. A row of pigeon peas (*mbaazi*) can protect your tomatoes, potatoes and even cabbages from red spider mites. Beans planted around tomatoes, potatoes or any crop also attract aphids and many other insects that may attack the crop, thus protecting it.

Farmers can order the TOF plant extracts special issue for more information. ***TOF***

Geese are precious and good askaris

Geese are easy to keep. They provide farmers with meat and supplementary income.

Valerie Corr



Geese are part of the duck family. However, they are much bigger and, unlike the ducks, they feed entirely on grass and other herbage spending very little time in water even if they need a pond for swimming. The goose (a single one) is a robust farm bird, is one of the fastest growing avian species commonly raised for meat. Goose rearing requires little attention and it ideally fits into integrated farming systems. Geese offer nutritious and delicious meat, large eggs and rich fat for cooking as well as soft down feathers for bedding and clothing. A goose can live in excess of 20 years. So if looked after properly, it is an easy domestic animal to keep as well as a cheap and productive asset.

Mature geese are independent, larger than other poultry species, and thus less vulnerable to predators. When kept in small flocks and allowed to roam about in the farmyard or field, they require less attention than any other domestic bird. They adapt easily to captivity, and if small quantities of supplementary feed are provided in the evening, they will even return home by themselves. But they are known to be messy birds, and it is better to house them a little away from the farmhouse.

Geese like short grass.

Geese should not be overcrowded. The house can be of simple construction providing ample shelter, clean dry bedding and protection from predators. They must have a plentiful supply of short green grass on which to graze (not more than 12 cm long). If they are to live on zero grazing and in pens, then they must be supplied with cut green grass in generous quantities If longer grass is fed, it can cause crop binding, which will kill the bird. But if you prefer healthy geese and quality meat, they must have space for roaming.

Geese can play a crucial role in weed control and pest management in integrated farming systems. They relish grasses and shun most broad-leaved plants. They have shown particular preference to troublesome perennial grasses.

Normally geese need very little supplementary feed if they are on free range but will benefit from dry layers, pellets and or wet wheat or maize at night. By wetting the grain, you make it more digestible and less attractive to marauding rodents. They will also enjoy chopped-up green vegetables but this should only make up 10 percent of the diet. Goslings (young geese) learn by example and will eat whatever they see the adults eating.

Geese also require grit (which can be made up of crushed egg shells, calcium, phosphorous and bone meal) and pure sand which they will peck at freely. It is essential to the digestive system, to help break up the grass. They must always have an easy access to clean drinking water.

KSh 2500 - 3500 for a goose

The flesh of a goose is delicious but is a dark meat and contains a high percentage of fat making it very rich.

Geese lay about two clutches of ten eggs each in a year. The eggs on an average will weigh about 115g each. They can be hatched using a brooder hen or in incubators at a temperature of 37.8 degrees Celsius, and they hatch in about 40 days. The goslings can be reared in brooders generally used for rearing chicks. They should not be let in to ponds and pools for swimming.

Only when they are over ten weeks of age, should they be let out to roam freely in the farm. Geese will be ready for mating in about two years, and they should be paired with ganders (a male goose) of the same age. One gander is sufficient to fertilise five to seven geese.

Worms the only threat to health

The main problem with geese is that they are susceptible to gizzard worms which will kill them if left untreated. Gizzard worms are a very common parasite and geese should be dewormed at least twice a year with 1 ml Levamisole 7.5%. (Consult your pharmacist who will advise you of similar products available) Never use more as it is easy to overdose and this may kill the bird. This treatment is not suitable for goslings of 10 weeks and younger.

Alternatively, use Flubenvet which is a multipurpose wormer and covers gizzard worms. It is a powder which sticks readily to feed. The correct dose (on the pack) should be administered for 7 days. It is suitable for goslings and it is adviseable to treat a hen when she starts sitting, as well as the gander.

Apart from worms, other problems associated with geese are bad legs and bacterial infections passed on by wild fowl and rats. If they are lame, worming should be your first defence. In case they are showing signs of swollen legs or ankles, they may also need antibiotics. But if they are eating a good diet of green grass, vegetables, pellets and wheat (which supplies vitamins and minerals) they should not develop leg problems.

If a bird is not eating, treat it with antibiotics immediately if you are certain it does not have worms. Laying birds sometimes suffer from complications associated with laying. This is prevented if adequate grit containing sufficient calcium and phosphorous is available.

Geese are good askaris

Geese with their sharp eyesight and wide field of vision, combined with their strident calls, make excellent guards against approaching intruders or predators.

They will ferociously charge at strangers entering the farms, and they cannot be cowed into silence by intruders. They are thus good tough watchdogs for the farms.

Parasites on livestock: small but dangerous

Farmers have many methods to fight external parasites on their livestock.

The Organic Farmer

External parasites such as ticks, lice, fleas, leeches and even flies are a real nuisance to livestock. We are not just talking about minor discomfort here. Losses can occur from these parasites due to irritation, blood loss, depressed appetite, and decreased rate of weight gain. Mange, for instance, which is caused by mites, can affect the mammary gland and interfere with milking. Studies have shown that even mild infestations of parasites could cost you half a kilogram of milk production per head per day. This loss accelerates too quickly if the animal is not treated.

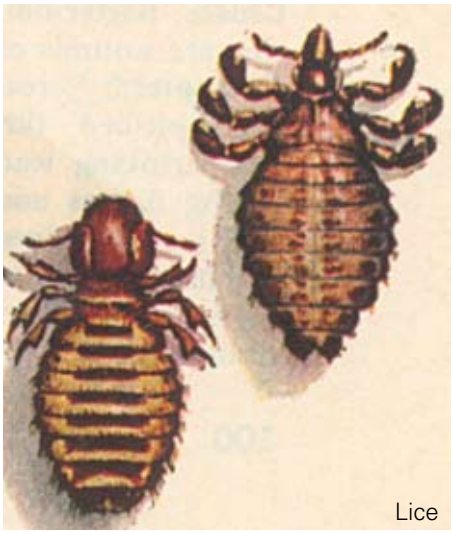
Another major economic loss due to parasites is skin damage. Indeed, tanneries are rejecting up to 35% of sheep skin and 56% of goat skin due to mange and lice infestation. External parasites transfer diseases between animals by sucking blood. Therefore, they should be kept firmly under control. The worst of all these external parasites is the brown ear ticks (see box on this page).

Acaricides are commonly used against external parasites. They are applied by dipping or spraying of the affected animals. These chemicals are expensive. To save money, many farmers do not apply them according to the instructions on the label. Instead, they add too much water and in the long run, the chemicals do not work efficiently.

Apart from chemicals, farmers can use other methods through a combination of prevention and control with organic methods. If an infestation occurs, it should be treated promptly.

Watch the livestock carefully

A farmer can save money if he observes his animals regularly. Most of the parasites are however tiny and cannot be easily seen. In such cases, there are many clear signs for the diagnosis of parasitic infestations and of livestock diseases. Some of them are listed below:



Lice

- Constant rubbing against the fence, trees or any other equipment.
- Lethargy (weakness) and depression.
- Low appetite indicated by reduced intake of water and feed.
- Reduced production of milk and poor rate of weight gain.
- High fever.

Prevention methods

Prevention is an important method of avoiding losses and damages:

- Always separate new arrivals for at least three weeks. Check these animals very closely for any signs of infestation and treat them if necessary.
- Separate animals that display early signs of infestation.
- Reduce animal stress; the animals should have access to the outdoors, pasture for ruminants, fresh air, direct sunlight, shade and shelter. Well kept animals are much less affected by parasites.
- Provide good quality feed with appropriate mineral supplements. Parasites prefer animals with a weak immune system, an indication of stress or poor nutrition. Animals that repeatedly have problems with external parasites often have some other underlying problems, perhaps internal parasites. The weakest animals (and thus the most stressed) are the most likely ones to develop parasite problems.
- Clean the environment off harmful pathogens and livestock parasites with a proper waste management and recycling of biodegradable materials.
- Use clean equipment for watering and feeding.
- Free-range chicken and ducks in the compound are an ecological control of disease causing vectors; they are able to eliminate a lot of ticks from the pastures.
- Know the life circle of parasites: Eggs of parasites are normally not killed by chemical and organic treatment methods. Lice eggs, for instance, need 8-19 days to hatch as nymphs. This means that after treatment, eggs can still hatch and continue the infestation. It is important to repeat the treatment every week until you are sure the parasites have disappeared.

Treatment of lice, fleas and mange

Like all external animal parasites, lice, fleas and mange (caused by mites) are common primarily in the cold season from June to September. They are a problem in all types of cattle, but especially in dairy cattle which are housed in closed quarters. There exists various methods of control:

Diatomite: Naturally, diatomite has very sharp edges. It kills insects and mites by piercing their exoskeletons and causing them to "leak" and die. Diatomite is not toxic, but farmers should take care when applying the powder. As a precaution, do not purchase the diatomite that is sold for pool filtration. This is not the same as is needed for parasite control.

Garlic: Garlic powder has an active ingredient called allicin. It can kill or repel parasites and also has excellent antimicrobial properties. Feeding a garlic tincture in conjunction with external treatment has shown positive progress, especially with mange mites.

Flea

Pyrethrum: Pyrethrum is very effective against mites and lice. It contains pyrethrin that kills insects on contact and can be used in liquid or powder form.

Soap: Soaping animals removes the waxy cuticle that protects insects and mites from drying out. It kills lice and mites, but repeat treatments will be necessary, especially with heavy infestations. Repeat the treatment in one week to do away with the lice from newly hatched eggs. Use pure soaps and avoid detergents.

Plant oils: A thin coat of vegetable oil in the affected area will suffocate

continued on page 6

Series on parasites

External and internal parasite infestation are a serious problem among livestock keepers. However there are various methods farmers can use to protect their animals against them. Starting this month, we will bring you a short series of articles on parasites and how to control them. In this issue we give you tips on external parasites such as fleas and lice. In our June issue we will feature the control of ticks in livestock and in July we will give you tips on internal parasites.

> > > from page 5: Parasites

insects and can probably kill insect eggs. Apply a light coat of oil to the areas of infestation. Also run oil along the neck and spine to cover some of most commonly infested areas. As with soap, repeat treatments may be necessary. One can also use various essential oils such as anise, camphor, eucalyptus, rosemary etc.: 1 part of each with 2-3 parts of any other oil. Good results are attributed to raw linseed oil, applied with a stiff brush.

Neem Oil: The neem tree is the source of this natural pesticide. A combination with oil is effective against all external parasites.

Aloe: Crush the leaves of aloe and sisal plant leaves and extract juice to make equal portions of juice. Mix with 10 litre of water and leave for 2 days. Apply the mixture on the animals once a day for 2 days to control lice and mange.

Fighting leeches

Leeches affect livestock that drink in shallow water. They suck a lot of blood from the animal by attaching themselves to the lining of the mouth or throat. To remove leeches, use alcohol, salt, soap, or lemon juice or just pull them off. The best way is to slide your fingernail under the front and tag on the tail to gently cause the leech to break the suction from the animal. This method substantially reduces the risk of bad infection.

Tobacco: Mix 50g of tobacco powder (snuff) with ½ litre of water and flush the animal's mouth with the mixture.The leeches will detach and fall off.

farmers forum

020 445 03 98 0721 541 590 0738 390 715

Do you want your own *TOF* copy?

Since we started publishing *The Organic Farmer* magazine, we have always insisted that it should be shared among members of farmers' groups across the country. Apart from reaching so many farmers, the idea behind this distribution system was that this would encourage you to come together, read the magazine and share the ideas, tips and new farming methods featured in each new issue.

The system would require well-organised farmers' groups that hold regular meetings. Such groups should build up a file with all issues of *TOF* to ensure that the few copies they receive are well-stored. This method would enable any member wishing to get information on a particular topic covered in one of the magazines to borrow the file and make reference. While some groups have adopted this system, many others have not been able to keep all the copies in a way that is accessible to other members. Some groups' chairmen rarely share the magazines with other members and distribute them within their extended family. Others prefer to give copies only to a section of the members denying others a chance to read.

This is one reason why farmers from many parts of the country keep calling us to send them a particular issue of the magazine which we produced months ago; most of which have run out of stock. Other farmers would like to keep the magazines to themselves for reference when they need it. We understand the problem, but this goes against the spirit and purpose of the magazine: That each copy should be read by at least seven to nine people, as is the case at the moment.

In the past few weeks we have received more than 300 fresh applications from individual farmers who want to get their own *TOF* copies. We have stretched our resources to the limit: Even after raising the circulation to 18'000 copies, we have realised that we are unable to meet the demand from farmers. Very few copies remain for our own use in the office, which means that we can no longer send more copies to new subscribers. Our budget has now risen to more than Ksh14 million a year.

To overcome this problem, we are starting a new subscription service for farmers. Those who wish to receive their own copies can pay a yearly subscription fee of Ksh 840. With this amount *TOF* will cost you only Ksh 70 per month. This is a negligible amount of money compared to the value of information and the knowledge you will acquire from the magazine. We will not make any profit from this subscription fee because this is exactly what we pay for the production of one copy in one year. Of course, we know that this new service will increase our administrative burden. We will accept only yearly payments, from January to December. If a farmer would like the individual *TOF* for this year, he has to pay Ksh 490 by end of May to get *TOF* from June to December 2009. Immediately we receive the payment, we will start sending you the copies. Renewal of subscription for the year 2010 has to be done by end of December 2009. You can send the money through M-pesa to our special subscription telephone number 0717 444 405. Send in a separate sms your name and full address.

Farmers' groups will continue to get their *TOF* copies free of charge. But they will have to prove that their groups really do exist. Groups applying for copies should include a photocopy of the registration certificate together with some details such as the number of members (men and women), describe how their group operates, including their management (their full address and, if possible, their mobile phone numbers).

The big demand for *The Organic Farmer* is a good sign – for us, the *TOF* team as well as you the farmers, this is a sign that you are interested and willing to improve your farming. We will do our best to fulfill these expectations. *The Editors*

Alert us if you do not get your copy

In the past few weeks we have visited various parts of the country and one problem we have discovered is that some farmers are no longer receiving their copies of *The Organic Farmer* magazine, yet they do not even inform us about it. Is it laxity? Or lack of interest because you get *TOF* free of charge? This behaviour is difficult to understand.

Several times we have reminded farmers to call us immediately if they fail to get their copies latest by the 15th day of the month. It is a waste of resources if *TOF*-copies do not reach the farmers. While we are trying to investigate the source of the problem especially with Postal Corporation of Kenya, it is very difficult to help you if you do not notify us that you are not receiving your monthly *TOF* copies.

If *TOF* does not arrive on time, farmers can send SMS to our new SMS telephone number 0715 916 136 or call us on Telephone numbers 0721 541 590 or 0738 390 715

Spider mite not easy to control

I have serious problems with spider mites which have damaged my tomatoes and are now attacking the black nightshade (managu) and eggplants. I have been using dictator pesticide but they keep on recurring. Please help. Tel. 0722 580 626.

Spider mites are a big problem especially if they are not controlled on time. They attack tomatoes, potatoes, tobbaco, black night shade, and more than 300 other plant species. One mistake farmers make is to spray them with pesticides when it is already too late. Another problem is that when spraying pesticides, farmers do not apply the pesticide on all the affected parts of the plant including the lower part of the leaf. Spider mites are found in many colours. Adult females that attack tobbacco are orange- red with reddish legs. Spider mites protect themselves from pesticides by use of silk threads that makes them stick to the plant leaves. They multiply very fast during the hot dry, dry weather, however their population declines during the rains.

Blown by the wind

Red spider mites are blown by wind from one crop field to another. People walking across the fields also help in dispersing the pests as they attach themselves on their clothing or working tools. The most common spider mites in Kenya are the tomato red spider mite and the two-spotted spider mite.

Control methods: The best biological way to control spider mite is the use of their natural enemies, such as predatory mites or lady beetles. The predatory mites have been discovered in parts of South America but are yet to be introduced in Kenya yet. However the

main problem in Kenya is that farmers rely on dangerous pesticides to control pests such as spider mites which also kill the predators. Some biological pesticides such as pyrethrum extracts also kill the predators. Neem extract with a high proportion of oil has been found to be very effective, but farmers should be careful not to use too much neem oil as it can harm the plants.

Field sanitation: Farmers should ensure the field is kept as clean as possible and free of weeds.

Intercropping: Plant tomatoes together with crops as garlic, basil, and onions can give some protection due to their strong smell.

Tomato leaves: Boil one kilogramme of tomato leaves in 2 litres of water, cool and use as a spray.

Castor oil (*Ricinus*): Soak green castor oil seeds and leaves in water for 24 hours, filter and then spray. However be careful because castor oil seeds are poisonous. Do not allow people or animals to eat tomatoes sprayed with castor oil.

...answers in brief

Eucalyptus

I have small piece of land on which I have planted eucalyptus trees. Is there anything else I can grow in between the lines as the trees get tall? James Kaburu Meru town. Tel 0725 511 334.

Yes you can plant maize or beans in the first year. However the eucalyptus tree grows very fast. In the second year the trees will have formed a canopy which makes it hard for any other plant to grow. Its water utilisation is also higher than many plants which tends to deny other plants intercropped with it a chance to grow.

In need of Sudan grass

Where can I purchase Sudan grass? I need 2 kg for some push-pull trials I am doing. I have desmodium and Napier grass. I have a ready plot for this season. Organic farmer, Mai Mahiu, Naivasha Tel. 0724 308 361.

Farmer Kiarie from Nakuru has 50 kg of Sudan grass and is looking for a buyer. Ask him if he still has some for sale. Call on Tel 0721 484 199.

Benefits of Amaranth

Does Amaranth have calcium minerals? Aggrey Mudete 0715 213 182

Amaranth is a good source of essential nutrients when consumed as grain or as a vegetable. Amaranth is a nutritious grain, with protein, particularly amino acid, Lysine, which is low in the cereal grains. Amaranth is also a rich source of dietary fibre, essential vitamins C, B1 and minerals like calcium, potassium, phosphorous, iron, zinc and manganese. Nowadays you can buy milled Amaranth in the supermarkets, 1 kg goes for Ksh 190. ***TOF***

Why your geese may not lay that golden egg

My geese stay too long without laying. Please help. 0725 695 253

A number of farmers have similar problems and are asking us why the birds take long to lay eggs. We have sought the answers from a number of experts who have given various reasons why the geese have stopped laying.

- Geese have very definite seasons for laying, and may be off at the moment. Flocks of domestic geese are known to synchronise their laying patterns and, generally, lay every other day.
- There may be dietary problems. i.e., are the geese getting enough water / the right feed including sufficient grazing / the correct housing / enough daylight hours/ are they penned or free range? Any one of the above

Canadian geese on the walk

could be the cause.

- A geese keeping lady in Nakuru has some other reasons. She advises fellow farmers that geese need a well protected nesting area away from prying hands; any fumbling with their precious eggs will result in immediate rejection in laying. They also cannot sit on eggs that are tampered with!

This lady told TOF-field officer Isaac Maina the following story: "One day a neighbour's dog strayed into my compound and came across a number of eggs that the geese had laid in a thicket. The dog ate the eggs leaving the empty shells on the nest. On noticing the damage, the geese sensed danger and stopped laying eggs altogether."

If you have any additional advice on why the geese fail to lay eggs or tips about their general management, write to us. We will share the information with other farmers.

See also page 4! ***Valerie Corr/TOF***

Mosquito control project in Malindi bears fruit

The BioVision-funded malaria eradication campaign is a model for other mosquito-infested areas.

By Lucy Macharia

Malaria kills thousands of people in Kenya every year, but for the coastal town of Malindi, the disease had attained epidemic proportions, affecting more than 80 per cent of all children between the ages of 2 to 9 years and more than 50 per cent of pregnant women. Realising the danger posed by the disease, a number of community groups came together 6 years ago to educate the residents on ways of controlling the disease. The local youth formed 250 Self-Help groups under an umbrella organisation by the name Punguza Mbu Malindi (PUMMA). To support the initiative, The Kenya Medical Research Institute (KEMRI) together with the African Insect Science for Food and Health (ICIPE) sent scientists to work with the community on malaria control. The BioVision Foundation for ecological development, which also funds The Organic Farmer has been financing the project since inception. The Ministry of Health and the Municipal Council of Malindi are also involved in the campaign. It uses integrated, environmentally friendly and cost effective methods of mosquito control such as the use of safe bacteria or Bt (*Bacillus thuringiesis israelensis*) to kill mosquitoes in their larval stage.

Stagnant water pools are the breeding ground for mosquitoes.

Having identified mosquito breeding areas, the project has launched a public awareness campaign on mosquito control in homes, schools and other institutions. A clean-up exercise known as "shine the village", which involves filling up of pools with stagnant water, draining of abandoned swimming pools, blocked canals and distribution of free Insecticide Treated Nets (ITNs) is done in residential areas in the town and the surrounding areas. Every year the project organises a mosquito field week where all these activities, the climax of which is the Mosquito day, are commemorated. This year's event took place at the Malindi Municipal stadium on April 4. It involved a procession through the town, songs and speeches by local leaders urging the community to double their efforts on malaria control. Already the campaign is bearing fruits, KEMRI reports indicate that malaria cases have declined from 10,000 at the beginning of the project to only 5,000 last year.

The Organic Farmer

The newspaper for sustainable agriculture in Kenya Nr. 5 August 2005

Harvest season: Happy boys carry home their bean produce. (Picture : Kamau)

The war against pest damage

Not all Kenyan farmers can take home a big harvest like the boys in the picture above. Many of them incur huge losses due to pests.

By The Organic Farmer

Every year, farmers in Kenya lose billions of shillings following the destruction of their crops by pests. Although many of them use chemical pesticides for control, they are now losing the war because most of the pests have developed resistance to the chemicals. Besides inorganic pesticides are causing great harm to human health and the environment some of which is difficult to reverse. Indeed, consumers are becoming more and more sensitive to chemicals applied during food production.

There are many methods a farmer can use to control pests without resorting to the use of synthetic pesticides. Intercropping for example is one (see page 5). Another one is Pyrethrum. In this issue (on page 8) we have featured various cost effective methods of making Pyrethrum extracts.

Preventive measures

It is a fact that many farmers already have some indigenous knowledge on how to control pests without the use of harmful pesticides. However they need to supplement these with additional information in order to promote effective pest management strategies in their farms. Know your pests and their natural enemies! The accurate identification of the species, life cycle, habitat requirements, time and location of occurrence form an important part of the knowledge of pests and natural enemies is indispensable for long-term pest management.

Crop rotation, timing of planting and harvesting periods, planting of trap crops and choice of crop varieties do play an important part in pest control.

BIOVISION

In this issue

Take farming as business

The Kenyan farmers face many problems. Of course, many difficulties they are confronted with are beyond their scope. But with commitment, encouragement and with cooperation, they could solve so many of these problems on their own. Before, many Kenyan farmers relied on the National Cereals and Produce Board and the cooperative movement to market their produce. But with the liberalisation of the agricultural sector they were caught flat-footed.

By The Organic Farmer

They now find it increasingly difficult to cope with the changing market demands. Most farmers will harvest their produce and keep it in their stores waiting for buyers. In most cases these buyers are middlemen out to make a quick profit and who often offer prices far below the prevailing market prices. Of course transport costs to markets may be high due to the bad state of the roads. But why are farmers not taking their own initiative? Why they are not coming together to share transport costs to exploit the available market opportunities?

In the last issue we heard the complaints of farmers in Nyeri who had big problems selling their cabbages. The reason why is very easy to explain: So many farmers are planting the same crops, and there are not enough customers to buy them. Who is to blame? The customers? The farmers? Our Farmers are rarely market driven. This has to change. A manufacturer of pumps for instance has to look for what the customers need, and he has to market his own products otherwise he will soon go bankrupt. There is no big difference with farmers. In order to remain competitive, what the farmers need to do is to take farming like any other business. Farmers should be able to balance between their subsistence and market needs. But most important of all, they should change their attitude and way of doing things in order to realise the full benefits of farming.

MY OPINION

By Francis Karuga

It is really heartening to see the rate at which people in the rural areas including farmers are embracing the mobile phone. Wherever you go nowadays farmers can communicate with their relatives and friends in towns and other far flung places. Indeed: The mobile phone is changing the way of life in rural Kenya.

But let us stop briefly and think a little: Why are our farmers not adopting new technologies when it comes to farming? It is really ironic that we can accept such new innovations as the mobile phone and at the same time continue using outdated farming practices that neither uplift our living standards nor improve our country's food security situation.

Francis Karuga is a farmer in Limuru.

The Organic Farmer
Nr. 5, August 2005

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly and distributed free to farmers.

The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. (020) 861 680
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Secretariat
Lucy W. Macharia
Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com

Comfrey is a healing plant

Comfrey is not only a health plant. It is also good for composting and for mulching in agriculture.

By Sandra Zumpano

Comfrey (botanical name: Symphytum officinale) has been used for hundreds of years in the external treatment of broken bones. We are much more interested here from the point of view of a farmer. In Kenya the plant is also well known under the name knitbone, knitback, or local: (*Mabaki*, in Kikuyu).

The plant is erect in habit and rough and hairy all over. The leafy stem, 2 to 3 feet high, is stout, angular and hollow, broadly winged at the top and covered with bristly hairs. One-sided clusters of drooping flowers, either creamy yellow or purple growing on short stalks.

Comfrey is a very hardy perennial. It grows in moist areas and has the ability to clean and extract nutrients from stagnant or foul water. It sends down long tap roots, enabling it to accumulate minerals in it's leaves. These minerals include potassium, calcium, magnesium, iron and phosphorus along with several vitamins. The leaves contain a lot of protein. When comfrey leaves are composted and returned to enrich the soil, all these elements are made available to your plants.

Comfrey grows in almost any soil or situation, but does best under the shade of trees. Propagation may be effected either by seed or by division of roots. The roots are very brittle and the least bit of root will start growing afresh. They should be planted about 2.5 feet apart each way and will need no further care except to keep them clear from weeds. Many farmers like to plant comfrey at the borders of their shamba.

Fertilizer with leaves

With its' high levels of potash, comfrey tea can be used as an excellent fertilizer for tomato, pepper, cucumber and potato plants. Pick a good sized handful of leaves. Place them in a container with enough water to cover the leaves. Cover and let this soak for 4 weeks in cool weather or 2 weeks in hot weather. The smell while it is "cooking" is strong. Then squeeze the leaves to extract as much juice as possible. Strain and use at a rate of 1/3 cup of comfrey juice to one gallon of water. Use as a foliar feed and soil drench around the plants. Put the solid wastes into the compost pile.

Fertilizer with flowers

When in full bloom, the stalks with flowers are cut, about 15-20 on each plant. They contain nitrogen and potash. That's what potatoes like very much so their furrows can be covered with this comfrey material. We can also put it between the other rows of vegetable or under tomatoes. After cutting the comfrey that way, it will look a bit worn out. But after about two weeks and the next rain it will get back the usual beauty.

Co-operatives can improve farmers' income

The running of a Sacco needs committed farmers, who can work together for their own benefit - and that of their community.

By Eric Lumosi Asiligwa

In the July-issue of *The Organic Farmer* we carried the story on the problems farmers are facing when trying to get loans. We have already mentioned the benefit of Saccos. In this edition we bring you more information on how co-operatives function. In the coming issue we will feature one model-Sacco.

Let us now look on the different types of Saccos before we come to the formation of Sacco's. There are three types of co-operative societies:

Producer
Individuals engaged in production form these co-operatives societies. It is possible for any group of businessmen engaged in production (e.g. manufacturers, any given industry, or factory owners) to form a co-operative society, In Kenya most producer co-operative societies are formed by farmers. These means that they are formed by people producing agricultural crops individually but join hands to sell their products collectively so as to get a good market price.

The farmers who engage in farming in a particular area form themselves into a co-operative society. This helps them not only get the best prices for their crops but also offer certain other services:

- They attain education on growing of a particular crop.
- The societies provide tools, fertilizers, seeds and insecticides to the members.
- The societies collect, store and sometimes process the produce before selling.
- They may to go to the extent of giving financial assistance to the members on loan or credit basis.

Some companies go through SACCOs to sell their products to the members on credit.

Members make all decisions on the running of a co-operative

Consumer
These societies are formed specifically with the aim of buying products jointly with a view to pay as low a price as possible. This trend is not common in the country because many producer co-operative societies already provide the service.

Savings & Credit
Employed persons or producer co-operative members who save a part of their monthly salary with their co-operative societies form these Saccos. Their money earns good interest and when they have saved a significant amount they are entitled to loans. The interest charged on the loan is usually very low as compared to ordinary banks or even some micro-finance organisations. Besides it has fewer formalities (see box).

Ownership
A Sacco is owned by members each of whom buys shares in the society according to ability. Membership is open and voluntary. This means that anyone can join a society as long as he or she is involved in the type of activity for which the society has been formed. No one can be forced to join a society.

Administration
The members run the affairs of the society. The members make the capital decisions that govern the society.. This is done in the Annual General Meetings (AGMs). A committee elected by members does the day-to-day running of the office. Each member has one vote, regardless of the number of shares held.

The committee officials are elected for a fixed period after which fresh elections are held. Non-performing officials may be voted out. In addition to elected officials some paid employees may also be hired to assist in the daily management of the society affairs.

Formation
Setting up this type of system is a matter of competency, commitment and motivation. But how can a structure of this type be born, grow and reach maturity? People wishing to form a co-operative society get together and apply for registration of their society with the Ministry of Co-operative Development, giving details of what the society will be doing, for example in the area of operation. The Ministry controls and supervises the growth and activities of co-operatives in the country to ensure they are well managed.

"Saccos are sensitive to farmers needs"

There are many co-operatives in Kenya. In the Central province alone there are 998 registered Co-operatives with 820,423 members. According to the Central Provincial Cooperatives Officer, Geoffrey Karuku, it makes sense for farmers to join savings and credit co-operatives, or saccos. "Saccos are sensitive to farmers needs and would not easily move in to auction property, even when one fails to repay the loan in the specified period".

The Saccos are managed by fellow farmers who understand the plight of their colleagues. "They also know each other, so they do everything possible to avoid such auctions", Karuku said.

They also offer credit at low interest and give enough time to repay. One successful Sacco that lends money to farmers is the Neccofosa, which has its headquarters in Nanyuki town in Laikipia District. Neccofosa's General Manager, Faith Muchoki, said the 7,500 members guarantee one another to get loans, which are paid at an interest rate of 5 per cent. This is extremely low compared to commercial banks, whose interest rates is as high as 20 per cent. Small loans are repaid within a few months, while bigger ones of Sh100,000 are repaid in three years. To qualify for a loan one need only register with Sh 500 *(PM)*

BIOVISION

Group changes dumpsite into garden

A slum women group in Kitale helps improve food security and living conditions in their poor community.

By Peter Kamau, Kitale

The slum women group at work with their leader Lydia Asipitar (Photos P. Kamau)

Two decades ago, famine stricken Turkana families were driven out of their home district by drought and cattle raiding. They settled around a refuse dumpsite in Kipsongo area on the outskirts of Kitale town where they scavenged for food. Soon their temporary shelters built of polythene sheeting and cardboard boxes, grew into a sprawling slum where more than 3000 people have been living in squalid conditions. Lack of basic amenities such as water and toilets has led to frequent outbreaks of cholera, typhoid and malaria, which has left many villagers dead.

Appalled by the poor living conditions in the slum, women from the community decided to form the Akiriamriam Slum Women Group two years ago. The group has now converted the refuse dump into a three-acre organic farm where they grow maize, beans and vegetables to feed their families. They have also set up a revolving fund that is helping members start income generating activities to uplift their living standards.

"When we ran short of funds last year, we decided to use stored maize as seed and planted without fertilizer. We were surprised to see the maize was healthier than that of our neighbours who had used inorganic fertilizers. We have discovered very good soil which does not require anything to grow food", says a happy Lydia Asipitar, the group secretary.

The group now has 56 members. Last year they harvested 67 bags of maize. Each member got one bag of maize while the rest was sold and the money deposited in the groups account in a local bank. Asipitar says apart from working in the farm, each of the group members has a market garden where they grow tomatoes, sukumawiki or cabbages organically.

Anna Arukudi sorts beans for sale

Fear of eviction

Although none of the women knows what organic farming is all about, growing these crops without any inputs has greatly reduced their expenses in terms of inputs.

Their efforts have impressed many visitors to the slum. Already Asipitar says the Ministry of Agriculture is considering funding them through the "Njaa Marufuku Kenya" programme to enable them buy certified seed. The VI, a Swedish agro-forestry project, has pledged to provide vegetable seeds and has already started a tree nursery on the group farm.

The only worry for the group is that the Kitale municipal council owns the land on which the slum is built, raising fears of eviction. However they are determined to change living conditions of the slums dwellers at whatever cost. "We have changed the notion that women cannot initiate development. Our involvement in this activities will help improve the quality of life in the community," says 26 -year old Asipitar who has two children.

At 5 o'clock every morning each of the women leaves the village and forms a beeline to the town. Some go to the local municipal council market where they help the traders sort maize and beans. After sorting they are allowed to take away low grade grains, which they later sell to fellow villagers at a lower price. Other women work in the local slaughterhouse and are in return given portions of meat unsuitable for sale such as calf foetuses and entrails. Many group members also undertake cleaning chores in local hotels while others sell firewood to fellow villagers and neighbours.

From their earnings in these activities, each member has to contribute between Ksh.5 and Ksh.10 daily that is later deposited in the group's account. Every month the group is able to save Ksh.4000. So far they have saved Ksh.16,000. "From this money we are able to assist members who want to set up small businesses or pay school fees or medical bills in case of sickness. It has made a big difference because it has stopped many of us from begging in town," says Asipitar.

Force for change

The women group has become a strong force for social change in the poor community. On realising that the poor sanitary conditions in the slum were responsible for the repeated epidemics that killed people every year, they started an intensive education campaign through chief's barazas, funerals and related social gatherings. The slum dwellers were taught hygienic methods of human waste disposal. The Intermediate Technology Development Group, a local non-governmental organization, last year built sanitation blocks that included toilets and communal bathrooms for use by the community.

"If you came here two years ago, you could hardly walk in the village because every path was littered with human waste but we have changed all that. At first it was difficult to convince them to use toilets but they are now using them," says Asipitar.

Intercropping has many benefits for farmers

Although farmers know that intercropping increases land productivity and overall yield many do not practise it.

By Sandra Zumpano

In July, *The Organic Farmer* informed you about crop rotation. In this edition we will inform you in detail about intercropping or multiple cropping.

Intercropping (multiple cropping) means that two or more crops are grown at the same time in the same field. This results in a bigger plant diversity which helps the small-scale farmer not to be dependent on only one crop. As with crop rotation, weeds, pests and diseases are reduced. Intercropping can also be used in succession planting. Here, early maturing crops are combined with later varieties for perpetual yield all season long.

There are different possibilities to associate crops: Some plants provide natural way of protecting crops against insect pests. Taller plants offer support to winding plants. Low-growing plants provide shade to the roots of nearby plants.

Different types of intercropping

Mixed cropping: two or more crops are sown at the same time sharing the same space without row arrangement (see pictures)

Relay cropping: is the growing of two or more crops on the same field with the planting of the second crop after the first one has completed its development.

Cropping in rows: different crops are sown at the same time, on the same field, each arranged in their own row

Combined cultivation: annual crops mixed with trees

Research by ICIPE

Maize is the dominant cereal in most of Sub-Saharan Africa and stem borers are the most prevalent maize pests. Therefore ICIPE conducted field trials. The aim was to assess the level of damage and yield reductions caused by the stem borers in monocropped maize and maize intercropped with non-host plants such as cassava, cowpea and soy bean.

Intercropping is for the benefit of the farmers *Photo TOF*

Maize monocrops had 3-9 times more stems tunnelled and 1-3 times more cob damage than intercrops. Maize yield losses due to stem borer were 2-3 times higher in monocrops than in intercrops. That means that total land productivity is increased with intercropping.

Advantages of intercropping

Because of the diversity of the crops grown, insect pests are reduced since they are usually host specific.

- More beneficial insects are attracted, especially when you include flowering crops in your intercropping system.
- Plant diseases are reduced because the distance between plants of the same family is increased since crops of other families are planted in between.
- Different plants with a variety of root systems can reduce erosion and protect the top soil better.
- Minimized cost for the control of weeds because a mixture of various crops gives often a better coverage of the soil. There is less space for the development of weeds.
- Better use of available resources (land, labor, time, water, nutrients).
- Different food crops are provided for the farm family in one cropping season.

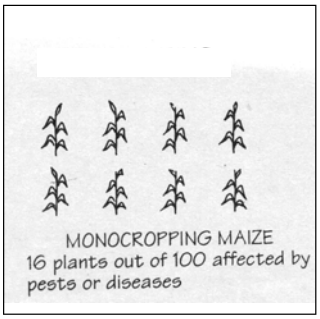
Examples for intercropping

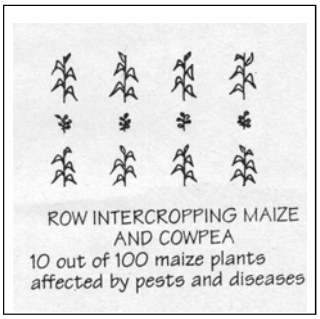
Leafy vegetables combined with root vegetables: like lettuces with carrots

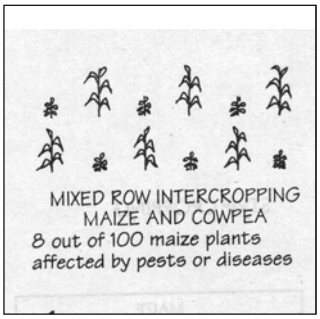
According to the plant families: legumes (for example beans, peas, groundnuts, soy beans or lentils) which are nitrogen fixers can be intercropped with cabbages, sukumawiki or spinach which are nitrogen users. Maize can be mixed with cowpea, groundnut, pumpkin, melon, cucumber, cassava or okra.

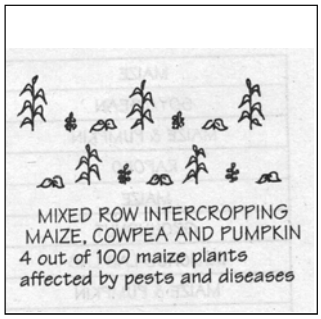
It is important for farmers to understand that plants of the same botanical family are subject to the same pests and should not be intercropped with each other and not grown close together (for example tobacco and potatoes)

References: Production without destruction, natural farming network, 1995, Zimbabwe; ICIPE Nairobi, Kenya.



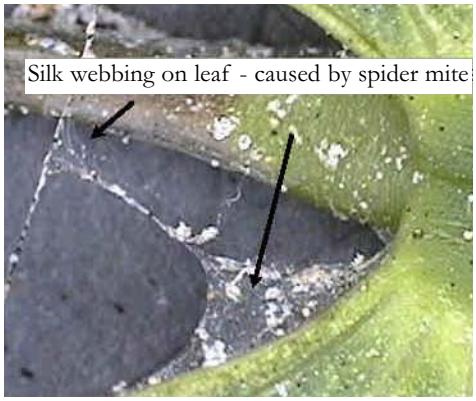






What can I do against Spidermites?

"It is very difficult to recognize the Spidermite in time", writes Isaac Maina Munyari from Subukia. "How can a farmer control this pests before it destroys the tomatoe plant"?



Silk webbing on leaf - caused by spider mite

A first step for us organic farmers in the protection of our crops from pests, is the ability to identify the pest at a very early stage (see also article on page 1). This can be done by regularly scouting our crops, and understanding the pest effect on the plants before we may even see the culprits. In the case of the Mashilingi effect, the pest in question, the spidermite at this stage, has done maximum damage. Let us work backwards from the problem.

Early inspection

Before this stage, on close inspection of the plant, one would have noticed fine silky spider webs normally where the leaf meets the stem. Infestation is already high when this is noticed. If one were to look closely at the silky strands, you would notice it is dotted with very tiny little reddish brown bug. With very bad infestation, whole plants may be covered in an orange looking web. Your plants at this stage may look very dull. Going further back, before this stage, when the infestation is much lower, on inspection of the plant leaves you would have noticed a white speckled effect on the upper side, on close inspection of the lower side, you will again see the tiny reddish brown mites but less numerous.

Dear farmers!

We are getting a lot of questions. Ronald Mokaya Nyabuya, P.O Box 995, Kitale for instance is asking for information about chicken diseases and medicine used. Or the chairman of the 3 km Self Help Group Machakos would like to have the prescription for making pesticides from chilli. We have only one problem: The Organic Farmer is a small newspaper with limited space. Su Kahumbu has already handed over the answers to us. We will publish them as well as the answers to your other questions in the next issue of *The Organic Farmer*. Thanks for your patience!

Hot spots

It is also very obvious at this stage that the mites are only in specific areas, we call these HOT SPOTS. It is cheaper and easier to control these pests from this level as later their web protects them from contact with bio-pesticides.

Conditions of the pests

Before we even get to the solution, now lets us learn a little more about the ideal conditions for these pests.

Spider mites are tiny (0.5mm) and we have 3 types in Kenya. They are oval in shape and at adult stage have 8 legs. Larval stage has 6 legs. They prefer to live within a temperature range of 16-37 ° C, however they flourish at relatively low humidities (24-26° C) where a new generation will develop every 10-13 days! Life span of a mite is 13-32 days, during which time the female may lay over 100 eggs!

With this information it would seem logical to identify and stop them at a very early stage.

Different pesticides

Our target area would be the HOT SPOTS. This will also ensure we have minimal collateral damage as well as being more cost effective. As the mites can develop resistance to pesticides it is advisable to use two different bio-pesticides alternatively. A pyrethrin-based bio-pesticide made from natural pyrethrum will kill the mites at adult stage on contact, however may not affect the eggs. To prevent the mites from developing resistance to the pyrethrin pesticide, alternate with spraying of a Neem based bio-pesticide. Although slower acting, it will ultimately affect the reproduction of the mites as well as act as a break against resistance. It is through constant vigilance, that we manage to keep the populations low enough not to affect the yield, as spider mites are very difficult to eliminate entirely. Keep checking and most importantly, practice good crop hygiene. If you have spider mite try not to spread it via handling, harvesting, forceful irrigation, etc.

Use of bio-pesticides

Even animals brushing against infected plants will spread these mites. A good idea would be to intergrow rows of crops that are not effected by mites, with those that are. Also keep good spacing between plants to minimise the spread.

These bio-pesticides are produced by BIOP at ICIPE and East African Botanicals as well as others. Ask the conventional fertilizer and pesticide distributors in your area to stock these products.

Make sure to scout all the crops these mites affect. Potato, tomato, egg plant , peppers, some wild plants and weeds, tobacco, black nightshade, gooseberry and bitter apple. Notice how most of these plants are in the same family. This family is called *Solanaceae*.

Remember, the Mashillingi effect is cosmetic. The nutritional value of the tomatoes is not affected and is by far healthier and superior in taste to tomatoes grown using poisonous artificial pesticides. We need to educate our consumers on this reality!

Su Kahumbu answers your questions

Write to:
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com

Letters to the editor

Members are happy
As new chairman of Kugeria Organic Farming Group, and on behalf of the entire active group in Kipipiri, we are grateful to receive your wonderful letter all the way from Nairobi (ICIPE). Kugeria Organic Farmers are grateful and happy to receive your magazine "The Organic Farmer" while speaking every member had a minute or more to congratulate your mindful thought since we learnt how to fight hunger in and society in Kenya. So please should you send us more copies and information through the new address as given above, and for us to get information quickly, the new chairman name is Davis Njuguna Mwangi. As secretary of the group I have found it wise to be one of your partners and be assisting us to get loans rural areas to uplift the standard of living.

Chairman Kugeria Organic Group, P.O Box 1155, Naivasha.

Give us more
I do hereby acknowledge receipt of your wonderful magazine. I find your magazine quite interesting and the farmers with whom we are sharing, are always longing for the next issue. Allow me to make a few suggestions that might make the magazine interesting and more informative.

1) Ask all the farmers who are giving suggestion and contributions to give their full contacts example postal addresses, telephone and cell phone numbers, emails so that we can be communicating direct with them without necessarily coming through you.
2) Ask the manufactures of products to make their labels strikingly con spicuous, and appealing to cus tomers.
3) Include uses of your products in the livestock sector example EM.
4) Give possible uses of foliage in different species of animals, for exam ple can mulberry leaves be fed to goats, rabbits or cows?

S. M. Muthui, Thika Poultry Self Help Group, Thika.

Market place

Any farmer wishing to sell their organic products should get in touch with Su Kahumbu at:
Green Dreams Ltd,
PO Box 1403, Limuru,
Tel: 0722 70 4488

Farmers in Kinangop like Purple Vetch

Our newspaper, *The Organic Farmer*, is getting a lot of letters. Some farmers have sent questions, which we hand over to Su Kahumbu, others come with their own proposals and ideas. In this edition we publish a letter from South Kinangop. Some farmers there know about the plant Purple Vetch. Do you have any additional knowledge on it? If you do you can share it with fellow farmers. Please write to us!

Taking the soil as a living entity and also the fact that the good performances of all plants generally depends on the good physical and biological properties of the soil, it is good to know much has to be done to protect conserve and even improve its quality. One of the ways we can get good fertile and quality soil is through mulching.

Since that there are many places you cannot get enough mulching materials, it is good to know that there are other ways which can work the same as mulching. One of them is planting ground covers (vegetation cover).

Ikinyukia Self Help group from south Kinangop Nyandarua district have been carrying a project on this issue by growing " Purple vetch" a plant that was introduced by colonial settlers in the White Highlands including Kinangop area. The immediate modern settlers gave little or no attention to the magic plant and this almost led to its extinction.

Benefits
With advice from one of the old hands who worked in the white settlers farms, our members have searched the plant seeds and carried a thorough study on growing it. The plant grows sideways covering a circumference of about 2 meters from a double or single seed.

Some of the plants benefit's are:

- Underneath the plant, it is always wet thus moisture is conserved
- Very few or no weeds grow under neath the plant.
- It is a legume; therefore it fixes nitrogen in the soil.
- The plant can cover a large area where mulching might be expensive.
- It is a fodder crop for livestock and can be kept as 'hay' for dry seasons.
- Its flowers are very much liked by bees and produce a lot of high quality honey.
- You can plant it along with other crops like maize, fruits and even fodder crops like Napier grass.

Help to conserve the soil and the environment for a better future. We have plenty of the plant seeds and if needed contact:

Benson Maina Muturi, P.O BOX 125. South Kinangop.

How you can make Pyrethrum pesticide

Kenya is the world's leading producer of Pyrethrum. Farmers can make their own Pyrethrum-pesticides. It is helpful in many ways, but farmers should be careful while handling it, plant extract can cause irritation to sensitive skin. All parts of the plant can be used - flowers, leaves, and roots. It's mode of action is insecticidal, repellent, fungicidal and nematocidal. Pyrethrum has a quick knockdown effect on insects and can be applied a day before harvest because Pyrethrins are quickly destroyed by sunlight. The following table was obtained from the agricultural information-service Oisat (www.oisat.org).

Used Materials	**Methods of preparation**	**How to use**	**Target pests**
Pyrethrum extract 1 cup of fresh pyrethrum, daisy flower heads, 30 ml of rubbing alcohol (70% isoprophyl alcohol), Pail, Strainer	Soak flowers in alcohol overnight. Strain through a cheesecloth.	Add 3 liters of water to the filtrate. Stir well. Spray on infested plants	Aphids, Cabbage loopers, Codling moths, Mexican bean beetles, Spider mites, Stink bugs, Thrips, Tomato pinworms, Whiteflies
Pyrethrum water extract 1-1.5 kg of dried pyrethrum 3 kg of liquid soap 100 liters of water Drum	Finely shred dried pyrethrum. Add into the drum with water. Stir vigorously. Strain. Add soap. Mix well.	Spray on the target pests preferably in the evening.	Aphid, Bean fly, Cabbage white butterfly, Coffee bugs, Colorado beetle, Diamondback moth, Eggplant fruit and shoot borer, Flea beetle, Gall midge, Grasshopper,Green leafhopper Locust, Mites, Thrips
Powder extract 3 g of pyrethrum powder. 1 liter of water 1 tsp of soap, and a Pail	Add the pyrethrum powder and soap to water.Stir well.	Immediately apply on infested plants preferably in the evening.	Flea beetles

Procedures for the preparation of plant extracts

Farmers should remember the following guidelines when making plant extracts.

- Select plant parts that are free from diseases.
- When storing the plant parts for future usage, make sure that they are properly dried and are stored in an airy container (never use plastic container), away from direct sun light and moisture.
- Make sure that they are free from moulds before using them.
- Use utensils for the extract preparation that are not use for your food preparation and for drinking and cooking water containers.
- Clean properly all the utensils every time after using them.
- Do not have a direct contact with the crude extract while in the process of the preparation and during the application.
- Make sure that you place the plant extract out of reach of children and house pets while leaving it overnight.
- Harvest all the mature and ripe fruits before plant extract application.
- Always test the plant extract for mulation on a few infested plants first before going into large scale spraying.
- When adding soap as an emulsifier, use a potash-based one.
- Wear protective clothing while applying the extract.
- Wash your hands after handling the plant extract.

The Organic Farmer in September

Biological Control: The wasp that is saving the cabbage

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 49 June 2009

New centres to help farmers

You have problems getting information on organic farming including essential inputs such as organic fertilizers? Soon *The Organic Farmer* will put up information centres known as *i-TOF* in a few selected areas in the country. In these centres farmers will have easy access to information, training and even buy essential organic inputs for their farms. Read more about this initiative on page 6.

Most agrovet shops are stocked with chemicals but rarely sell organic inputs

Diseases reduce passion fruit yield

Despite being a high value crop, farmers are getting low earnings from passion fruits due to diseases.

The Organic Farmer

There is a huge demand for passion both in the local and export markets, but farmers have been unable to exploit this opportunity due to poor yields caused by increased fungal diseases. There are two factors responsible for this problem:

- Farmers do not take the trouble to buy certified planting material from reputable seedling suppliers. If the planting material is diseased, farmers transfer the diseases to their farms.
- Another reason for the declining production is poor management by farmers which has led to the spread of diseases. Farmers rarely observe field sanitation; all diseased leaves, vines and fruits should be removed and burned or buried in a pit to stop the disease from spreading to the healthy plants. Old unproductive shoots and deadwood must be removed. All the equipment used for pruning should be disinfected to avoid spreading viral infection from one plant to the other.

A healthy passion fruit (above). Below is a fruit affected by alternaria fruit spots.

Photos: Infonet-Biovision

To avoid a build-up of soil-borne diseases, passion fruit growers should ensure that they practise crop-rotation. Passion fruits should not be grown on the same piece of land for 2- 3 years to keep it free of diseases. A wide range of vegetables can be intercropped with passion vines such as beans, cabbages, tomatoes, potatoes, beetroot, Swiss chard, carrots, strawberries, leeks and head lettuce. However, plants in the pumpkin family (cucurbits) such as pumpkins and squash should be avoided as they bring in diseases such as woodiness and fruit flies. *Page 3*

in this issue

Dear farmers,

Kenyan farmers are slowly beginning to change from the traditional method of relying on only one crop to a more diversified range of high value crops that earn them more income. It is encouraging to see that farmers are no longer waiting for other people to come and solve their problems for them; they are taking their own initiatives to better their income.

We are saying this from what we have observed in the past few months. We have received dozens of questions from farmers who want to diversify into new high value crops and keep livestock in a professional manner. One example we can give is the large number of farmers who have gone into the production of passion fruits; others have began poultry keeping as a business, as you can read on pages 5 and 6. These farmers can count on the increased demand and the good prices these products fetch in the market.

However, this new interest at diversification should be matched with a will to adopt the best production practice that enables them to attain the desired yields. But the situation is quite the opposite on the ground. Although most farmers have gone into production of these high value fruits and vegetables, their poor management methods have led to low yields: For example passion fruit production in the country is declining. The main cause for low production is the increase in fungal diseases. With crop rotation and field sanitation, farmers can effectively prevent and control these diseases.

Our farmers are really struggling to better their income, and they are hard working. But working hard is not enough; they need to have the right skills to do things the correct way. Since farming is a business, farmers have to adopt the best methods to increase production and avoid incurring losses. This not only needs an intensive search for more knowledge on how to grow crops such as passion fruits. But it also requires effort to look around for certified seedlings. To buy them from roadside nurseries might be the easiest way; they are near and one can avoid the transport costs to well known and recognised nurseries. But this short cut will cost them dearly, because even the best farmer cannot expect to get a good crop when the seedlings are already infected with disease.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0721 541 590, 0738 390 715, Email: info@organickenya.com

Medicinal plants bring fortune to farmers

Mondia and ocimum kilimandscharicum plants are a source of income for Kakamega farmers.

Anja Bengelstorff

Before they started conservation work in Kakamega forest in western province of Kenya, it was just one of the fast disappearing tropical rain forests in Africa, exploited for firewood, timber, charcoal and building posts. But now the African Insect Science for Food and Health (ICIPE) must be proud of their conservation efforts. They have not only managed to save the forest, they have also shown the surrounding farming community the benefits of conserving its rich biodiversity while exploiting its resources to improve their liveslihoods.

The forest is host to many medicinal herbs; among these are the mondia and *Ocimum kilimandscharism*. For centuries the local communities had used these plants to treat various ailments. But it was not until the ICIPE came to the area that the community realised that they had been sitting on gold; the medicinal plants could be processed and sold in the markets, locally and abroad. A powder developed from *Mondia whytei* is used as a revitaliser, appetizer and clearer of hangovers: A group of farmers who have domesticated the "highly threatened" medicinal plant, known locally as "Mkombela" (*Mondia whytei*), used to collect and sell the roots locally. The plant is widely distributed in tropical Africa. In Kenya, it is more prevalent in the remnant tropical rain forest of Kakamega. *Mondia whytei* is also known as mondia, or Whites's ginger. It is a vigorous climber (3-6 m high) with attractive heart-shape leaves and a vanilla aroma.

Remedy for flu

Another group of farmers is involved in the domestication of the medicinal plant *Ocimum kilimandscharicum*, commonly also known as kilimanjaro basil, camphor basil, hoary basil or feverplant. A leaf extract from the plant is used in the manufacture of a balm and an ointment used to treat flu, cold, chest congestion, aches, pain and insect bites.

Ocimum kilimandscharicum is one of the species of the genus of the Ocimum plant that is native to East Africa. It is an evergreen aromatic perennial under shrub. It thrives as a natural rounded, woody shrub that can grow to a height of up to 2 m. It has an efficient rooting system and perennial habits which prevent soil erosion where it is grown. The plant requires little management in the field and no pesticide control.

"We believe the project has a major role to play as a model for conservation or biodiversity and in the improvement of the livelihoods of communities living near the forest," says Wilber Lwande, ICIPE leader of the Applied Bioprospecting Programme. "It is also one of the ways of enabling indigenous traditional knowledge to be useful to humankind before [that knowledge] is entirely lost." According to ICIPE, this is a new venture that is developing a sustainable financing plan and with measures to increase farm productivity to enable farmers to exploit the potential markets. The total asset base for both community groups amounts to Ksh 7.5 million, including buildings and equipment.

Ocimum kilimandscharicum

Communities living near the forest relied on it for firewood, building materials and various herbs. However, since commercial cultivation and processing of the medicinal products began about eight years ago, reliance on the forest has decreased, allowing better forest conservation.

Community enterprise

James Ligale, assistant administrator of the Mondia community enterprise, said a group of 30 farmers, known as the Muliro Farmers, were involved in the initial domestication of the mondia plant, which takes six months to mature. These farmers have since encouraged outgrowers to cultivate the plant, which is processed at the factory MFCG Enterprise Shinyalu, built with financial assistance from international donors.

Mondia whytei

Products of these medicinal plants that are currently available at supermarkets like Nakumatt are Naturub Balm and Naturub Ointment (30 grams, Ksh 179, against muscular aches and pains), made of Camphor from Ocimum kilimandscharicum as the main ingredient. The root barks of mondia are processed wholly to make Mondia Tonic.

Additional income

The farmers harvest the plants three times a year and earn three times more from mondia or Ocimum kilimandscharicum than they did cultivating crops like maize and tea. On average, a farmer makes Kshs 35,000-40,000 a year from one acre. The cultivation of O. kilimandscharicum does not involve external inputs like fertilizers, pesticides or insecticides. However, Evelyn Ndenga from ICIPE's Applied Bioprospecting Programme points out that farmers around Kakamega forest still grow maize, beans and other food crops. Cultivating those medicinal plants was meant to provide supplementary income and reduce dependency on the forest, she says. Currently, nearly 1,500 farmers within four districts around Kakamega forest grow the two plants.

Ligale said those who previously lived in grass-thatched houses now have better homes; awareness about environmental conservation has improved. Many local people now seek computer and business management skills to improve their production and marketing.

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

How to control passion fruit diseases

Farmers can increase passion fruit production and income, if they can be able to identify and prevent fungal and bacterial passion fruit diseases.

The Organic Farmer

A major problem facing passion fruit farmers across East Africa is an increase in fungal and bacterial diseases which have forced most growers to stop production altogether. To help farmers, we have compiled a list of the most common diseases, how they can identify them and measures they should to take to protect their crop. We hope farmers will use the information to prevent the diseases and improve on passion fruit production:

Brown spot disease (*alternaria passiflorae***)**

This is the most important disease in the passion fruit production in the world today. Its symptoms are brown spots on leaves, vines and fruits. The spots can be upto 10 mm in diametre on the leaves often extending along the veins and drying out in the centre. On the stems, spots are up to 30 mm long. When they occur at the leaf edge, they may kill the vine, resulting in "dieback" appearance. On the fruit, the spots are light brown, light and sunken; they often merge, covering large areas and produce large brown spore masses. Spores produced on the leaf, stem and fruit, are dispersed by wind-blown rain. Warm moist weather favours the disease's development.

Preventive measures

• Planting disease-resistant varieties such as yellow passion and its hybrids is one way of avoiding this disease.
• Collect all diseased leaves and vines and ensure the field is free of any fruit residue.
• Prune vines to reduce density and humidity that encourage the disease.
• Spray copper-based fungicides. An interval of 2 to 3 weeks should be observed in order to protect new shoots.

Septoria spot (*septoria passiflora***)**

The disease attacks leaves, stems and fruits. Brown spots up to 2 mm with tiny black dots develop on leaf surface. Infected leaves fall off (the diseased vines have no leaves. Light brown spots with tiny black dots can be seen on the fruit. Spores produced by the blackdots are blown by wind to other vines during wet, windy weather further spreading the disease. The disease is spread by rain, dew and overhead irrigation. Warm moist weather favours the development of the disease.

Preventive measures

Preventive measures are the same as those of the brown spot disease.

Fusarium Wilt (*Fusarium oxysporum f.sp passiflora)*

Symptoms consist of yellowing of leaves, collar region of affected plant at soil level turns brownish and vertical cracks. The vines wilt, followed by a complete collapse of the plant. When the stem is split, its vascular tissue shows brown discolouration.

Preventive measures

• Affected plants should be removed and burnt. Snap off the affected parts or remove the affected plant manually.
• Do not cut affected plant tissue and then use the same on other healthy plants.
• Keep the base of the plant clear of grass and weeds which encourage fungal development.
• Grafting to wilt-resistant yellow passion fruit rootstocks is the most effective way of controlling the disease.

Phytophthora blight (*phytophthora nicotianae var. parastica***)**

Affected leaves are water-soaked and light brown in colour. They fall easily leaving the vines without foliage. The affected areas of the stem are first purple and later brown above the graft union. They may completely girdle the stem causing wilting and collapse of the vine. The fruit shows large, water-soaked areas and the diseased fruits fall off easily and are later covered with a white fungal growth. Another strain of fungus (*phytophthora cinnamon)* causes root rot. The yellow and purple varieties have different patterns of susceptibility. The yellow vine is affected by the fungus *p. cinnamoni* and the purple vine is susceptible to *P.nicotianae.* Both fungus strains attack both passion fruits and can cause root rot, wilt, damping off and leaf blight. Fungal spores are initially produced in wet soil beneath the vines and are splashed up to lower leaf canopy. Wet windy weather encourages the disease.

Preventive measures

•Observe good field sanitation
• Prune and keep the ground covered with grass to reduce the possibility of disease spores being splashed on the lower leaves
• Graft with resistant varieties
• Apply copper-based fungicides every 2-3 months during the wet season to reduce disease incidence. Wounds on the stem can also be painted with copper- based fungicides.

Passion fruit woodiness Virus (PWV)

Passion fruits affected by viruses in this family show light and dark green mosaic pattern often with light yellow speckles. At times small, yellow ring spots may develop on upper leaf surface. Infected fruits are small and misshaped with very hard rind and small pulp cavity. When the affected fruit is cut, the inside rind tissue may have brown spots. Some strains of the virus cause cracking of the affected fruits. The viruses are spread by aphids and pruning knives. It is also found in bananas, pumpkins and many other weeds

Preventive measures

•Farmers are advised to use clean planting material
•Use clean pruning tools
•Use resistant rootstocks such as yellow passion fruit.
•Remove diseased vines from the field
•Ensure the passion field is free of weeds.
•Do not plant bananas or pumpkins near passion fruits.

Source Infonet-Biovision

Ticks pose a great danger to livestock

They look small, but they can cause heavy economic losses to farmers if not controlled on time.

The Organic Farmer

The worst of all types of ticks are the brown ear ticks. They harbour the parasite that causes the dreaded East Coast Fever (ECF). Ticks are masters of survival. Burning the pastures does not help as ticks hide up to 20cm deep into the soil, and they can survive for up to two years without food. Moreover, the main problem is that ticks are quickly getting resistant to chemicals; farmers should frequently change the chemicals they use to control them. Worse still, many agrovet shopkeepers are not willing or able to inform the farmers about the efficiency of acaricides (anti-tick chemicals). Very often, farmers dilute the chemicals too much in order to save money.

The most promising chemicals are those made from synthetic pyrethroids (chemicals that act in the same way as pyrethrum). They are applied in dips or by hand spraying. These chemicals also come in oil-based formulations that allow the farmer to pour on the animal's back. The oil spreads throughout the animal's body repelling any ticks.

Since the frequency of application is normally on a weekly basis, the cost of this control measure is too high for many small-scale farmers. Dipping for instance, costs 15 to 20 shillings per cow every week. It is unfortunate the Government stopped the management of cattle dips and handed them over to communities or private dip-owners. Very often farmers are cheated as the dip-owner does not apply the right and or sufficient amount of chemicals which have made ticks to develop resistance to some of the chemicals.

With fencing, pasture management and rotational grazing farmers can avoid or reduce the damage caused by ticks; zero-grazing for instance sharply

A brown ear tick before sucking blood

reduces the effect of ticks. Free-range chicken if allowed to roam in the cattle shed can pick and thus reducing the population of ticks in a cow.

Organic ticks control methods

Diatomite: This white powder of Diatomaceous earth is efficient in the control of ticks. The sharp edges of its particles perforate all body parts of insects and at the same time absorb the body fluids. This results in total dehydration and eventual death. As it works physically rather than chemically there is no chance of insects building up an immunity, or resistance. It can be dusted on cattle, pigs, goats etc for control of ticks and fleas.

Pyrethrum: Pound 250g of dried flowers with little water into paste. Dissolve in 10 litres of water and boil for 20 minutes. Leave it to stand for 12 hours, then sieve and apply with a knapsack sprayer. Alternatively, one can mix 250g of dried flowers in 10 litres of water and let it stand in a dark room for 12 hours (always use protective clothing when handling pyrethrum).

Tobacco: Boil 1 kg of fresh tobacco plant leaves in 10 litres of water for 30 minutes. Allow to cool, filter and rub the preparation on the infested animal using a clean cloth. 5 litres of this solution are enough for an adult cow.

Plant extracts: There are some other plants that are efficient as repellents, for instance

A tick infested ear (above left). Areas affected by Brown ear tick in Kenya

Series on parasites

External and internal parasite infestation are a serious problem among livestock keepers. However there are various methods farmers can use to protect their animals against them. In the last issue we gave you tips on external parasites such as fleas and lice. In this issue we feature the control of ticks in livestock, and in July we will give you tips on internal parasites.

The soft ticks that affect chickens

The chicken soft tick, (*Argas persicus*) is a serious pest in chickens and it causes a great loss to the poultry farmer. Although the parasites very seldom kill the chicken instantly, losses occur in terms of stunted growth, decreased body weight in broilers and layers and reduced egg production. Chicken soft ticks can cause economic damages, as the egg production of layers can drop to more than 30 percent. They can cause paralysis and can also transmit a disease called spirochaetosis, which is a gut condition that leads to diarrhoea.

In cases of an infestation, the larvae are found all over the cages day and night, while the adults hide in cracks and crevices during the day and emerge to attack the birds and suck blood at night. The female lays eggs in the cracks and crevices of the poultry house and under the bark of trees in batches of 100-250. Each female lays 4 to 7 batches of eggs in her lifetime.

Preventive methods

Efficient poultry management methods assist materially in minimising parasites population.

- Sanitary measures (cleaning or fumigating the chicken house) should be properly carried out.
- Periodic removal of droppings as a source of breeding places for many insects and beetles should be practiced as some insects and beetles transmit chicken diseases.

Control methods

Diatomite: As mentioned in the article above, is a very effective method in soft tick control if dusted on the chickens. Dust chickens in diatomite daily and dust housing, change bedding etc. weekly as the ticks live and breed in the bedding and in cracks in the chicken house.

Pyrethrum: Dip chickens twice a week in a pot filled with the pyrethrum extract (preparation see article above)

It is important to ensure chicken are released to run around the compound and have enough space for movement, this helps to reduce the build up of pests in chickens house.

Chickens require good care to be productive

We are receiving many questions from farmers regarding poultry keeping. This is a clear indication that they regard poultry keeping seriously and as a good source of income. However, disease control and general poultry management are some of the challenges farmers are facing. Proper housing, feeding and sanitation are important in any poultry keeping enterprise. In this issue, Su Kahumbu attempts to answer some of the questions we have received in the past few weeks; we have answered many other questions directly by phone.

My hens are not laying eggs!

Kitui Children of God Relief Institute is rearing Kienyeji (indigenous) chickens, we have 130 of them since January 2009. My worry is that they have not been laying for all that long. Please advice.
Ann Tel. 0725 085 184;

Hi Ann, I would need to know the ages of the hens to answer this question, layers normally start laying at around 7 months of age. It could just be that your hens are young? Also do not expect them to lay, all at the same time and as they are kienyeji types, they may have a few days interval between laying. If they are not the same age, you will get some laying while others may take time to start laying.

Sometimes we make the mistake of expecting 130 chickens to produce 130 eggs. This would be ideal, and would be a 100% production. But, more often than not, only 70% of your brood will be actively laying at any one time. In your case, the fact that they are kienyeji and could perhaps be of mixed age it is hard to tell how many should be laying.

Unless the birds are looking unwell, with ruffled feathers and sunken eyes, I would not be worried. Make sure they have access to ample clean water, feed, sunlight and enough space for roaming around. Keep them happy and you shall be rewarded.

If provided with good care all chicken breeds will lay eggs. Photo Kamau

Preventive medication for chickens

Which is the most effective medicine against early mortality in chicks? Can it also prevent them from getting diseases (both Turkey and hens)?
Tel. 0712 249 845

Poultry chicks normally suffer from coccidiosis which can lead to death. This disease can be detected when you notice the chicks starting to have a loose stool, at first a brownish colour that soon changes to a bloody colour. There are many sulphur-based remedies available from agrovet shops that you can mix with the drinking water. Another solution is EM effective micro-organisms. A teaspoon of EM in 5 litre of drinking water helps to prevent this disease, as does a teaspoon of vinegar in the drinking water. It is also a good idea to add some vitamin drops to the drinking water when the chicks are unwell.

A trick I learnt for spraddle leg (this is a condition where they cannot stand and their legs seem to grow at funny angles from the knees) which is very common in broilers is to add a few drops of cod liver oil to their drinking water once a week from the time they are 4 days old. On average I would get at least 5 chicks with spraddle leg, I swear by this remedy of cod liver oil. Be careful not to use too much as it will give the chicks loose stools. Also be sure to start early as once the knees are affected it is almost impossible to cure as the birds gain weight and put more pressure on their joints.

Kenbro chickens in big demand

Dear Su, I am a month old Kenbro Poultry Farmer. Please give contacts of farmers of the same. I need to learn from them. Thank you. Anna, Ruai Tel. 0722 388 949.

Dear Anna, I do not currently know of any farmers producing Kenbro at the moment. I produced them myself and found them to be so much fun. They seemed more alert than the normal white meat producing chicken, almost like a cross between a layer and a broiler. They seemed to be more resistant to disease, I reared mine free range so that during the day they were outside in an enclosed area, but during the night they were in an indoor secure area. This meant that they spent a lot of time running around enjoying the outside. They seemed much more active than broilers and this could be why they gained weight at a slower pace. They seemed to be roughly 3-4 weeks behind the growth weight of white broilers of the same age. Physically they also had longer legs and when slaughtered, had a redder meat than the white broiler which has very white meat.

I also noticed that as they grew up, they seemed to mature quite quickly and we soon had very clear ideas which were female and which were male due to their crown size and calling sounds. The males had large crowns and started waking us up in the morning as roosters normally do!

Another very interesting observation was how they were so hardy when they were chicks. We had 1% mortality with the Kenbro's whereas we had 4% with the white broilers.I hope this information helps and would encourage any readers who are rearing Kenbro's to call you so that you can compare your production experience.

A broody hen changes its behaviour

I would like to venture into poultry farming. How will I know that a hen wants to incubate eggs? Tel. 0727 599 114.

This is a good question, and the answer largely depends on the type of chickens you have and also sometimes the character of the chicken.

Hybrid chickens like the commercial red and black layers are extremely bad

continued on page 6

>>>> from page 5: Chickens

brooders infact they do not brood. They lay an egg a day for a period of about 18 months if they are given a good layers feed. Once the egg is laid they get up and go. They very rarely stay for longer than a few minutes before they are on their way. If they happen to lay the egg in an open field and not in a nesting box, they more than likely will not come back to it, though they may lay another egg in the same place the next day. They do not get broody or defensive and do not hide their eggs very well.

A *kienyeji* chicken on the other hand does not lay every day, and when she starts she finds a secretive spot if possible. She will continue to lay every day for about 12 days and then she will start to brood her clutch in the most protective manner. As she builds up to this stage you will notice her behaviour change. Where she may have been very normal she suddenly becomes secretive and at times you may think she is lost as she hides for long periods of time.

Observe carefully

An easy way is to watch your hen and see where she is laying her eggs. If she is a kienyeji type, leave an egg or two where she is laying her clutch. You may take some away for safety, however when she sits to incubate the last one return all the eggs to her. Be careful when doing this; wait until she is off to feed.

If you would like to brood many eggs a combination of a few red layers with kienyejis and some cockerels is good. Hopefully the cockerel will mate with both types of hens and fertilise all the eggs which you can brood under the kienyeji hens. On the character of chickens, sometimes you get the odd hen that is expected to brood but decides not to and vice versa. Observation can be very enlightening and a lot of fun.

farmers forum

020 445 03 98 0721 541 590 0738 390 715

Serving farmers with information and inputs

Since we started the publication of *The Organic Farmer*, we have always mentioned a number of organic inputs that farmers can use in organic production. However, most farmers cannot be able to get these inputs in every part of the country. Every week, we receive enquiries from farmers: "*TOF*, where can we buy diatomite powder, neem or pyrethrum-based insecticides? Our local agrovet shops do not stock them." This is an indication that many more farmers would like to go organic but it is difficult for them to get the right inputs.

Another serious problem is training and information. We are really committed to uplifting the standard of farming and raising incomes in rural areas. To achieve this objective, we have decided to set up four farmer information centres in selected parts of the country; They will be called *i-TOF*s (since they are connected to and managed by *TOF*). These centres will have two basic functions: Transfer of knowledge and assisting farmers to get organic inputs.

1. Transfer of knowledge: The information centre will be a library of sorts that will provide farmers with a bulk of information they need. All issues of *The Organic Farmer* since we started publication in 2005, will be available in one big volume for farmers who would like to make a reference. The centre will also be equipped with a computer which has all information on farming from the infonet-biovision project (you remember the cartoon of the farmer sitting at a computer)? Each of the centres will have an organic agricultural extension officer. He/she will be in the centre for two or three days in a week to assist farmers who may need some information or advice. The remaining days of the week, the extension worker will visit the various farmers groups to train them on organic farming technologies such as making plant extracts, compost making or visit a farmer who may be facing a pest problem or disease. These services will be offered free of charge.

2. Organic input scheme: One main problem as we have mentioned above is the lack of organic inputs in almost all parts of the country. There are about 15 organic inputs that farmers really need in organic farming, because much of the material used in organic farming is available on farm. After a lot of discussions with farmers, agrovet shops and manufacturing companies on how we can make the inputs available to farmers, we came up with the following solution: The *i-TOF*s will be connected with a local agrovet shop, which will stock organic inputs in a section of the shop. It is from this shop that farmers can get the organic inputs they need; of course they have to pay for it! *TOF* will produce a small leaflet on how to use the various inputs in the correct way.

Make use of centres

The four centres are a kind of a pilot project. They offer farmers a good opportunity to get information, to talk together and to share experiences – the *i-TOF*s could become a sort of a market place. At the same time farmers will have an agrovet shop where they can buy organic inputs. If they expect the agrovet shops to stock them, they have to buy the inputs. No shopkeeper can keep or buy stock which they cannot sell, in the same way that no farmer will grow a product which they cannot sell or eat. Depending on the success of these centres , the project can be expanded to other parts of the country.

In our July issue of *The Organic Farmer* we will inform you more about these *i-TOF*s, give you details where they are and how they will be operating. We shall repeat this information in our August issue.

In July and August, all our readers including farmers groups, agricultural extension workers and organisations working with farmers will be updated on this new service. The same will be aired through our radio programmes on KBC radio.

Do not play politics with maize

I am very disappointed at the way our politicians are playing politics with maize. This is happening at a time the country is facing a critical food shortage. The daily reports in the local press and the electronic media are very confusing to Kenyans. Quality is not the work of politicians. I think this is very unethical, the government should come out and state its position regarding the quality of the imported maize. nobody can risk buying a commodity whose quality is questionable.

Mary Oduor, Nyanza

Select well-bred dairy cows

Please send me information on where I can buy pedigree dairy in calf heifer registered with the Kenya Dairy Recording Services.
Charles , 0738 397 977

Indeed, dairy farming as a business requires that farmers acquire good sources of breeding stock. Most livestock breeder farms are encouraged to register their animals with the Kenya Stud Book by the Kenya Livestock Breeders Organization. The Kenya Friesian Breeders society is a member of the Kenya Livestock Breeders Organization.

There are several Friesian dairy farms that are members of the two societies and are registered with the Kenya Stud Book. If you are interested in a Friesian in calf pedigree heifer, you can make enquiries about the availability through your nearest District livestock extension office or by direct contact, to the under listed farms. William Ayako

Breeders

Kapsoen Farm, Box 1025, Kitale,
Mweiga Estates, Box 453 Nyeri,
Wangu Embori, Box 219 Nanyuki,
Tintawn Farm, Box 631 Karuri,
Pokea Farm, Box 157 Njoro,
Kenana Farm, Box 23 Njoro,
Sunset Farm, Box 13366 Nakuru,
Kimwatu Farm, Box 256 North Kinangop,
Nyara Tea Estate, Box 18 Limuru,
Amboni, Box 595 Nyeri,
Risa Farm, P. O. Box 641 Nairobi,
Chura Farm, Box 244885 Karen Nairobi
Deneside Farm, Box 72 Njoro,
Maradju Ltd, Box 362 Naivasha,
Fairview Dairies, Box 48592 Nairobi,
Chemusian, Box 86 Menengai West,
Kihumba's Dairies, Box 14827 Nakuru,
Homa Lime Company Box Private Bag Koru,
Ngamini Farm, Box 33 Njoro,
Ngera Fancy Farm, Box 1273 Nakuru,
Thengeini Farm, Box 611 Nakuru,
Egerton TDU Farm, Box 536 Njoro,
Bonbeef Farm Ltd, Box 17947 Nairobi,
Baraton University of East Africa, Box 2500 Eldoret,
Ngongogeri Farm, Box 140 Njoro,
KARI- Naivasha, Box 25 Naivasha,
KARI Ol joro orok, Nyahururu Private Bag Ol joro orok.

Upgrading or replacing your dairy cows?

This list of farms with the best breeding stockist is very helpful. However, the cost of these pedigree cows is quite high (between Ksh100'000 to 200'000) and beyond the reach of many small-scale farmers, not to mention the high level of management, feeding and maintenance. The Kenya Dairy Board (KDB) together with a number of organisations in the dairy sector are encouraging farmers to upgrade their dairy cows through selective breeding. Pokea Farm Njoro (Tel. 0733 555 621) has a training programme for dairy farmers who want to upgrade their milk herds. Farmers groups interested can contact this farm and arrange for training. The farmers have to pay a fee for these training, depending on their location and duration of training. **TOF**

Maize cobs are poor quality feed

What is the nutritive value of maize cobs in feeds? 0722 304 469

As much as maize cob is regarded by most farmers as an important feed resource during dry season in some parts of Kenya, it is generally of very poor quality in terms of the available nutrients it contains. Some studies done in Kenya as well as Tanzania in the seventies indicate that the crude protein value in the cob varied between 3- 4%.

This value is too low to support the protein requirement of a dairy cow if offered as a sole diet. Other implications involved in feeding such a poor diet include low voluntary intake, poor digestibility and hence reduced production (growth or milk). The metabolisable energy (ME) in the cob was reported in those studies to range between 1.60 – 1.80 Mcal/kg of dry matter. While the required ME for maintenance of a steer weighing 300 kg was 9.4 Mcal, the cob was found to contain 7.99 Mcal. Another negative attributes of maize cob include high fibre content estimated at about 30% of the dry matter. **William Ayako**

Some farmers wrote to us that they are using maize cobs as feed and that they never had any problems.

*This is okay. But farmers, who need to use maize cobs because of lack of other feed are advised to incorporate ingredients with a high protein content such as soya bean meal, fish meal sunflower or cotton seed cake to make the feed more nutritious.***TOF**

Termite control is not easy

I planted 1000 seedlings of eucalyptus (South African variety) but I have lost almost all of them to termites. Please advice. Tel 0722 269 184

Termites are very difficult to control once they have established themselves in an area. But you can try spraying with a solution of bicarbonate of soda and dishwashing soap in water. The proportion should be 1 teaspoonful of bicarbonate to 1 litre of water. Hot water poured into a termite nest can also eradicate them. Urine also repels termites especially if it is applied around the nest. Mulching material tends to attract termites because they feed on decaying plant material. Try and remove all these type of plant material around your seedlings and see if this will keep termites away. **TOF**

...answers in brief

Carrots

Which diseases affect carrots? Tel. 0725 652 290

The main disease that affects carrots is the leaf spot disease (*alternaria dauci*) whose symptoms include small spots on the leaves. This disease makes the whole crop to turn brown especially during wet conditions. The disease can wipe out the whole crop if it is not controlled on time. You can treat the crop with copper based fungicides which are allowed in organic farming. Another common disease is the bacterial soft which can be controlled through crop rotation and maintaining crop hygiene.

Vegetables?

I would like to get information on vegetable dehydration.Kipsang Kirui Tel. 0729 594 704.

There are several simple driers that can be used for vegetable drying. We are yet to identify a suitable drier that is affordable for small-scale farmers. Soon we will write an article on various methods and equipment that farmers can use for dehydration.

Plant trees and restore our fast disappearing forests

With the long rains having started in most parts of the country, this is the most appropriate time for farmers to start planting trees. The forest cover in the country has reduced from 10 to 2 percent in the last 20 years. One of the reasons for deforestation is largely due to human encroachment into our gazetted forest areas. Most farmers know that it is now very difficult to predict rainfall patterns due to climate change. This has affected food security and made it difficult for farmers to plan their farming activities. Our water sources have reduced and many former permanent rivers are now seasonal streams.

Farmers have been blamed for deforestation since most of the forested land has been turned into farmlands, but they can also be part of the solution if they embraced the tree planting on their farms. Trees have many benefits to farmers; apart from being a source of firewood and building material, they also prevent soil erosion. Farmers have many options on where to plant

Good seedling grow into healthy trees

trees. They can be planted on hedges or even along the terraces. Trees have many advantages, they can grow on hills and rocky places, they do not dry easily during times of drought and help protect fields and houses from wind. Agroforestry involves the planting of trees and crops or pasture on the same field. Farmers can choose to plant fruit trees and crops together; the trees in this case help the crops by drawing water from deep in the soil while keeping the soil fertile and cool. But farmers need to be careful when choosing the type of trees to plant. Trees such as the eucalyptus or pines should not be planted near crops. The best trees to plant with crops are those that help fix nitrogen such as grevillea, leucaena or even sesbania.

The best way to plant trees is to do it in rows (also known as alley planting), using this method: Farmers can leave a space of 2 to 5 metres between the tree rows and then plant their crops between the rows. If the trees are nitrogen-fixing, they can provide the plants with nitrogen and mulch, which stores moisture and organic matter for use by the plants. Trees that are planted with crops should be fast growing varieties which can be prunned and be able to regenerate after a short period. Trees such as eucalyptus can also be planted in an isolated part of the farm which is not being used for crops. Such perennial trees are planted in a wood lot mainly for the purpose of providing firewood, timber or building material.

The Organic Farmer

The newspaper for sustainable agriculture in Kenya Nr. 8 December 2005

Farmers lose a lot due to poor storage. *(Photo courtesy of ICIPE)*

Benefits of proper maize storage

Early harvesting and good storage can reduce losses and increase earnings for farmers.

The Organic Farmer

In order to protect their harvest, many farmers in Kenya build well-sealed stores that cannot be broken into by thieves. But they forget other "thieves" already waiting in the stores. These include weevils, the larger grain borer or ©Osama" and even moulds that contain deadly poisons such as aflatoxin. Many people died in parts of Kitui district last year after eating poorly stored maize that contained aflatoxins.

Can you imagine buying fertilizers, seeds and tending your maize crop all year round, only to have it destroyed by pests after harvest? Yet this is what happens to many farmers every year. According to the United Nations Food and Agriculture Organization (FAO), farmers in Africa lose between 15 to 40 percent of their harvest to pests. This can be avoided if only they could take a few simple measures to stop the loss, called "post-harvest loss", during storage.

Many buyers, milling companies and the National Cereals and Produce Board often reject poor quality maize, forcing farmers to sell it at lower prices to middlemen. This is mainly due to poor harvesting and storage.

Early harvesting is the answer

Losses always begin in the field. It is a practice among many communities in Kenya to wait for the school holidays to start harvesting. Of course we understand that smallscale farmers are not able to pay for outside labour. This is the reason why they depend on their children for harvesting.

But this will already be too late. At the moment, many farmers have not yet harvested their maize, although it has been raining in most parts of the country in the past two months. Farmers are going to lose a considerable quantity of maize due to rotting and pests even before they harvest. Most of the maize varieties planted in March and early April should be ready for harvesting by October. If the already mature maize stays too long in the field, the husks tend to open. They are then not only exposed to pests, but also to water from the rains. The water in the cobs is responsible for the yellow colour and rotting. Hybrid varieties are especially vulnerable to pests and decay. *See page 3*

BIOVISION

In this issue

Dear farmers,

This is the last issue of the The Organic Farmer this year. In the last 12 months, many of you have faced a number of challenges in your efforts to increase agricultural production, both for food self-sufficiency and for sale. Despite it being the festive season, many farmers are already engaged in harvesting maize and related food crops. That© why we have given additional tips on maize storage. It will be most unfortunate if farmers lose their precious crop after working so hard during the last 12 months.

Now the year is coming to an end. What does it mean to you? First of all it is helpful and always important that farmers take stock of failures and achievements. This gives you an opportunity to evaluate yourself so as to perform even better in the coming year to avoid the same mistakes. The decisions you make today will have consequences tomorrow.

After selling farm produce, farmers need to focus sharply on the tasks ahead. A lot of financial requirements will be waiting for you, such as land preparation, farm inputs and even paying school fees in the month of January. You may also have various debts that need to be settled. All these obligations mean that you have to plan properly in order to meet all these responsibilities.

Every year farmers who do not prepare their activities carefully are caught up in a vicious cycle of problems. Planning is an important step to avoid troubles later in the year. Careful choice of what to plant and where to plant is essential; not all plants like each other, as you can see on page 8. If a particular crop has not done well this year, the farmer has to find out the reason for the failure and make the necessary changes - of course not forgetting what the market demands.

We are looking forward to a fruitful and rewarding relationship with you in the coming year. We should not forget that agriculture is the backbone of this country©economy. Let us work together to increase production in a sustainable way that uplifts the living standards of our people. We wish all our readers and their families a happy holiday season and a prosperous New Year.

The Editors

MY OPINION

By John Miriti

Whenever I introduce myself as a farmer to other people, the reaction I get is that of somebody who is way down the career ladder. This is despite the fact that we farmers play a very important role in Kenya's economy. We should be proud of our occupation and let other people know this fact. It is from the work of our hands that millions of our people get something to eat. Otherwise they would not survive. Farmers are hardworking and self-employed. It is so satisfying to work on the land. It is what makes me to be proud as a farmer.

John Miriti is farmer in Meru.

The Organic Farmer

Nr. 8, December 2005

The Organic Farmer is an independent newspaper for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by ICIPE and distributed free to farmers. The reports of *The Organic Farmer* do not necessarily reflect the views of ICIPE.

The Organic Farmer is sponsored by BioVision, a Swiss based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher
International Centre of Insect Physiology and Ecology (ICIPE)
P.O.Box 30772, 00100 Nairobi
KENYA
Tel. +254 20 863 2000
e-mail: icipe@icipe.org
homepage: http://www.icipe.org

Editors
Peter Kamau, Peter Baumgartner
Secretariat
Lucy W. Macharia
Advisory Board
Dr. Bernhard Löhr, ICIPE
Dr. Nguya Maniania, ICIPE
Dr. Fritz Schulthess, ICIPE
Address
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com
Layout:
In-A-Vision Systems(k)

ICIPE assisting African farmers

ICIPE will strengthen the cooperation with African universities to promote agriculture in Africa.

The Organic farmer

Dr. Christian Borgemeister

Farmers in Kenya and the rest of Africa face a big problem with insect pests such as the larger grain borer, aflatoxin (a toxin produced by a fungus) in maize, thrips or even the diamond backmoth. If you mention these and many other pests, the name of one person always stands out - and that is Dr. Christian Borgemeister, the new director-general of the International Centre of Insect Physiology and Ecology (ICIPE). He is credited with having pioneered research on ways of controlling these devastating pests.

Born in 1959 in Germany, Dr Borgemeister is no stranger to Africa and its problems. He worked as a researcher at the the International Institute for Tropical Agriculture (IITA) in Benin, West Africa, between 1992 and 1997. After that he moved to the University of Hannover in Germany where he rose to become a professor at the prestigious Institute of Plant Protection at this university last year. But Africa would not lose its grip on him. "It is really a new challenge for me to lead ICIPE", says Borgemeister, who describes himself as practical in his approach to problems. "ICIPE is specialised in research into insects but our field of knowledge stretches further. While we try to solve problems of African agriculture we can help improve the living standards in the continent".

That is one of the reasons why ICIPE wants to strengthen the cooperation with African universities. "We want to establish good relationships", explains Borgemeister, "there exists a great potential because African Universities have developed very well since I left. This is especially so in Kenya in particular and in East Africa in general", he says

Capacity building is a magic word for the new ICIPE-director. He sees opportunities in that area for ICIPE. " It is an African Institute. We work in 24 African countries. The knowledge we gather in all those countries has to be used in a more intense way for the good and the benefit of the people in Africa and especially for the African farmers."

That is why Dr. Borgemeister attributes a great value to the newspaper *The Organic Farmer*, published by ICIPE. "Scientists can share their knowledge with the farmers, and the farmers can see the commitment of the scientists when they are trying to solve the farmer©s problems".

Fight against malaria

Dr. Borgemeister pleads for continuity of the work of ICIPE. The baseline research has to be activated more, as well as the advice to farmers. "We have to supply them with natural ways to fight pests in their crops."

But the task of ICIPE stretches further. It is also one of the leading organisations in the world in the fight against malaria. "We are not allowed ever to lose sight of the problems malaria brings along, and we always have to put human life at the centre of our focus." The manifest of ICIPE is of great importance to Dr. Borgemeister. It states: "ICIPE©s mission is to help alleviate poverty, ensure food security and improve the overall health status of peoples of the tropics by developing and extending management tools and strategies for harmful and useful arthropods, while preserving the natural resource base through research and capacity building".

"Those are challenging goals", says Dr. Borgemeister, "especially when we look at all of them together. But the effort is worthwhile."

Farmers can easily reduce storage losses

With simple storage measures farmers can keep away pests and can avoid the destruction of their precious harvest.

By *The Organic Farmer*

Harvesting at the right time and using the appropriate storage methods can greatly reduce losses due to insect pests, rodents and development of mould. These are the biggest threats to farmers in their efforts to get a good harvest. As we wrote on page 1, farmers should ensure maize is harvested immediately it matures. What else can they do to save their maize?

This type of maize storage encourages pests. *(Photo courtesy of Helvitas)*

Careful preparation

Sorting: The crop should be sorted to remove the cobs that have already been damaged by insects and mildew (mould). Studies have shown that sorting helps to reduce the amount of damage by up to 36 percent.

Drying: It is always good to dry maize before it is stored. Maize cobs should be left to dry in the sun for at least one or two days.

Shelling: Another step to protect maize is to shell it. Shelling is the best way to check pest damage. Pests prefer maize while it is still on the cob because it is easier for them to move around the cobs. If a farmer has to apply pesticides, it is more effective in shelled maize. After shelling, maize should be dried in the sun for 3 to 4 days. This should bring the moisture content to 13 percent, which is the best moisture level for long-term storage.

Storage: If you have to build a store, it should have adequate space for air circulation at the lower end and even more space in the upper part. Indeed the store should have at least 40 to 50 percent open space for the stored cereals to dry properly. The store platform should be raised up to 2 or 3 feet (or 1 metre) off the ground to allow for air circulation. (Do not forget that air circulation discourages pests which like a warm environment!) If you use a store, which is already built, thorough cleaning is recommended. This will ensure that all remains of the previous harvest, which could be infested by weevils, are removed and destroyed. Weevils reside in cracks in the wood in the store. They can survive there until the next harvest and therefore need to be removed before fresh grain is stored.

Fumigation: Farmers are advised to fumigate the stores before storage (fumigation is the use of chemical fumes to kill pests). Fumigation tablets are available in agro-veterinary stores. .

Methods of pest control

Even with all these precautions, farmers have other methods to control pests. In some parts of the country farmers use cypress leaves and eucalyptus trees to help repel pests but their effect is not long lasting. Neem leaves are also used, and act longer. Wood ash is also very common as it prevents the movement of pests in maize. A new, useful and natural dust for pest control is Diatomite (see box). Unfortunately it is not well known by farmers. But since they cannot afford to loose their precious maize harvest, they can apply the recommended chemical pesticides if the alternatives given above are not effective.

Every farmer should check the grain regularly while in the store to make sure pests do not re-invade it. Controlling rats and mice is also important. Rats eat large quantities of maize, especially during storage. They can be controlled by use of traps and rat poison. On raised stores, fixing of metal rat guards on the supporting poles can stop the rodents from gaining access to the store. The rat guards look like a collar fitted around the pole. Great care must be taken when using fumigants or rat poisons, however, so that children, pets and livestock do not become exposed to these chemical products.

A natural preservative for stored grain

Diatomite is one of the most widely used dusts in the control of pests in stored grains. It is a natural preservative dust that does not affect the quality of grain. Diatomite is a porous white rock made of fossilised, microscopic plants called diatoms, which existed in pre-historic times. The powder consists of millions of sharp edges, which resemble broken glass. When the edges come into contact with the insects, the outer coat is pierced, killing the insect. With diatomite, farmers do not need to use chemical pesticides, which leave residues in stored grains. It is not poisonous to animals and human beings, although farmers should take care not to inhale it.

In Australia and America, farmers have used diatomite in pest control for many years with good results. Although it is available in good quantities in South Africa and Kenya, very few African farmers use it for pest control.

Application

Farmers can apply 3 kg of the dust to 1 tonne of maize, barley, wheat, oats, rice or sorghum directly into the stored grain and mix I with a shovel. The outer surface of the grain is covered with the dust with the compound at the time of storage to eradicate or stop any pests from damaging the grains.

In Kenya, Diatomite is mined at the African Diatomite Industries at Kariandusi in Gilgil and is sold under the brand name Kensil F. The cost is about Ksh 20/kg. Interested farmers can get in touch with the company at the address below:

African Diatomite Industries,
P.O. Box 32 Gilgil
Tel 050-4015209, 050-4015209. (*TOF*)

Farmers benefit from growth activator

The activator is helping farmers get better results and strengthen plants to withstand diseases and even pests.

By Peter Kamau, Kangema

If any one were to claim that organic inputs such as compost are slow in promoting plant growth compared to chemical fertilizers, 70-year old Rosemary Nyambura would laugh it off. The mother of six children is among hundreds of farmers in central province and the rest of the country who have discovered the use of Effective-Microorganisms (EM), a solution of beneficial bacteria that help to speed up the decomposition of organic matter while releasing essential nutrients for use by plants. The EM technology is changing fortunes for many farmers who are now using it for many purposes on the farm to increase production.

Compost decays faster

"Before my compost used to take 3 to 6 months to decompose, when I apply EM it takes only 1 month. My crops are healthier and the yield has increased considerably," says Nyambura.

Together with 28 other members of the Ngoeini-Kanyenyaini (Ngoka) Self-Help Group, Nyambura had been introduced to using organic mode of production back in 1999. Then, the group was growing Arabicum flowers organically with farmyard manure. She later abandoned flower growing due to the poor prices offered by middlemen. It was then that a businessman from Kiriaini market taught them how to use EM. She attended several training sessions until she became conversant with compost making and preparation of Fermented Plant Extracts (FPE) using the activator.

Yield has increased

From then, farming has never been the same again for Nyambura. Today she is one of the most successful farmers in Kangema division of Muranga district. The crops in her 7-acre farm show what the activator can do to crops if it is properly used. Her 3-acre market garden is intercropped with healthy passion fruits, onions, turnips, courgettes, cabbages, sukumawiki, capsicums and improved pumpkins. A half-acre is reserved for maize while the upper section is a cattle shed with 6 dairy cows that provide farmyard manure while the remaining 4 acres are under tea.

Rosemary Nyambura shows her healthy passion fruits. *(Photo TOF)*

She has seen a great improvement on the productivity of the various crops on the farm. " I used to harvest only 6 bags of maize, last year I got 10 bags on the same piece of land. My cabbages now weigh an average of 6 kg apiece. The most interesting thing with organic farming is that the yield keeps on increasing every year. By eating organic foods, my health has improved too," she says

With the extract she has managed to control many pests and diseases that were difficult to control even with chemicals. Another big advantage she has discovered with the use of EM is that crop residues sprayed with the solution decompose fast. The residue is readily converted into quality compost that cannot transfer diseases from one crop to the next. She has also reduced the number of crop rotation cycles in each portion of land. This is because the soil fertility is maintained and enhanced while diseases and pests are controlled.

Local material

The 28 members collect money and buy the EM jointly (a litre costs Ksh 200), they then prepare the FPE as a group and use it in their individual farms. The remaining cash is deposited in the group©s account for future purchases.

"The good thing with organic farming is that I use material which is readily available on the farm. The problem with many farmers who use chemical fertilizers and pesticides is that they do not sit down to find out the cost of these inputs. If they did they would discover that conventional agriculture is much more expensive," she says

Marketing organics a big problem

Now the main handicap for the group is finding market for their vegetables. Although they have produced quality vegetables and fruits for the last five years, not a single buyer has expressed an interest in them. As a result they are forced to compete with conventionally grown substitutes.

Need for certification

Geoffrey Kiragu, another member says that with the new method of organic production, the group is able to supply any quantity of organically grown items. He said they had responded to an advertisement in *The Organic Farmer* by Su Kahumbu, the farmer from Limuru who grows and supplies organic vegetables to local supermarkets. (She also answers farmers questions on page 6). Kahumbu had advised them that for their products to be accepted as organic, their farms have to be inspected by qualified organic farming experts who would then give them a certificate to show that their methods of production meet the required international standards for organic foods. But Kiragu says they do not understand the procedures involved or the people who provide certification services.

"Our problem is just the market. We hope that one day we will be able to sell locally and even export, he adds.

Dear farmers,

So many farmers are calling with enquiries on where they can buy organic fertilizers and growth activators such as phymix, bio-algene, neem and EM as well.

Beginning January 2006 *The Organic Farmer* will carry a series of articles giving details including instructions on their proper usage. If you have any questions please forward them to us and we will try to respond.

Why nitrogen is good for maize

Maize planted in soil with high nitrogen does not only grow better, it is more resistant against the stemborer.

By Felix Mbitu Murimi

Maize is one of the most important staple foods in large parts of Africa, including Kenya, as we all know. So it is obvious that scientists working on the continent are very committed to doing all kinds of research on maize. The results of different trials in Cameroon and Tanzania are very informative and have many lessons for all farmers engaged in organic farming.

The field trials in Cameroon investigated the effects of crop rotation, intercropping with a legume, cover crops and bush fallow on infestation by stemborers and on yield of maize. The scientists compared four treatments:
(i) where maize has been planted continuously year after year,
(ii) where maize was planted in fields where a grain legume (such as cowpea or soya bean) had been planted the previous season (rotation)
(iii) where maize was intercropped with pigeon pea, velvet bean (both legumes),
(iv) where maize was planted in a field that was left to bush fallow (no crops) the previous season.

Compared to the continuous maize cropping system maize in the crop sequence with legume and fallow systems (iii and iv) had much a higher nitrogen content in the stem and leaves. During the research the scientists discovered that maize in the rotation system (ii) had 1 □ - 2 times more stemborers per plant compared to the continuous maize production system, especially at the early stage of maize growth. This is because the maize in the rotation system was better off and stronger and much more attractive to the stemborers.

Beans provide maize with nitrogen. (TOF)

However, 2 months after planting, the stemborer larvae were 1 □ times more likely to die in the rotation system than in the continuous maize system. And 2 - 3 times more grain was lost due to stemborers in the in the continuous maize production system (i) than in the crop sequences of grain legumes with maize (ii), and 5 - 11 times more was lost compared to growing maize after cover crops (such as legumes). This result is easy to understand. On fields where maize was intercropped or rotated with a legumenous crop or where the land hat been left to fallow the previous season, the soil got much more nitrogen which could feed the plants better. The increased nutritional status of the plants lead to an increase in stemborer attacks at the early stage of plant growth, but also to improved plant vigour (strength), resulting finally in a net benefit for the plant and higher grain yield. The highest maize yields were obtained when maize was intercropped with a legume ground cover (iii).

Nitrogen the decisive factor

This results have been confirmed in similar field trials, conducted at Kibaha and Morogoro in eastern Tanzania. This project also included an economic analysis. The scientists compared two maize fields. One had been treated with pesticides against the stemborer and with nitrogen fertilizer. On the other field maize was grown without pesticides, and the scientists added only nitrogen fertilizer.

The results showed the beneficial effect of nitrogen on the plant©s ability to compensate for borer damage:
- Yield loss was less with an increase in nitrogen application.
- There was not a big difference between the field where pesticides were used and the one without pesticides in terms of yield.

The analysis of the economic benefits of applying fertilizer and insecticide treatment shows the following: "Using insecticides is not profitable when the soil quality is very poor", says ICIPE scientist Dr. Fritz Schulthess. "The soil quality and the nitrogen content of the soil are the decisive factor in getting a higher yield.. To replenish soil fertility is even more important than using improved crop varieties".

Therefore, the cheapest way to add nitrogen to the soil is rotating maize with a leguminous cover or grain crop, or using a nitrogen fertilizer. In areas where striga is a problem, intercropping maize with desmodium is recommended.

"Nitrogen factories" of the plant world.

The growth of all organisms depends on the availability of mineral nutrients. Nitrogen is he most important element. There is a plentiful supply of nitrogen in the earth©s atmosphere - nearly 79% of the air is nitrogen gas.

How do these natural "nitrogen fertilizer factories" work? Bacteria in the root nodules (swellings) of certain plants, mainly legumes, produce biologically usable nitrogen (mainly ammonium) from nitrogen gas in the air. This process is called nitrogen fixation. The bacteria called Rhizobium exist in soil and attach themselves to the roots of legumes, causing the formation of small nodules, in which they live. Within this nodule, the bacteria multiply and fix nitrogen from the air that is found between the soil particles. The roots become rich in nitrogen, sending it to the rest of the plant where it stimulates growth. Some amount of nitrogen may dissolve into the soilwater, benefiting other plants. Following harvesting of a legume (such as beans or peas), the roots may die, releasing further nitrogen. Although legumes are not the only group of plants that form a relationship with nitrogen-fixing soil bacteria, they are probably the most important for agriculture to improve soil fertility.

The crisis in soil health in Africa is a quiet catastrophe. Over the decades, Africa©s smallscale farmers have removed large quantities of nutrients from their soils without returning them in sufficient quantities in the form of manure or fertilizer. These practices have resulted in a very high average annual loss of 22 kg of nitrogen, 2.5 kg of phosphorus, and 15 kg of potassium per hectare of cultivated land each year over the past 30 years, according to research conducted in 37 African countries. This annual loss is equivalent to US $ 4 billion in fertilizer.. (*fmm*)

Seedlings require tender care while in the nursery

Subukia farmers are known all over Kenya for their acumen in horticultural farming especially that of tomatoes and cabbages. There is however a handicap in realizing the optimum yields because of the following reasons;

1. Lack of proper knowledge on the preparation of nurseries resulting in failure in germination of a large population of seeds.
2. Attack by pests especially aphids and cutworms.

Please sensitize us in these two issues so as to effectively improve on the yield and improve our economic well being.

In my list of questions from farmers this month, I was pleasantly surprised to see a question form *The Organic Farmer* readers - Subukia. This indicates cross sharing of information between some farmers out there which is just fantastic to know. Congratulations to you!! Sharing of knowledge especially in the organic world is necessary. It is the religion of our planet and if we are to improve our health and that of our planet, we must be selfless in sharing and caring.

Su's answers

Whilst aknowledging their fame and experience in tomato and cabbage growing, these farmers feel handicapped in realizing maximum yields because lack of proper knowledge on preparation of nurseries resulting in failure of seed germination.

Fragile condition of seed

Great attention must be given to the preparation and maintenance of our nurseries or seed-beds if we desire healthy seedlings. Common sense and logic go along way when we think about the fragile condition of seed and seedlings.

Soil must be light and crumbly to allow the young seedlings an easy journey from their seed casings, and moisture must always be present to avoid drying out, thus stress to the young plant. Upon emergence, seedlings like young children require tender care while in the nursery. Nutrition must be easily accessible and is best provided through mature compost, combined in the seed-bed with the soil.

Watch the soil...

As there are many types of soils and differences in fertility within the same, one must judge the amount of compost by the feel, smell and colour of the soil. One aims to create a dark healthy seed-bed soil with high organic content, crumbly texture and good water holding capacity. The final mixture of soil and compost must smell very earthy. Offensive odours suggest compost that has not fully rotted and will create problems in the seed-bed.

Seed-beds must never dry out completely and may benefit from slight mulching until the emergence of the young plants. Feeding of seedlings is not necessary if seedlings are to be transplanted between 30 to 45 days. However, weekly feeding via a mild liquid compost tea is necessary for seedlings and cuttings of fruit trees , trees etc. that require a longer stay in the nursery.

...and watch the seedlings carefully

Location of nurseries is very important. Ideally they should be located in a cool area as close as possible to a water source. If possible, they should also be protected from the elements by a low fencing and possibly a thatch or net covering. (For some odd reason, my dogs given the chance use seed-beds to dig and play in!!)

One area most overlooked in farming is the time of transplanting. Seedlings left in the seed-bed for too long may look healthy and strong however they will battle most when transplanted. Make sure to date your seed-beds so that you remember when to transplant the seedlings. A week of delay is acceptable, any longer - and you already have a compromised plant that will struggle to reach it©s full potential.

Another much over looked problem which originates in the seed-bed is that of over crowding. To help sow very small seed, mix in a tablespoon of soil with the seed. This will ensure good spacing. Crowded seedlings struggle for nutrition, become stressed and succumb to diseases such as fungus, which thrive in damp over crowded seed-beds. If crowding is a problem, thin the seedlings out. It is better to loose a few to save the rest. Be sure to

Su Kahumbu answers your questions

Write to:
The Organic Farmer
P.O.Box 14352, 00800 Nairobi
KENYA
Tel. 020 445 03 98
e-mail : info@organickenya.com

What's wrong with my carrots?

George Githuku asks: "I am an organic farmer based in Tetu (Subukia). I planted some carrots on a well-manured plot. To my surprise the carrots did so poorly despite having weeded them and watering them regularly. What could be problem considering that the other crops I planted alongside the carrots (potatoes) did very well."

Observation is our first step in understanding nature. George Githuku rightfully observed that carrots did not perform well despite regular watering and weeding when planted on a well-manured plot. Potatoes however planted in the same area did well. He is wondering what the problem may be. Astonishing as it may seem, carrots do not like newly manured soils and bearing this in mind, they are a perfect crop to follow in rotation behind a heavy feeder crop where a lot of manure and compost was used.

We do need however to lightly aerate the soil by shallow digging before planting carrots. This will allow easier penetration by the carrot root and will also allow better water holding capacity. So George, there is no problem, you have just discovered how to save money by realizing you can plant carrots without any manure!

Letters to the editor

Please send us some more copies

Congratulations for the good job of The Organic Farmer editorial team. To the best of my knowledge it©s the only one of its kind I have come across. PHCD Ortum (Primary Health Care and Development Programme) is an organization in West Pokot District working with marginalized farmers and pastoralist in agriculture, livestock and water development. It is in this regard that we are requesting for copies of your very informative and educative newspaper on sustainable agriculture. I just came across this article Nr. 5 August 2005 from a friend. So please if we can get at least a copy of each of the previous issues and then be getting copies enough for 20 farming groups in our working area will be a great help. We look forward to contribute to your newspaper the experience on the ground as we also advocate for sustainable agriculture in the community. Thanking you in advance.

Peter O. Okwany, Agricultural Sector Head, PHCD Ortum

Dear Mr. Okwany,

Thank you for writing to us. So many farmers are making the same request. This is our dilemma. We print 12,000 copies, which are not enough to go round because of the huge demand. While we consider your request, we encourage farmers, who receive copies, to share with those who do not. If we continue this way, the message will reach as many farmers as possible.

Interested in organic farming

I hereby wish to subscribe to your magazine. I have a natural interest in nature and natural foods. I am also aware of the danger of food crops grown under chemical conditions. I am also giving awareness of the same to my fellow members of the group. Thanks in advance.

David Steve Osiako,
Umoja Forest Group
P.O. Box 49, Kesogon

Su's answers

Continues from page 6

plant only strong healthy seedlings.

And finally, do not over-water seed-beds, unless your plants are aquatic, they do not need to be permanently wet. This inhibits gaseous exchange at the root hairs and results in rotting roots and thus death to the plants.

Rotate in the seed-bed

When a seed-bed is emptied it can be used again quite soon afterwards as long as we re-introduce some well rotted manure and dig the bed lightly for aeration. It is advisable to rotate the seed in the beds so as to avoid build up and spread of problems within the same plant family groups.

Oh, and finally again, make sure you are planting fresh healthy seed whether your own or purchased. Old seed will not do well in the best of seed-beds!

The answers to aphids and cutworms questions could not get space in this column we will bring them in the January 2006 issue.

Complaints

We are receiving complaints from farmers who cannot get their monthly copy of *The Organic Farmer*. It appears some chairmen of farmer groups do not pass the copies to their members. Others who own rental boxes used by farmers do not take the parcels to their owners. This is very bad. How can we promote farming when we have to deal with people who do not want farmers acquire the right information? We hope they will change. We also advise farmers who do not receive their monthly copies to get in touch with us or change their addresses.

Organic farming is productive

We the Johnson©s family including other people in our farming community have gained a lot from your newspaper. We have been receiving copies but we are requesting for more so as to improve our farming practices. We are requesting for more support from you to show that farming is important even to the unemployed. We have found out that organic farming is more productive and we can prove it to other farmers. We hope you will support us with the right information. Thank you.

Mrs. Nduru, Karo Group, P.O Box 85, Nyeri, 0724 488127

We want to increase production

I take this opportunity to salute the editorial committee of the organic farmer for publishing this most educative magazine. I shall be most thankful if you will be sending to Kongasis Pyrethrum Growers Self-Help Group at least one copy. This self-help group is not only interested in growing pyrethrum but it also carries out other farming activities and its members are interested in improving agricultural productivity. Thanks in advance.

Elijah K. A Kisiara, Kongasis Group, P.O Box 266, Londiani

Starting Bee keeping

I am a person who has great interest in farming more so for commercial purposes. I have gone through your September/October issue and found it to be very informative. I live on a acre piece of land and would very much wish to have an apiary. I really would want to produce my own honey for commercial purposes by using Langstroth beehives. However I fear the size of my plot could be a limiting factor. Please advice. I would also wish to be furnished with technical advice on modern methods of bee management. I look forward to hearing from you. Thank you.

Sammy K. Ngigi, P.O Box 1917, Embu

Dear Mr. Ngigi,
We refer you to Mr. Charles Kimani of Box 1388 Kikuyu Tel: 0721-382-556. He is practising bee keeping on a small piece of land like yours and would share the experience with you. Alternatively you can buy the Bee Farming Handbook from the National Beekeeping Station P.O Box 34188 Tel. 020 564-302, Nairobi. Many farmers would like to know more. We will feature this in one of the future issues.

Students want newspaper

Thank you very much for starting a newspaper for sustainable agriculture. I find it useful especially for our students who are doing agriculture in secondary school. Therefore I am requesting your office to be supplying us with your copies in future. I will be participating by writing articles concerning organic farming. Thank you very much and keep it up.

Tuei Richard, Ambusket Sec. School, P.O Box 272, Olenguruoni

Count on relationships between plants

Not all plants like each other. However, if you choose the right companion, your garden will benefit a lot.

By *The Organic Farmer*

Maybe you did not know it, but the association between certain plants gives excellent results, not only for the very plants themselves but also for the producer. Every plant, from the roots to the leaves, produce smells (odours) and expels substances that might be beneficial, or fatal, to other plants and insects. For instance, did you know that celery, because of its smell, drives away the pierid butterfly pest from cabbage? As a result, it will be enough to associate celery and cabbage as companion crops in the field to drive away this insect that has the nasty habit of laying her eggs between the leaves of the unfortunate vegetable.

Pea beetle may also disturb cabbage. In this case, to repel the pest it will be advisable to put a branch of thuja on the cabbage. In the same way, placing strawberry plants next to garlic, or onions next to leeks, will help ensure general protection against nematodes in the soil. Plants can therefore, in certain cases, be as effective as insecticides, but have an advantage because they will not kill the insects nor poison human beings. This is not all. By associating climbing beans and maize, both crops will give good output.

Managing the space ....

However, we should not associate vegetables together only for plant health reasons. We should also use the space we have for planting efficiently. Indeed, it is often interesting to make use of the association in the root systems. The most typical and profitable example is that of carrots and leeks. The first crop has very deep roots that extract nutrients deep in the soil, whereas leeks have extremely superficial roots which help the crop feed on nutrients near the soil surface. Moreover, carrots can drive away worms from leeks, while leeks can drive away flies from the carrots.

Tomatoes and radish, or better still beans with cucumbers, are other typical examples of this helpful relationship. In addition to the question of space, there is also the problem of resolving the selfishness of certain plants. Cabbage, for example, consumes water and nutrients greedily, and cannot reasonably be planted alongside other vegetables that are just as demanding. It is even better to isolate cabbage or associate it with small plants such as peas, which are satisfied with very small quantities of nutrients.

... and managing time

Time is also an important factor in this method of associations of vegetables. Mixing long-cycle species with short-cycle species can optimize the natural productivity of the ground, while assuring a constant coverage of the soil and helping fight against the invasion of weeds. Radish, for example, once it is sowed, germinates quickly and occupies the soil, while carrot takes a longer time to germinate. Sowing radish and lettuce together, and possibly transplanting some seedlings of lettuce near them, would allow harvesting of crops gradually on the same parcel of land; radish and lettuces would be ready for harvest when the carrot is not yet mature.

Finally, it is necessary to know that legumes use large quantities of nitrogen from the air and restore them to the soil and that many other plants take advantage of this nutrient supply. Mixing maize and beans is not only good as *githeri*, it can also help an informed farmer improve on their output. Another small detail: it is necessary to note that there are many fatal associations of vegetables, as well as the profitable associations, described above. The association of pea and garlic for instance, always ends up very badly. It is therefore important to always keep watch in our gardens!

Some good associations of plants

- Garlic: beet, carrot, potato and tomato.
- Carrot: garlic, dwarf bean, lettuce, onion, parsnip, leek, small peas, pea mange-tout, (snow peas), radish, tomato
- Celery: spinach, dwarf bean, leek, tomato
- Cabbage: beet, celery connects, cucumber, dwarf bean, lettuce, leek, small peas (garden peas), mange-tout peas and tomato
- Cucumber: beet, celery, connects, cabbage, cauliflower, shallot, bean with oars, dwarf bean lettuce, maize, small peas
- Courgette: bean with oars, onion
- Dwarf bean: aubergine, beet, carrot, celery, cabbage, cauliflower, kohlrabi, cucumber, nitwit, lettuce, maize, melon, small peas, potato, radish and tomato
- Lettuce: beet, carrot, celery, leek, maize, small peas, onion, tomato, cabbage, mange tout, radish, black radish
- Maize: cucumber, nitwit, dwarf bean, bean with oars, lettuce, melon, small peas.
- Melon: dwarf bean, lettuce, maize
- Onion: beet, carrot, cucumber, courgette, strawberry, lettuce, leek
- Parsley: radish, potato
- Leek: asparagus, carrot, celery, cabbage, watercress, spinach, fennel, strawberry, lettuce, lamb©s lettuce, onion, chicory, endive, scorzonera, tomato
- Tomato: garlic, asparagus, carrot, celery, cabbage, cauliflower, spinach, dwarf bean, lettuce, maize, mint, onion, parsley, leek, radish.

The Organic Farmer

in January 2006

Where can farmers sell organically produced vegetables?

The Organic Farmer

The magazine for sustainable agriculture in Kenya

biovision

Nr. 53 October 2009

Water, scarce and valuable

People take water for granted when there is plenty of it. In Africa, almost 90 per cent of the drinking water available to human beings is used for agriculture. When water becomes scarce, agricultural activities are affected – and thus the livelihoods of millions of people. The current drought should be a lesson to farmers that water is a critical resource in our lives. With this issue, TOF is starting a series of articles on water. How can farmers cope with challenges in the efficient management and conservation of this valuable resource? *Page 5*

Breeding problems persistent

Lack of training opportunities for farmers and inbreeding affect the quality of dairy cows in the country.

The Organic Farmer

Cattle inbreeding is still a big problem in the country. At the same time, more farmers are seeking training opportunities in order to acquire the necessary skills needed to improve the quality of dairy cows. In particular, there is a huge demand for training on livestock breeding. The other cause of the problems in the Kenyan dairy industry is the reluctance by small-scale farmers to do record keeping which leads to inbreeding. More than 75 percent of the 3.4 million dairy cattle in the country are owned by small-scale farmers, but only 50,000 cows have been registered and graded by the Kenya Stud Book.

Although more than 90 percent of the dairy cattle in the country are bred using Artificial Insemination (AI) methods, most small-scale farmers do not understand what inbreeding is all about. Inbreeding occurs when two closely related animals are mated. Most farmers do not care about the quality of semen served to their dairy cows. If a farmer does not keep the code name of bull whose semen is used to serve their cows, AI service providers often end serving cow's daughters with semen from their father bulls, causing inbreeding. Experienced farmers avoid inbreeding by keeping AI service records of all their animals, showing the dates when the animals were served and by which bull.

See pages 2 and 3

in this issue

Dear farmers,

We are sure that each one of you has experienced first hand how crucial water is as a resource for agricultural activities. And of course, all of you know what disaster the lack of water can mean to your farm and to you.

Water is becoming an increasingly scarce commodity. It doesn't rain as much as it used to anymore. The rainy seasons have shifted, and sometimes can't even be called "season" anymore. Almost every year now, Kenya experiences floods while at the same time, certain regions of the country don't see a single drop of rain for years. Agricultural activities have become more unpredictable and thus risky than ever before.

We cannot blame this on the global climate change alone. An uncontrolled growing population needs more and more water. Careless deforestation, the destruction of centuries-old water reservoirs like the Aberdares, badly leaking water pipes, destruction of rivers through sand collectors, or flood irrigation. At the same time we need more water than we can afford. To make things worse, we are now exhausting the last remaining water sources. When extracting this water, our policy makers do not have any idea how to protect water catchment areas in order to conserve the little water resources. Upto now the country has no idea on where to get this valuable commodity to meet future water requirements for the increasing population.

When it comes to agriculture, the situation is critical. Farmers need to think seriously how to conserve and manage the diminishing water resources to sustain food production. This is not the first time that our magazine encourages you to use this important resource wisely. We have in the past introduced and explained various methods of water collection and management, and most farmers know them. What we do not understand is, why more of you are not willing to put these ideas into practice. Is it lack of understanding or money or fear of doing some extra work?

There are many farming practices that help to conserve water such as covering the soil, planting trees, cheap and water efficient irrigation systems e.g. drip irrigation: We will bring you all these technologies in the coming issues of The Organic Farmer. *Farmers like other business people have no choice but to be innovative, as this is a matter of their survival.*

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

Farmers discover the benefits of breeding

Increased awareness and higher milk prices encourage more farmers to upgrade their dairy cows.

The Organic Farmer

Most Kenyan farmers have started realising the benefits of animal breeding, leading to a thirst for training in order to upgrade their dairy cows. More small-scale farmers want to improve the productivity of their animals and prevent inbreeding. There are two reasons for this:

- Many articles in *The Organic Farmer* magazine have aroused awareness on the benefits of having good quality cows.
- The ever escalating prices of milk encourage so many dairy farmers to seek training services from breeders and even buying improved breeds or are at least eager to upgrade their cows using the latest breeding methods.

Lack of qualified personnel

However, the country still lacks adequate skilled personnel to train farmers. According to James Karanja, a Director of the Kenya Dairy Board, who is also a Friesian-Holstein breeder, the quality of dairy cows owned by the small-scale farmers has been very low – leading to low milk production due to lack of basic skills of animal breeding. The problem became worse following post-election violence in parts of the Rift Valley province last year; a large section of dairy farmers lost their breeding stock during the unrest. The loss of dairy cattle and earnings from milk sales is estimated at Kshs 20 billion over the violence period. Having lost their dairy cows, many farmers are yet to restock. Even for those farmers who are restocking, the AI services are still costly (Ksh 600 per animal). This forces most of the farmers to go for village bulls whose quality is undefined.

High demand for training

According to Karanja, the biggest problem now facing the dairy industry is lack of trained breeders who can offer quality training to scores of small-scale farmers seeking breeding services to improve the quality and productivity of their dairy cows. The only other organization offering training is the Kenya Livestock Breeders Organisation (KLBO), but it has only one extension officer who is only able to train 200 farmers every month.

Overwhelmed by the demand for more knowledge, James Karanja has been travelling every week to various parts of the country where he trains farmers on how to upgrade their stock. He says that he has been able to train an average of 30 farmers in a week. Karanja says more farmers who have read or heard from fellow farmers about the importance of livestock breeding have booked appointments for training. Among the areas he has covered so far include Uasin Gishu, Elgeyo Marakwet, Kericho Nyeri, Narok, Nyandarua, coast and Eastern provinces. He says the training programme identifies 5 farmers in each region who are trained and encouraged to train other farmers at a small fee. But he has to make a regular follow-up to verify that the trainers are doing their work properly and inspecting animals according to established standards.

Neglected animal husbandry

A big dilemma facing the dairy industry in the country is that farmers have been left on their own when it comes to animal husbandry. Since the privatisation of veterinary services following the withdrawal of donor aid in the early 90s, the government has given little support to small-scale farmers in the dairy sector.

Currently, it allocates a paltry Ksh 600,000 to the Kenya Livestock Breeders Organisation to cater for its running costs. The US Agency for International Development agency USAID is working with the Kenya Dairy Board through the Land 'O Lakes organization which is aimed at improving the dairy sector. But very little funding has been allocated for the training of small-scale farmers on breeding; a large sum of this money is spent to cover administrative costs. With many new farmers expressing interest in upgrading their dairy cattle, there is an urgent need for an organisation that would come in with additional funding to train more breeders at the community level, who will train more farmers in every region in the country. With such a kind of support the dairy industry will increase milk production and thus a higher income for farmers.

A German AI company has offered 30,000 straws of high quality semen to help farmers who lost their dairy cows during the post election-violence. The semen is being sold to farmers in the affected regions at Ksh250. But this is a drop in the ocean, considering the large number of farmers who require training and affordable AI services. Farmers interested can contact James Karanja Ndungu, P.O.Box 157, 20107 Njoro, Cell. 0733 555 621 or KLBO P.O.Box 478 Nakuru, 20100 Tel. 051 2216996 cell. 0723 379 048

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.
The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development. www.biovision.ch
Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000,
icipe@icipe.org, www.icipe.org
Editors Peter Kamau, Peter Baumgartner
Secretariat Lucy W. Macharia
Layout In-A-Vision Systems, 0720 419 584
Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe
Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

How to prevent inbreeding

Inbreeding can be reduced considerably if farmers observed a few simple rules:

•Always maintain records of each animal's date of birth, AI records such as the name of the bull whose semen was used to serve the cow. The date and age at service, number of services, calving and calving intervals are also important.

•Avoid using village bulls whose quality is not known. They can also transfer venereal diseases to your cow. If you keep bulls, separate them from the cows at all times to avoid mating.

•Try and register your graded animals with the Kenya Stud Book (this is a secretariat that maintains records of all graded animals and breeders in the country. A registered animal can be sold at a better price because its pedigree is already known; some of the pedigree animals produce as much as 40 litres of milk in a day and can fetch as much as Ksh 250.000 in the market).

•Do not throw away the semen straws after your animals are served. You can use them for future reference. All straws are labelled with the name and code of the bull from which the semen was obtained.

•Always use semen from high quality bulls whose potential is already known. Using semen from known service providers such as CAIS will help improve your cows' pedigree, milk production health and accelerated growth rate.

Selective breeding

Upgrading dairy cows is a process that requires expertise. This is how it is done:

•A dairy cow with the right quality of a selected breed has to be identified by a qualified inspector. It is then served with semen from a pedigree bull. The cow is then registered with the Kenya Stud Book as a "foundation".

• The calf which the foundation cow gives birth to is called the "intermediate".

• When the intermediate stock heifer comes on heat, it is served with semen from a different pedigree bull of the same breed. The calf which the intermediate heifer produces is called the "Appendix".

• When the appendix comes on heat, it is again served with semen from another pedigree bull of the same breed. Finally the calf produced by the appendix is now called the "pedigree".

An improved Holstein-Friesian calf

An experienced breeder can maintain the pedigree line by continued use of semen from quality bulls locally and abroad. Each of the animals from the foundation to the pedigree has to be registered with the Kenya Stud Book.

Brucellosis affects people and animals

Vaccinating young animals against the bacterium Brucella abortus can protect both people and their animals.

The Organic Farmer

Brucellosis has become a common disease in Kenya. Indeed, many people simply call it the "milk disease". This shows that at least they have an idea where the disease originates from, namely from our animals suffering on Brucellosis (caused by the bacterium Brucella abortus). The disease is transmitted to people if they drink unsterilized milk (not properly boiled) or eat meat from infected animals. One can also be infected through close contact with the animals' secretions.

Symptoms include fever or flu-like feeling, restlessness, muscular pains, sweating at night, tiredness, lower back and joint pains, menengitis or heart-valve infection. People infected with brucellosis can be treated using antibiotics which have to be taken over several weeks. Infected people should always consult a doctor for proper diagnosis and treatment.

Spreading of Brucellosis

The bacteria which cause Brucellosis are spread from an infected animals around the time of calving or abortion. It can be introduced to your cows when they lick or sniff fluids from the birth canals of infected animals which are permanent carriers. Infected bulls can become infertile. Cows can get the disease from bulls when they smell or lick fluids from its sexual organs. Heifers get the disease when developing in the uterus. The most common clinical signs of cattle infected with the bacterium Brucella abortus bovi are high incidences of abortions, arthritic joints and retained after-birth.

Few things are important to know:

• Cows can carry the disease throughout their life and pass the disease causing bacterium to other animals.

• The disease cannot be cured.

• Upto 80 percent of heifers or cows infected for the first time can abort. If the calves are not aborted they are born weak and cannot grow normally.

Vaccination controls brucellosis

Since the disease cannot be treated once the animals are infected, the best way to prevent it is through vaccinations. Vaccinations against brucellosis can only be done in calves at the appropriate age. Calves vaccinated at 4-7 months followed by 3 other vaccinations which help to boost their immunity can be protected against the disease throughout their lifetime. All new animals should be tested

before being allowed to mix with the herd.

In Kenya and other developing countries, there is a tendency to treat only those diseases that often kill our animal herds; this is one reason why most farmers would not bother to test their animals for Brucellosis. But the cost to the farmer is high especially when the disease is transmitted to people or when they lose their valuable calves through abortions. The disease is difficult to control in Africa because of the uncontrolled movement of animals and presence of scavenger birds that spread the disease from one area to another.

NOTE: Others animals such as goats, sheep and even dogs can be infected and pass the disease to people. Scavenger birds and animals can also spread the disease.

A surplus of vegetables? Then dry them!

Drying products from your shamba is a clever way of coping with hard times.

The Organic Farmer

Drying of vegetables and fruits is the simplest method of preservation and is used all over the world. However, for good results and quality, some basic rules must be followed.

Sun drying
Sun drying is used for products which are not sensitive to direct sunlight like dry beans, nuts or coffee: they are protected by solid coats or shells. Cereals consist mainly of starch which is also not sensitive. These crops can be spread directly in the sun.

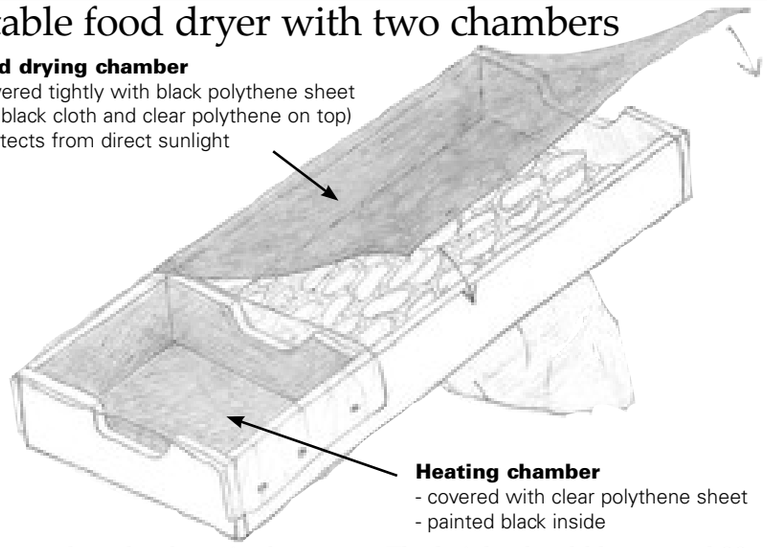
Air drying
Most fruits and vegetables should be protected from direct sunlight, because it affects their quality, taste and colour. A product which looks nice and tastes good can always fetch a better price!

The simplest method is air-drying in the shade of trees, under a roof or in a well-ventilated room. But in the shade, the drying process is slow, and fruits and other juicy material may go mouldy before they are dry.

Solar food dryers
In solar dryers, sun heat is accumulated and the drying process is much faster. Such driers consist of a box with black walls or a black cover absorbing the sunlight and trapping the heat inside. The material for drying is placed inside the box.

You may at first want to experiment with a simple dryer (below), and (above right) you find the solar dryer with two chambers. If you have good market opportunities and higher quantities to dry, you may want to construct a larger and more professional solar dryer.

Portable food dryer with two chambers



When you place the dryer in the sun, the heating chamber should be at a slightly lower level than the drying chamber. Since hot air goes upwards, the heated air can flow upwards through the openings shown below into the drying chamber and out again on the top, this way drying the food in the drying chamber.

The height should be around 20 cm, but you may determine other measurements on your own. The larger the dryer, the more space you have for drying your vegetables. Place the product on some kind of grid (but avoid metal as it contaminates) and make sure the black cover does not touch it.

Preparation of fruits and vegetables

Fruits like mangoes, pawpaw, guavas and bananas should be ripe, but still firm. Wash them thoroughly, peel and remove the seeds if necessary, and cut them into uniform pieces.

If you dip them in a solution with lemon juice (1 part juice, 4 parts clean water), they will retain their colour for a longer period of time.

Vegetables with hard, thick leaves (like kale and cabbage) should be washed, chopped, then dipped in salted boiling water for 2 minutes and drained before they are spread on the tray in thin layers. The same can be done with green beans, but do not chop them.

Drying time in the solar dryer
Drying time depends on size and water content of the pieces. Tomato halves may need 2 to 3 sunny days, while tender leafy vegetables or herbs may be dry within hours.

All dried products must be packed in clean bags and stored in a dry, dark and cool place. Moisture, heat and light will promote deterioration.

Additional information by Njeri Kinuthia

Drying system with one chamber

• First you need a tray or frame with a stable bottom which is also permeable to air. You may of course use several trays. You could build a frame like the one below and prepare the bottom with clean thin sticks:

• When you have filled the product into the tray, place it on a piece of corrugated metal roofing, or even on a roof, if you can reach it easily. The metal must have a gentle slope.

• Cover the tray with a piece of clean black cloth. You may need to place a few sticks across the frame to make sure the cover does not touch the product.

• On top, stretch a clear polythene sheet or cover with window glass. Make sure the wind can not blow both the cloth and sheet away. The upper opening of the tray must be left free for the moisture to escape.

General rules for drying food

Ventilation
Air must be allowed to circulate. Fresh air must reach the product while moisture must be able to escape the drying area.

Hygiene
Clean processing protects the consumers and is essential for the durability of dried products.

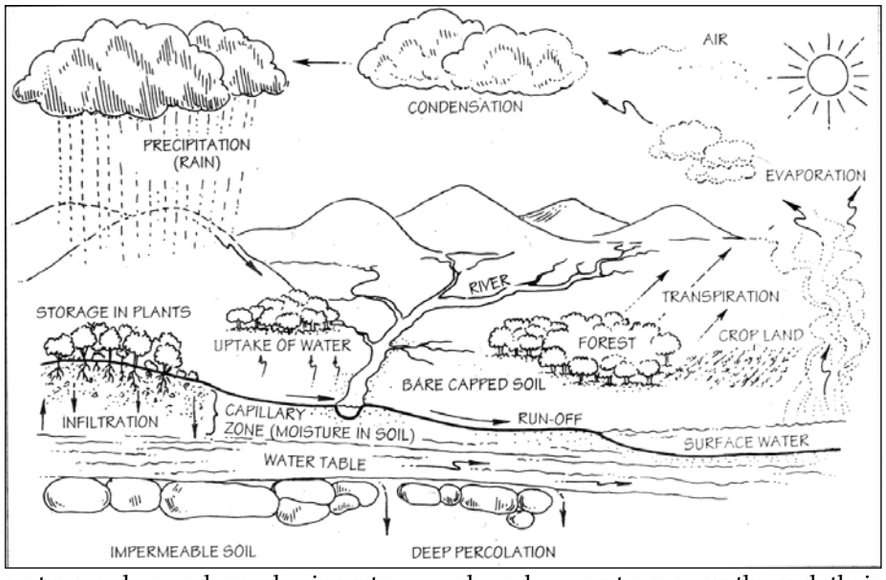
• All trays, cloth or areas which are used for drying the product have to be clean. Wash, scrub, rinse well and dry before using them.

• Always wash and dry your hands and any tools like knives, chopping boards or pots carefully.

Making better use of water resources

Sustainable use of the available water resources is the only way to save this diminishing resource.

Anja Bengelstorff



Nobody is more dependent on rain water than a farmer. The current drought has led not only to crop failure, but it reduced power generation and even domestic water supplies in most parts of the country. The water shortage should be a lesson to all, that due to climate change, we are going to have more serious water shortages if we do not manage our water resources well.

Kenya is classified by the United Nations as one of the countries with chronic water scarcity, it can only supply about 647 cubic metres per person, far below the 1000 m^3 per person set as the mark for water scarcity in the world. Yet we are busy destroying water catchment areas such as the Mau complex, Aberdares, Cherangany hills, and Mt Kenya through human settlements, deforestation and soil degradation. Rapid population growth will complicate the situation, further depleting the remaining water resources in a few years.

Apart from meeting our domestic water needs, nowhere else is water so important than in agriculture. Food production is the largest consumer of water in the world. More than 70 per cent of water we use from rivers and groundwater sources goes to agriculture, about 10 percent is used for domestic consumption and 20 percent in industries. Unless the available water resources are used in a sustainable way especially in developing countries such as Kenya, then we face a crisis of unimaginable proportion. Farmers can greatly contribute to water conservation if they understood where water comes from and the process through which it moves through the environment- this is called the water cycle, which is described above:

Understanding the water cycle

When sunlight strikes water, whether in a lake, river or even moisture or on the earth's surface, the water turns into vapour and rises into the atmosphere in a process called evaporation. Plants also release water vapour through their pores (holes on leaf surface) when the sun strikes their leaves sending the vapour into the atmosphere in a process called transpiration. When the vapour reaches a certain height in the atmosphere, it condenses into liquid form which forms clouds that later fall in droplets as rain.

The water moves across the land's surface as run-off, some of it penetrating the ground where it is stored. This water cycle affects the patterns, practices, quantity and even the quality of the water we use for all purposes. The major sources of water we use for agricultural production comes through the following processes:

Surface water: This supplies water to plants indirectly through evaporation, condensation and rainfall, or directly when tapped and channeled for irrigation purposes.

Rainfall: Rain falls on plants directly and filters down or penetrates through the soil to the plant root zone and continues to replenish ground water supplies.

Moisture: These are tiny droplets of water that are formed on any surface either by transpiration or condensation. Moisture nourishes plants by availing water that promotes plant growth.

Groundwater: Groundwater accumulates underneath the soil at various depths. The water moves up through the soil profile just in a process called capillary action and is taken up by plants.

Managing the water cycle involves processes that protects available supplies and reduces water losses; this is called water conservation. The other process that helps increase the amount of water available for our use is called water harvesting. The way water is

Continued on page 6

Water

In this issue, *The Organic Farmer* starts a series of artices on water. For a proper understanding of this highly valuable, but often neglected resource, it is important to know the water cycle, as is shown on this page. In the November-issue, we talk about water harvesting.

Water catchment areas like the Mau Forest or the Aberdares that supply water for the surrounding lowlands are lifelines for humans and animals alike, as well as for farming. When trees are cut, water runs off over the surface of the land, washing away nutrients and minerals found in the soil. Trees instead break the run off. They "catch" rain water on their leaves, needles and roots and store it – for their own growth as well as the supply of rivers, streams and groundwater sources.

>>> from page 5

conserved and harvested is called water management. Managing the water cycle in a farm has to be done in the right way as it can affect the water supply both positively or negatively.

Balance between water intake and off-take

The way a farmer balances between rainfall, evaporation or transpiration determines the amount of water available for better crop production. When rainfall exceeds evaporation and transpiration, the crops will have adequate water for proper growth since the root zone will have adequate water. When evaporation and transpiration exceed rainfall, the water available for plant growth is decreased. In analysing water needs for agriculture, evaporation and transpiration rates are very important. Run-off and percolation also affect the amount of water remaining in the root zone. The main objective of water management in sustainable agriculture is to make maximum use of run-off, percolation evaporation and transpiration.

One way of increasing the amount of water available for agriculture is to reduce the loss of water through transpiration. For example one hectare of maize can lose as much as 37,500 litres of water in a day or 1,900,000 litres per growing season through transpiration. However, establishing a mixture of crops and trees creates a micro-climate where the moisture produced (transpiration) is used by nearby crops. Raising seedlings in shady places protected from wind also prevents loss of moisture. In the next issue we will show other methods of water conservation for crop production.

The cost of El Nino

A World Bank report released almost a decade ago after the 1997/98 El Nino rains followed by La Nina drought in the year 2000- 2001, shows the country lost at least 14 percent in each of these years. At the moment the loses are much higher considering that water resource degradation has intensified. Lack of investment in water resources cost the economy even more. It shows that droughts and flooding would not be so severe if there was better access to water supply through more surface water storages such as earth dams and more groundwater development in arid and semi arid areas (ASALs).

farmers forum

020 445 03 98 0721 541 590 0738 390 715

Dear editors,

A short while ago I read a report from the German Heinrich Böll Foundation "Study on the Impact of High Food and Factor Prices on Kenyan Farmers" from April 2009. I think it would be of interest to my fellow farmers if you would publish the conclusions of this report. Thank you. Anthony Otieno, farmer

Dear Anthony, we have gone through the report, and agree with you. We hereby publish its conclusion. Some parts have been adapted to enhance clarity. The Editors

Do farmers benefit from high food prices?

Countries that rely on imports to meet their food requirements may, in future, have to reorganize their trade and national marketing systems to ensure they are self-sufficient in food production, if at all they want to avoid escalating and unstable global food prices. Countries such as Kenya which, in normal years, are almost self-sufficient in food production are highly influenced by their domestic food production, national market structures or failure of the government.

Yet, besides the global trends with their enormous influence, country-specific factors seem to limit the possibilities for farmers to benefit from higher food prices much more. As long as staple food marketing is to a certain degree controlled by cartels or monopolies with high market power, weak institutional governance and corruption, economic activities of farmers might depend much more on domestic agricultural policy reforms than on global food price developments.

Meanwhile, farming households are already diversifying their incomes in Kenya as elsewhere. A clear trend to more off-farm and more non-farm income for rural households can be observed. Furthermore, household investments are not directed towards farm improvement or "farming as a business". This shows that rural households with opportunities divert from agricultural activities, because they are not seen as promising avenues for the future. The stagnating productivity of African small-scale farms might be a cause and a reason for this phenomenon.

Investing, but not in agriculture

Yet, the need for food production increases. We can only expect a reaction towards investment in agricultural production or productivity, where price increase took place; if it mainly takes place at the level of traders and millers, little production impetus can be expected. Moreover, further evidence is needed on future food price projections. So far, it is not clear whether the trends on commodity world markets were "just" unusually volatile during the past 18 months due to unusual domestic and international circumstances or whether they were indicating a longer term increase in real food prices. On the other hand, decreasing food prices make it better for poor consumers. But this might put producers in a situation of "agricultural treadmill".

But even if prices stabilise, agricultural production remains an economic activity with a number of other risks. One of them is the weather which might gain more importance in the forthcoming years due to climate change. The argument of price incentives for producers doesn't seem to materialise soon for small-scale farmers in Kenya or elsewhere in Sub-Saharan Africa. The assumption is that "As product prices climb higher, so too is the producer encouraged to invest in higher agri-inputs" This, as formulated by many observers, has in the short term not proved to be right.

Needed: better infrastructure

Higher prices can theoretically mean incentives to producers; however it is not prices but profits that count. The challenges will be to translate higher food prices into motivators for lasting investment in rural areas and sustainable agricultural production in order to achieve food security for all – producers are also consumers.

This study couldn't find evidence that high food prices alone will provide incentives for smallholders to intensify their production in the medium term. From the Kenyan experience it is much more likely that farmers would respond to more reliable, affordable and available services for inputs and to improved rural infrastructure. Secure access rights to productive resources such as land and water and a reduced volatility in input and output markets seems to be much more important for rural incomes than temporarily high prices.

Choose the right material for compost

I am planning to make compost but the only material available is a fern called "ruthiru" that decomposes very slowly. Do you think it will have decomposed in 3 months? Tel.0716 913 127

I would like to make compost manure and the only material available is a fern specially called 'ruthiru'. It decomposes very slowly. Are the conditions of the compost heap able to break it in a period of 3 months as TOF wrote once? 0716 205 540

It is important to use well- decomposed compost as organic fertilizer because it releases the required nutrients to your crop. While preparing your compost make sure that you include all the material you can get. This can include animal manure, crop residue, kitchen and other household waste such as wood ash, potato peelings etc. It is also important that you include particular plants such as tithonia (*kiruru* in kikuyu) which contain a lot of plant nutrients. All kinds of legume leaves such as those from soya beans, desmodium, lablab (*njahi*) etc. can be added. Avoid using material from only one plant as you want to do with the ferns. You may use it in thin layers if you want to be sure that the compost is ready within three months.

For quicker decomposition, add comfrey (*mabaki*) leaves which help speed up decomposition. However the use of Effective Microorganisms (EM1) greatly improves decomposition. The EM1 should be mixed with water and sprinkled on the compost after every layer of material used (EM1 is available in most agrovet shops throughout the country). Ensure your compost is always moist but covered to protect the nutrients from the sun or rain. Farmers should know that the different material used in compost making can also be mixed without affecting its quality including decomposition; some farmers prefer arranging the material in layers first and then mixing the different layers while turning it the - the result is always be the same.

For use of fern, I would just give it a try. You could make a separate heap using larger amounts of the fern and observe what happens. You will then be able to judge when you will have to set up the fern compost heap before the next planting season.

Donkey droppings are good for manure

I am a farmer in Yatta and I keep three donkeys on my farm. Can I use their droppings as organic manure on my shamba? 0737 603618

You should! Like all animal waste, donkey droppings give excellent organic manure. Fresh droppings should however be used with caution, because delicate plants may be affected by their high content of ammonia. The best manure you can get is when you compost the droppings for some months. I would just collect them continuously under a shaded spot and add any vegetative matter and some household water from time to time to keep the heap moist. This manure can then be used for all crops and is especially good for vegetables. Tomatoes in particular will do well with this fertilizer.

...answers in brief

I need tree seedlings

Where can I get seedlings for moringa oleifera, tissue culture bamboo and Muiri indigenous tree? Charles Macharia, Ol Kalou Tel. 0721 814 717

You can get seeds and seedlings for these trees from the nearest forestry station in your area. If they are not available, you can try the Kenya Forestry Research Institute (KEFRI) at Muguga, they have seeds for most of the indigenous and exotic tree species in the country. Contact: 0722 157 414 , 0734 251 188, 0722 801 539.

Organic coffee

Please advise me on how to grow coffee organically and where to sell it. John Muchangi. Tel 0725 338 255

It is possible to grow coffee organically. Some farmers, including companies, are already doing it. We will publish a series of articles on organic coffee production later in the year, from which you can get the details on how to grow organic coffee.

Eucalyptus saw dust

How can I use eucalyptus saw dust? Tel 0710 623 867.

Saw dust has many uses on the farm. Most farmers spread it in the animal or even chicken shed where it mixes with farm yard manure. When this waste material is well-composted, it can provide you with very high quality compost. Some energy-saving jikos also use saw dust which reduces the cost of buying firewood or charcoal especially at this time when everybody is talking of conserving our remaining forests.

In Rwanda, sawdust is now the only authorised source of energy for making bricks, a sector that consumes huge amounts of energy. However, this commodity is highly sensitive to humidity, and its heating power is weaker than that of wood or charcoal. Strict regulations for tree felling introduced in Rwanda in 2005 as part of a campaign against deforestation have fuelled a search for other less expensive energy sources such as saw dust.

Grevillea tree for fodder

How do I prepare fodder from grevillea tree? Paul Njuguna Kirere 0724 600 491

Grevillea leaves can be used as fodder for livestock by cutting into small pieces that animals can be able to chew. But farmers should know that the fodder from Grevillea leaves is of low nutritional value compared to that from fodder trees such as calliandra, Sesbania, Lucaena or gliricidia which have a higher protein and mineral content.

Harvest early to avoid losses

A lot of maize in the country will rot in the fields or be destroyed by pests if farmers do not harvest early.

The Organic Farmer

With the threat of El nino rains hanging over us like a cloud, many maize farmers across the country must be facing a real danger of losing their precious crop. As we have said many times before, a sizable portion of the maize crop is lost every year when farmers make the wrong timing for harvesting their crops. When you delay to harvest your crop, there are two things involved: You either lose your crop due to rotting or early pest infestation.

Research shows that farmers in Kenya and most countries in Sub-Saharan Africa lose between 15 and 50 percent of their maize crop due to these two problems. And this is one of the questions that many farmers ask themselves: When is the right time to start harvesting the maize? When there is little threat of the rains, most farmers cut their maize immediately the stalks turn brown and the maize cobs face downwards; this is especially so when there is little or no rains. After staking the maize, it will take three weeks or even a whole month before they start harvesting. When farmers do this, they tend to expose their crop to early pest infestation. Maize should be harvested as early as possible to avoid the losses.

Dr. George Ombakho, the chief maize breeder at the Kenya Agricultural Research Institute (KARI) Kitale, advises farmers to start harvesting their crop as soon as the grain hardens. Another important sign that maize can be harvested is when the silky flowering at the top of the maize cob turns black. One other important advice he gives farmers is that different varieties of maize reach maturity (dry down stages) at different times. The farmer should check for these signs and start harvesting. But this does not mean that farmers cannot harvest early. Dr Ombakho gives the example of contracted seed growers who harvest their maize as early as August when most of the maize is too wet with a moisture content of 37 per cent and still manage to dry it to a moisture level of 12.5 per cent. Although most of the seed growers use machinery to dry the maize to the required level for storage, small-scale farmers can still be able to do sun-drying and save maize from decaying in the fields due to the wet conditions. Farmers can also take the following measures to ensure they reduce post-harvest losses during the harvest season:

Drying Maize: Maize should be properly dried after harvest to ensure that it does not develop mould that is responsible for the growth of aflatoxins, a dangerous fungi that can kill both people and animals. To test if your maize is dry, put a handful of grain and a handful of salt in a dry bottle. Shake for 2 or 3 minutes and allow it to settle. If the salt sticks to the side of the bottle, this shows your maize is not dry. You should put it in the sun again to dry. Repeat the same process until there is no salt sticking on the walls of the bottle. Store the maize if it is dry.

Sorting: Remove all cobs that are already damaged by pests and the rotten ones before storage. Always shell your maize before storage. Unshelled maize is easily attacked by pests.

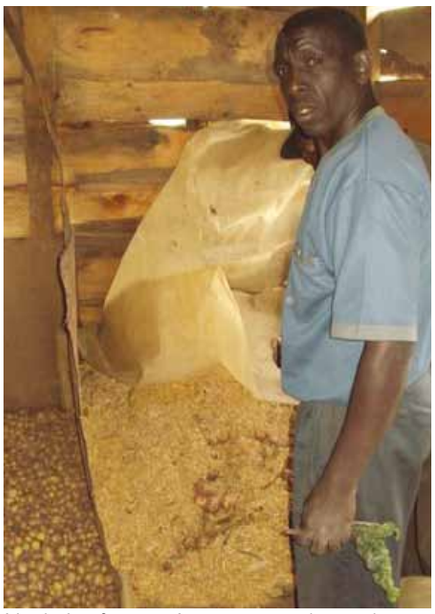
Apply diatomite: Since weevils including the Larger Grain Borer have developed resistance to all pesticides in the market, using of ½ kg of diatomite for every bag of maize can preserve it for as long as the farmer desires.Mix thoroughly. The diatomite kills all insects by piercing their bodies and dehydrating them. Diatomite is harmless to humans and animals.

Storage: Maize stores should properly cleaned before storage to remove crop residue that can habour pests. It should also be well ventilated to allow air circulation.

Saw dust can prolong potato storage

Potato storage is one of the most challenging undertaking for farmers. Just like vegetables and fruits, potatoes are one of the most perishable farm products and farmers have to sell or eat them after a short time after harvest, if exposed to light potatoes turn green and acquire a bad taste. Nyakairu Farmers Group members in Kinungi, Naivasha, had faced this problem for many years. They would try to preserve the potatoes in his store by covering them by use of dry grass to prolong their shelf life, but the potatoes would not last the desired period. However three years ago one of them Githenya Kariuki decided to try saw dust. He applied it on the floor of his store to ensure the potatoes did not come into contact with the floor. After this, he sorted out the potatoes to remove all the bruised, the rotting ones and those that had already been infested by tuber moths. He later covered his potatoes fully with saw dust to stop light or moisture from getting into the potatoes.

Githenya observed that the potatoes stayed longer than they had lasted using other preservation methods. For the last three years now, all the group members have adopted the saw dust method. The use of saw dust is so efficient that nowadays we can store our potatoes for as long as three or four months, sometimes until the next harvest", says Githenya. He says this method of potato storage has enabled them store and sell to local market long after the other growers have exhausted theirs. The can now store potatoes until market prices are favourable.



Nyakairu farmers' group members show how they store potatoes using saw dust

The Organic Farmer

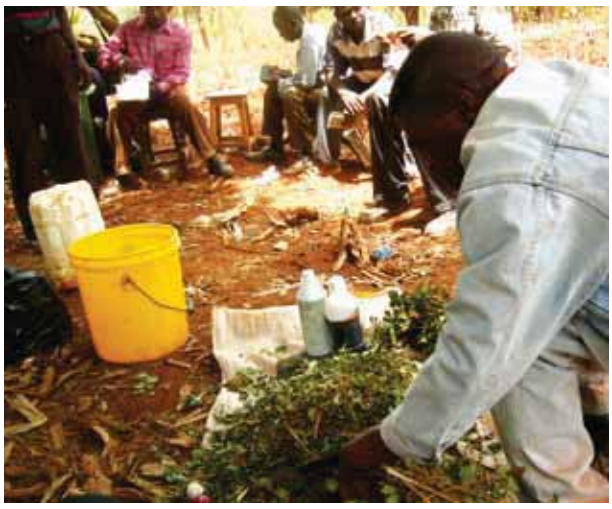
The magazine for sustainable agriculture in Kenya

biovision

Nr. 54 November 2009

i-TOFs at work

Dozens of farmers' groups have already benefitted from the i-TOF training programme offered by the information and input centres of *The Organic Farmer* magazine. The picture shows members of the Mukui Farmers' Group during a training session in Sagana, preparing plant extracts. *See page 6*



Fertilizer not effective in poor soils

Soil organic matter increases soil fertility, improves soil structure, retains and stores nutrients and water and makes them available to plants over a long period. Two new studies conducted in Western Kenya add a new dimension to this common knowledge. They show that mineral fertilizers are less effective and may even be unprofitable on soils which are very low in organic matter. In such soils, fertilizer nutrients are not retained in the soil, but are washed out before they can be taken up by the crops. These soils had been planted for decades without a break. In addition, the most degraded soils were often cultivated by the poorest farmers, and they were using less than half the fertilizer amounts compared to farmers with better soils. Three things can be seen from these studies.

Firstly, the government's well-intended efforts to make fertilizers available and affordable don't help the poorest farmers much, but may actually reinforce income inequalities. Secondly, farmers should be aware that fertilizer application is not economical on very poor soils. Thirdly, the results emphasize the central role of soil organic matter.

Organic matter is central

Organic methods are the best way to improve poor soils. Compost, animal manures, green manures, mulches and cover crops all contribute to the building up of soil organic matter - which is what poor soils need most to improve.

Rift Valley Fever: Outbreak likely

Livestock keepers should be aware that with the current rains, an outbreak of the Rift Valley Fever is looming. Farmers across the country are advised to take preventive measures to contain the disease when they notice symptoms. The Rift Valley Fever virus is spread primarily by the bite of infected mosquitoes, mainly the Aedes species, which can acquire the virus from feeding on infected animals. The female mosquito is also capable of transmitting the virus directly to her offspring via eggs.

These eggs can survive for several years in dry conditions. Periods of rainfall enable the eggs to hatch and the mosquito population to rapidly increase, spreading the virus to the animals on which they feed. *See page 3*

in this issue

Dear farmers,

Our article on livestock breeding in the October issue of The Organic Farmer *generated a good response from farmers who have requested for advice and guidelines on how to keep records. Indeed, animal breeding goes hand-in-hand with record-keeping. These documents help to reduce the risk of inbreeding and also increase animal productivity. There can be no sustainable livestock breeding without maintaining proper records.*

Even though we have written about this in the previous TOF-issues, we cannot ignore these requests from fellow farmers. In The Organic Farmer *will from December we feature the basic principles of record keeping including guidelines on how farmers can keep records for animals as well as for crops.*

Record keeping requires discipline and time to put down the figures regularly. Proper records are a useful instrument of planning and a good management tool, not only on livestock breeding, but also for small-scale farmers. Careful planning does not require money, it needs creativity, initiative, the courage to tackle problems instead of lamenting, and a will to succeed.

The recent drought with its devastating consequences should be a lesson to farmers on the need to plan ahead. Let us give you two examples. Most farmers did not have adequate forage compared to the number of their cows. There are various methods farmers can use to prepare fodder for the dry season; we have featured them in our magazine. If you need some of this information, send us an SMS with your address and key word like "hay" or "silage", and we will send you the material. A longterm solution for producing fodder during the dry seasons is to plant fodder trees such as Leucaenea or Calliandra.

Another example for the need to plan ahead is the availability of water. When the rains come, farmers forget all about drought; but within a short time, they will be facing the same problem. There are many cheap methods of harvesting water (see pages 5 and 6). All you need is labour and the determination to harvest as much water as you can to use for food and fodder production.

Small-scale farmers need to take their fate in their own hands. Do not wait for other people to assist you, take the first step to address your problems. Experience shows that proper planning is the first step to success.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

"It is time for organic farmers to pull together"

Su Kahumbu, well known to our farmers as the person who answers their questions, plans to bring Kenyan organic farmers together. We give her the opportunity to explain her vision. (TOF)

As a key stakeholder in the organic industry, I am always looking for innovative methods of solving the myriad problems small-scale organic farmers face: An aging farming population, unemployed youth, a less than enabling farming environment due to global climate change, lack of genuine transparent representation in the sector as well as in the larger agricultural sector, lack of organic markets, lack of national representation etc. These issues cannot be addressed by one person alone.

Upto now Kenya lacks strong farmers organizations, that can represent farmers interests both at the district or national level. Farmers have become victims of exploitation at every level. The few organizations that claim to fight for farmers' rights are individual outfits that have very little following among the small-scale farming community. There needs to be an organization that can lobby to bring the desired changes in the agricultural sector.

I believe in the power of numbers. Statistics show there are a few hundred thousand organic farmers in Kenya, and the country's farming population is approximately 60% of the total national population, according to the 1999 census.

Integrity and transparency

The organisation will charge a small yearly membership fee which may be payable in monthly instalments. My target would be to achieve a million members over a five year period. With these economies of scale, membership could be as low as 10-20 Ksh monthly.

Office bearers of the organisation will have to undergo a due diligence examination. Information on potential office bearers will be made available to members using new technologies, where members will be enabled to elect office bearers using their mobile phones. Accounts of the organisation will be posted quarterly in *The Organic Farmer* magazine.

Our targets

As this is the birth of an idea, I have developed a draft 'mandate' for the organisation together with a few other interested organic stakeholders, and I imagine that this draft will be adapted in due course according to the requirements and input of the organisation members.

The aim of the organisation shall be:

1. To create a national unified body of organic farmers across Kenya.
2. To provide a national communication network for farmers to enable them voice their views, concerns, requirements, at a national as well as international level.
3. To create a paying membership network that will address issues of its members at a national level
4. To use the power of numbers to lobby for issues and concerns related to its members.
5. To use modern technologies to enable the most cost effective operations of the organisation.
6. To avail quarterly financial reports to all members via TOF ensuring absolute integrity and transparency of the organisation.
7. To develop new innovative models of agri-enterprises aimed at bringing the youth members into organic agriculture.
8. To develop organic markets at national level for members.
9. To eventually develop a national merry- go- round for members where monthly contributions will be used to develop clearly identified development projects (dams, credit systems, boreholes, etc). **Su Kahumbu**

It is now time to act


Su Kahumbu

I feel it is time the world realized the most important folk on planet Earth are the primary food producers, small-scale farmers, upon whom the entire planet population depends for their very existence.

It is time, as food prices soar and supplies dwindle, that farmers should take the opportunity to rise up as one voice and demand the respect they deserve from both consumers and country leaders.

It is time that – if farmers are expected to continue with the responsibility of feeding the world, they must be recognized and supported in this endeavour.

It is time that we use new technologies and platforms to make the farmers' voices heard.

It is time the farmers join together, take and state their stand. There is no better time than now!

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development. www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org


One of the objectives of a farmers' association is to ensure that they have access to markets and to get competitive prices for their produce. (Photo TOF)

Farmers, beware of the Rift Valley Fever

Farmers can avoid economic losses if they vaccinate their animals against Rift Valley Fever, a highly infectious disease.

William Ayako

With the onset of the rainy season, livestock keepers, especially cattle, goat and sheep keepers, are advised to vaccinate their animals against Rift valley fever. Due to the expected heavy El Nino rains, the disease is expected to become severe this year.

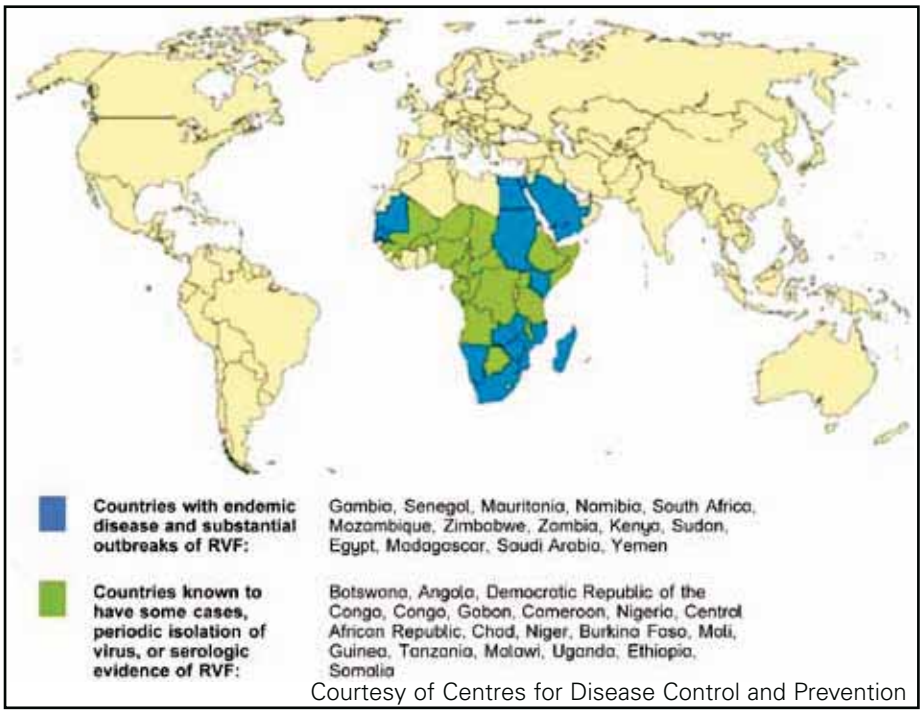
The disease, also known as enzootic hepatitis, is an acute infection of cattle, sheep, goats and humans and is caused by a phlebovirus. It recurs mainly in Africa. The epidemic occurs in cycles of between five and twenty years in association with heavy build up of mosquitoes after abnormally heavy rains. Transmission between animals is mainly by mosquitoes, while transmission from animals to people is by direct contact.

Clinical signs

- In cattle, Rift Valley Fever is characterized by abortion in pregnant cows and hepatitis in calves.
- In mature animals, abortion in pregnant females is outstanding. There is high fever and mortality may reach 10 %. Erosion of the oral mucus membranes may be observed.
- Other symptoms: Raised body temperature, excessive salivation, lack of appetite, weakness, dullness, and reduction in milk production.
- The incubation in calves may take 12-36 hours
- In severe form, calves will develop high fever, and may vomit. Some nasal discharge may also be seen, followed by prostration; mortality may reach up to 70%. In very severe infection in calves, death may occur in two days after the incubation without showing any clinical signs.
- In humans, there is lack of appetite, nausea, severe headache, joint pains, dizziness and nose bleeding. There are rare deaths among humans who usually recover and develop immunity.

National campaign

Like many other viral infections, RVF has no cure; it can only be prevented through vaccination. In Kenya, the ministry of Livestock development in collaboration with other stake holders has conducted a national vaccination campaign to control the infection of cattle and other animals. The campaign involves provision of free vaccines and personnel and the public have been sensitized through the local print mass media. The public is encouraged to cooperate during the campaign to enable us to save the remaining livestock.



Courtesy of Centres for Disease Control and Prevention

Preventive measures

- Prohibition of movement of suspected animals across national borders in Africa and from Africa to other countries would prevent transfer and new outbreaks.
- Grazing of animals in mosquito infested areas should be avoided.
- Vaccination of animals and humans with suitable vaccines should be practiced. Pregnant cows should be vaccinated with special vaccines to avoid the risk of abortion.
- Human exposure to mosquito vectors can be prevented through use of protective clothing, application of insect repellents, and avoidance of outdoor activities during times of peak vector activity.

Warning

There is no known medical treatment of Rift Valley Fever and the public should be aware that the disease can also infect humans. Vaccination should be done by qualified personnel to avoid human infection through handling of the vaccine and infected animals.

- Report any diseases and deaths of cattle to the nearest veterinary office
- Report all cases of abortion in sheep, cattle, goats and camels to veterinary authorities
- Comply with the Department of Veterinary Services quarantine restrictions barring movement of livestock out of or into infected areas.
- Do not handle aborted foetuses without wearing adequate protection.
- Do not assist animals with difficult calving but consult the nearest veterinary office or clinic instead.
- Wash your hands with soap and water or disinfectant after handling animals or animal products.
- All animals should be slaughtered in authorized slaughter houses and be inspected by an authorized meat inspector.
- All meat should be transported in a permitted meat carrier and each consignment accompanied by a certificate of transport indicating the origin and destination of the meat.
- Do not drink raw milk before boiling or pasteurization.
- All animal products should be well cooked or processed before eating.

East Coast Fever vaccine available

Millions of cattle in 11 African countries could be saved following the mass production of a vaccine that controls East Coast Fever (ECF). The vaccine that works by infection and treatment of healthy animals to develop their immunity to the disease has not been available to most livestock keepers in these countries due to lack of adequate funding for its production.

The International livestock Research Institute (ILRI), at the request of Africa Union/Inter-Africa Bureau for Animal Resources has produced one million vaccines that will be used to vaccinate livestock in the affected areas. (**TOF**)

Tanzania supports organic farming

With official assistance, Tanzanian farmers have increased crop yields using organic methods.

Peter Kamau, Pare (Tanzania)

Farmers in Pare mountains (Tanzania) working in their *shamba*. (Photos P. Kamau)

Hussein Mavoa, a 52-year old farmer in Ntenga village in Pare mountains in Tanzania had for a long time practised farming the traditional way. However, like many other small-scale farmers in rural Tanzania, his crop yields were not very good. The average maize yield was three to four bags per acre which could not meet the food requirements for his family of five. For maize seed, he would select his seeds from the previous year's harvest. But all started changing for the better two years ago when the Tanzanian government with assistance from donors introduced the Participatory Agricultural Development Programme (PADEP) to train farmers on sustainable agriculture.

"In the last three years, I have seen a steady increase in my maize and bean yields. Now I can harvest between 12 and 13 bags of maize per acre which was something I could not imagine just a few year ago," Mavoa says.

Farmers learn organic methods

Mavoa is a beneficiary of PADEP. Together with 40 other farmers in Ntenga village from Same district in Tanzania, he enrolled for the training programme in 2007 when it was launched. They were divided into 4 groups with each group of 10 farmers being given a choice of the area they wanted to be trained in. The 4 groups chose crop production, soil conservation, dairy farming, poultry keeping, irrigation and water development.

Mavoa's group went for crop production with maize and beans being their main crops. The programme started training the farmers on the importance of restoring soil fertility, composting and use of organic fertilizers. "For pest and disease control they introduced us to various plants that can control pests, fungal and bacterial diseases. We were also shown how to prepare foliar fertilizers. We never knew that many plants that we often take for granted are very useful to the farmer", says Mavoa. A little more labour is needed in organic production; however, the benefits outweigh the cost of buying what he calls *Mbolea ya viwandani* (chemical fertilizers) including chemicals pesticides and fungicides. He says the use of organic methods has opened the eyes of many poor farmers who have now found cheaper methods of crop production that have considerably cut down on their production costs.

Exchange of skills …

To ensure the new technologies introduced to them are adopted by all members, each of the groups has to train others what they have learnt. For example, Mavoa's group has to train the other groups that specialised on soil conservation, poultry keeping, irrigation and water development, what they learnt on crop production. Each of the other groups have also to train Mavoa's groups the skills they have acquired in their areas of specialisation. At the end of the training and exchange of skills learnt, all the members in the four groups will have gained experience in crop production, soil conservation, dairy farming, poultry keeping, irrigation and water development.

… and financial support

The government extension staff do not stop there; they have to visit each group and do an evaluation to test if the farmers have learnt all the skills. The evaluation is done in a selected demonstration plot specific to each of the areas the farmers have been trained on. Satisfied that they can put into practice all they have learnt, the farmers are given certificates and allowed to go back to their farms where they are expected to start various farming activities.

To facilitate the farmers and enable them implement the various projects, the programme granted them Tsh 35 million. From this amount, the farmers were given grants, each according to their requirements such as money for purchase of seeds, ox ploughs, improved dairy cows or goats or irrigation pipes. "This money has made a considerable improvement in our livelihoods," Hussein Mavoa says. "35 out of the original 40 members have managed to start various income generating activities that are now supporting them."

Changing farming systems

Most farmers in the Pare mountains still practise traditional farming systems with little use of fertilizers and chemicals. Intensive farming over the years on the slopy mountains had to led soil erosion and reduced soil fertility. The introduction of organic farming including provision of certified maize seed varieties is changing the way farmers practise agriculture in this region and other parts of Tanzania.

The most interesting approach being used in this program is that it is farmer-driven. The farmers identify priority projects within their community, then the government comes in to provide technical and financial support to help them realise their goals. Other projects that the government has initiated on the same model have had a big impact on the overall agricultural production in the country. Increased productivity has enabled Tanzanian farmers to export fruits, vegetables and cereals to Kenya which has been made easier following the cross-border trade pact signed under the East African Community trade agreement. (pk)

Collect water while it is raining

A lot of run-off water can be harvested and put to good use instead of going to waste.

The Organic Farmer

The rains have already started. Most farmers are taking advantage of them to replant after the crop failures of the recent drought. As the rains continue, billions of cubic meters of water that could be harvested and stored across the country will go to waste. With the diminishing water resources as a result of deforestation and climate change, we just cannot afford to lose such large amounts of water any more. Instead, farmers should collect as much water as possible now, to have it ready for use during the next dry season!

Farmers can choose between various methods to harvest water for domestic as well as for agricultural use. They should take into account all available water resources and all ways in which water can be collected, stored, and treated. In the same way as your crop harvest provides enough food for your family all year round, an adequate amount of water should be available to carry your family, your livestock and your *shamba* safely through the dry season.

Water

Our series on water *The Organic Farmer* underscores the value of this neglected resource. In the December issue, we will feature indigenous technology in water conservation.

Harvesting water for domestic use

Farmers need water for two main uses: Clean water for the household and animals, and less clean water for crops. The best source of clean water is rainwater. Iron sheet roofs can supply free and clean water throughout the year – it only needs to be caught by gutters and drained into a storage tank.

Use all roofs on your farms to harvest rainwater! Also water flowing from smaller roofs of sheds and stables can be collected in smaller tanks or drums. In a household with 6 persons consuming 100 liters of water per day, 36 cubic meters of water are required throughout the year. In a semi-arid climate (600 mm of rain per year), this amount of water is provided from a roof area of 60 square meters. This corresponds to a house of 6 meters x 10 meters.

All gutters need to be checked and maintained permanently to make sure that no water is wasted and the inflow to the tank is not blocked.

A roof, well maintained gutters and a clean and covered tank are vital in dry regions. (Source: Sustainable Agriculture Manual, IIRR 1998)

Storage tanks

Tanks, reservoirs and cisterns for clean water storage can be constructed above ground or below ground. No matter whether they are made of plastic, bricks, masonry, steel sheets, or concrete, they must be tightly covered to prevent evaporation and pollution, and mosquitoes breeding inside. They also need regular inspection and cleaning. Before the rains start, the tank must be cleaned. The first direct flush of rainwater should always be directed away from the storage, since it contains the dirt from the roof.

Do not waste rain water! (Source of all photos: www.infonet-biovision.org)

A storage tank should be placed near the place of usage, e.g. the kitchen, or the cattle unit. An overflow should redirect excess water to a smaller water container or tank.

Protect your family from malaria

All open water areas are breeding places for mosquitoes, also in the dry season, when malaria transmission is normally decreased. Cover tanks and all other inlets where mosquitoes may invade (taps, ventilation pipes) with screens and mosquito-proof mesh!

You can get enough water for your livestock and crops

Water for farm animals and for irrigation of crops can be collected from surface runoff which is directed into ponds or reservoirs. Such structures can hold large amounts of water. Usually, soil is excavated and the material is used to form a dam. The ground of the pond or pit has to be compacted to reduce leakage. Trees and scrubs are grown on the windy site of the dam to function as windbreaks and to reduce evaporation. This requires some effort, but there are many examples of initiatives where farmers alone or together by forming water user associations successfully constructed dams and ponds.

Run-off water from roads can be harvested from cut-off trenches or road ditches

Collecting runoff surface water

Surface water runoff, e.g. from roads, should always be directed into ponds or reservoirs. Trenches channeling water directly into the fields should be avoided, because uncontrolled water flow during heavy rainfalls leads to soil erosion and development of deep gullies in agricultural land. Water from ponds can be used for livestock as well as for irrigation of fields and crops. From the pond, small channels can then direct the water to the fields.

Pits, dams and ponds

Natural depressions or pits which were left by road constructors can be used for water storage, especially if you observe that water tends to drain slowly from

Continued on page 6

>>> from page 5

Water

them. A trench can be dug to divert water from the road into the pit. To construct a dam and a pond, use a natural depression where rainwater flows or accumulates naturally. Also gullies can easily be diverted into a pond. The soil should be clayey. Avoid building dams near livestock enclosures to avoid pollution!

Dams should always be circular or oval in order to have an evenly distributed water pressure preventing cave-in of the walls. They can be lined with clayey soil to make the bed more impermeable. On slopes, a dam of half-circular shape may be sufficient to hold the water in the pond. A spillway lined with stones is built at each upper end of the dam wall to discharge surplus water safely.

Excavation dams are circular or oval excavations where the excavated soil is used for building the dam walls. Their sides should slope at least 45 degrees to be stable.

Enlarge your pond gradually

A farmer can start with digging a small pond during dry season and enlarge it every year, until he is satisfied with the capacity of his dam.

Channels to the shamba

Diversion channels direct the water from the pond into the shamba, where it can be collected in small pits. These are dug along the contours. Pits allow the water to sip into the soil, thereby increasing its moisture content. Use of pits is also a soil conservation measure as it prevents the run-off water from carrying the soil away.

Round dams are built on flat land (above), semi-circular dams hold water on hillsides (left), and excavation dams can also be built in succession (below).

Nr. 54 November 2009

farmers forum

020 445 03 98 0721 541 590 0738 390 715

More farmers benefit from i-TOFs

Peter Kamau, Gatuto

It is a hot Tuesday morning, and members of Mukui Farmers Common Interest Group near Sagana town are seated in a semi- circle under a tree in a group member's farm. Before them are a variety of plants in a heap for preparation of plant extracts, there are also ingredients for preparation of natural milking salve. The members are involved in a lively discussion on the steps they have to follow in the preparation of the two products.

Peter Murage, an extension worker who is in charge of i-TOF training programme in the area is supervising the farmers to make sure they prepare the ingredients according to the way he has trained them. Finally the farmers get down to work.

The Gatuto training centre is one of the four information and organic input centres (i-TOF), which have been set up by The Organic Farmer magazine in Gatuto (Central), Kangundo (Eastern), Majengo/ Buyangu (Western) and Baraka Agricultural college in Rift Valley province.

Exchanging information

The 24-member group is a beneficiary of the i-TOF training programme, which was launched two months ago. Already many farmers' groups near the i-TOF centres are reaping the benefits of organic farming and sustainable agriculture through direct training by our extension workers.

After the practical session is over, the farmers review areas they had not understood in their previous training. They seek clarifications from Murage who answers all the questions with ease. The farmers then share their own experiences on the different aspects of farming.

Anne Wairimu says termites used to be a big problem to her, but since she attended a training session last month, a termite control plant extract solution they were introduced to had managed to wipe out termite colonies in her farm. Other members who have used the extract agree with her.

Apart from the use of plant extracts and the milking salve, the farmers have also learnt how to prepare compost in the right way and various methods they can use to improve soil fertility and crop yields. " Previously we have had to depend on a few experts who came to train us at an exorbitant cost", says group chairman George Maina. "We are not paying anything for this valuable training and information material. We hope the project will continue so that more farmers can acquire knowledge on sustainable agriculture", Maina says. The farmers want more training in agroforestry, water harvesting and dairy farming.

Using Infonet

Like the other extension workers in the programme, Murage's diary is always full. When he is in the office, farmers thirsty for information come to consult him. Others bring diseased plants and even pests for him to identify and recommend a solution. Murage opens his small laptop computer. It contains the infonet-biovision information package which provides answers to most of the diseases and pests that affect farmers in East Africa. After going through the pictures showing various diseases on the computer, the farmers are able to identify the particular disease and how to control it. They leave the office satisfied.

Mukui farmers' group members in a group discussion with i–TOF extensionist Peter Murage, (left in cap)

Organic inputs

In addition to the training, one area that farmers have a problem with is access to organic inputs. The i-TOF programme has made arrangements in the four i-TOF areas where farmers can buy some basic organic inputs such as diatomite powder that can protect cereals such as maize, beans, rice or any other cereal crops from pest damage for long periods of time, for instance against the Larger Grain Borer.

Why some eggs fail to hatch

Why do some eggs remain unhatched after the hatching period is over?

Chickens are naturally rather poor brooders. Very often, only a part of the eggs will hatch. Even Bankiva-chickens, the wild ancestors of our domesticated chicken, are often not very successful and have to start a second and third clutch. There can be many reasons for unhatched eggs. If the egg was not fertilized by a cock, no chicken will develop. Eggs may also have remained cold for too long. In case the egg had a crack or the shell was of poor quality, the egg might have dried out. Also the age of the hen can matter: the proportion of unhatched and infertile eggs is larger from the third laying period of a hen onwards.

Phosphorus is essential for plants

Is organic phosphate better than DAP?
Ruth Ruto, Bomet

Phosphates are a naturally occurring form of phosphorus. Phosphorus is absolutely essential for both plants and animals as an energy carrier and for growth and reproduction.

Rock phosphate in its natural form is used in organic farming to provide phosphorus to the soil for plant uptake. Rock phosphates release phosphorus and other minerals gradually and slowly, and the effect may not be seen immediately.

DAP on the other hand is synthesized in a factory by combining ammonia with phosphoric acid. It contains both Nitrogen and Phosphorus which are transferred to the plant directly, as DAP is a water soluble fertilizer.

However, when DAP is applied as plant food frequently, it increases soil acidity. In soils where DAP has been used for long time it is difficult to reduce acidity. This reduces crop yields and income for the farmer.

Enriching compost with rock phosphate

When using rock phosphate, you have to know:
- Legumes and millets respond best and directly to rock phosphate, whereas on maize the effect is only long term.
- In acidic soils, rock phosphate is more soluble and more available to plants
- Rock phosphate shows best effects when it is composted together with organic materials like manure or vegetative matter. This natural acidification process makes it available to plants in most soils.

Ratio of cocks to hens

How many hens can a cock serve?

Chicken naturally live in groups of one cock and two to five hens. But if the poultry they are kept in confinement, there should not be too many cocks, as they will start fighting and may even kill each other. In such a system, provide not more than one cock per 20 laying hens. If the cocks start to fight seriously, weaker cocks have to be removed.

If you want eggs for brooding, you will of course want that the entire clutch is fertilized. In this case, one rooster should probably serve not more than six hens.

...answers in brief

Cowpeas

What is cow peas in Kikuyu language?

Cowpea is known as thoroko in Kikuyu language.

What type of cassava

Thanks for your radio programme aired on 24/09/09. How long does cassava MM96/5280 take to mature? L.A Omuka. 0724 417 182.

MM96/5280 is an early maturing variety developed by KARI scientists. It is tolerant to Cassava Mosaic Disease, has sweet taste and is high yielding. The variety takes 6 months to mature. For more information get in touch with KARI Kakamega. P.O. Box 169, 50100 Kakamega, Tel 056-30031.

Control ticks

Why are ticks common on some particular breed of cows than others?

It is true that ticks may attack a particular cow in the herd more than others but the reason for this has not been researched on. It may be similar as with mosquitoes – some people get bitten all the time while others remain untouched. Some veterinarians say animals with tender skin may be more prone to attack but no scientific evidence exists to back this explanation. We would advise to ensure all your cows are dipped often to reduce tick infestation which can cause several livestock diseases if they are not controlled.

Super-gro

I would like to know more about a product called super-gro.Which I have been told is an organic fertilizer. Do you really approve it. Walter from Rachuonyo district? Tel 0724 112 142.

Super-gro is a wetting agent that enables plants to utilize water more efficiently. It is non-toxic, non-caustic and environmentally friendly. It is often mixed with pesticides to make them work better when applied on plants. However an American company who introduced it into the country, registered it as a cosmetic product running into problems with the Kenya Plant Inspectorate Service (KEPHIS) which banned it. So it is not available in most agrovet shops because of the ban. However it is absolutely safe to use in organic farming.

Starting a proper organic kitchen garden

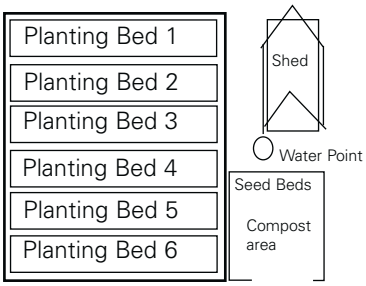
The Organic Farmer *magazine often gets questions like this: "I have recently moved to a new home and would like to grow a kitchen garden and flowers organically. Please advise, thanks". I think it is important to show how to set up a kitchen garden.*

Su Kahumbu

I'm happy to hear you intend to also grow your flowers organically!

When locating a 'place' for a kitchen garden, a few considerations must be taken into account. Firstly choose a spot with good, fertile soil. Secondly, there should be adequate water nearby as this will save you the trouble of trekking back and forth. If you have any buildings close by, water could be harvested from the roofs. Thirdly, you should not have too many big trees in the area as crops have difficulty growing under big trees. Finally, ensure the area is safe from animals and even unwelcome humans who may be tempted to taste your crops!

Once you have the ideal location, draw it out and take some measurements so that you have a kitchen garden map.



From this map, draw out your planting beds. I recommend beds that are a meter wide and can run for up to 50 meters. Between each bed leave 1.5 feet of space as a path. Once you have prepared the beds it is imperative that you do not trample on the soil again. Many farmers do not leave paths and thus damage the soil structure as they weed and tend to their crops. If you have a path running down the side of the bed you can easily do all maintenance on your crops without damaging them. Paths should be wide enough to take small wheel barrows, thus compost can be distributed efficiently and harvesting can be done without damaging the soil. Number the planting beds as this will help you with referencing and record keeping.

Now that you have a map you need to figure out what you are going to grow and in what quantities. Once you have made a decision, start a planting calendar as shown below. This will ensure you keep track of your planting regimes as well as ensure you have a continuous harvest.

Your planting calendar will follow the planting patterns of the rains if you rely on rain fed irrigation. However, if you are using irrigation to water your crops do proper planning so that harvesting time does not coincide with rainy season to avoid losing your harvest especially for cereal crops.

Some tips

1. Use your planting calendar to plan your farm activities and follow good crop rotation in each planting bed. This will reduce the incidence of pest and disease on the crops.
2. Planting in beds with this plan will allow you to adapt the system into using drip irrigation very easily. One of the future TOF-editions will demonstrate how this is done on the same plan.

Seed Beds

Before you begin to plant, start preparing your seed beds. This area must be near a water source and may require a little shading if it is too hot. Prepare your soil for your seed beds and dig up beds approximately 2m x 1 m. The number of seed beds will depend on the size of your kitchen garden. An eighth of one acre plot may require 2 seed beds this size. Incorporate a large amount of very well decomposed compost into the seed bed soil. It is important that this soil drains well but does not dry too quickly.

Follow the direction on your seed packets with your planting calendar so that you do not under or over plant.

An organic kitchen garden requires a lot of compost fertilizer. Ensure you keep all your biodegradable wastes from your house and garden as well as from your flower garden, grass cuttings etc for this purpose.

Compost Making

Again, choose the compost making area close to a water source. Make compost heaps ideally 2m long by 1m wide by 1 meter high, using layers of materials you find on your farm such as crop wastes, kitchen wastes, green materials e.g. tithonia and comfrey leaves, weeds, dry leaves, manure, wood ashes, and if available *minjingu* rock phosphate. For a compost pile this size approximately 5 kg ashes and 10 kg *minjingu* can be used. Make sure that as you make the layers, you keep wetting them down just to a damp stage, with water, or water with E.M.

When the compost is piled up, cover it with plastic sheeting or banana leaves and wait for 3 weeks making sure to check it does not dry out. After 3 weeks turn it and again make sure it is damp; then cover it again. It will be ready when it resembles dark brown rich soil and has a great earthy smell. This may take a few months. If it has a bad smell do not use it, but turn and stop it from getting too wet which is probably why it was smelling.

Make a new compost pile as often as possible so that compost is always available for application in your kitchen garden. Transplant seedlings when they are approximately 1 month, and water them well, especially after planting. For your flowers, use the same compost. Put mulching material around the bases of the plants to keep soil moist and avoid having to water frequently. You can do the same with other crops.

Voila, keep the cycle going! Good Luck!

Planting calendar

Bed	Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	kale	tp	w	h	h	h	c/p						
1	carrot						d/s	w	w	t	h	h	c/p
2	corn	c/p	d/s	w	t/d		h						
2	beans	c/p	d/s	w	w	h	c/p						
2	potato						d/s	w	t/d	h	h		

tp = plant w = weed t/d = top dress c/p = clear and
d/s = direct seeding h = harvest t = thin prepare bed

The Organic Farmer

The magazine for sustainable agriculture in Kenya

biovision

Nr. 55 December 2009

Tomatoes can now be grown organically in a greenhouse (Photo TOF)

Huge interest in greenhouses

(TOF) There is a growing interest in greenhouse farming. Our rather sceptical article in the October issue provoked a huge feedback.

The biggest hurdle is that greenhouses require a heavy capital investment which is far beyond the ability of most small-scale farmers. On the other side, the greenhouse technology has attracted the interests of banks. Another tricky point for organic farmers who do not use chemicals is the danger of diseases in greenhouse crops. But a new range of organic biopesticides, fungicides and organic fertilizers are already in the market.

Now there is a real danger. It seems that all greeenhouse farmers are rushing to grow the same crop as their fellow neighbour: Tomatoes. When they flood the market, the prices go down and farmers earnings are blown in the wind. Diversification in the range of crops in greenhouse production very important because of the huge investment involved. *Pages 2 & 3.*

No fodder, no milk

Most cows owned by small-scale farmers are underfed. The result is a low milk production. How much fodder does a dairy cow need in a day? And what type of fodder? *Page 8*

in this issue

Addresses please!

We receive requests through SMS and e-mail from farmers who want to get copies of *The Organic Farmer* magazine. We can only consider them under the following conditions:

Farmers have to prove that they are genuine farmers' groups; they should therefore send us a copy of their registration certificate together with such details as number of members, their full address complete with telephone numbers of the contact persons.

For farmers who want to get copies of various articles, do not send SMS' containing only the keyword, "silage" for instance; we may not have the time to call you back to request for details of your full address. With regard to our free service, it is a minimal sign of courtesy that farmers indicate their full name and address.

NOTE: Farmers often complain that e-mails sent to us are not answered. Some months ago we informed you about our new e-mail address; here it is again: info@organickenya.org

Dear farmers,

The year has now come to an end. When we look back at the many articles we have done in the past twelve months, we have seen some very positive response from the farmers, who not only took our advice, but have gone ahead to practise what we have reported in the various articles in the magazine. A good example is the biogas article we carried in February. It provoked an overwhelming feedback from the farmers. The same response has come from farmers who read our article on greenhouse farming recently.

This shows that small-scale farmers are ready to adopt new technologies and ideas that help them improve production and income. It is encouraging to note that farmers and farmers' groups are able to take initiatives without assistance from the government and even NGOs.

We shall continue to support our fellow farmers in this initiative, with our magazine, with the TOFRadio (every Thursday evening at 8.15 pm, and with the input and information centres of The Organic Farmer, *i-TOFs. This new service is a big success, as you can read on page 6. In getting closer to the farmers, the i-TOF programme has made it possible to offer solutions to some of the problems that face small-scale farmers through intensive training by our extension workers.*

It has not been a particularly successful year for farmers due to the prolonged drought that led to crop failure and livestock deaths. We hope that farmers will take advantage of the current rains to plant early maturing crops in order to improve their food stocks in the coming year.

Finally, our heart goes out to the Internally Displaced Persons (IDPs) who are still suffering in transit camps two years after they were thrown out of their farms during the post-election violence at the beginning of last year. Although these people had been promised resettlement and some money to sustain them, to date, many of them have not received a cent. It is really shameful that a country like Kenya cannot find a solution to such a small issue as the resettling of the IDPs. We hope that something can be done to ensure that these people are resettled so that they can resume a normal life.

We wish all farmers a merry Christmas and happy new year.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

Farmers can now buy greenhouse starter kits

Farmers have discovered the benefits of greenhouses. To build one needs capital and ambition.

The Organic Farmer

Greenhouse farming is becoming one of the most popular agricultural enterprises among farmers in the country at the moment. As we mentioned in our September 2009 issue of *The Organic Farmer*, farmers now want to grow high value crops that give them quick returns for their investment. Under optimal conditions, growing vegetables and fruits in a greenhouse can give the farmer up to ten times what they would get if they did the same in an open rain-fed field. The changing climatic conditions have brought very unpredictable rainfall patterns and frustrated many farmers. This explains why they opt for alternative methods of generating income; for them, the greenhouses seem to be a way out of the dilemma.

No loans without security

The biggest problem for farmers is lack of start-up capital. To put up a greenhouse requires a lot of capital. Most farmers cannot overcome this hurdle unless they get support in form of credit from a bank or their local Savings and Credit Cooperatives (SACCOs). The only other institution offering credit is the Agricultural Finance Corporation (AFC) which lends only to farmers with five or more acres of land.

A greenhouse made using local materials

Getting loans is not a big problem for farmers with title deeds or any other security such as household goods, a car or even a permanent residential house. Equity bank has a special credit facility for those who want to set up greenhouses. The farmers have to present their bank statements for the last two seasons. A detailed business plan showing the inputs required for the entire investment, including the expected crop yield and earnings, should be provided. The bank assesses the business plan and inspects the security and immediately disburses the loan, as long as the farmer meets all the conditions.

The cost of a greenhouse

Farmers can put up a greenhouse using locally available materials for the framework. But the construction needs a person with some technical knowledge on this specific task. The use of local material reduces the costs; the proceeds from savings can be used to buy other important inputs such as the plastic sheeting or seeds.

A number of companies are already selling entire kits for greenhouses, including the irrigation system. It is easier for farmers who can raise enough capital to buy these kits because they come as a complete package.

One rather good value kit is produced by Amiran Kenya Ltd, a company based in Nairobi. This kit can cover an 1/8 of an acre (500 square metres) and goes for Ksh 139,600. The cost of the farmers kit does not include technical assistance, labour, seeds, organic inputs and other incidental costs (see table below).

The Amiran Farmer's Kit (AFK) is designed in a simple way. It comes with steel structures for the framework of the greenhouse, the cover and a high roof that provides adequate space for crops to grow as required. The kit has a drip irrigation system, a collapsible water tank, a knapsack sprayer including seeds of various crops such as tomatoes, specially suited to a greenhouse environment. Farmers who purchase the kit are trained on every aspect of greenhouse management, pest control, environmental health and safety.

Agro-Tunnel International, another company based in Kitale has a similar kit at the same cost.

Budget for a Amiran greenhouse (1/8 acre) used under ideal conditions

Item	Costs Ksh
Farmer's kit	139, 600
Labour (technical and support staff	24,000
Seeds	10,000
Biopesticides, organic fungicides and foliar feeds	20,000
Miscellaneous costs	5,000
Total costs for the greenhouse	198, 000
Income from 1,000 plants *	400,000
Gross profit margin	202,000

* Estimates: 1000 tomato seedlings planted, each plant produces 10 kg during its lifespan, 1 kg is sold @ 40 Ksh

NOTE: Organic inputs are available at Lachlan (k) Ltd (*See page 3*).

Farmers interested in the construction of a greenhouse can get more information from the following companies:
- Amiran (K) Ltd P.O. Box 30327, 00100 Nairobi, Tel. 020 824 840 -9 or 0725 647 924, e-mail: eva@amirankenya.com.
- Agro Tunnel International Tel. 0720 560 727, 0722 360 311 Kitale, Kenya e-mail: agrotunnel@gmail.com.

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.
The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development. www.biovision.ch
Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org
Editors Peter Kamau, Peter Baumgartner
Secretariat Lucy W. Macharia
Layout In-A-Vision Systems, 0720 419 584
Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe
Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

TOF gave Zipporah the greenhouse idea

Innovative farmer, Zipporah Itinga, manages organic tomato production in a greenhouse.

Peter Kamau, Kamulu

Zipporah Itinga always wanted to grow her crops the organic way. But she lacked information on how to do it. But luck came her way two years ago when she came across *The Organic Farmer* magazine and visited our offices. From the various articles in the magazine, she has acquired a wealth of knowledge on organic production. Last year she read an article that featured a company that was selling a range of organic inputs suitable for organic farmers and immediately contacted them.

Organic production programme

The company, Lachlan Kenya Ltd introduced to her a range of products that can be used in place of chemicals and which produce better results. At the same time, her husband, Francis Itinga had learnt about a tomato variety that could be grown in a greenhouse and which matures in six months. The couple had already lost their six dairy cows to diseases and also abandoned French beans production in their 10-acre farm in Kamulu in the outskirts of Nairobi. After reviewing their options, they decided that growing tomatoes in a greenhouse was the best way to go.

Technical back up

Zipporah Itinga once more approached the company for advice on how she could do it organically. Lachlan Ltd. was interested and promised her that in some kind of a trial, they would provide the necessary technical back up through every stage of tomato production using their organic fertilizers, fungicides and pesticides. The company offers free technical service to all farmers who buy their products.

Organic inputs

Itinga put up a 16 by 60 metre greenhouse with 3500 plants last August. She later spread tonnes of compost in the greenhouse. Afterwards, technical personnel from the company helped her to sterilize the soil in the greenhouse and the nursery, using Bioxx 5000. This is a broad spectrum soil drench. It kills all pathogens that attack crops in the soil while sparing beneficial organisms.

Later the soils were inoculated with the product Eco-T. It contains beneficial fungi that control fungal diseases, and fortified with bio-stimulants. Black majick, a soil conditioner that helps to balance the soil pH and reduce acidity, is also added during early soil preparation. After planting, TwinN for nitrogen fixation and Aton A to Z, an organic foliar feed with amino acids and trace elements are added. To ensure sustainable quality yields, Biocure, a crop protection product, is applied at intervals of two to three weeks for the entire growth cycle to control pests and nematodes.

Mrs Zipporah Itinga tending her crops

Drip irrigation saves water (picture above), the ropes support the plants during fruiting (picture below). Photo TOF

All these products are certified by the British Soil Association, an internationally recognized certification body, and Ecocert of South Africa. Another advantage is that these products are cheaper when compared to chemical pesticides and herbicides.

Greenhouse sanitation

Mrs. Itinga also uses plant extracts and ash to repel pests and to increase potassium levels in the soil. No plants in the tomato family such as potatoes, capsicums or eggplant are planted near the greenhouse to avoid disease transfer. Anybody entering the greenhouse has to dip their shoes in a disinfectant solution to prevent any contamination that can introduce diseases to the crop. When The Organic Farmer visited the farm, Itinga and her daughter, who also has been trained in organic farming were busy tending the healthy and succulent tomatoes that she expects to start harvesting in a week's time.

"I have always wanted to avoid the use of chemicals when growing crops." Mrs. Itinga says. "This is after learning that most of the chemicals are responsible for most of the diseases that affect our people. I knew it is only the farmers who can change the quality of the food in the market. I am happy to grow food that is healthy," she adds.

Any farmer interested in greenhouse organic production can get more information from Zipporah Itinga Tel.0722 739 025 or Lachlan (K) Ltd P. 0. Box 494, Nairobi, 00100, Tel. 020 207 39 12/3/4 or 0722 209 474.

Proper air circulation in a greenhouse is very important. (Photo TOF)

Record keeping is a must for breeders

Lack of records contribute to the declining quality of the Kenyan dairy animals.

The Organic Farmer

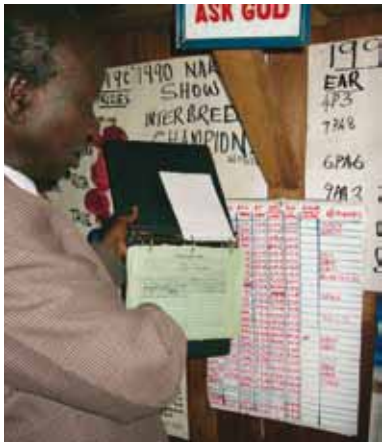
Farm records are part and parcel of the management system in any farm. They help the farmer to know how the various activities on the farm are performing. For those who keep dairy cattle, farm records are an important guide for any farmer who wants to keep essential details of their dairy animals. They can help farmers track the history of their dairy cows right from birth to calving, lactation for breeding and general livestock management purposes. Records of individual animals, their milk production, health, feed usage and other essential details can be kept for future reference and use.

The records are useful and can be used to improve the production of the animals. The records must therefore be kept in a way that they can be retrieved and used to help make important decisions regarding each of the animals. Farm records must be done in a simple way that anybody including the farm workers can understand. Farmers can use dairy farm records to improve and compare the performance of different animals on the farm. They can then decide if they want to keep the animals or even dispose them of.

A farmer who has maintained records of each cow will know when it was born, its daughters, the bulls whose semen was used to serve it, how much milk the animal produced in a day, how many times the animal fell sick, the type of disease and treatment that was given. From this history, a lot of information about an animal and its progeny (future calves) can be obtained. These can help the farmer to recall the quality of a particular cow or bloodline. The information can also be used by other farmers who buy the breed or even breeding societies.

Record details of each dairy cow

Most farmers have very limited knowledge on the importance of maintaining records. Do not trust your memory. A lot of facts will be forgotten within a short duration, making it difficult to



know figures and facts that can help you know about a particular animals and its young ones two or three generations down the line; written records can help you remember these.

Simple records can go a long way in assisting farmers to know the fertility and qualities of their animals. For those who want to upgrade their herds and produce high yielding dairy cows, record keeping where all details on the animals are provided, is a must. Breeding societies require that farmers maintain proper records of each of their dairy cows. The animals are registered with Kenya Stud Book (KSB), this is a secretariat that maintains all records of graded animals in the country. Farmers are required to keep records of daily milk production of each registered cow and the records sent to the Dairy Milk Recording Services of Kenya (DRSK).

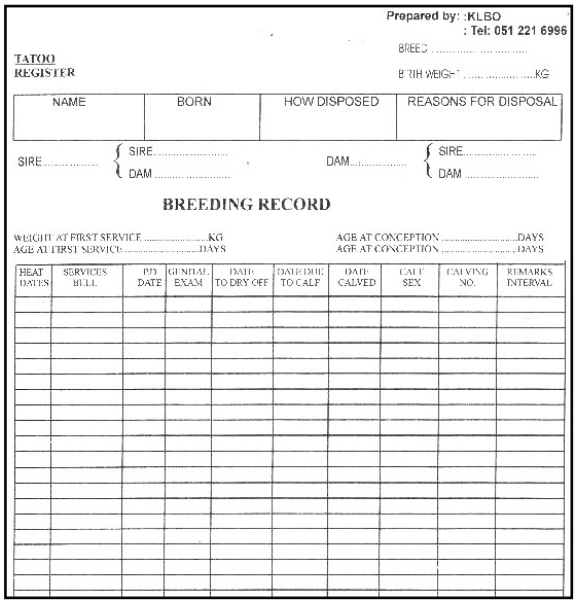
Very few animals registered

Research shows that out of 3.3 million dairy cows in the country, only 5 percent are registered with the Kenya Stud book. This means that there is a lot of inbreeding going on without the knowledge of the farmers, which is to blame for the declining quality of dairy cows in the country. Farmers should also ensure that all their graded animals are registered with the Kenya Stud Book. An animal whose records are registered fetches a higher price in the market because its quality is already known and can be proved through its records.

Semen straws contain very vital information such as the name and code of the bull whose semen was used; the farmer only needs to show the straw to the AI provider, who will then choose the right semen to avoid inbreeding.

Farmers interested in keeping dairy records for purposes of upgrading their animals should get into contact with The Kenya Livestock Breeders Organisation (KLBO) P.O. Box 478 Nakuru, 20100 Tel.: 051 2 216 996, Cell: 0723 379 048.

Animal records are more difficult to make compared to other farm records. Below we provide you with an example of a dairy cow record sheet and the details that must be included it for personal information and the KSB recording service.



Prepared by: :KLBO
: Tel: 051 221 6996

TATOO REGISTER

BREED .....

BIRTH WEIGHT ....KG

NAME	BORN	HOW DISPOSED	REASONS FOR DISPOSAL

SIRE..... { SIRE..... DAM.....

DAM..... { SIRE..... DAM .....

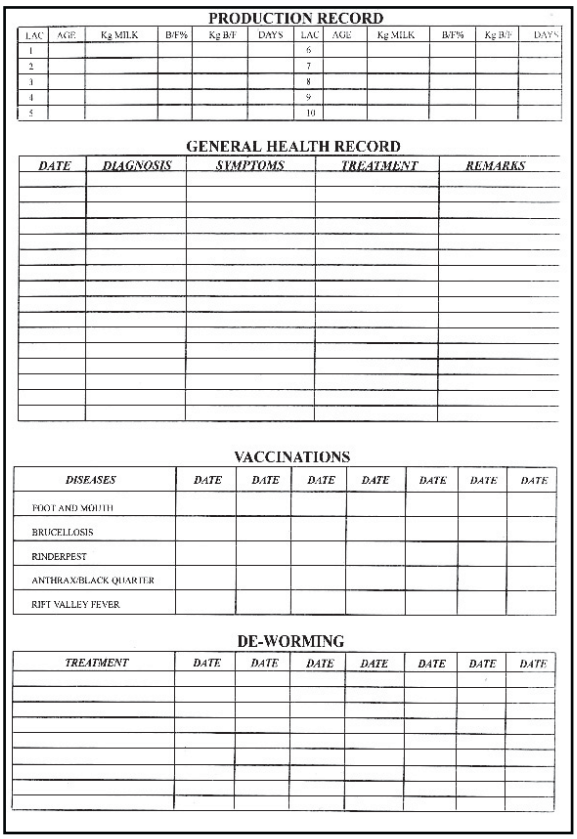
BREEDING RECORD

WEIGHT AT FIRST SERVICE .....KG
AGE AT FIRST SERVICE .....DAYS

AGE AT CONCEPTION .....DAYS
AGE AT CONCEPTION .....DAYS

HEAT DATES	SERVICES BULL	P/D DATE	GENITAL EXAM	DATE TO DRY OFF	DATE DUE TO CALF	DATE CALVED	CALF SEX	CALVING NO.	REMARKS INTERVAL

Dairy cow breeding records are only issued to farmers who have registered their dairy cows with KSB. The picture left shows a breeder with his dairy cow breeding records.



PRODUCTION RECORD

LAC	AGE	Kg MILK	B/F%	Kg B/F	DAYS	LAC	AGE	Kg MILK	B/F%	Kg B/F	DAYS
1						6					
2						7					
3						8					
4						9					
5						10					

GENERAL HEALTH RECORD

DATE	DIAGNOSIS	SYMPTOMS	TREATMENT	REMARKS

VACCINATIONS

DISEASES	DATE	DATE	DATE	DATE	DATE	DATE	DATE
FOOT AND MOUTH							
BRUCELLOSIS							
RINDERPEST							
ANTHRAX/BLACK QUARTER							
RIFT VALLEY FEVER							

DE-WORMING

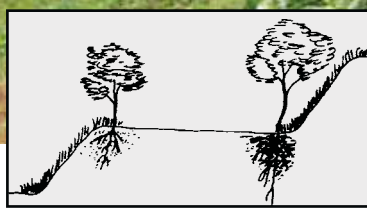
TREATMENT	DATE	DATE	DATE	DATE	DATE	DATE	DATE

Use proven methods to conserve water

A lot of water can be conserved in the soil for crop prodution and to avoid loss through runoff.

Anja Bengelstorff

Crops need moisture to grow well. A lot of moisture can be retained in the soil if the farmer employs appropriate methods of water conservation on the farm. These methods ensure that as much water as possible is arrested and allowed to seep into the soil where it can be taken up by crops during the growth phase; otherwise that water would be wasted as run-off. In sloppy land for example, a lot of water is lost because it flows away by gravity. In flat land, water logging can be a problem, if drainage channels are not made and water flow regulated and used by crops. Farmers should ensure that the available water is conserved and used for crop production. There are various methods that farmers can use to conserve water for these purposes.



Terraces expand usable land and help collect water for your crops. The picture shows terraces in Rwanda.

Planting on terraces

Terraces are usually put in place as soil and water conservation measures on slopes and hills. They provide flat areas of land that can be planted with crops. Grasses, trees and shrubs can be planted on the ridges to stabilise the ground. They also provide leaf mulch and protection from wind for crops; trees and shrubs are useful products for firewood, fuel, building poles or fodder.

Trees can be planted on the ridge or at the back of the terrace. If the tree is planted at the back of the terrace, it will get all of its water requirements. If a tree is planted on the ridge of a terrace, it will be on drier ground but the leaves will spread around more evenly and provide more nutrients for crops. Trees can be planted in both locations if the terrace is wide enough. The type of tree or hedge used will vary according to the site it is planted on and what products or services you wish it to provide. If the aim of the terrace is to stabilize the soil, trees and shrubs with strong root systems should be planted. These will be able to withstand the movements of soil and water.

Water

In our series on water, *The Organic Farmer* underscores the value of this neglected resource. In the January 2010 issue, we will feature drip irrigation systems.

Water remains in pits

Tumbukiza ("throw all in") pits have revolutionized fodder production and improved soil fertility. Huge pits, 60 – 90 cm in diameter and 60 – 90 cm in depth are filled with trash, vegetative matter, farmyard manure and topsoil, then fodder crops, preferably Napier grass, are usually grown. Some farmers apply 20 litres of water per hole per day during the dry season. The organic material in the pits retains the water, enabling the Napier grass to grow rapidly and yield one cut per hole per month. Thus, if a farmer owns one cow, he needs 30 pits; these, when watered at a rate of 20 litres per day, will provide enough fodder for the cow for the month. At the end of one cutting cycle (30 days), the fodder has grown enough to allow for the next round of cutting.

Contour vegetation strips hold water

In traditional systems, lines of grasses, stones, crop residues and other organic debris are placed along hillsides to control water and soil erosion. Contour vegetation strips are living barriers of trees and shrubs which are planted along the contour lines of a slope, bands 0.5-2m wide, or strips simply left unploughed to be colonized by grasses or weedy shrubs This method requires little labour. These lines of vegetation can serve the same purpose and can also provide useful products such as food, fuel, building poles or fodder. There are many factors to consider when building contour strips as bad design can lead to even more severe erosion. The effectiveness of the strip depends on the type of tree planted, the spacing of the trees and the width of the strip, the steepness of the slope, the amount of rainfall and the type of soil.

The advantages are that the strips can provide additional nutrients and organic matter into the soil. This can be increased by using nitrogen-fix-

Continued on page 6

>>> from page 5

Water

ing plants. In addition, excess vegetation can provide food for animals. These can be allowed to browse through the strip to feed on crop remains after harvesting. However, contour strips can take up land, which could be used for crops. Instead of trees and shrubs, grass strips can provide an alternative and are effective in reducing runoff and erosion.

Windbreaks or shelterbelts

A shelterbelt, or windbreak, is a barrier formed by trees and shrubs strategically planted to reduce the speed of wind in order to protect agricultural lands, people, animals and buildings. They can also be used to support sand dune stabilisation. Shelterbelts are most successfully introduced in areas where there are high wind speeds or prevailing winds for long periods, or where the soil

A well maintained windbreak is made-up of small, middle and high tree; the wind can pass through.

A poorly managed windbreak: The trees block the wind totally. The wind whirls behind the windbreak, it spoils the soil surface and vegataion behind the windbreak.

is dry for a large part of the year to protect loose soil. Shelterbelts are made up of strips of trees, shrubs and grasses planted in single or multiple rows. Ideal species are those that are bushy and withstand harsh environmental conditions such as hot or cold winds, salt-laden winds, wind-borne sand or drought.

Evergreen species are recommended unless trees and shrubs are in full foliage during the period of winds. Grasses and herbaceous plants can be planted at the base of the shelterbelt to protect the wind from eroding the surrounding soil. The shelterbelts are sited on the upwind side of the land to be protected and are most effective when planted vertical to the prevailing wind direction. Sometimes large areas are protected by several parallel shelterbelts. Research shows that wind speed is reduced on both sides of the barrier.

Winbreaks need maintenance

The advantages are that physical damage to soils, crops, pasture and animals is reduced, the temperature of soil and air behind shelterbelts is modified, moisture loss is reduced, the leaves from the shelterbelt can help fertilize the fields and soil erosion can be prevented. Among the disadvantages, again, is that the space the shelterbelt takes up reduces the overall land available to the farmer. Also, the trees that make up the shelterbelt may compete with crops for water and nutrients, leading to decreased production. Shelterbelts need continual maintenance to ensure maximum efficiency.

farmers forum
020 445 03 98 0717 551 129 0738 390 715

*i-TOF*s become more popular

Increased demand for training courses offered by the i-TOF extensionists.

The Organic Farmer

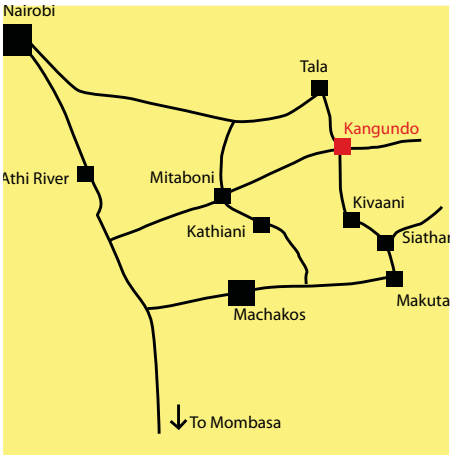
Three months ago, we started the *i-TOF* programme, the four input and information centres of *The Organic Farmer* magazine. The *i-TOF*s in Kangundo, Gatuto, Majengo/Buyangu and Baraka/Molo have served farmers very well in offering training and access to some of the organic inputs that may not be easily available. Our extension workers are overwhelmed by the demand for training services from farmers in areas surrounding the four centres.

This huge interest has brought another problem: Farmers from as far as two or three hundred kilometers away from the *i-TOF* centres have also been calling the extension workers. They are requesting to be trained on various topics on sustainable agriculture.

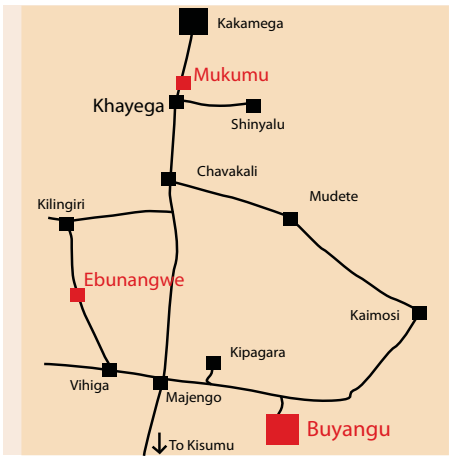
Unfortunately, this is not possible. At the moment our financial resources are limited; we cannot be able to serve farmers beyond the project areas as shown by the maps below. Just now, we are discussing the possibility of farmers' groups from far off places meeting the transport, food and accommodation costs for the extensionists. Since the training is free of charge, these farmers are only expected to facilitate our extension worker to reach them and offer the training. A final decision will be made by the end of January 2010.

Extension workers fully equipped

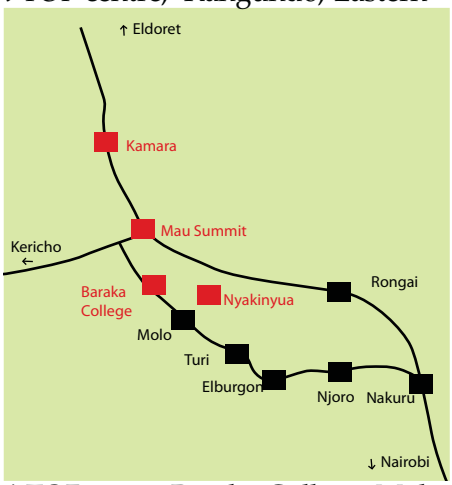
Our extension workers are fully equipped with information material on every aspect of agriculture. They have also been given a small laptop computer through which they can access the offline version of the infonet-Biovision website. If a farmer has a disease or pest problem, all they need to do is to take a sample of the affected plant to the extension worker. He will then use the computer to identify the problem and also give a solution. In addition, the centres have all issues of *The Organic Farmer* magazine from when we started publication of the magazine in April 2005 to the present issue, including books on various topics that cover every aspect of farming. Through the centres, we try to offer farmers a forum where they can come together and share their experiences and ideas on how they can improve their farming practices, yields and even income.



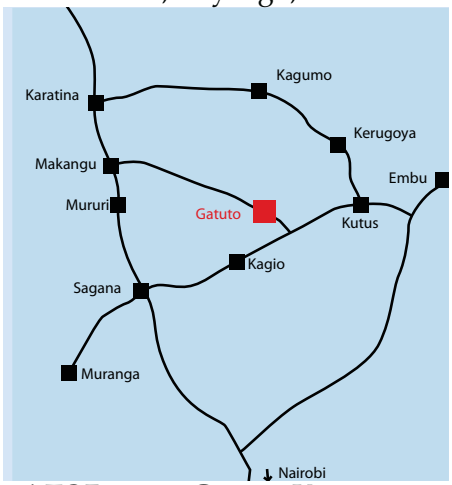
i-TOF centre, Kangundo, Eastern



i-TOF centre, Buyangu, Western



i-TOF centre Baraka College, Molo



i-TOF centre Gatuto, Kerugoya

Managing the eye worm disease

My cows are suffering from eye worm disease. What can I do?

The eye worm disease is an infection of the eyes of livestock with Thelezia species of worms. Thelezia are thin white worms up to 2 cm long. It is known to affect cattle, sheep, dogs, horses and donkeys, camels and buffaloes. It is distributed all over the world but mainly occurs in tropical countries. The disease may affect one or both eyes of the animal.

The infection is spread from host to host by the house fly and other similar flies when feeding on the infected eyes. The larvae of the eyeworm develops inside the housefly to a stage where it again comes out as a by product of waste. When the housefly lands on the eye of an uninfected animal, the eyeworm is again transmitted to the animal and the process continues. The worms can be seen with naked eye but a veterinarian should be consulted to confirm the presence of Thelezia.

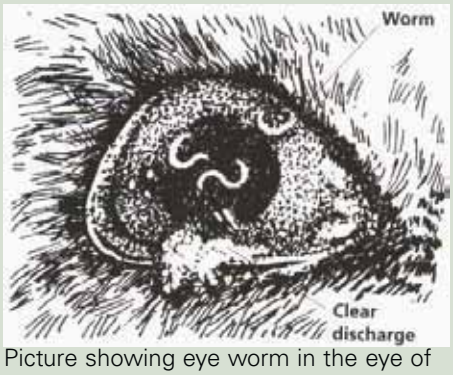
Clinical symptoms

The worm infection has no clinical signs but:

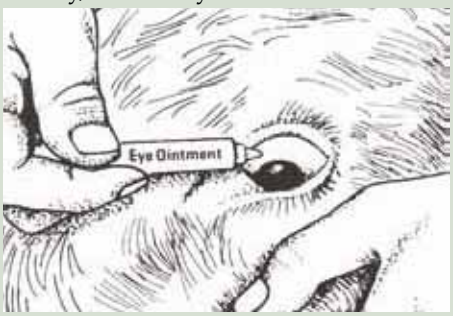
- There are excessive tears and a clear liquid comes out of the worm, which may sometimes become grey, white or yellow; in severe cases, there may be inflammation, and pus can be seen on surface of the eye.
- The animal will try to avoid bright light.
- The eyelids often stick together.

Treatment

- Treatment is possible with topical application of levamisole which can as well be administered by mouth. Treatment with ivermectin is also effective.
- Put 1% solution of levamisole or ivermectin directly into the eye.
- - It is also advisable to apply antibiotic eye ointment if the discharge is cloudy, white or yellow.



Picture showing eye worm in the eye of an infected animal



How to apply eye ointment into the eye an animal

Prevention and control measures

The condition is not life threatening and there is little we can do to control houseflies which transmit the infection. When you observe these symptoms in an animal, it is always advisable to consult a veterinarian for treament.

William Ayako

Bananas need good management

Which chemical can you advice me to use to stop my bananas from aborting? (Kinyua Maringa, Farmer in Gichugu).

Failure of bananas to produce fruits may be due to by a number of factors. Lack of crucial nutrients during growth may be a major cause. Like any other plant, bananas require good management. The farmer should always ensure adequate compost is applied on the areas surrounding the base of the plants (mat). Apart from compost application, bananas require mulching to conserve moisture and maintain soil fertility. Mulch can be obtained from the chopped banana leaves and spread around the base but not too near the base as this may increase the growth of unwanted roots. You can be able to monitor the fertility levels of your banana plant by simple observation of the stems of the plants; after one year, the stem of the younger plant (daughter) should be larger in diameter than the main stem (mother) plant. If the stems of both stems are similar in size, this is an indication that soil fertility is declining. The farmer should ensure more compost is applied to increase fertility levels. The best time to apply compost is when the two stems are equal in size. Make sure that there are only two or three plants in every mat by continuous removal of new suckers. This helps the growth of new plants that may lead to competition for the available nutrients.

...answers in brief

Compost is always good for the soil

How many planting seasons can the compost last in the soil once applied? (Joselyn Karimi)

As part of good organic farming practise, compost should be applied every planting season. This helps to replenish nutrients in the soil which are taken away by the previous crop. Ensure the compost is well-decomposed to make it release all the nutrients to the soil and for the crop to be planted.

Various plants for plant extracts

Can the FPE (Fermented Plant Extract) be sprayed on coffee plantation and Napier Grass? (Joselyn Karimi)

Plant extracts can be used for any crop or even fodder crop. The farmers should ensure that the FPE is well balanced in terms of plants used in its preparation to ensure it contains those plant that have both nutrients and pesticidal properties. Try to make it complete by adding EM and molasses to activate microorganisms in the solution; it becomes more effective.


Tithonia

Correct use of diatomite

At what intervals do I apply diatomite in my Livestock?

Diatomite is of great benefit to animals when it is mixed with animal feed. When given feed containing diatomite your animals will benefit from about 14 trace minerals that make up diatomaceous earth. The following are the recommended amount that you can use.

Cows/donkeys: 30- 60 g per day
Sheep/goats/pigs: 15 g per day

Chickens or other poultry: You need to weigh the feed and add only 2% of that weight with diatomaceous earth. Wet the feed slightly to ensure animals do not inhale the dust because it can irritate the lungs and cause harm to the animal.

Can diatomite be given to a pregnant heifer? (Graziella Maria, Farmer in Gichugu)

Yes, you can mix it with the feed in the same ration as given above.

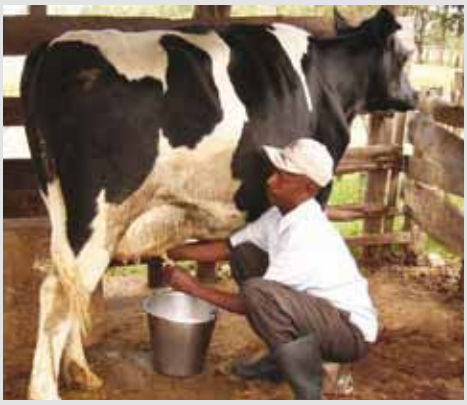
How many animals can I feed from my *shamba?*

Animal husbandry needs careful planning; a badly fed cow has a low milk production.

Theresa Székely

The main limitation for a cattle holder is usually the amount of fodder he can provide on a regular basis. The most important question for a farmer keeping animals is: Do I have enough fodder and water available throughout the year, including the dry season?

Cattle need a lot of feed. One good dairy cow (pure Guernsey or Jersey) needs at least 5 tons of dry matter from fresh or dried grass per year (see box below). This is 25'000 kg of fresh Napier grass, or about the amount you can grow on around one acre of land. Provided you practise a very good fodder grass management or interplant the grass with legume fodder plants like desmodium, you will still need 0.75 acres to feed this cow well. On two thirds of one acre, you will be able to grow enough fodder to feed an improved local cow which yields around half the amount of milk (3000 litres per year) of a Friesian cow.



More milk with quality fodder (Photo PD)

Basic cattle diet: grasses

Grasses are the basic diet of all cattle. Their quality of feeds depends mainly on the stage at which they are harvested. They give the highest yield when they are cut at a medium stage, but the best fodder quality is achieved when they are cut at an earlier stage of maturity. Fertilizing (with manure for instance) also contributes to quality. The best grass for cut-and-carry is Napier grass, but Naivasha star grass, Bermuda grass or Elephant (guinea) grass are also good.

When Napier grass is well managed and cut frequently, it is of high nutritional value. To farmers with dairy cows, using the "tumbukiza" method is recommended as it gives the highest grass yields, especially during the dry season (*see page 4*). It requires some work, but because Napier grass can stand in the field for 3 to 5 years, the effort for the digging is well invested labour!

Important: enough water

Water is required for all body functions and must be provided at all times. All creatures will die from lack of water quicker than from lack of any other nutrient. A cow needs:

- 40 to 50 litres of water per day for her own body
- 1.5 litres of water for every litre of milk produced

Only well-fed animals can earn you a profit

A small animal will obviously require less feed than a large animal. But the amount an animal feeds depends also on the quality of the feed: From good feeds, an animal consumes higher amounts.

A cow requires a certain feed quantity just to keep her body weight. For milk production, she needs additional forage: About 3 kg of fresh grass for each litre of milk. As her milk production increases, so does her forage intake.

A lactating dairy cow may therefore eat more than three times the amount of fodder which is necessary during the time she is dry!

There is one important reason why a farmer should never keep more animals than they can feed well and keep healthy: An animal which is not fed and kept properly has also very low milk and meat production – if any at all. In other words, an underfed and suffering animal will cost you more than you can earn from it.

Breed	Live weight (kg)	Milk production per year (kg)	Average forage intake per day (kg fresh matter)	Forage intake (ton/year dry matter)	Land for forage for one cow (acres)
Pure Friesian	650	7500	100	6 - 7	1 - 1.5
Pure Guernsey Pure Jersey	400-450 kg	5000 - 6000	65 - 75	5 - 5.5	1
Crossbreed, Improved local breed	350 - 500 kg	2000 - 4000	40 - 60	3 - 5	0.5 - 1
Beef breed Boran,Sahiwal	350- 400 kg	up to 2000	35 - 40	3	0.5

Low cost protein sources

Fodder trees

Tree crops provide dairy farmers with high quality low-cost fodder, mostly during the dry season. As most of them are leguminous plants, their leaves are high in protein. They are therefore an ideal feed supplement for Napier grass and cop residues. They should not be fed in higher shares than 30 percent of the diet though, as they contain substances which can interfere with animal health.

The most common fodder trees are leucaena and calliandra. It is estimated that three kg of fresh calliandra has the same effect on milk production as one kg of dairy meal. Other good fodder trees include gliricidia, tree lucerne, and mulberry.

Legume fodder crops

Legume fodder crops enrich the diet of cattle with protein needed for milk and meat production. They are rich in calcium; they also grow on during the dry season when good feeds become scarce. Legumes should be allowed to wilt before feeding, and must be mixed with non-leguminous fodder to prevent bloat. Green manure crops such as purple vetch, mucuna, clitoria, or canavalia can also be used as fodder.

Lucerne (*Medicago Sativa*)

Lucerne is considered the 'King of Fodders' because it provides ruminant fodder of the highest quality. Protein and calcium levels are high including milk and meat production when lucerne is added to the fodder.

However, lucerne does not grow well in acidic soils, and where sub-soils are too acidic (pH below 5.5), lucerne cannot be grown at all. In areas where lucerne has never been grown before, a rhizobium inoculant needs to be added to the seeds.

Lablab purpureus

Lablab can be intercropped with maize, sorghums and millets. It should be sown about 28 days after the main crop to avoid cereal yield depression from competition. When fed together with maize stalks or other residues, lablab improves the dry-season diet of cattle.

Desmodium

Desmodium has a long growing season and grows well together with grasses, in a pure stand or as a cover crop under fruit trees, bananas or coffee. Like for lucerne, addition of rhizobium inoculant may be necessary.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

biovision

Nr. 57 February 2010

Choose the right seed variety

Poor seed selection can lead to a poor harvest or total crop failure.

With the planting season just about to start next month, one problem that farmers are likely to face is the selection of seed. The majority are still unaware of the importance of selecting seeds that can do well. So many farmers have fallen prey to fake seed merchants and companies selling seeds of unknown quality.

This is not the only problem. Each seed variety has been developed for a particular climatic region in the country. If you buy seeds without verifying if it is suitable to your area, you risk the failure of your crop. Farmers nowadays have the opportunity to find out about suitable seed varieties via SMS. *Page 8*

TOF

In April 2005, we started *The Organic Farmer* magazine (*TOF*). We use this 5 year anniversary as an opportunity to launch a competition within the *TOF* readers' community. *Page 6*

More maize in rotation with soya

Maize planted in rotation with soya beans produces markedly higher yields, compared to a maize-on-maize system. This is the result of research done by the South African University of KwaZulu Natal; the results have been published by the South African magazine *Farmers Weekly*. Even at a nitrogen application of as much as 180 kg/ha, maize-on-maize yields were lower than the second maize crop which followed the soya beans.

The university relies on figures collected by Dries Cronje, a soya bean producer from Kriel in Mpumalanga. He studied 16 minimum or no-till farmers who practice a maize-soya bean rotation. Cronje found that on lands planted with soya bean the previous season, dryland-maize yields of 11t/ha were harvested. Maize on-maize lands only yielded 5,5t/ha, with more root and stem rot and other diseases.

Where maize was planted for two consecutive seasons after soya beans, 8t/ha were harvested in the second season. – Soya has extremely high nitrogen-fixing benefits.

An intelligent crop rotation practice does not only improve soil quality ; it is the strongest weapon against diseases and pests. We highlight crop rotation systems and give you a list of beneficial cropping sequences. *Page 3 & 4*

Crop rotation has many benefits

in this issue

Dear farmers,

Farming is a challenging business. Apart from the fragile economic situation that Kenya is now facing, there are no other professionals in such a difficult situation as farmers: They are the only ones who rely on rainfall whose occurrence they cannot influence. We do not know what the future holds in terms of climate; but it is evident that the weather patterns are becoming more and more unpredictable.

However, there are challenges which can easily be tackled by the farmers themselves. In this issue, we highlight two very important problems which we have featured many times before: The choice of the maize seed varieties and improvement of crop yields by practicing crop rotation.

Each year, farmers blame seed quality for their poor harvest. However, to some extent, they are to blame. Before committing their money, they have to inspect the item carefully. Why are farmers so careless when buying maize seed, on which they rely for their own food security and income?

Farmers have many options now on how they can verify the quality of seed varieties in the market; they can simply use their mobile phones to send a simple SMS to a seed company (as shown on page 8) to confirm the right seed variety for their area. It is common knowledge that many shopkeepers selling seeds are just ordinary business people out to make money. They can sell anything as long as it posts a profit.

The deteriorating soil fertility on the farms, including pests and diseases, is another example. Farmers know that growing the same crop on the same piece of land every year is bad for the soil. A change of crops through crop rotation replenishes soil fertility as well as reduces disease and pest pressure. In the same way, pests and diseases only attack particular crops while avoiding others. Rotating crops therefore reduces pests and diseases.

Farming is a business. Businessmen look for proper information, calculate and weigh up their options before they act. So many small-scale farmers would be better off if they acted like businessmen. This does not require a lot of money but rather an open mind, persistence, courage and a strong will to make the best out of their limited resources to succeed.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

Healthy pigs need good feeding and housing

Pigs not only need good shelter; they are better off if they have an open-air ground for exercise.

William Ayako

Without doubt, the returns from rearing pigs are far much higher than those from most livestock. However, such attractive income comes with a price. Swines have to be taken good care of and made comfortable at all times.

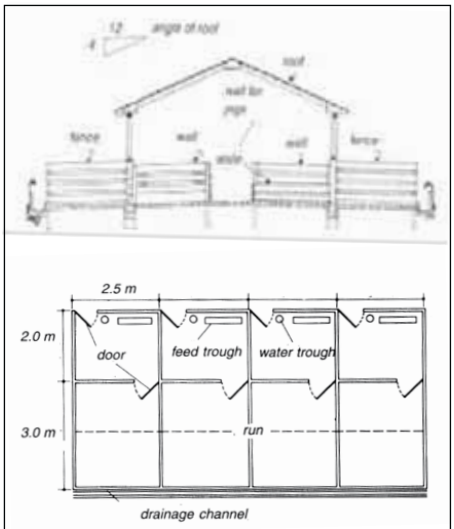
The major practice in an intensive pig keeping system is that pigs are kept in a complete confinement in a building/ housing provided to keep all categories of pigs separately (fatteners, boars, dry sows and lactating sows with piglets). In pig farming, housing should be much more than a simple shelter. There is no simple clear design of such a housing unit. However, the design should incorporate some technical hints as indicated in figures 1-4. The unit can be modified to fit the flock number which each individual farmer would wish to keep.

Pigs need an outdoor run

In organic farming, intensive pig keeping is not allowed. According to the set standards, all animals shall have access to pasture or an open-air exercise area or run, whenever the physiological condition of the animal, the weather and the state of the ground permit. Animals which have space for free movement are healthier. It is also recommended that all livestock has access to drinking water at all times.

Figure 2: Design and dimensions for feeding and water troughs

Whenever possible, feeding should be done outdoors. The feed trough may be made of cemented concrete, iron, or hardwood. It should be long enough to cater for all the animals in the pen.



A well constructed pig pen should include the following features:

- Should not be draughty (allow cold wind to flow in).
- Bright sunshine and heavy rain should not be able to penetrate.
- Should control great temperature variations inside the pen.
- Should be easy to clean.
- Should provide manure storage for later use.

Use a variety of feed ingredients

Many farmers seek to know the right formula of pig finisher, weaner and pig starter. There is no single pig feed formulation which could be applied universally by all farmers or producers. However, the principle of formulation using special programs is standard depending on the feed type to be mixed and the production objective of different farmers. Other factors determining feed formulation include the available feed resources and the production system employed on different farms. A variety of feed ingredients can be used but correct formulation is the key to satisfying nutritional requirements.

It is also important to note that feed ingredients may vary somehow in nutrient levels and therefore it is important to sample and analyse the available ingredients prior to formulation from a reputable animal nutrition laboratory like the one at KARI, Naivasha. Nutritional requirements of pigs will vary according to genetic make up, environment and phase of growth and age.

Note: Organic diets may reduce performance compared to traditional diets due to difficulties in meeting all nutrient needs of pigs.

Ingredient as (%) of dry matter	Pig starter	Sow & weaner	Finisher
Peas	-	10	-
Barley	-	57.05	-
Maize grain (%)	54	-	75
Maize and cob meal (%)	-	-	-
Soya bean (full fat) (%)	42.4	29	25
Dicalcium phosphate (%)	1.4	2.05	0.75
Limestone (%)	0.8	0.9	0.95
Salt (%)	0.5	0.5	0.5
Vitamin/mineral premix (%)	0.5	0.5	0.5
Nutritive value			
Metabolisable energy(kcal/kg)	3417	3045	3388
Crude protein (%)	19.4	18.5	14.8
Lysine (%)	1.08	1.0	0.74
Calcium (%)	0.73	0.9	0.61
Phosphorous (%)	0.66	0.79	0.49

Organic feed formulation for different pig categories

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development. www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

The most powerful weapon against diseases

Rotating crops is good agricultural practice all over the world. Crop health and yields suffer if crops are not rotated.

Theresa Székely

There is a way of controlling diseases and pests that is more powerful than the strongest pesticide. You cannot buy it. But you can practise it: It is crop rotation.

Growing the same crop on the same field again and again leads to increased disease and pest levels, reduced yields and crop failure. Especially vegetables are heavily attacked by diseases and pests if they are not rotated systematically.

All seasonal crops need rotation!

There are two main reasons why crop rotation is so essential:

1. Many diseases and pests, including weeds, are specifically associated with certain crops or plant families and can develop only together with their host. They survive the dry or the cold season in the soil or in crop residues left on the field. If the same crop is planted again in the next season, they will immediately start multiplying even more. But if another crop is planted, they will just starve and die after some time.
2. Each crop requires a specific set of nutrients from the soil. If you plant the same crop on the same piece of land season after season, this leads to nutrient depletion, poor growth, and weak plants which are easily attacked by pests and diseases.

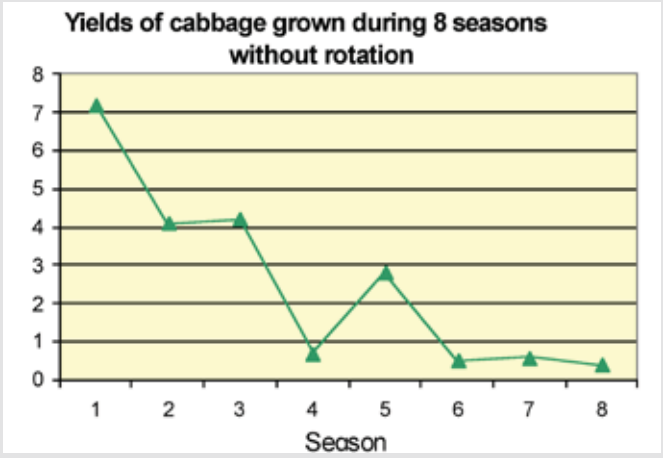
Rotated crops are healthier crops

Different root systems of different crops improve soil health and enhance aeration and soil structure. Soil fertility is maintained or increased. The more different crops you grow, the better! In addition, soil borne diseases and crop specific pests and weeds are reduced by rotation, and crops will show a healthier growth.

Crop rotation increases food security: If a wider variety of crops is grown, the failure of one crop will have a much smaller impact than if only a few crops are grown.

Higher yields with crop rotation

Healthier crops produce higher yields. In the diagram below you can see what happened to a cabbage farmer who planted cabbage in the same field for 8 consecutive seasons. In the first season, he harvested 7 kg cabbage per square meter. Then the yields dropped, and in 4 out of 8 seasons, he had not a single cabbage to sell. The problem in this case was root rot. Of course he could have sprayed high amounts of fungicides. But he could also have just shifted his cabbage to another plot to harvest 7 kg again – without any spraying.



Rotating your crops neither requires more work nor any investments. The only thing you need is a minimum documentation, because nobody can remember which crops were planted on which plots during the last four years. First, buy a small booklet and draw a sketch of all your plots. Give them a number or a name. Just write down on which plot you have planted which crop in the current season. Keep the booklet in a safe place to have it at hand at the beginning of the next planting season.

What are the minimum rotational intervals?

How long do you have to wait before you can plant the same crop on the same field again? This depends mainly on the plant family of a crop and its susceptibility to associated soil-borne diseases. In Table 1 on page 4 you find a guideline for the different plant families and the most common crops grown in Kenya.

How do you go about it?

The easiest way to establish a good rotation is to divide land for seasonal crops into eight plots of more or less equal size. These plots should be permanent in subsequent years. Eight plots are ideal for a four-year-rotation and two growing seasons per year.

Crop rotation cycle *Page 4*

Most vegetables should be grown only once in four years. In a climate with only one growing season, you need at least 4 plots. You can start on only a part of your land, preferably where you grow vegetables. Plot size does not matter.

Reserve up to two thirds of the area for maize, and on the remaining plots you can plant vegetables and fodder grasses. Then for each plot, follow a cropping sequence which meets your needs and keeps the necessary planting intervals. In Table 2 you find the most favourable crop sequences to choose from.

Can all diseases be prevented?

Crop rotation protects your crops from the most common diseases and pests which survive in the field. This is especially important for susceptible crops like the cabbage and the nightshade family. In cabbage, anthracnose and fusarium wilt is controlled. In potatoes and tomatoes, early blight, late blight, wilts and bacterial diseases can be prevented or reduced. Various fungal, viral and bacterial diseases, root rots, weevils and nematodes are controlled in other crops. Unfortunately, on some fungi which persist very long time in the soil like Fusarium wilt, or on rusts or smuts, rotation has only a limited effect. Crop rotation is therefore not a complete protection - but it will reduce ocurrence of diseases to a manageable level.

Crop rotation cycles

Table 1: Plant families and planting frequencies

Family	Crop	Plant on one plot
Grasses	Napier, Boma, Kikuyu, Sudan, Rhodes, etc.	for 3 or more years
Grains	Maize, sorghum, millet	2 out of 3 years
	rice	continuously, but rotation is better
	wheat, barley	once in 2 years
	oats	once in 4 years
Legumes	Dry beans, French beans, soybeans, groundnuts, cowpeas, pigeon peas, grams	once in 4 years
	Garden peas, snow peas, sugar snaps, chickpeas	once in 6 years
Nightshades	Irish potatoes, tomatoes, peppers, chillies, eggplants, African nightshade	once in 4 years
Cabbage family	kales, cabbages, broccoli, cauliflower, radish, rape, turnips, collards	once in 4 years
Apiaceae	carrots, celeries, fennels	once in 4 years
Roots **different families**	sweet potatoes cassava	once in 4 years once in 2 years
Beet family	spinach, beetroots	once in 4 years
Onion family	onions, garlic / leeks	once in 5 years / once in 4 years
Asteraceae	Sunflowers / lettuces	once in 5 / once in 4 years
Cucumber family	pumpkins, squashes, gourds cucumbers, zucchini, melons	once in 4 years once in 5 years
Mallow family	okra, cotton	once in 3 years

Table 2: A guide to a good crop rotation sequence for some common cropss

Good in the preceding season	Planted crop	Good to plant afterwards
All crops are good	maize, sorghum, millet	all crops except carrots
All crops except wheat, barley, oats	wheat, barley, oats	all crops except wheat, barley, oats
Legumes, maize and other grains, cotton, sweet potatoes	rice	cowpeas
Maize, grains, rice, irish and sweet potatoes, sunflowers, spinach	legumes	Irish potatoes, tomatoes, cabbages, squashes, maize, grains, cotton
Maize, grains, spinach, carrots, onions	beans	Irish potatoes, tomatoes, cabbage, onions, maize, grains
Spinach, maize, grains, fodder grass	groundnuts	grasses, cotton
Maize, grains, grasses, legumes, spinach, onions, sunflowers	Irish potatoes	cabbages, spinach, onions, pumpkins and squashes, sunflowers, soybeans, maize, grains, lettuce
Legumes (and all families except nightshades and the cucumber family)	tomatoes	cabbages, maize, grains, grasses
Maize, grains, grasses, legumes, tomatoes, irish potatoes, onions	cabbage family	only maize, grains, grasses, leeks
Irish potatoes, onion family, spinach, legumes, maize, grains, grasses	pumpkin, squashes	root crops (but not Irish potatoes): carrots, sweet potatoes, yam, cassava
Cucumber family, onion family, beet family, grains, grasses	carrots	maize, grains, grasses, beans
Grains, french beans, irish potatoes, spinach	onions	all crops except onion family
Cucurbits, spinach, lettuce, sunflowers	sweet potatoes	legumes, maize, rice, grains, grasses
Onion family, irish potatoes, carrots, peas, grains, grasses	spinach	groundnuts, soybeans, all crops except the beet family and lettuce
Maize, grains, spinach	sunflowers	Irish potatoes, maize, grains, legumes

Integrating trees and shrubs into cropland

Agroforestry aims at reducing the destructive impact of deforestation and overuse of land resources.

The Organic Farmer

Natural vegetation, if not interfered with by human activities, is a mirror of the regional water balance. Trees and shrubs are good indicators of local rainfall patterns. In humid tropical regions with high rainfall, rainforests with high biomass production are predominant. In regions with seasonal rains, trees shed their leaves during the dry season, and plant productivity declines. With diminishing rainfall, trees become scarcer while savannahs and rangelands become dominant.

Trees are an important part of the water balance: they store water in their root zone, protect the soil from drying out by shading and improve soil structure as well as water holding capacity. A tree canopy catches and stores rain drops temporarily, preventing soil erosion and releasing water slowly to infiltrate into the ground.

Planting selected trees in your farm is a good farming practice. (Photo AO)

Trees release water back into the atmosphere through evaporation and transpiration, contributing to the formation of rain clouds. If forests are removed, most rainwater will run off on the surface and disappear from the regional water cycle, carrying the often thin soil layer and nutrients with it.

Agro-forestry research and development of methods for re-integration of trees and shrubs into the farmland have thus become important tools to stop the ongoing land degradation. Some elements have already been described in TOF No. 55 (Dec. 2009): Windbreaks, planting on terraces, and contour vegetation strips.

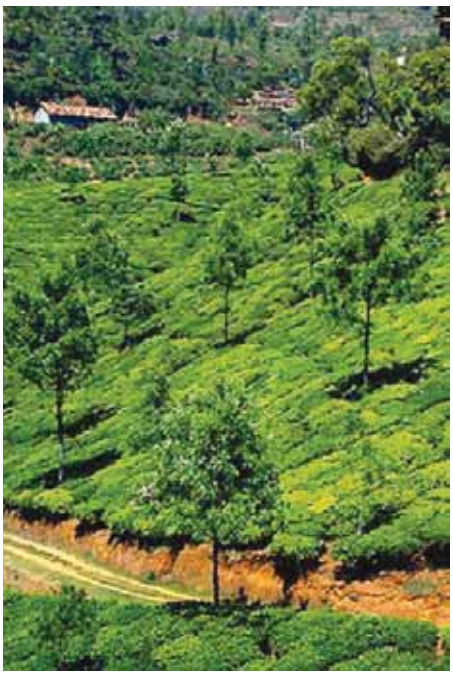
Below are some further approaches – all farmers are welcome to try them out and to make use of their numerous benefits!

Water

With this article we come to the end of our water series. Interested farmers can order them as a module.

Well spaced trees on your *shamba*

Trees in cropland improve the microclimate, reduce run-off, conserve soil and water, and provide organic matter and protective shade for crops. They also provide food, fodder, fuelwood, and poles. Depending on the type of tree and crop grown, they are usually planted at 8 to 10 or more meters apart to reduce competition. Deep rooting, nitrogen-fixing trees are preferred. Besides *Leucaena leucocephala* which does not do very well in drier areas, *Sesbania sesban*, *Crotalaria grahamiana*, *Tephrosia vogelii*, and *Gliricidia sepium* are recommended, but also fruit or nut trees are beneficial. Good examples are:



Grevillea robusta in a tea plantation

- Fruit trees in home gardens
- Shade trees in Arabica coffee plantations are especially advantageous. They prevent alternate bearing only every second year by reducing flowering and die-back from overbearing. This can double the productive lifespan of coffee trees! On sloping land, soil erosion is also controlled.
- *Grevillea robusta* is a very good shade tree in tea.

Dispersed trees in rangelands

In this traditional agroforestry system, trees are preserved for livestock browsing, shade and sometimes for other products. The high protein content of leguminous species enables animals to benefit more from low quality forage during the dry season and supports milk production.

Alley cropping of Leucaena and maize

Alley cropping

In alley farming or hedgerow intercropping, rows of woody species are grown with annual crops. This system works best in humid climates with soil fertility problems. In Kakamega, Sesbania sesban trees grown in corn fields improved maize yields. The trees must be managed well and need to be pruned regularly. The prunings are used as fodder for livestock, as mulch in crops to improve soil fertility and to suppress weeds, and for fuelwood or poles. Unfortunately, there is too much competition between woody species and crops in dry areas.

Living fence

Lines of trees or shrubs are planted along farm and field boundaries. This is actually an old tradition, and a wide

Continued on page 6

>>> from page 5

Agroforestry

variety of plants may be used. If they are planted densely enough, they can serve to keep animals away from crops. Sticks or dead branches can be twisted between them, or wire can be attached using them as living fence-posts. They provide fuelwood, fodder, shade for crops and livestock, act as windbreaks, and cuttings can be used to replenish the fence. Good examples: *Gliricidia sepium* is often used for live fence posts. A few large (1.5 - 2 m) stakes can be planted into existing wire fences. They normally take root quickly and can be cut back after 6 to 10 months.

Living fence with Gliricidia sepium

Subsequent pruning and staking can be carried out every 6 to 8 months. Gliricidia can be used as forage, as green manure and as a rat poison.

Tithonia diversifolia is another very useful species. Tithonia hedges should be cut back often. Young shoots used as mulch increase crop yields effectively (see page 7). As a protein rich fodder supplement and for browsing it is especially liked by goats.

Fodder Banks

Tree foliage helps overcome the shortage of high quality feed during the dry season. Feed supplements of *Calliandra calothyrsus, Leucaena diversifolia, Gliricidia sepium,* mulberry and others increase both the quantity and quality of milk produced by dairy animals and reduces dairy meal costs. Feed leaves from fodder trees at only 30% of the ration.

farmers forum

020 445 03 98 0717 551 129 0738 390 715

Win a watertank worth Ksh 18,000

To mark 5 years of TOF, we invite our readers to take part in a farmers' competition.

The Organic Farmer

In April this year, *The Organic Farmer* (*TOF*) will be 5 years old. The magazine for sustainable agriculture and Kenya's most resourceful agricultural paper, has grown from strength to strength since the first edition was published in April 2005. *TOF* has managed to give farmers in Kenya, Uganda and Tanzania practical information on crop and animal production using sustainable and ecologically sound methods that have helped them improve their yields and income. *TOF's* circulation has moved from the initial 10,000 copies to 20,000 reaching approximately 160,000 farmers.

To celebrate 5 years of enriching farmer information and communication, *TOF* is pleased to invite you to a farmers competition. We are looking for farmers who have found an innovative idea in The Organic Farmer magazine, and which has made a big difference to their lives. That means: The competition is meant for *TOF* readers who have adopted technologies that contribute to improving food security, increasing incomes and which include good environmentally friendly farming.

Who can participate?

The competition is open to individual small-scale farmers and farmers' groups that have been in existence before 1st January 2009. These two categories can make entries in any one of the following areas: Agro-forestry, soil fertility management, plant varieties, food production and processing, water conservation, energy conservation, animal production and breeding, storage and post-harvest handling (including livestock and fisheries), marketing and small-scale technology etc.

Categories and Awards

Five entries that demonstrate creativity will be picked and awarded.

1st Prize: 3000 litres plastic water tank, worth Kshs 18,000

2nd Prize: Family drip Irrigation Kit from KARI, worth KShs 9,000

3rd Prize: 50-litres milk can, worth KShs 7,500

4th Prize: Knapsack sprayer, worth KShs 6,000

5th Prize: Money Maker irrigation pump, worth KShs 4000.

In addition to the above prizes, we shall publish the ideas from the five top winners in the April, May and June 2010 editions of the *TOF* Magazine and also air them in our TOF*Radio* programmes.

Terms and conditions

- All ideas implemented by farmers must originate from an article read in any issue of *TOF* magazine
- You can send any number of ideas you may have tried and which have changed your farming experience or income.
- No entries will be accepted later than 31st February 2010
- *TOF* will not accept liability for late or lost entries
- The judges' decisions are FINAL.

Our questions

In this letter you should answer the following five questions:

a) Which idea did you get from *TOF*?

b) When and how did you put it into practice?

c) Any problems at the beginning?

d) What benefits has this new farming method given you?

e) Did other farmers imitate you? What makes it more successful than other methods you were using before?

Submissions must include:

- Name, age, gender, phone number/e-mail, postal address, village, district.
- A brief letter of not more than two pages (you can use your own handwriting).

Judging

The panel of judges is composed of 3 experts in the field of agriculture.

Send your entries to:

The Organic Farmer
P.O Box 14352, 00800 Nairobi, Kenya
or info@organickenya.org. Your entry should reach us by 31st February 2010.

Use good fodder to make silage

I would like to know the right fodder materials for ensiling. Can I cut any grass along the road? Caroline Waithera, Farmer in Thumaita

To prepare silage, the most essential thing is good fodder quality. Actually most grasses are suitable if they are cut at a young and nutritious stage, before flowering. If you want to use grass along the road, it should be clean, and the risk that it contains parasites from roadside grazing is high.

Napier and Bana grass are very good grasses for silage. Cut them when they are about three feet high. Spread them in the sun to wilt for one day, this will also reduce parasite infestation. Chop all bulky fodders into pieces of about one inch before you ensile them. Adding up to 30% of leguminous fodder like desmodium, cowpea or lablab vines, chopped calliandra or leucaena shoots to the mixture will increase protein content and silage quality, and dairy animals will give more milk! If possible, sprinkle some molasses mixed with water over the chopped fodder (up to 10% of the fodder weight) to ensure a good fermentation process.

Information modules

The Organic Farmer magazine has prepared about 20 information modules on organic farming. One of them is Nr. 12 which features dry season fodder. It contains advice on how to prepare fodder for the dry season including silage.

Interested farmers should send us an SMS with their request and their address to the following Mobile number 0715 916 136

Can I use flat ground to make silage?

I want to ensile my maize on flat ground, please advise. (David Chege Ndungu, Farmer in Elburgon)

Maize or sorghum (cereal forages) are actually excellent plants to ensile, as they contain high amounts of sugar. You can ensile your maize on flat ground without any problem, provided you make sure that rainwater can drain from the place. You may prepare the silage in the usual way. The most important thing is to compact and wrap the fodder well to ensure no air and water can get inside.


Lablab

Preparing plant extract from Tithonia

I would like to make plant extract from Tithonia in large quantity, but my main concern is its shelf life. Please advise (Johnson Waweru, Farmer in Kianjai)

Tithonia certainly deserves to be used by as many farmers as possible. It has wonderful properties and can serve as green manure, as mulch, as liquid manure, as fodder (especially for goats), and it has some fungicidal effects as well. If you are thinking of manufacturing a marketable product, it would have to be bottled and sterilized to prolong shelf life. The other concern is concentration: A product should have a certain concentration; otherwise efficiency and transport are a problem.

How to make the extract

We suggest you try and experiment yourself to solve these problems. Nutrient content of tithonia leaves is highest when the shoots are cut before flowering. It can be slashed near the ground level, and several harvests are possible per year. Usually, the plant material is chopped, put into a container, covered with water, sealed, and then left to stand for two to three weeks. Sealing the container is necessary to prevent nitrogen from escaping.

In your case, to obtain a relatively concentrated extract, you might mix 1 litre of molasses with 1 litre EM1 (both can be found in Agrovet shops) and pour it on 10 -20 kg of chopped and compacted Tithonia. This will improve fermentation. Add just enough water to allow the material to soak.

Shelf life and nutrient content

Unfortunately, we are not able to advise you on the shelf life of the extract. It is usually used immediately. The liquid may be boiled and the bottles sterilized; but you would have to test yourself whether and within which period the product deteriorates. We also suggest to have the product tested for its nutrient content by a laboratory in order to be able to make recommendations about application dosages. They will most probably be quite high (around 1l litre of the undiluted solution for 1 to 2 square meters) to have the desired fertilizing effect.

Note: Tithonia extract should not be used as a medicine (e.g. against malaria), as it seems to have a toxic effect on kidneys and liver! **THS**

Napier does very well in pits

I want to plant Napier grass. Please advise me on the right system and the right spacing. (Margaret Wambui, Farmer in Kihuti)

A good method of planting Napier grass is planting in pits, as this conserves water. Pit size and spacing depend on the climate, your soil type, and on the scale of labour you are able to invest. Good soil and enough rain will support denser planting. A common recommendation is to dig pits one to two feet deep, or just enough to break a hard pan. The pits can be one foot wide and up to two feet long. The distance between the pits may be one to two metres, and the rows can be one to two metres apart.

Mix 1 *debe* of top soil with 1 to 2 debes of farm yard manure and refill this mixture into each pit. Leave about 10 to 15 cm of unfilled space at the top of the pits. Plant 4 - 10 cane cuttings or single root splits into each pit.

If you interplant leguminous forage like desmodium, leucaena or even sweet potatoes (which is highly recommended), leave enough space between the Napier rows and dig pits for the intercrop. It will suppress weeds and improve forage quality if mixed with the Napier grass.

Napier grass should also be planted along the contours or in any unused spaces to prevent soil erosion!

Add manure or slurry

Napier grass needs good fertilization, and some farmyard manure or slurry (manure with high urine and water content) should be applied preferably after every harvest. The best time for harvesting Napier is when it is about three feet high, as it is most nutritious for dairy animals at this stage.

Buy certified seeds, suitable for your area

Farmers should select seed varieties carefully in order to improved the quantity and quality of the yield

The Organic Farmer

Seed selection remains a big challenge for local farmers. Every year, *The Organic Farmer* takes the trouble to remind farmers about the importance of proper seed selection. The reason for our emphasis is simple: The choice of seed can determine if the farmer will get a good harvest or a poor one. Seeds are developed according to climatic regions, soils and other factors; if a farmer plants the wrong type of seeds in a given climatic region, they cannot do well. The overall crop yield therefore will be less than expected.

It is a pity that even wise farmers do not select their seeds carefully. Last year, wrong seeds combined with prolonged drought led to total crop failure in most parts of the country.

Lack of proper information

The last few years have witnessed an increase in the number of companies producing and importing seed into the country. Many farmers are going for these varieties hoping to increase their yields. But only few of these are suitable for the areas in which they are being marketed.

These new seed varieties pose serious problems to farmers: There is very little research done to determine their quality. Due to lack of agricultural extension services, most farmers therefore rely on advice given by agrovet shops, where they buy their inputs. What farmers do not realise is that the traders are driven by profit maximisation, not by the interest to help farmers. New seed varieties are also to blame for the increase in diseases that farmers find difficult to control.

Good and certified quality seeds bring a good yield (Photos AO)

Beware of fake seed

Sale of fake seeds, also called "Dubai" seeds is very common during the planting season. Aware that most Kenyan farmers cannot afford genuine seed, unscrupulous farmers contracted by seed companies sell condemned seed as genuine seed, often at a lower price. Farmers will buy it believing it is of good quality only to end up with a poor yield. Others acquire seed packages from genuine companies, then treat ordinary commercial maize with the chemicals used for seed preparation and offer it for sale to farmers. To avoid this cheating, farmers should be extra cautious when buying seed.

A reliable maize variety

During the prolonged drought last year, one variety that withstood the harsh dry spell is H614. Although the variety is recommended for high altitude areas with annual rainfall of above 1000mm, most farmers who planted this variety in medium altitude areas managed to get some harvest. All other varieties recorded poor yields or total crop failure. H614 can withstand sudden climatic changes and does well, even with poor management.

Poor quality seeds give a poor yield

Confirm first, buy later

To help farmers, some seed companies such as the Kenya Seed Company and the Kenya Plant Health Inspectorate Service (KEPHIS) have launched an information service. Farmers can use their mobile phones to get information on which seed varieties can do well in various agro-ecological zones in the country. Farmers can access this information using the following steps:

Kenya Seed Company varieties

Go to messages → Write the word MAIZE * YOUR DIVISION→ Send to 3000. You will get a reply on varieties suitable to your division, their qualities and how long they take to mature. Farmers can also call the company on Telephone numbers 0716 647 693 or 0733 854 713

KEPHIS Information Service

Write the message: maize/name of your division, SMS to 2964 using your Safaricom, Zain or Telkom lines. If you cannot get the information you need, you can call KEPHIS personnel on Tel. 0722 516 221 or 0733 874 274.

Some tips for seed buyers

The following tips will assist farmers to get quality seed that can help improve their crop yields:

- Farmers should only buy tried and tested varieties suitable for their areas (see box "Call first, buy later"). In case a farmer wants to try another variety, it is advisable to plant it in a small portion of land. They can then observe all the characteristics of the variety during every stage of growth and finally the quality of its grain and yield before going into large-scale production.
- Buy certified seed only from stockists licensed by seed companies and the Kenya Plant Health Inspectorate Service (KEPHIS). When buying the seed from an unknown stockists, insist to be shown the licence before buying.
- All genuine seeds have company tags and labels of KEPHIS tucked inside the package. Farmers should verify that the tags and labels are present when they open the seed bags.
- Buy your seeds early before the planting season starts to avoid last minute rush. Popular maize varieties are in short supply during the planting season. This is the time when fake seed peddlers go into business to cash in on the shortage.
- All seeds should be stored in a cool dry place.
- Maize seed is treated with dangerous chemicals to kill pests and control diseases. It should thus not be eaten.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

biovision

Nr. 56 January 2010

There is a high demand for good quality dairy cows. (Photo PD)

A big step for small-scale farmers

More than 7,000 small-scale farmers benefit from a new lending system, 80,00 more are on the waiting list.

The Organic Farmer

John Maina Nguru aquired a Friesian cow through his membership in a micro-leasing system, which we explain on pages 2 & 3. The initiative to support small-scale farmers was lauched in 2006 by Swisscontact, the Swiss Foundation for Technical Cooperation, as a pilot project in Makueni. Within no time, the idea has spread to Muranga, Kirinyaga, Meru, Bomet, Kisii, Kitale and Wundanyi in Taita Taveta.

80,000 applications

Up to now, assets worth Ksh 146 million have been handed over to small-scale farmers, in form of cows, dairy goats, chickens, beehives and motorpumps for drip irrigation. More than 80,000 small-scale farmers have applied for consideration in this micro-leasing system; the majority of them are on the waiting list for a high yielding dairy cow. The only problem is the lack of such cows, since no farmer with a good cow wants to sell it.

The micro-leasing system considers the farmer as a reliable partner and farming as a business: All the leased assets are not given for free. The small-scale farmers on the other side, majority of them being women, confess that this system has improved their livelihood. The lease repayment performance rate is 98 percent.

Véronique Su, the East African representative of Swisscontact and founder of the micro-leasing system, is proud that her initiative has spread so fast. Future plans are set to focus on pastoralists and camel holders. "I am happy to see how well this project works," declares Véronique Su. "For me it is a clear sign that we need to use modern methods to support small-scale farmers, since they are willing to improve," she adds. *Pages 2 & 3*

in this issue

Composting becomes popular

Our TOF-office gets an average of 10 questions per week about compost, either through mail, SMS or telephone. This is a good sign. It seems that more and more farmers are changing to organic or at least to more natural farming practices, and prefer to feed the soil with compost instead of chemical fertilizers. Due to this interest, we answer to some of the most common questions. *Page 8*

Dear farmers,

Something is seriously wrong with the local seed industry. Although research institutions often come up with new high quality varieties that can boost production and farmers income, the seeds are not available in the market. One good example is the climbing beans developed by KARI, which we highlighted in the July 2009 issue (Nr. 50). Immediately farmers read the article, we were swamped with enquiries on where they could buy the seeds.

It is then that reality struck us: There are no seeds in the market! This is because KARI's mandate is to produce basic seed. We were told that seed companies are supposed to do the multiplication of seeds for sale to farmers. The main problem, as we have so far discovered, is that the local seed industry is monopolised by a few companies. Such firms are, in most cases, unwilling to multiply seed developed by research institutions such as KARI; instead, they prefer to develop their own varieties. A visit to most of their stores reveals that all these companies do not stock popular bean seed varieties preferred by farmers.

But research institutions such as KARI cannot escape the blame. Nowadays, everyone is talking about farming as a business. If this claim is to be taken seriously, a premier institution such as KARI should explore ways of commercialising some of its operations, for instance seed multiplication. This move would ensure that farmers benefit from new seed inventions as soon as they are developed. With the government's assistance, the institution can set up a commercial entity whose main function would be seed multiplication and sale to farmers. Alternatively, there are many farmers willing to produce seeds. Such farmers should be provided with basic training on seed production.

Seed production is a sensitive activity that could have serious implications on the country's food security. It should not be left to a few monopolies, whose interests may not be in line with the government's objective of boosting food production. To meet the needs of the swelling population, it is important to ensure that farmers have access to all seed varieties and in adequate quantities. Otherwise promises to increase food production are all but empty words aimed at pleasing donors.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

How can a farmer get a high yielding cow?

The micro-leasing scheme allows small-scale farmers to acquire high yielding dairy cows.

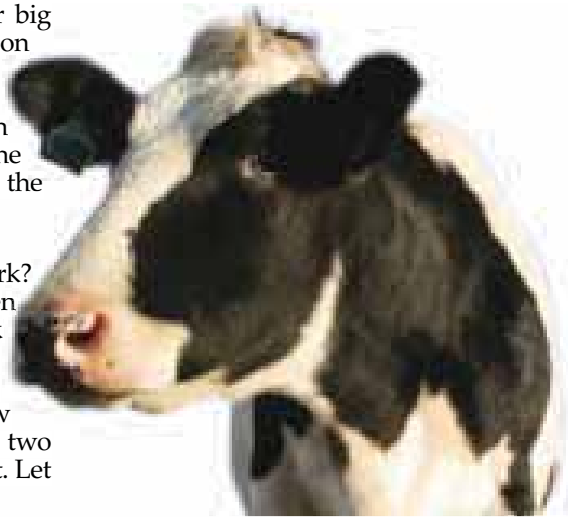
The Organic Farmer

Did you know that one can lease a cow? And what does leasing actually mean? Before we answer these questions, we need to explain the origins and the idea behind the cow-leasing project.

The idea of a Swiss banker

When a Swiss banker Véronique Su in 2005 took over as the East African Regional Director of Swisscontact, a Swiss Foundation for Technical Cooperation, she assessed the situation of Kenyan agriculture to find the best way farmers could be assisted. She immediately realised two problems: 1. Most of the small-scale farmers could hardly afford to buy a high yielding dairy cow. 2. For the majority of small-scale farmers it is difficult to get credit from banks, since most of them either lack security in form of title deeds, or they fail to meet additional conditions set by credit institutions.

Véronique Su came up with the idea of a micro-leasing-system for small-scale farmers, some kind of renting-system. In western countries leasing is quite common and mostly used for purchase of motor vehicles or big machines. Supported by a donation from a big Swiss bank, Swisscontact started the micro-leasing system in 2006 as a pilot project in Makueni, in cooperation with the K-Rep Development Agency as the implementing partner.



Easy to handle

How does this micro-leasing work? And, what is the difference between it and a normal SACCO or bank loan? Let us explain it with the example of a small-scale farmer, owning 3 1/2 acres land, one cow and enough fodder for feeding two more cows in his zero-grazing unit. Let us call the farmer Isaac.

1. Isaac applied for a leasing contract. The K-Rep Development Agency visited Isaac's farm and agreed to lease him a cow after an assessment. He fulfilled two conditions: He is already a responsible cattle holder, and he is member of a registered farmers' group.

2. A few weeks after an intensive training, Isaac signed a contract. He got a cow, a pregnant one, valued at of Ksh 42,000, and with the balance of Ksh 8,000 he bought a second hand chaff cutter. After a few weeks, the cow gave birth, and he started selling 18 litres of milk to his neighbhours every day.

In simple terms, it means that under the micro-leasing system, the farmer normally does not get money, he gets an asset, in Isaac's case it is a cheque for buying the dairy cow, and Ksh 8,000 in cash for the chaff cutter. The cow starts giving an income within a short time. This shows the difference between micro-leasing and a SACCO or bank loan:

- *Isaac does not have to provide security for the loan; he does not have a title deed since the land belongs to his father.*
- *The cow acts as the security to the lender, in this case the K-Rep Development Agency, which bought the cow. If Isaac cannot repay the cow and the interest as agreed in the contract, the lender will just come and take away the cow. Concerning the Ksh 8,000 for the chaff cutter: The colleagues in the farmers' group guarantee this for Isaac.*
- *If it were a SACCO or a bank loan, it would require a lengthy legal and administrative process to recover the loan if the farmer fails to repay it.*
- *Isaac's farmers' group acts as guarantee, and advisor.*

The financial issues

3. Under the micro-leasing contract, the farmer has the benefit of a grace period of up to three months. After this period, the farmer has to begin repaying the cost of the cow at an interest rate of 16 percent, 2 percent below the current bank rates. The farmers can also choose, if they want to repay in 9, 12 or 18 months. Isaac chose 12 months and the possibility of a grace period of one month. So he began to refund in the second month. He could afford to do it, since the cow gave 18 litres of milk daily (earning him around Ksh 450 a day).

His repayment plan looks as follows:

Price of the cow & the chaff cutter	Ksh 50,000
Interest rate for 1 year 16 %	8,000
Insurance (to pay only once) 5 %	2,500
Total amount	**60'500**
Isaac has to pay per month	5'000

That means: after 12 months he will have repaid the cow and the chaff cutter and will therefore own the cow:

- *When the lease is fully paid, the K-Rep Development Agency will formally hand over the cow to Isaac.*
- *Since all farmers are given a cow which is already pregnant, Isaac will have a double benefit: the cow and its calf.*

Covered risks ....

4. As we have seen in the table above, Isaac has to take an insurance cover for the cow and also for himself, according to the contract.

This means that all the risks to both the micro-leasing company and the family of the farmer, are covered:

- *If anything happens to Isaac, the company gets paid the outstanding amount of money; Isaac's family can retain the cow and the calf.*
- *If the cow gets sick and has to be slaughtered or dies, the insurance pays the damage.*

Continued on page 3

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development. www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

"Now I can send my children to good schools"

Like for John Maina Nguru, leasing a cow has increased the earnings of many small-scale farmers.

Peter Kamau, Makuyu

John Maina Nguru, a member of Gakungu Arimi Self Help Group, had two Friesian dairy cows. He had always wanted to have at least 4 dairy cows that could help him increase his income. He lives on a 3-acre rented land, he therefore could not qualify for a loan from any bank or any financial institution.

But luck came his way when he met the conditions for the micro-leasing system of the Juhudi Kilimo Company (*see article on page 2*). From the Ksh 50 000 he was given, he bought a Friesian dairy cow worth Ksh 39,000. From the three Friesian cows, he gets 42 litres of milk during their peak periods which he sells to milk vendors, restaurants and civil servants.

More earnings

Nguru says the additional cow has brought a big difference to his earnings. "Every day I make an average of Ksh 1,000. I have managed to take my wife back to college. I have also transferred my children from public schools to private schools where they can get better education. If it was not for the leased cow, I would not have managed to do all this", he says.

John Nguru has completed his repayments and now owns this dairy cow (Photo TOF)

In December, Nguru finished repayments for the leased cow, which has also produced a calf. He now plans to take another lease cow, to buy a chaff-cutter and expand his zero grazing unit and rent more land for growing fodder. "The demand for milk is so high in this region, and I want to take advantage of this to increase my earnings further," he says.

>> > > from page 2

…. and good training

5. When applying for a lease, Isaac was a little bit unsure how he would manage such a high yielding dairy cow and the financial burden. But the company took him through an intensive training that equipped him with all the knowledge he needed.

That means: Swisscontact and the K-Rep Development Agency built up a network of collaborators including extensionists from the Ministry of Fisheries & Livestock Dev., who are dealing with the farmers:

- *They train them on how to manage the finances*
- *They advise them on correct cattle holding (feeding, housing & veterinary care).*

A success story

With this micro-leasing system, small-scale farmers can not only lease cows, they can also get dairy goats, chickens, beehives and water pumps for irrigation. In the meantime, the K-Rep Development Agency has founded a private company, Juhudi Kilimo, which has taken over the micro-leasing project under the same conditions as the founder organization.

Juhudi Kilimo Company Ltd, Head Office K-Rep Centre, 7th Floor Wood Avenue, off Argwings Kodhek Rd, PO Box 10528 - 00100 Nairobi, Kenya, Tel: +254 020 396 000

Leasing system a benefit for women

For many years, women have been a neglected a lot when it comes to development issues. But the situation seems to be changing rapidly. In most rural areas, women are increasingly becoming involved in many projects aimed at raising their income to support their families. It all started with merry-go rounds, where they would come together, raise a lump sum of money which would be given to each of the members on a rotational basis. Later on, micro-credit institutions and even NGOs and churches came in with the same goal of assisting women in rural and urban areas.

The micro-leasing system, now run by Juhudi Kilimo (*see article on page 2*) therefore came as a blessing to many women. Nelly Njoki, the Juhudi Kilimo manager in Mt. Kenya region explains why this system is so popular with women. "Many of them do not own the land on which they live. Unlike men, women do not have title deeds," she says. "Getting credit from commercial banks for them is out of question. The number of female headed households is also increasing due to problems such as HIV and increasing divorce cases," Nelly Njoki adds. It is therefore not surprising that in the micro-leasing system, women outnumber men by a ratio of almost 1:2, when it comes to the number of those who have benefited from asset financing.

Strict rules in organic farming

Dairy cow management is quite a challenge to many farmers. A dairy cow requires utmost care and attention with respect to housing, feeding and management. In the region I visited, when doing this article, it was evident that many farmers are yet to observe basic hygiene and housing requirements in zero grazing.

Although most of the units have a concrete floor, the sheds are constructed in a way that does not allow proper drainage of urine, water and washing of animal sheds to ensure they are clean and comfortable. Some of the units are so small that the animals have very little space for movement and rest. This forces them to lie on their own droppings.

Space for movement

Landless zero grazing is not allowed in organic farming. In organic farming, animals should always have adequate space for movement and rest. Lack of adequate space causes stress to animals, and their milk production is also affected. Adequate space allows the animals to express their normal behaviour. The farmer should ensure animals have fresh air, water, feeds and natural daylight. Natural bedding such as hay or dry grass should be provided in the rest area. ***Peter Kamau***

Garlic production can earn you more

Most of the garlic found in Kenya's markets is imported. Local farmers lack information on how to grow it.

By Kennedy Masibo

Garlic is a high value horticultural crop in the onion family. Farmers in most parts of the country can be able to grow it and considerably increase their income because garlic has a good local market. It is mainly used as a food flavouring and for medicinal purposes. Garlic has anti-feedant (insect stop feeding), bacterial, fungicidal, insecticidal, nematicidal and repellent properties.

Garlic is effective against a wide range of disease-causing pathogens and insects at different stages in their life cycle (egg, larvae, adult). This includes ants, aphids, armyworms, diamondback moth and other caterpillars such as the false codling moth, pulse beetle, whitefly, wireworm, beetle, mice, mites, moles, and termites as well as fungi bacteria and nematodes. Garlic can kill beneficial insects as well. Therefore it should be used with caution.

When growing garlic for pest control, it has been recommended avoiding use of large amounts of fertilisers. This is because heavy doses of fertiliser reduce the concentration of the effective substances in the garlic.

Not common crop

Very few farmers grow garlic mainly due to lack of know how and experience on its production. This is one of the reasons for the poor quality of locally produced garlic; another reason is the stiff competition from China (see box below). Very often, farmers sell the garlic even before it has matured and cured properly (hanging and drying in controlled light). Exploitation by middlemen is another big problem; farmers who grow garlic rarely sell it directly in the market; they have to rely on brokers.

Climatic requirements

Garlic can grow well at an altitude of between 500-2000 metres above sea level. The right temperatures for garlic are between 12-24 °C. Extremely high temperatures are not suitable for garlic production. Excess humidity and rainfall interferes with proper garlic development, including bulb formation. The crop is grown in low rainfall areas where irrigation can be practised, especially in early stages when the plant requires enough water to growth. Adequate sunlight is important for bulb development. Garlic develops its flavour depending on sunlight conditions during growth.

Well cured garlic bulbs ready for market (Photo TOF)

Soils: Garlic requires a fertile, well-drained, light soil. Clay soils should be avoided since they lead to poor bulb development. Soil pH should be between 5.5 to 6.8. Deep soil cultivation is important to ensure rooting depth. Farmers should seek for advice on the garlic varieties suited to local conditions to ensure they get good yields that meet market requirements.

Planting: Garlic is vegetatively propagated. That means that the farmer has to plant individual cloves separated from the main bulb. Very small cloves should not be used. The larger the cloves, the more the space required for planting. The cloves should be planted in upright position. The bulbs intended for use as seed should be stored at 10 ° C and a relative humidity of 50 -56 per cent. Stored bulbs should be fumigated and continously inspected to ensure they do not rot.

Spacing: The crop is grown on raised beds or on ridges at a spacing of 30 cm between rows and 15 cm between the plants, giving a plant population of 15,000 to 20,000 per hectare. The normal seed clove requirement is 500-700 kg per hectare. Closer spacing within the rows is possible; but disease risks are also high when garlic is planted too closely; bulb formation is also affected when the cloves are near each other. The cloves should be planted at 2.5 cm deep in well-firmed, but not compacted soils.

Kenyan farmers have devised their own method of determining whether their clove seeds are ready for planting: They cut a cross-section of a clove to see if the inner leaf is developing. Its colour and appearance help them determine if the cloves are ready for planting.

Manure application: Garlic does well if well-composted manure is ploughed in before planting. Top dressing with liquid manure should be done regularly at the beginning of 6 - 8 weeks and increased during bulb formation. The field should be weed free to ensure garlic does not compete for nutrients with weeds.

Disease control: The most common diseases are purple blotch, downey mildew, rust and bulb rot (white rot). They can be controlled through long crop rotation, improved drainage and use of copper based fungicides such as copper oxydchloride, which is accepted in organic farming.

Competition from China

The tendency to produce the same crop is so common that Kenyan farmers rarely want to grow crops that fellow farmers are not planting. Apart from the obvious benefits of controlling diseases and pests in choosing various crops, farmers can earn extra income from crop diversification. Farmers in areas with suitable conditions for the production of garlic can reap great benefits from this produce. The retail price of one kilogramme of locally produced garlic is Ksh 250 in supermarkets, but imported garlic from China sometimes floods the market bringing down prices to Ksh 200. Due to lack of supply and lack of quality garlic from local farmers, local supermarkets and retail outlets prefer to buy imported garlic from China.

With drip irrigation, every drop counts

Drip irrigation is the best option for farmers to become independent from rain.

Anja Bengelstorff

Drip irrigation is a very efficient method of watering plants. Drop by drop, the water flows through a special pipe to very small outlets called emitters, in this way watering the soil around the plant roots – hence the name "drip irrigation". Water is applied close to the plant so that only the soil immediately surrounding the plant receives a very limited volume of it. That means: No water is wasted as runoff or lost by moving down through the soil too quickly for the roots to absorb it. Compared to the water sprinkler systems or to furrow-irrigation methods, drip irrigation can achieve 90 – 95 percent water efficiency.

Drip irrigation is becoming popular with farmers in drier zones because it is efficient in use of water. The technology has been further simplified and requires low water pressure to operate. The drip pipes are very flexible and can be modified to suit different lengths of rows or plot sizes.

Use the right system …

The choice of irrigation method depends on geographical characteristics of the site, the amount of water available, the quality of the water and soils, as well as the amount of money a farmer can invest. As one can see on this page, there are drip irrigation systems for nearly all budgets.

Photo P. Lüthi

Water

In our series on water, *The Organic Farmer* underscores the value of this neglected resource. In the February 2010 issue, we will feature agro-forestry.

Many advantages...

- More efficient use of the water available
- Uniform and higher crop yields since one can maintain the soil moisture at an optimum level
- Reduced labour costs since a farmer has only to fill the bucket or the water tank

… and some hurdles

- To install a drip irrigation system costs money.
- You need clean water since the outlet units use a special mechanism to control the pressure that forces the water to come out in drip form after one planting season it is good to rinse the drip lines (the water pipe with the outlets).
- If a drip irrigation system fails, the plants are affected because the low water volume does not allow water storage in the soil for the plants.

Grow vegetables with the bucket drip kit

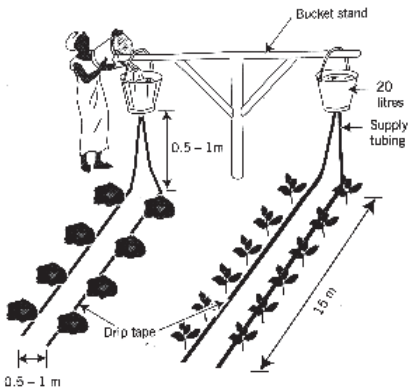
The simplest drip system in use by many small-scale farmers for production of vegetables is the "bucket kit". The standard bucket kit system consists of two drip lines placed 0.5 metres apart on a bed with a width of one metre (see sketch). A bucket is placed on the stand at one end of the bed and connected to the drip lines.

This bucket kit systems can irrigate 10-20 square metres, depending on the length of the drip tube and plant spacing.

The tapes are connected to a 20-litre bucket mounted on a stand, one metre above the vegetable bed, so that gravity provides sufficient water pressure to ensure even watering for the entire plot size. The bucket system enables a farmer to grow vegetables using 30-60 litres of water daily during the crop growing season.

A bucket kit system comprising of two 15-metres long drip lines can be used to grow 50 plants such as tomato, egg plant and similar crops requiring a spacing of 60 cm along the plant rows; 100 plants of spinach, cabbage, kale, pepper and similar plants requiring space of 30 cm along the plant rows; or 300 plants of onion, carrot and similar plants requiring a spacing of 10 cm.

The bucket should be filled in the early morning and in the late afternoon to supply 30-60 litres of water to the crop every day. The actual amount of water depends on crop water requirement and rainfall. In very dry areas and during the dry season 60 litres of water will be required per day.



Bucket irrigation system with two drip lines.(RELMA Technical Handbook No. 24)

Drip systems for cash crop

Larger systems exist, and farmers can choose depending on their scale of production and availability of cash. The following drip irrigation systems are developed as kits by KARI (*See address on page 6*).

Drum kit

The drum system is a combination of several bucket systems but modified to use a water supply from a 200-litre drum instead of a 20-litre bucket. The drum kit is a gravity flow kit that comes complete with a filter, sub main, drip lines, connectors and a 200 litre plastic drum. The system irrigates a 9m x 15m plot. Designed to irrigate 500 plants (60cm x 30cm spacing). The drum should be elevated 1m above the planting surface by constructing a stand made from local material. Such a system requires about 100-200 litres of water a day, depending on the environment and crop.

Costs (including a drum): Ksh 9,000 (KARI product code: 1002)

Continued on page 6

>>> from page 5

Drip irrigation

The 1/8 acre kit

This system, also called a family drip irrigation kit, comes with a filter, sub main, drip lines (12mm) connectors, end lines. The system irrigates a 15m x 30m plot. It can irrigate 2,500 plants (60cm x30cm spacing). The system works with 1m tank pressure head. A 920 to 1000 litres tank is sufficient if direct piped water connection is not available.

Costs: Complete with 920 -1000 litre tank: Ksh 9,000 (Product code: 1004)

The ¼ acre kit

This drip irrigation kit is delivered complete with filter, sub main, drip lines (12mm), connectors etc. The system irrigates a 30m x 30m plot and can irrigate 5,000 plants (60cm x 30cm spacing). The system works with 1m tank pressure head. Preferable tank size is 920-2300litres.

A home made water tank

Costs: ¼ acre drip irrigation kit complete with 1000-litre tank: Ksh 47,500 (KARI product code 1006), with a 2300-litre tank: Ksh 50'000 (code 1007)

For More information contact: KARI Irrigation and Drainage Research Programme, (KARI NARL) Waiyaki Way, P.O.Box 14733 Nairobi Tel/fax: (020) 4 444 250; Cell- 0722 764 751, 0722 397 750, ask for Isaya Sijaji or Esther Muriuki. Email: irrigation@iconnect.co.ke

farmers forum

020 445 03 98 0717 551 129 0738 390 715

Support for organic farmers' organisation

In the November issue, Su Kahumbu proposed the launch of an organisation for organic farmers. About two dozen farmers called us to support Su Kahumbu, others wrote to us. Here are some of their responses:

Farmers need to work together

I have been reading *TOF* publications from a friend, for slightly over six months now. I have been moved by Su Kahumbu's article in the recent issue (No. 54), on the need for organic farmers to work together. I stand to be counted with Su's vision and mission for the organic farmers. I have been practicing organic farming on my 2-acre plot for well over ten years that is without using conventional fertilizers and pesticides. I therefore, have first hand experience and witness that it works.

I would, consequently, request Su to arrange and inform me how stakeholders shall go about forming the organisation that will advance and protect the interests of the organic farmers in our beloved country. John Githinji Ngondu, Box 280 – Othaya, Tel. 0722 635751 / 0733 299945

We also need training

Greetings from Maeni Co-operative Society. We thank you for *The Organic Farmer* magazine we have been receiving up to now. We also appreciate the suggestion of Mrs. Su Kahumbu of setting up an organization to cater for the interest of small-scale farmers with low membership fee of Ksh 10 Ksh 20 as you proposed in the November 2009 *TOF* magazine.

Secondly, we also congratulate you for *i-TOF* centres that have been opened in some parts of the country. We request if you could consider opening up one in Kimilili, for local farmers, as that nearest centre is in Kakamega District. We are regular readers of your magazine therefore we need more information through the extension workers from the *i-TOF* centres.

Yours faithfully, I. S. MBULE. 0735 016 202, Secretary

I support a farmers' organization

First thank you for November 2009 issue of The Organic Farmer magazine, which I have received. The following are my reactions on the same: Su Kahumbu's plan to bring organic farmers together is a well thought out idea and should be supported at all costs. Please, I need some information on methods of preparing silage for the dry seasons. Can you please send me the material on the same? Otherwise I thank you very much for your positive response. Keep it up.

Samson O. Akungu, Waringa estate farm, Box 360 Bondo, Tel.0734 563 629

Regulations on use of water from public sources

According to the Water Act 2002 of the Republic of Kenya, any individual who wants to use water from a natural water body like a river or a lake needs to apply for a license to do so. Those licenses can be obtained from WRMA, either in Nairobi (see contact details below) or its sub-regional offices. The issuing of a permit is supposed to take 21 days.

The permits are classified into classes A, B, C and D, according to the amount of water to be used. Small-scale farmers who, for example, farm on a 0.5 acre plot, might need, depending on the crop and the season, 20 cubic metres per day. In class A which provides for up to 50 cubic metres per day, no fees are charged. However, a water metre must be installed before using water from a river or lake in order to control the quantity. Even though the extraction of up to 50 cubic metres of water a day are free of charge so far, a permit must be obtained.

In response to the growing scarcity of water in Kenya, local bodies like the Lake Naivasha Water Resource Users Association, a development of WRMA, encourage water users to acknowledge the serious situation and pay Ksh 2,000 per month for a class A permit, particularly in areas where water scarcity has reached an alarming level. The money, collected by WRMA, is used by the associations to manage the country's scarce water resources. ***AB***

WRMA (Water Resources Management Authority) in Nairobi, NHIF Building, Upper Hill, Tel. 020 – 272 99 46, www.wrma.or.ke

Useful addresses

We have been receiving questions from farmers on where they can buy various organic inputs and tree seedlings. Although some of the organic inputs such as diatomite are already available in agrovet shops near our 4 *i-TOF* centres, only farmers near the centres have access to the inputs. Below we provide you some of the inputs and where you can buy them.

Diatomite

African Diatomite Industries P.O. Box 32 Gilgil, 20116, Kenya Tel. 0722 277 120

Mijingu rock phosphate

MIPCO East Africa P.O. Box 53822, 00200 Nairobi-Kenya Tel.0720 817 072

Tree seedlings

KEFRI P.O. Box 20 412, 00100 Nairobi Tel. 0722 801 539, 0722 157 414, 0734 251 188

Fruit tree seedlings

Benjamin Lugano Tel. 0733 990 374

NOTE: Most certified tree seeds and seedlings can also be obtained from nurseries run by the Kenya Forest Service and KEFRI stations in almost every district.

Please, do not use diesel on soil

I uprooted a portion of Tea Plantation to start Horticultural farming as a way of enterprise diversification, but I later realised that the soil is so poor and cannot support any crop due to over use of agrochemicals for many years. Another problem I am facing is the slow rate at which tea stumps/roots are taking to decay. I was advised to apply used lubrication oil mixed with diesel to accelerate the process. Please advice on these two issues (Ruth Munene, Farmer in Gitugi)

We just hope you did not follow the advice of applying diesel on your tea plot! All petroleum-based products are highly toxic to the soil and are considered to be the soil pollution of the worst kind. Even small amounts of Diesel make the soil loose its natural fertility, and its biological activity may not recover for many years. As soil microorganisms are killed, decomposition processes will be extremely slow instead of being accelerated. In contaminated soils, seeds may not germinate, and seedlings may die. Plant growth and yields can be drastically reduced. Our advice is to remove polluted soil spots quickly, if this is still possible, and to avoid growing crops for human consumption for several seasons.

Improve the soil quality

Concerning the generally poor soil, the situation is difficult to judge. A soil test could help you to analyze what is wrong with your tea plot. If you just used mineral fertilizers up to now, the soil might be poor in organic matter. In this case, all measures which can increase soil organic matter will be beneficial. This is what you should do:

- Start preparing compost on a regular basis, and add livestock manure to the soil or to the compost if you can.
- A very effective way of providing organic matter is green manuring, preferably with leguminous plants like desmodium, crotalaria, mucuna, purple vetch, or whatever is available and doing well in your region. Green manure crops are not harvested but are slashed and incorporated into the soil while they are still green. If your soil is very poor, the effect will be worth the labour!
- Another option is repeated addition of thick layers of chopped Tithonia prunings or chopped prunings from trees and shrubs like Leucaena, Calliandra, Sesbania etc. If you plant them along the field borders, you will always have them ready at hand in the future.
- The second best solution is planting Napier grass, preferably with the "Tumbukiza"-method, as it disturbs the soil only moderately. If you sell the harvest, this could provide at least some income.
- If you have animals, you could also establish a pasture for some years. If not overgrazed, pastures have a beneficial effect on soil fertility.

Note that it will take time to recover soil fertility, just as it takes time to reduce it and to deplete the soil. We suggest th at you give the soil some rest of at least one year before you start cropping and harvesting again. In the meantime, a combination of the suggested measures will build up soil life and promote decay of the tea roots too. ***THS***

Climbing beans

I would like to grow climbing beans. Where can I get seeds?

KARI developed this variety of bean but they can only produce basic seed. Seed companies, who multiply seeds for sale to farmers are not willing to do so. Due to the increased demand for this variety all seeds in stock in KARI Embu were bought last year. (See the editorial on p. 1)

Avocado leaves

Are avocado leaves good for dairy cows? John Ndegwa, Kitale

You can feed avocado leaves to dairy cows. But they will only accept them, when there is no or only few other fodder.

Charcoal earths contain good soils

Why is it that soils that have been used to burn charcoal provide a perfect environment for raising seedlings or good for nursery establishment?

Where charcoal is being produced, the heat of the process actually disinfects the soil, destroys all diseases and pests, and creates a weed free environment. In addition, usually a layer of wood ash is left behind. It contains all the minerals which were accumulated by the trees to build their trunks and branches.

Also organic matter which is not completely burnt during charcoal production falls on the ground and is left on the place, enriching the soil and binding nutrients. All this together is just ideal for raising healthy seedlings. What you observed is absolutely accu Charcoal production is becoming one of the most destructive human activities that contributes destruction of our remaining forests. Kenya's forest cover has been reduced from 10 per cent to less than 2 per cent. The increasing urban population has led to a big demand for charcoal which is the cheapest source of energy for the rural and urban population. Apart from depleting our scarce forest resources, charcoal burning is wasteful since the charcoal kilns are not properly made. ***TOF***

When cows eat clothes, soap…

My cow eats plastic wastes, clothes. What can I do to arrest this problem? (Jecinta Mutugi, Farmer in Gichugu).

When animals lack essential minerals such as calcium and phosphorus in their diets, they develop strange habits such as feeding on clothes, rags, bones, soap etc. This is a sign that the body is lacking particular nutrients. The habit stops immediately you provide the nutrients through licks or feed that contains the minerals. Ensure your animals are provided with salt licks at all times. Be careful when buying mineral licks because there are many types of licks in the market but only a few are of good quality. There are a number of plants that contain a good source of minerals; these include Amaranthus, spider weed, pumpkins, stinging nettle (Thabai in kikuyu) Oxigynum sinnathium (conge in Kikuyu) and black night shade are very rich in both calcium and phosphorus. These plants can be chopped mixed with animal feeds or dried and made into powder and applied on animal feed to balance the mineral content in the feed. (Many farmers may not have read the answer we gave before. I think it is ok to give an answer).

What kind of nutrients are found in compost?

Farmers are really getting interested in compost. In this article, we answer the most common questions we receive.

Teresa Székely

Synthetic fertilisers contain specific quantities of elements e.g. DAP may have 20: 0: 38. How do we know the quantity of elements that are contained in compost manure?

This is indeed a good question, and there is no straight forward answer. The nutrient content of composts can vary extremely, because it depends on many factors like the material used, composting duration, composting method etc. Compost consists mainly of plant material and animal manure (which is usually nothing but digested plant matter). The composting process breaks this material down and stabilizes it in the form of humus. Compost therefore naturally contains all nutrients required for plant growth including Nitrogen (N), Phosphorus (P), and Potassium (K) but also many other important elements like calcium, sulphur, magnesium, iron etc. All these nutrients are bound to the humified organic matter and are released to plants only gradually. There are some rules of thumb for the content of N, P, and K in composts:

• Poultry, pig manures and urine from all creatures are rich in nitrogen. Adding these materials to the compost heap enriches the compost with N. It is not a stupid idea to urinate on the compost heap!

• The older the compost, the less nitrogen it contains as some of it is lost over time.

• Poultry manure is rich in phosphorus. Adding poultry manure and rock phosphate to the compost enriches the compost with P. P does not get lost as easily as N.

• Wood ash, goat and sheep manures, poultry and cattle manure and therefore all composts which are prepared with them are rich in K. K easily washes out with rain.

Keep sun and rain away

Usually, nitrogen is the problem, and we would like to explain this a little further. In a natural environment, nitrogen is only stable as N2. This is a gas, and the air you breathe consists of 80% nitrogen gas. Unfortunately, this gas cannot be used by plants. All forms of nitrogen which can be taken up by plants and can be found in the soil, in manures, or in the compost tend to transform and to disappear. They are either washed out with water in the form of nitrate, or they go back into the air as ammonia and N2. This is why compost and manures should not be exposed to rain and sunshine. You may now also see why leguminous species are so important: With the help of specific bacteria, they can take nitrogen from the air and convert it into a form which can be used to build up plant material.

Composting recycles and stabilizes at least a part of the nitrogen which is present in all plant material and animal manures. Compost does not have the high concentration of nitrogen synthetic nitrogen fertilizer has. But it is most essential in another way: Compost enriches the soil with organic matter. Organic matter retains and stores nutrients including nitrogen, supplying them to plants over many seasons.

...and some more questions on compost!

Turning: Why do we turn compost during preparation?
Turning compost manure ensures that the material is evenly mixed and can decay evenly, resulting in a uniform and easily applicable product. If you don't turn the compost, some parts of it may be too dry or too woody, and these parts will not be ready for use together with the rest of the heap. When you turn the heap you will also easily see whether the material is too wet or too dry, giving you a chance to correct this.

A heap: Can we prepare compost in a hole deeper than 2 feet?
There is actually no problem with holes of any depth, except that it may be difficult first of all to dig the hole and secondly to turn a heap at the bottom of a deep cavity and thirdly to get the material up when it is ready. But it should also be said that in a dry hot region, using a deeper hole would actually be the ideal place for compost, as it would be protected from the sun and thus from drying out!

Ants: Can ants consume/destroy our materials in the compost?
They certainly may consume some of the good things you are putting there, and they will digest it too, which is actually what you want: The breaking down of any organic material is a process very similar to digestion. Ants sometimes like compost heaps, especially if they are not too moist. They do not do any harm and will usually disappear when you turn the heap. If you want to get rid of them completely, turn the heap frequently, and keep it wetter than usual. Some aggressive ant species also feed on worms, and if you have worms in the compost, it may be good to get rid of the ants.

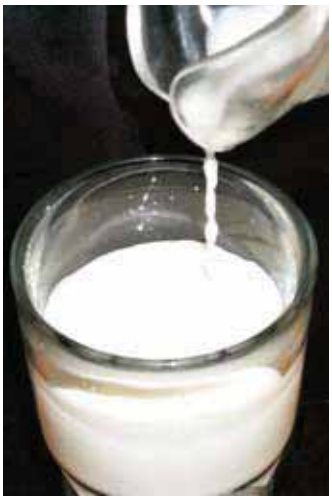
Fertilizer: Can we use both inorganic fertilizer and compost manure on our farms?
Inorganic fertilizers like urea, NPK, DAP are produced synthetically and are not used in organic agriculture. There are several reasons for this: Their production requires large amounts of energy. They are highly concentrated and have adverse effects on soil fertility and the environment, if overused. In organic farming, we do not rely on single nutrients, but soil organic matter is regarded as central for plant nutrition, as it improves soil structure, promotes soil fertility, and stores nutrients. In poor soils it is important to increase organic matter content by using compost and manures, because using inorganic fertilizers alone will decrease soil fertility. For phosphorus, there is a very good organic alternative: Rock phosphate. K can be provided with wood ash. Both can be added to the compost. Nitrogen is more of a problem. In "Integrated Resource Management" farming system, a combination of organic and conventional techniques are used and some nitrogen fertilizer like urea is added to the compost at planting or to plants with high nitrogen requirements.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 44 January 2009



Milk from a cow in this dirty condition will always be contaminated. Unfortunately, the bare eye cannot detect unhealthy milk. (Photos *TOF*)

Quality of milk worrying

Milk produced under unhygienic conditions is being sold to unsuspecting consumers.

The Organic Farmer

In a bid to get information about milk, *The Organic Farmer* collected, in mid-November 2008, nine samples of milk; four from milk processing companies and five from farmers and milk bars around Nairobi. The results of the analysed milk samples will shock many milk consumers. None of the samples passed the standards as specified by the Kenya Bureau of Standards (KEBS) and were therefore unfit for human consumption. One problem facing the dairy industry is the lack of a regulatory framework that can enforce quality controls to ensure that farmers, milk traders and processors maintained the set standards of quality. The Dairy Act as it is now cannot serve the interest of farmers and protect the consumers unless it is overhauled.

Lack of hygiene

The biggest problem is the lack of hygiene, not only on the side of the farmers, but also on the hawkers and even processors. If they would observe the basic requirements of hygiene, at least the quality of milk reaching the market would be slightly better than the samples show. In some of the samples, the amount of bacteria was 281 times higher than the minimum allowed! Adding of water, flour, Blue Band margarine and other additives is a common practice as boiling the milk (see page 4). Some milk processors, however use Hydrogen peroxide and even formalin to prolong the milk's shelf-life. Formalin is especially harmful to both people and animals.

Hydrogen peroxide

In most countries, hydrogen peroxide is allowed for use as a preservative in raw milk, according to a decision made by the UN Food and Agriculture Organisation and the World Health Organisation in 1991. The argument behind this decision was that hydrogen peroxide would assist small scale farmers in developing countries, who do not have refrigeration facilities. However it is banned in Kenya. One reason for the ban is that farmers, milk traders and processors are supposed to ensure milk is delivered to consumers while still fresh. Strange enough, only the tested milk samples of the processing companies contained the banned hydrogen peroxide, the five raw milk samples did not. *See pages 4 & 5*

in this issue

Dear farmers,

Something is seriously wrong with Kenya's dairy sector. Although the sector has witnessed tremendous growth in the last six years, employing over 2 million Kenyans directly or indirectly, quality standards have considerably declined to the point of endangering the lives of consumers. As the samples we analysed from milk bars and processed milk show, milk sold in both the informal and formal market contains a high bacterial load and is therefore unfit for human consumption. Adulteration of milk is also common with some of the processors even adding water and hydrogen peroxide to increase the milk quality and lengthen its shelf-life. Since the milk industry was liberalised, and more milk processors allowed to operate, quality standards are no longer observed.

Although the Kenya Dairy Board is trying to enforce quality controls among farmers and processors through spot checks and even training programmes in a few regions, our investigations show that they lack the capacity to streamline and improve the quality of milk in a way that can protect consumers from unscrupulous players in the industry. Illegal taxation of milk traders by police, municipal authorities and criminal gangs has also compromised quality as it forces them to adulterate milk to maintain their profit margins. What is even more confusing is that the figures we received from KDB show that milk exports from Kenya have increased from 2.5 million to 22 million in the last five years. How come that the same processors selling poor quality locally are able to meet the stringent quality standards in the export market? One possible explanation for this is that the processors are able to produce two sets of milk consignments; the adulterated milk is sold in the local market while the unadulterated one is exported.

One solution to this problem is to amend the Dairy Act. The 1958 act was meant to protect the colonial dairy farmers. Since independence in 1963, successive Kenyan Governments have done little to change the act, which has allowed a few players to control the sector at the expense of the majority of dairy farmers. The government should enforce quality standards across the board and ensure consumers get value for their money. In this case we really have to ask ourselves: how can big milk processors sell their milk even without fulfilling the requirements of the Kenya Bureau of Standards?

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0721 541 590, 0738 390 715, Email: info@organickenya.com

Moringa can feed both people and animals

Each part of a Moringa tree, from top to the roots, is useful to the farmers.

The Organic Farmer

Even though it is an exceptionally resourceful plant, the Moringa tree has, to date, received little attention in our country. You might know it as *mrongo* or *mzunze* or under the English names Horseradish tree or Drumstick tree. Other times it is even called "mothers best friend". Names aside, it may well have the potential to become your best friend in future!

Rich in all types of vitamins

Almost every part of the Moringa tree is edible. The leaves are the most essential product of the tree. You can eat them fresh or cooked like spinach, or you can store the leaves as dried powder for many months to supplement soups and sauces. And, of course, the leaves provide great forage for your livestock.

Scientific research confirms that the leaves are of high nutritional value. They contain seven times the vitamin C in oranges; four times the calcium and two times the protein in milk, four times the vitamin A in carrots and three times the potassium in bananas (see the graphic below).

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org
Editor Peter Kamau
Secretariat Lucy W. Macharia
Layout In-A-Vision Systems, 0720419 584
Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe
Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

The moringa tree is identifiable by its long pods. Photos: www.treesforlife.org

The flowers, rich in calcium and potassium, are not only a good source of nectar for bees but can also be boiled and eaten as a vegetable. Further, dried flowers provide you with a nice tea. Finally, the pods can be cooked like green beans; the seeds from more mature pods can be eaten like peas or roasted like nuts.

An organic fertilizer

Moringa trees are very useful especially for organic farmers. Apart from providing a live fence around homesteads or serving as a windbreak, they produce a lot of biomass, since they grow very fast and can be planted close to each other. The high protein content in the foliage serves as an organic fertilizer for the surrounding food crops. The deep roots without extended shallow, lateral branching do not compete with nearby crops, and its loose canopy prevents excessive crop shading.

The Moringa tree is well known in the traditional medical practice, especially in India. The leaves, flowers and pods have been claimed to function as a natural medicine with anti-bacterial and anti-inflammatory effect. Finally, you can purify water by adding pounded Moringa seeds to dirty or even muddy water. The solid matter will then sink to the bottom and the surface water can be used after boiling.

How to grow Moringa

Although the Moringa is originally considered a tree of hot semi-arid regions, it has also proven to be well adapted to wet conditions. Water logging should be avoided as it can cause root rot, the only common disease that threatens Moringa. The tree does best in well drained and sandy or loamy soils. Nevertheless, the tree also tolerates heavy clay soils.

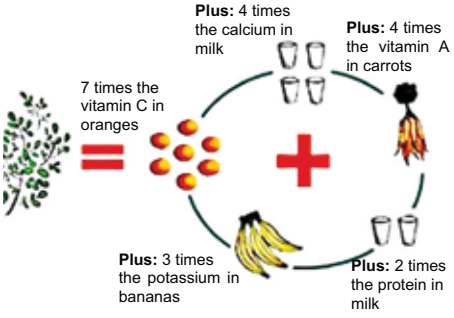
Moringa trees can be grown from seeds, stem cuttings and even from roots. Soak the mature seeds in water for one day and then plant them one inch deep. Keep the soil moist after planting. The seeds should germinate within 15 days. The best time for sowing is at the beginning of the wet season.

Cuttings of healthy branches with hard wood (1 m to 1,5 m long) should be taken in the rainy season. Let the cuttings' ends dry in a shady place for 3 days, then place one third of each cutting length in the soil. If you keep the soil moist but not over watered, the branches will take root readily in just a few months. Within three years of planting, a single tree may produce 300-1000 pods annually. Frequent pruning following harvesting is recommended as it promotes branching and increases leaf growth. And your animals will benefit from this healthy fodder!

Increasing demand

Earthoil Kenya is at the moment the biggest buyer of moringa seeds in the country (Earthoil Kenya PTY EPZ Ltd, Langata South Road, Nairobi, Tel: 020 891 13 46, 0728 023 240). The farm gate price for Moringa seeds shot up to Kshs 40/kg in early 2008. By now, the farming of Moringa for commercial purposes has taken root in Nyanza province, where 71 farmers' groups deliver Moringa seeds and leaves twice a year and generate additional income from the recently rediscovered multipurpose tree.

You can buy Moringa seeds from: Kenya Forestry Research Institute. Call John Obango, 0722 763 016



Mature compost boosts your crops

Compost can be used effectively in many ways. Nevertheless is has to be mature compost.

The Organic Farmer

A farmer adds rock phosphate to improve the quality of his compost (Photo TOF)

Many farmers still doubt the effectiveness of compost as a source of plant food and a soil conditioner. In fact, compost is not high in the essential nutrients (N-P-K and Ca). But the most beneficial aspect in the use of compost is it's capability to develop the soil and to improve, in the long term, the quality of the soil; humus' acids pass through the soil and free the nutrients naturally present in it. Of course, considering the local soil conditions, there may still be need for a supplementary soil boost. (see box).

How much compost?

It depends on the quality of the garden. If the garden has been treated organically for years, then the soils microbial life will be existing in large quantities; the levels of humus in the soil from previous applications of compost will be high. On the other hand, if the soil has not been organically maintained and has a low level of humus and organic material in it, then the levels of compost must be greatly increased for several years. This is because the soil's microbial life will be so depleted that the organisms that decompose and release the nutrients and elements cannot adequately perform their work fast or immediately. Besides, the organisms present in the soil are greatly influenced by factors such as temperature, PH, soil texture, and moisture.

On the other hand, starting a virgin garden in a soil which has not had applications of soil destructive chemicals, one will notice a very quick assimilation of the compost into the soil. It may be noticed that such a soil is darker, evidence of high carbon content. Further, the workability of the soil may be easy, an indication that the humus has worked its way into the soil structure; opening up the clay soil, or binding the sandy soil.

There is a cumulative benefit of using compost from season to season and year to year. After several years there begins to be a net gain in the levels of humus as well as beneficial organisms including worms and insects. It is at this time that addition of new compost may be reduced to a certain extent. The high levels of soil quality will at that time be easily maintained by addition of compost or other bulk organic matter at regular intervals.

The more the better

The principles of organic agriculture are based on a simple premise: "Feed the soil, not the plants". The addition of compost will not only help the plant roots to absorb the natural elements available in the soil; it converts these elements into a form that is easily taken up by the roots. The humus that the compost will decay into will serve as a buffer against PH, temperature, moisture and airflow changes. To a certain degree we can say: the more the better. A six inch layer of compost, well turned into the soil, will do no harm to any soil; so one can easily add plenty and improve the soil faster.

How to add compost

It is important to let the compost to mature fully before use, then work it into the soil to a depth of 12 cm to 20 cm. Using compost which has fully matured will reduce any problems from weed seeds, pathogens and also "nitrogen stealing" from the coming crops roots by the decomposing material.

In fact, to till any half finished compost or crop residues directly into the soil causes "nitrogen-draft". What does this mean? The micro-organisms which accelerate decomposition may "steal" some nitrogen from the surrounding soil, because they need sufficient food energy to generate the decomposition process. This leads to a temporary deficit of nitrogen at the cost of the plants which will be put

Continued on page 6

Use compost to cut down fertilizer costs

Farmers will continue to pay more for farm inputs this year. With the present tendency for speculation on all essential commodities that are in short supply in the country, fertilizer prices may not come down even though oil prices have reduced. This means that most of the farmers may not be able to afford fertilizer especially at this time of the year when many rural households have just spent a sizable portion of their earnings to pay for school fees and other financial commitments that come with the new year.

Several times, we have shown farmers how to prepare compost for use during the planting season. Well-prepared compost will build fertility in the soils in the long term and can help cut the cost of using fertilizer for crop production. But one point farmers should not forget is that compost releases nutrients slowly, so plants may not benefit immediately compost is applied. Studies conducted in various parts of the world show that a little fertilizer mixed with compost can solve this problem. Fertilizer, when applied, goes directly into the plants while compost builds up soil fertility over time. Trials done by scientists showed crops yields almost doubled when a little fertilizer (about 10 percent) was mixed with the compost at the time of planting. For financial reasons, farmers can even share one bag of fertilizer.

Of course, farmers should know that this production system is not organic but it can at least boost their yield in the short term and also reduce their input costs. Continued use of compost however will have the same effect on crops. (TOF)

We have received complaints from several farmers that most of the organic inputs we often recommend to them are not available in any agro-veterinary shops near them. We understand the problem. Farmers interested in buying these products can order them from Lachlan Kenya ltd P.O.Box 49470 Nairobi, 00100 Tel 020 207391.2/3/4 or Hygrotech East Africa Ltd P.O.Box 41446 Nairobi, 00100 Tel.066 73567/8/9

Milk contamination begins on the farm

Poor hygiene, dirty milking equipment, added water and fats reduce milk quality.

The Organic Farmer

Milk is an important item in human nutrition. To make it safe for consumption, it has to be handled carefully from the time of milking, transport and processing to ensure it is not contaminated in a way that poses a risk to the consumer's health. This is by far not the case, as the analysis of the nine milks samples shows, which TOF collected from 4 milk processors and 5 farmers and milk bars. None of the samples passed the quality control standards as specified by the Kenya Bureau of Standards (Kebs). The samples show that most of the milk not only has a high bacterial load; it contains additives such as hydrogen peroxide which are prohibited by the Kenya Dairy Board.

Big processing companies as well as farmers and hawkers add water to increase the quantity of milk. A sample from one company added 8.3 percent water to the milk. Hawkers are especially in a very unfortunate situation because those without milk trading licenses have to bribe the police, municipal authorities and criminal gangs to be allowed to transport and sell their milk in towns. So they then add water to maintain their profit margins. "This adulteration is bad", one milk specialist told TOF. "What makes the issue even worse, they do not adulterate it in a hygienic way. They just add any water they find along the road or add flour or Blue band margarine to make it appear creamy", he says.

Many cow sheds especially in zero grazing units are terribly dirty, and the animals live in bad conditions. No wonder the milk from these cows is contaminated with millions of harmful bacteria.

Milking in dirty sheds

In some places the milk is so much contaminated with antibiotics and hydrogen peroxide that it can not even be used for yoghourt production; antibiotics and hydrogen peroxide kill the bacterial culture which is needed for fermented products manufacture. Hardly any farmer is willing to pour away the milk from an animal on treatment with antibiotics, which remain in the milk. Instead, they sell it to consumers exposing them to the risk of developing resistance against antibiotic drugs.

About 80 percent of the milk in the country comes from small-scale farmers. But the conditions under which the milk is produced are very unhygienic. The typical milking shed is a structure full of mud, cow dung and urine. In the last years we have seen so many zero grazing units that look like a manure pit rather than like a proper and safe cow shed! When milking, dairy cows splash this dirt on the milk, contaminating it. Farmers should know that any milk from the cow's udder is usually clean and sterile and has no bacteria. Contamination only occurs during milking and later handling of the milk, storage for instance and at the point of trade.

Only a minority of small scale farmers do have any proper cooling storage facilities. If milk stays for more than 4 hours, the bacterial load multiplies very fast and the milk goes bad. This is especially the case, when the containers used in milking are not washed with hot and clean water. Since detergents are rarely applied, the containers are therefore a major cause of milk contamination at the farm level. Moreover, since it takes a lot of time for milk traders to deliver the commodity to the market from the rural areas to the nearest town, milk traders often improvise preservation methods such as the use of hydrogen peroxide.

The problem with the use of plastic jerry cans is that it has a small opening, which makes it very difficult to clean. Continued use of the same jerry can for milk storage and transport leads to accumulation of dirt which the farmer cannot be able to wash away; fat sticks more in plastic. So the jerry cans are a major cause of milk contamination but farmers find them most ideal because they are cheap to buy and maintain.

An ideal cowshed with clean beddings

Feed can spoil milk

The most common practice among farmers is to sort maize after harvesting. The good maize is stored for consumption and sale, while the rotten maize is preserved as animal feed (maozo). When maize is exposed to wet conditions, mould grows on it. If mould development continues, it produces toxins (also known as mycotoxins). Aflatoxins is one type of toxins that occurs in rotten maize which is dangerous to animals and even human beings. When animals are fed on rotten maize that has already developed mycotoxins, the mycotoxins are stored in the cow's liver. But small amounts of the mycotoxins are transferred to the milk, contained in fat cells. When people consume the milk, these mycotoxins are retained in the liver, where continuous accumulation can lead to serious diseases such as liver and pancreatic cancers.

The type of feed given to a cow before milking is another factor that contributes to milk spoilage. Many farmers feed silage mixed with molasses to the cows just before milking. This transfers the taste of the feed to the milk. In the same way, if a cow is allowed to graze on such crops as onions, Mexican marigold or is fed with dairy meal containing omena, the taste of these feeds goes into the milk and spoils its quality. (TOF)

Millions of bacteria

Quick multiplication of bacteria spoils the milk within hours.

The Organic Farmer

Milk is very rich in nutrients. This is the best breeding ground for bacteria. They can develop very fast in milk, multiplying into millions within one hour. This process is even faster when the milk is not stored cold. The milk industry uses the term "Total Viable Count", (TVC) to determine the bacterial load in milk. According to Duncan Ndegwa, a scientist at Analabs in Nairobi, that analysed our samples, the Kenya Bureau of Standards (KEBS) allows 1 million bacteria per millilitre (Colony forming Units, CfU/ml) for best quality raw milk, and less than 30,000 for processed milk.

In the four tested samples of processed milk (which you buy in tetra packs or plastic bags) the bacteria contained an average of between 250 up to around 30,000 TVC, which is more or less within the KEBS standards; through pasteurization most of the bacteria are killed. All the processed samples failed the test because the processors added Hydrogen peroxide which prolongs the milk's shelf-life. This is not permitted by the law. The samples of farmers and milk bars did not contain Hydrogen peroxide; the reason may be the short distance they have to cover to reach the market in Nairobi.

A grim picture

However, in terms of bacteria, the five samples of raw milk from farmers and milk bars paint a grim picture. The sum of all bacteria per millilitre ranged between 3.5 million and 281 million! KEBS allows 1 million. That is the reason why all raw milk samples failed to pass the KEBS-standards. This huge amount is a clear indication of the unhygienic handling of milk (dirty milking sheds, unclean storage and careless distribution of the milk), see page 4. The only good thing is that most of these bacteria disappear when the milk is boiled to least at 70° Celsius.

If this is not done, the dangerous Coliform bacteria remain in the milk. Coliforms are bacteria resulting from dirty hands and unclean cans, buckets and jerry cans. The KEBS-standards allow less that 500,000 cfu/ml (Coliform units per millilitre). Only two of the five raw milk samples passed the tests; the others had between 3.5 and 26.5 million. Serious enough, one sample of processed milk contained more coliforms than the KEBS-standards allows for pasteurized milk.

Tuberculosis and mastitis

Similarly, a cow with tuberculosis can pass the TB-causing bacillus into the milk. If the milk is not properly boiled, anyone taking it has a high chance of contracting TB. The same happens when an animal has brucella infection. These bacteria are transferred to the milk. People drinking the milk face the risk of contracting brucellosis which causes bad fever and takes a long time to cure. A farmer should not sell or drink this milk until seven days after the withdrawal of the antibiotics.

Mastitis is an inflammation of the mammary glands in the udder caused by infection with disease-causing bacteria. These bacteria can also end up in the milk and results in illness and fever in milk drinkers. For this reason, milk from cows suffering from mastitis should not be sold or drunk.

All you need is hygiene

If a cow is contented, well-fed, cared-for in a clean environment, she will produce quality milk. Clean bedding is also important.

The Organic Farmer

A dairy farmer should be a professional and an expert in the care of cows. He must know that milk is a natural product and hygiene is therefore extremely important. Good hygiene begins long before milking starts. The predominant sources of coliforms and environmental streptococci are manure and bedding materials. The cleaner we can keep the cows, the fewer problems we will have in the milk (and the less money you spend for the veterinary!)

Hygiene is important

Whether the cows are kept outdoors or in stalls, there may be dirt on the udders that should be cleaned before milking.

- After washing your hands with soap, clean the udder and teats. Wash them with a clean cloth and warm water, dry the udder with a clean dry cloth.
- The teats should be thoroughly dried; water on teats helps in transporting bacteria and concentrating them at the opening of the teat canal.
- Cloth towels are more effective than paper at removing pathogens. Cloth towels should be disinfected by washing with bleach or very hot water.
- Now wash you hands again properly with soap.
- After cleaning the udder, the teats are fore stripped. Make the first draw into a strip cup to check for mastitis and other abnormalities and throw it away from the milking area even if the milk appears clean.
- After milking, sieve the milk through a strainer or muslin cloth to remove solid particles that may have fallen in during milking.
- Cover the milk to avoid contamination.
- Move the milk to a clean and cool area.
- Always handle milk in clean metal containers.
- When transferring milk between containers, pour the milk instead of scooping. Scooping may introduce spoilage bacteria.

Farmers should clean the udder before milking. To transport milk, one should use aluminium cans and not any metal or plastic containers, to avoid contamination.

Storage

- Store milk at a cool place. Cooling milk will slow down the growth of harmful bacteria and prolong the milk's shelf life.
- Keep the milk in easy to clean and sterilize aluminium containers, NOT in plastic jerry cans; plastic containers can not be cleaned in the same way and are breeding grounds for bacteria.
- At any rate, do not store milk in plastic jerry cans that previously contained paint, herbicides and other chemicals because traces of these substances can taint your milk.
- Use cleaning and sanitation detergents specially designed to clean and disinfect milk-handling equipment carefully.
- Always rinse your equipment with clean (boiled) water properly after cleaning to prevent detergent residues from contaminating the milk.
- Good milk quality means more profit for your farm.

> > > from page 3: Compost

into the soil. It can be argued that the nitrogen uptake by the organisms will be released upon the 'finishing' of the compost, when the organisms die; but still, the temporary problem can be a big one to growing plants that require sufficient supply of nutrients. So it is advisable to spread some mature compost around such plants.

Raw manure and half finished compost also have a reputation for 'burning' plant roots. This is as a result of the heat generated during the decomposition process. This heat can also affect many of the soil organisms that cannot endure hot conditions. Therefore one should not spread raw manures or half finished compost directly on or into the soil.

Compost as a mulch

When compost is used as a mulch, it has all of the good attributes normally ascribed to other mulches. It also has a higher nutrient content than most mulch material. But again: It is strongly recommended to use finished, mature compost.

Compost is generally kept damp to increase the chance of survival of the life it maintains. In Africa, the strong sunrays may damage and dry good quality compost, rendering it less effective if used as a mulch. It may be used more effectively in damp conditions like around fruit trees, vanilla, etc., where there is a shaded canopy of foliage above the compost.

In areas where rainfall and humidity are high, mulching with compost also reduces the work of digging the compost into the soil. It will simply wash down to the plant roots with each rain shower. (Much like the fallen leaves and other material, on a forest floor.) With this in mind, a good time to apply compost as mulch around your vegetable crops would be when the crop foliage is large enough to create cover, and when overhead watering is available, rain or sprinkler.

Another easy application where compost can be used without too much labour is as a layer upon the soil around the crop bases that is then mulched with grass, banana leaves etc. to protect the compost from drying.

Source: Rivenrock Gardens Organic Philosophy ■

farmers forum

020 445 03 98 0721 541 590 0738 390 715

Low cost maize flour not a solution

As a small-scale farmer who is a low income earner, I seize the opportunity to applaud the Kenyan government for its positive intervention in the price of maize flour that in the past few months had skyrocketed. Now, at least a majority of Kenyans can afford a smile as their staple food item is now retailing at an average of Ksh 72. In addition, there is a cheaper brand of flour that is retailing at Ksh. 130 per 5kg bag. This translates into Ksh.26 a kilo, a great reprieve to the low income earners like me!

In the midst of this celebration however, one cannot stop to think whether the reduction in the cost of maize flour is a long term solution to this particular problem in general, and in particular, the high cost of living that is experienced in this country. To me, the low cost maize flour is not a solution to the looming food shortage as the distribution of this commodity is very poor. It does not reach the target group – that is the low income earners. Additionally, this cheap commodity might be abused by unscrupulous businessmen who might repackage it and make high profits. Another question arising from this maize flour saga is; does the reduction in the price of maize flour mean reduction in the cost of living? Of course not. If we address the issue of maize flour today, what other commodity or service do we address tomorrow? Is it the cost of sugar that now is on the rise, or cooking fat, which is following the same trend, or is it electricity? Clearly there are imminent economic hardships coming and the government should not wait for pressure from the public to act. If one does not repair a crack on the wall, then eventually he shall build it whole; so goes a Kiswahili saying.

Jeremiah Kimemia, Thika

Beware of GMOs

The Biosafety Bill 2008 has now been passed and is now awaiting presidential assent. As with any other laws and policy documents that affect agriculture in this country, we the farmers know very little about the consequences of this new law that allows the introduction of Genetically Modified Organisms (GMOs) into the country. According to what we hear, the bill makes it possible for companies that manufacture genetically modified seedlings to sell them in the country. But our fear is that nobody really knows the side effect these GMOs are going to have on our health or the environment. What about our local maize varieties for example? Are they going to disappear because of cross-pollination with GMO seeds? Nobody is answering these questions to enlighten farmers.

The common practice among our farmers is to use farm stored maize as seed when they are unable to buy certified seed. Now we are told that the GMO seeds cannot be replanted again and if this is done, it might produce varieties of maize that may have dangerous traits that can have negative effects on consumers, the environment and even other crops. I would like to warn other farmers to be wary of using any of the so called GMO seeds until we are sure that they cannot bring any harm to us.

George Makau, Kangundo.

Can farmers afford GMOs?

Now the government has allowed the use of GMO. Fine, apart from the problems with GMO, let me ask you: How will small-scale farmers pay for these expensive seeds? So many farmer do not even have the money to buy hybrid maize or the drought resistant Katumani maize. This is strange. We run behind the Americans to get the GMO and feed to provide their companies with a market for their seeds; at the same time we neglect seed varieties made by our own scientists which are well-adapted to our climate.

Mary Awuor, Siaya

Order your CD

The Infonet-Biovision CD contains all the information that a farmer may need. Farmers interested in buying the CD only need to send us airtime worth Ksh 200 through either our Zain line (former CELTEL) 0738 390 715, or through our SAFARICOM line, 0721 541 590. After sending this airtime, please send us an SMS detailing your full name and correct address. We shall send you the CD by registered mail.

Papayas need male and female

What can I do to a papaya when it produces flowers and they drop off? Which chemical can I apply? Gitau, 0723 729 495

Papaya plants are quite funny. They can be male, female or both (hermaphroditic). A female plant will need a male plant in close vicinity in order for pollination to take place. If a male plant is not available, female plants will produce flowers that will eventually shrivel up and drop off.

This could be your problem, Gitau. You can recognise the difference between male and female papaya plants by the flowers. Male plants have clusters of small white flowers on branched tentacles, sometimes as much as 18 inches long. Female plants have a larger single white flower sitting on the head of a tiny fruit close to the stem in a leaf axil. The flower petals are normally straight. As the female plant bears the fruit.

When planting papaya it is advisable to plant several seedlings and then to thin them out transplanting approximately seven females to one male. This should ensure adequate pollination for good fruiting. **Su Kahumbu**

... answers in brief

Marigold: Can marigold extract also be used to protect tree seedlings? Charles, 0738 711 117

Marigold extract can protect tree seedlings from some insects.

Lachlan: Are those products from Lachlan, for instance TwinN organic?

To ensure products are organic, look for organic certification symbols on the packaging. If they are absent, request the dealer to get you written approval for the product from a recognised organic certification body. Lachlan's TwinN- nitrogen fertilizer is declared organic by the British certification company Soil Association.

Tithonia: Hi! Is it advisable to apply tithonia on sukuma wiki and managu? 0724 757 780

We are assuming the tithonia is being applied as a liquid feed. In this case, yes, it can be applied on both those crops.

Contact: Hi, thanks for the organic farmer magazine. It has helped me a lot. How can I contact Madam Su Kahumbu?

Mburu Gabriel. 0722 128 398

Su can be contacted on the following email: info@organic.co.ke

Bean waste: Can I use bean waste as mulching cum compost? 0722 580 626

Yes, it is ok as long as the bean waste was not infected with any diseases or carrying pests that might damage the crop that it is mulching. A good rule of thumb is like that of planting, mulch with waste from different family groups. That way you reduce the risk of spreading pests and diseases.

Fed-up with black ants? Remove the aphids!

How can I control black ants in yams? 0722 499 813

My name is Dan Ngure, a coffee farmer. I would like to get advice on how to control ants that infest the trees (*muthigiriri*) without spraying. 0723 746 103

Black ants usually farm aphids form the sweet honey dew the aphids extract from plants. They are therefore not interested in yams and coffee. Getting rid of the aphids is your solution to getting rid of the ants. You can do this by spraying the aphids with biopesticides such as the juice extracted from pyrethrum, neem, Sodom apple, African marigold etc. You can also sprinkle either diatomite or ashes on the aphids. **SK**

Manure from bats is good fertilizer

I am Edwin from Kagio, Kirinyaga. The bat dung I found when cleaning my ceiling is more efficient than any fertilizer, as I have evidence in my farm. Can they be raised? 0727 066 250

It might not be so easy to keep bats as domestic animals, Edwin, even if they are very helpful in eating a lot of insects and pests. But you are right, the droppings of bats, called guano, is a very good fertilizer. Today guano is harvested from many caves in South East Asia, the USA, Cuba and South America. Large populations of bats live since thousands of years in these big caves, the guano piles (manure piles) can be many metres deep. In Niah Caves, Sarawak, it is estimated that

birds and bats have been producing guano for at least 100,000 years, and that 7-9m depth of guano has accumulated over that time.

Cave guano is rich in nutrients as inside the cave there is no sunlight, wind or rain, and so the components don't break down as quickly as they would outside (that means Edwin, the guano on your ceilings has the same quality as the cave guano!). As Guano is rich in nitrogen and phosphates, it is good for crops. When manmade chemical fertilizers became readily available, guano was used less. However, it has now regained its popularity as an organic fertilizer.

Today scientists are turning their attention to guano for other reasons. This guano is now being studied to determine climatic changes over the past 10,000, even maybe 30,000 years. **Felix Mbitu Murimi**

tips and bits

from farmers for farmers

Farmers adopt push-pull method

More farmers in parts of central province are taking up the push-pull technology which is aimed at controlling the stemborer through planting desmodium between the maize; the smell of this plant expels the stemborer. Looking around for a place to drop the eggs, the stemborer flies to the Napier grass which is planted around the maize field. The project is being implemented by KARI and funded by the Swiss foundation BioVision, that also sponsors *The Organic Farmer* magazine.

During a farmers field day at Kandani sub-location Maragwa, division, Muranga South district most farmers were full of praise for the new method of stemborer control. "I have already seen a significant reduction of stemborer damage on my maize," said James Kinuthia. "Although the rains are not very good this year, the maize yield will no doubt be higher because of this new method."

According to Florence Gichuru, the Maragwa division crops officer, the Ministry of Agriculture had already started seed nurseries all over the project area to supply the desmodium seedling to interested farmers. For Samuel Njihia, the push-pull project coordinator, the growing demand for desmodium a clear indication that the project would achieve the desired objective of controlling stemborer and producing additional fodder for livestock.

Cost of water to go up

Charges for water meant for domestic, irrigation and industrial use is likely to go up in this year. This follows new rates set to be announced by the Water Regulatory Board this month. The newly proposed rates which sources at the board indicate will be much higher than what consumers are paying at the moment, have met with stiff opposition from water users who argue Kenyans cannot afford "I think the move to increase the rates at this point in time is ill-advised." says a water expert at the ministry of Agriculture.

The new rates are expected to face a stiff opposition from farmers and other water users. Large water users including manufacturing companies may find the cost of production going up which may force them to increase the price of various goods and services. Similarly companies that use large amounts of water such as flower companies may be forced to incur increased costs which may force some of them to relocate to other countries that give better incentives.

Issue 7, January 2009

The Farmers Classified

Home Made

BURNS:

Milk it. "Milk is an excellent compress for minor burns," says Stephen M. Purcell, D.O., chairman of the Department of Dermatology at Philadelphia College of Osteopathic Medicine and assistant clinical professor at Hahnemann University School of Medicine in Philadelphia. "Simply soak the burned area in milk for 15 minutes or so, or apply a milk-soaked washcloth to the area." Whole milk is effective: Its fat content soothes burns and promotes healing. But make sure to rinse your skin and the washcloth in cool water afterward, because the milk will smell.

Source: www.mothernature.com

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 45 March 2009

Every farmer desires a good maize yield. Correct seeds play a major role (Photo TOF)

Plant the right seed variety

Many farmers often use wrong seed varieties for their areas and end up with poor yields

The Organic Farmer

Most farmers are now preparing to plant this year's maize crop. Although a section of them know which varieties are good for their areas, there is a lot confusion in the market with regard to choice of the right varieties for the various agro-ecological zones. One reason for this is that there are many seed companies competing to sell their seeds to farmers.

These companies have launched big marketing campaigns to sell their seeds throughout the country. The problem is that in their advertisements, they do not tell farmers which of their varieties are suitable for which regions. Whether this is deliberate we can hardly tell. But the result is that farmers are lured into buying varieties that are not suitable for their areas. Every year *The Organic Farmer* educates farmers on maize varieties and agro-ecological areas where these varieties can do well (see TOF Nr 33 February 2007). However, most farmers do not take this advice seriously and only end up with low yields or total crop failure.

Lack of knowledge

Most of the maize varieties, especially those from South Africa, are meant for medium potential areas, but those selling the seeds do not inform the farmers appropriately. Dr. John Ombakho, the Chief maize breeder at KARI- Kitale advices farmers in high potential areas such as Trans-Nzoia and Uasin Gishu, not to go for these varieties because they cannot do well in those areas. Following the current maize shortage and the unpredictable weather, it is important that farmers choose the right variety they want to grow carefully.

in this issue

Information service

The Kenya Plant Health Inspectorate Service (KEPHIS) has launched an SMS information service for farmers who want to know which varieties they can grow in their areas: Just write: maize/ name of your division, SMS to 2964 using your safaricom, Zain or Telkom lines. If your division is not in the mailing list, you can talk to KEPHIS personnel who will assist you.
Just call them on Tel. 0722 516 221 or 0733 874 274.

Dear farmers,

The current maize scandal involving the National Cereals and Produce Board is just a pointer of how deep corruption has entrenched itself in the government. For the last six years, we have been treated to high sounding policy initiatives that the government intends to take to revive the agricultural sector and improve the food security situation in the country. How then could the same people we have entrusted with the custody of the national strategic food reserves sell maize that is meant for starving people?

A serious government would channel a sizeable portion of its budgetary allocation to foot in order to ensure that the country not only has enough food both for local consumption but also for sale. Kenya, where more than 80 percent of the country's population relies on agriculture as its major economic activity, has great potential to feed itself. The government had enough time to put in place measures to address the looming food shortage. But since nothing was done, the poor are going to bed hungry forcing the government to make yet another appeal for food aid from donors. It is a shame!

Although the high fertilizer prices are partly to blame for depressed yields last year, lack of other inputs or reliable credit schemes for small-scale farmers contributed greatly to low production; in the past, seasonal credit schemes have enabled farmers to produce surplus food. Nowadays small-scale farmers cannot meet the high interest rates on loans charged by local banks.

This does not mean that small-scale farmers cannot do anything. If they have to overcome problems that now threaten production, they have to rely more and more on themselves. They can buy some of the inputs as a group and share among themselves. Some organic inputs are cheaper than conventional ones. Farmers can also exploit all available resources within their own shambas. As we have done before, we shall continue to provide farmers with all the relevant information that they need to increase production. We believe that this information, if well utilised, enables you to make the right decisions that will help increase crop yields and fight poverty. In this issue, we guide you on the choice of seed varieties which is very important during this planting season.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0721 541 590, 0738 390 715, Email: info@organickenya.com

Inspired by TOF, Subukia farmers form groups

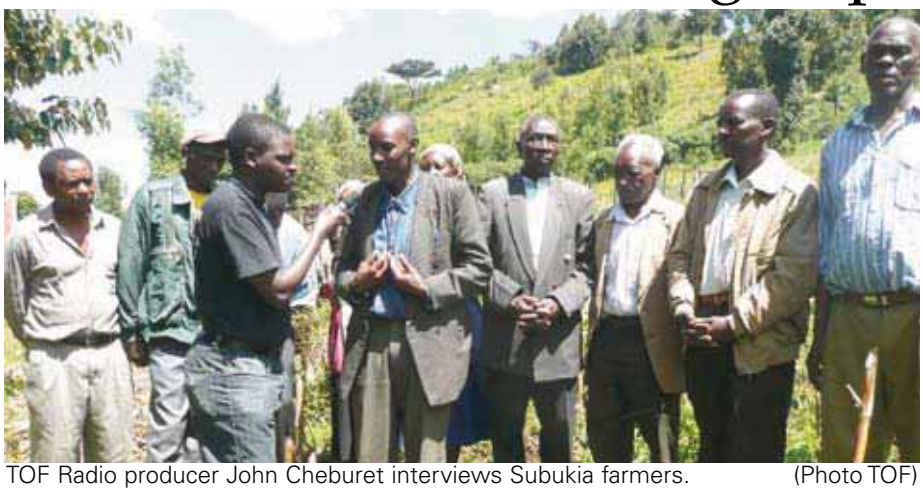
TOF has always advised farmers to form groups. Farmers in Subukia complied and benefitted.

Katharina Kijani.

Paul Njenga leans against one of his forty large avocado trees and proudly explains, "I started growing avocados in 1984. At that time, I was the only farmer with avocado trees in Subukia valley. Since then, I have continued selling seedlings from my tree nursery to surrounding farmers, and I am still teaching others how to graft avocado trees." Paul Njenga's passion for avocados has led to the foundation of a farmers' group -Miroreni Horticulture Growers with 40 members. It was registered by the Department of Social Services in 2006. All the farmers who now grow organic avocados come from Munanda location in Subukia valley in Nakuru North district.

An active group

The group's chairperson Paul Njenga recounts that, from the beginning, his avocados have been organically grown as chemical fertilizers would, in his own words, "completely spoil the taste of my avocados". He has not had any serious problems with pests or diseases that would have forced him to spray pesticides.



TOF Radio producer John Cheburet interviews Subukia farmers. (Photo TOF)

Every farmer with at least four Avocado trees can join the group after paying a registration fee of Kshs. 300. The farmers' group is well organised. Each member pays a monthly contribution of at least Kshs. 200. They hold a general meeting on the first Wednesday of every month.

The disciplinary board of the group can penalise members if they do not attend meetings, fail to hand in money in time or sell against the group's regulations to individual buyers. After the second warning or a fine, an errant member has to leave the group. The chairperson, secretary and treasurer are elected once a year by all members through a secret ballot voting system. There is also a regular assessment to ensure all members observe organic standards. Njenga says that there is a high level of integrity and commitment amongst his farmers who have to maintain high standards of organic farming.

Organic pays

The farmers' group received a real boost in early 2008, when they established contact with the US-based company, Olivado, which after a rigorous assessment started buying avocados from them. Olivado buys organic avocados from farmers' groups to process them into certified organic and fair trade avocado oil at their production facility in Nairobi. The deal assures all participating farmers of a regular buyer, permanent access to a market and above all, a much higher price. Instead of selling avocadoes to the local market at between Kshs 400 -500 a bag, they now sell at Kshs 1,500 a bag. The farmers save on transport costs and time; they gather the harvest at their chairman's place from where the buyer comes to collects them.

Paul Njenga points out that *The Organic Farmer* magazine played a central role in starting off the farmers' group. Primarily, the magazine prompted the farmers to start meetings in order to share and discuss ideas from the articles and secondly to dispel doubts about the benefits of organic farming. In each of their monthly meetings, they read articles of interest from the magazine and discuss possible ways of implementing new methods of farming.

Young poultry farmers

Adjacent to the avocado group, a second farmers' group specialising in poultry keeping has been established. The Good Shepherd Youth Group is mainly composed of young farmers between 18 and 25 years old. John Njuguna Muchina, the chairperson, sees his main objective as proving to the youth, that poultry keeping can be a profitable business and farming a highly reputable profession. At the moment, the group has 15 active

Continued on page 6

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editor Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0721 541 590
e-mail: info@organickenya.com,
www.organicfarmermagazine.org

TOF celebrates fourth birthday

In April 2004, we launched your magazine, *The Organic Farmer*. In view of the commemoration of this event in April, we shall publish a short series on farmers' groups in Subukia valley as an example of all the farmers' groups we are dealing with. How has *TOF* influenced their farming methods and their social life? And what is the experience of Charles Munyari, a *TOF* distributor since the inception of the magazine?

In this second article on this page, we feature farmers in Subukia who have formed groups after gaining experience from the magazine.

Growing wheat organically is not easy

Crop rotation and an integrated pest and disease control mechanism can reduce the use of chemicals.

The Organic Farmer

A number of farmers have requested us to provide them with information on how they can grow wheat organically. In a hot climate such as the one we have in Kenya and other tropical countries, it is very challenging to grow wheat without use of chemicals. One of the major reasons for this is that wheat is prone to many diseases and pests that are difficult to control using organic methods. Under warm tropical conditions, disease-causing fungi and pests multiply very fast and thus organic control methods may not work very well. This subjects the crop to a variety of fungal diseases and pests.

In Europe and Australia organic production of wheat is now on the rise among farmers due to the high prices offered for the product; but the acreage is still low compared to that of conventional wheat. As with any other cereal crop, soil fertility is the most important factor in wheat production. The soil has to have adequate supply of organic matter. A farmer can attain this through the addition of compost, green manuring and practising crop rotation. Organic matter in the soil can encourage growth of micro-organisms which help to recycle nutrients essential for wheat development. Wheat requires nitrogen, phosphorus and potassium in sizeable quantities. Good quantities of organic matter in the soil can alleviate deficiencies of these nutrients.

Useful guidelines

An integrated system of both disease and pest control can be the best way to produce wheat under these conditions. The system may not be fully organic but the farmer can reduce the incidence of diseases and pests considerably while at the same time reducing the use of chemicals. The following guidelines are important.

Land preparation: Proper land preparation can considerably cut your cost of chemical application especially in weed control. To reduce the problem of weeds, wheat should be grown in rotation with legume crops such as beans or mustard (See TOF Nr.41 October 2008). Mustard is especially useful because it can help suppress most grass and broadleaf weeds. Mustard should be planted at the rate of 10-15 kg per hectare at a depth of 10-15 mm in moist soil. The mustard crop is chopped and worked into the soil. As it decomposes, the plant releases two compounds: glucosinolates and myrosinase. Both of them are toxic to soil fungi, nematodes and even weed seeds.

Seed preparation: Before planting, dressing of seeds is important to protect the germinating seed from fungal and pest attacks before and after germination. A range of organic fungicides and even pesticides in the market can be used for this purpose. One of these is Eco-T which helps speed up germination, increase root growth, water uptake and also control root-borne fungal infections. The seed can also be coated with organic fertilizers and soil conditioners such as fulvic and humic acids or vitazyme (See TOF Nr. 45 February 2009).

Planting: Wheat should be planted on land that has just been under a mustard crop. The land can be harrowed 14 days after the mustard has been chopped into the soil. Wheat can be planted without second harrowing depending on the condition of the soil (there are minimum tillage seed drills in the market that can plant directly without the need for ploughing and harrowing). Seed rates will depend on the wheat variety and are set using the seed planter.

Early tillering: Early tillering is the period between 3 to 4 weeks when the wheat crop has produced three leaves. At this stage the crop will need extra feeding, disease and pest control. There is a range of organic foliar feeds such Phosgard, Synergizer, TwinN and Vitazyme. Pesticides such as Nimbecidine or Thuricide or Neemroc+, a biological insecticide that contains Neem can be applied to protect the crop from diseases and pests.

Mid-tillering to ear emergence: This is another critical stage in the growth of a wheat plant. Apart from additional feeding, the crop is susceptible to many diseases mainly fungal in nature from the sixth to ninth week. These include leaf rust, stem rust, stripe rust, loose smut etc. The most dangerous of these diseases is a strain of stem and leave rust known as UG 99, which originated from Uganda (see box).

This fungal disease has now spread to almost all wheat growing areas in the country. Organic methods cannot help. Farmers therefore need to apply chemical fungicides at the first sign of the disease, and the most effective fungicides that can control UG 99 include Artea, Amistar Extra or Folicur. Application should be done up to the time of the ripening ear (ear washing) to ensure the spores from infected plants in nearby farms do not affect your crop.

A devastating virus

The virus UG 99 is a strain of black stem rust (*Puccinia graminis tritici*). It is virulent to the great majority of wheat varieties. Unlike other rusts, which only partially affect crop yields, UG99 can bring 100% crop loss. The blight was first noted in Uganda in 1999 (hence the name UG 99) and has spread throughout the highlands of East Africa. In January of 2007, spores blew across to Yemen, and North into Sudan.

Try drought resistant maize varieties

Due to unpredictable rainfall patterns and amounts, farmers need to grow varieties that require less rain.

The Organic Farmer

If the current drought in most parts of the country is anything to go by, the rains this year shall be so unpredictable that farmers have to think of ways of coping with the prevailing weather conditions. One of the strategies that farmers can employ is to choose carefully what they intend to grow. Maize is the major crop grown by farmers across the country; the amount of maize harvests every year determines the household's as well as the country's food security. It is therefore important that farmers choose the right varieties for their areas and also look for varieties that can withstand depressed rains to ensure the chances of crop failure are reduced to a minimum.

Varieties that do not require much rainfall will tend to do well not only in marginal areas but also in high potential areas if the rains are not in sufficient amounts. One of the mistakes that farmers make is to go for varieties that are high yielding even when they come from areas with less rainfall. This will always results in low yields or total crop failure because such varieties will only do well when there are adequate rains.

The advantage with drought resistant varieties is that they can be grown in both high potential and marginal areas and still do well. This is one reason why farmers in high potential areas should always go for these varieties. However they should know that most of these varieties do mature early. They can therefore be used for consumption as green maize and meet immediate food needs of their families while waiting for the late maturing ones to be ready. For example planting the early maturing varieties in early March means that the family will have something ready for consumptions in July when there is a severe food shortage in most parts of the country.

Drought resistant varieties

The following are some of the drought resistant varieties that farmers can buy to reduce chances of crop failure:

Katumani composite

This was the first dry land maize variety to be developed in the country in 1967. It does well in areas with an altitude of between 1000- 1800 metres above sea level. The variety does well even in high potential areas. It matures between 3 and four months. It can be reused as seed for up to three years without affecting the yield. It can yield 12 bags per acre.

H511 and H12

These two varieties can do well in dry land high altitude in West Pokot, Keiyo Marakwet and Nakuru which have moderate rainfall. They mature between 4 to 5 months and can produce between 16 and 18 bags an acre.

DH01

This an early maturing drought tolerant variety released in 1995 to help improve maize production in dry areas where Katumani is grown. It is recommended for arid and semi-arid areas. It perfoms well even in areas with cotton soils where varieties such as H511 cannot do well due to lack of rain. To produce a good yield DH01 should be planted just before the rains start.. Farmers should use a seed rate of 20- 25 kg per hectare and a spacing of 90- 30 cm. It takes 100-120 days to mature. It can withstand diseases such as leaf blight, common rust and ear-rot.

Maize seeds are normally treated with coloured chemicals for easy identification and to protect them against pests and diseases (inset).

DH02

Dry land hybrid 2 was released in 1995. It is a drought resistant variety that performs best in areas where Katumani composite is grown (between 1000 – 1500 metres above sea level). Places where it has been grown successfully include Mwea, Kitui, parts of Makueni and Baringo.The variety is resistant to maize streak virus.

DH03

This is early maturing hybrid maize that was released in 1999. It is recommended for drier, low to medium altitude areas between 800-1200 m.a.s.l where it performs better than H511. It has better husk cover, resists blight, Maize Streak Virus and drought.

DH04

The variety is early maturing. It is recommended for production in dry low to medium altitude 800- 1200 m.a.s.l. It performs better than H511 (by 15 %) in the drier zones and along the Lake Victoria region. The variety does better than DH02 and DH03 though it takes longer to mature.

DH09

The hybrid does well in lower coffee growing areas mainly in central province Eastern and western provinces Bungoma, Busia and Teso districts between dry land and medium altitude areas (1000- 1150 m.a.s.l). It does well if planted before the rains start. It matures between 3 and 4 months. Compared to H511, it produces 30 percent more yields.

DH10

This is a high yielding variety which performs well in areas with an altitude of 800-1400 masl. The variety does well in Kangudo, Thigio, Thika and Bumula. It does produce 62.5 percent more than H511 and is more resistant to lodging, blight Grey Leaf Spot disease and ear rot.

PH4

This is a new variety suitable for lowland coastal areas. It is adapted to hot humid lowland areas between altitudes of 0- 1200 masl. These areas include Mombasa, Kilifi, Tana River Lamu and Kwale. It matures between 3 to 4 months after planting and is capable of producing 16 bags of grain

continued on page 6

Choose the right salt for your livestock

Salts are vital for livestock. In the last few weeks, we have received a number of questions on salts for livestock. Most of them have been answered directly, on phone or with SMS. Some of the questions however are more important for all farmers to know. William Ayako, a Livestock specialist at KARI Naivasha answers them here.

Cows need a variety of minerals

Is it okay to use minerals only for my high yielding milk cows? Tel.0735 123 188

It is important to understand that a productive dairy cow requires mineral supplements rich in both macro elements and trace elements in the right balance. The macro elements include: calcium, magnesium, phosphorous, sodium and sulphur. Trace elements include among others: copper, selenium, cobalt, zinc, iodine and iron.

Any deficiency in the two categories of elements is the cause of major metabolic disorders which affect productive dairy cattle. The disorders are associated with the short or long term imbalances between mineral 'inputs' the animal gets in the feed and water. These may vary in quantity and quality and may contain other minerals that interfere with absorption. Animals lose minerals from their bodies through urine, faeces, calving and milking. They also use minerals to maintain their bodies.

There is also mineral 'throughput' (stored minerals) in the animal body reserves that are used to compensate between the inputs and output imbalances. In this regard, it is important to feed the right minerals that take care of the above explanation. The practice of mineral feeding should embrace offering the animal the required mineral as added and mixed in the concentrate at the rate of 150 grams per cow per day on top of the offered lick. Therefore it is not advisable to offer only block licks to high yielding milk cows since this may cause a major disorder.

Do not blame your cow!

What is the problem with my cow's delayed oestrous. Twelve months have past since she gave birth. I give her salts and molasses. Camlous E. Jagona, Lugari. 0722 582 329

There are several causes of delayed oestrous (coming on heat). These include:

Poor management: This includes lack of proper fertility records and lack of proper heat detection.

Diseases: Reproductive diseases such as brucellosis, vibbriosis and trichomonasis are other causes of delayed oestrous.

Hormonal disturbances: This leads to inactive follicles or cystic follicles which do not rupture.

So before you blame your cow, please observe the following:

- Good nutrition that contains sufficient energy, proteins, minerals and vitamins. An additional mineral lick is advisable on top of the normal ratio especially for high milk yielders.
- That heat detection is proper
- That heat records are properly kept
- Prevention of inflamed uterus by providing a clean environment during and after calving
- Good feeding by providing good rations, mineral and vitamin supplements.

Which is the right mineral salt for cows?

I am a small-scale farmer with 3 milk cows and would like to know the right salt to give them. 0728 014 551

There are several types of mineral supplements recommended for supporting dairy cows, such as Unga High Phosphorous, Super Maclick, Bay Mix Maziwa, Super Vitafos and many others. It is advisable to seek advice from the local livestock extension office for the recommended mineral in your region to make the right choice. We should not forget that soils from different regions have different mineral composition and hence the forages which the animals graze on.

What causes vomiting in calves?

My calf vomits when chewing cud. The Veterinarian advised me to give it more salt but this did not work. What could be the solution? Maurice Abuoro, Rongo. Tel 0712 789 219

The digestive system of an adult ruminant (animal that chews cud) is developed to enable it break down cellulose and cell wall components. Ruminants do not have the ability to break down cellulose by themselves; their digestive system is adapted to supply an ideal environment to a range of micro organisms (microbes) that break down cellulose and produce required energy units called volatile fatty acids and synthesize proteins.

The rumen of an adult animal acts as a large anaerobic (without oxygen) fermentation chamber that can store chewed fodder for up to 10 days to enable small micro organisms in the stomach to cause fermentation and breakdown of feed in the stomach. So after initial chewing, food is swallowed and enters the rumen. Large particles of food are returned to the mouth after every minute and re-chewed (chewing of cud or rumination) to reduce particle size and re-swallowed. This process is enhanced through a reflex action which could be lacking if their rumen has not been fully developed.

The vomiting will stop

Since rumination is an action that the calf learns with time, the process often results in vomiting in young calves. Calves would develop the art after a short while and vomiting would cease to happen. If vomiting is caused by the foregoing, the problem would last just for a short time.

However, the other cause of vomiting could be due to an injury in the mouth. In this case, the process of regurgitation could be normal but due to the injury, the calf would not be able to re-chew the food. This would last for as long as the injured tissue has not healed.

> > > from page 2: 4 years TOF

members; all of them rearing indigenous chicken breeds. Apart from holding regular meetings and making financial contributions to the group, it also engages in shared activities. If, for instance, a new member gets registered and has not yet gotten a good chicken house, the group comes together and helps to put up the structure.

John Njuguna Muchina files all the *TOF* magazines in a folder at his house. Whenever they hold meetings, the farmers will read and discuss a particular issue. On many occasions for instance, *TOF* has given them knowledge on how to combat livestock diseases and how to improve on feeds. The group is preparing to get certification for organic poultry keeping in 2009. Instead of selling the chickens individually at the local market, the group has found a buyer from outside, who comes to buy from their homes. He pays Kshs. 250 per chicken which is higher than the Ksh180 that they get for the same at the local market.

Social advantages

Besides an increased and regular income, the chairperson sees the members of the group benefiting from an improved social interaction and cooperation between farmers and the community. The group serves as insurance for members in urgent need. Moreover, receiving lump sum cash gives farmers the opportunity to diversify and share expensive farming tools.

It is clear that farming in Subukia valley has been transformed through the extensive collaboration between local farmers. Both farmers' groups have survived obstacles to benefit their members enormously. Above all, the integration of young people has resulted in high innovative potential. After reading one issue of TOF magazine that featured rabbits, some of the farmers are already preparing to start rabbit keeping.

> > > from page 4: Seed varieties

per acre. The variety is tolerant to most leaf and ear diseases.

PH1

The variety is suitable for hot humid coastal lowlands (0-1200). It requires a growing season of 75-120 days and a minimum of 400mm of rainfall. It has been found to do well in Kilifi, Kwale, and Mombasa districts. It is also suitable for the irrigated lowlands of Tana River district. It requires a spacing of 75 by 30 cm and can be intercropped.

Farmers can also plant early maturing and drought resistant varieties from other companies, these include WS103, WS909 and WS202 from (Western Seed Company), Duma41 and Duma43 (Seedco Company).

farmers forum

020 445 03 98 0721 541 590 0738 390 715

TOF for our Library

My husband and I together with our gardener are residents in Malindi. We have a productive kitchen garden, in raised beds, and many fruit trees. We shred all our biodegradable waste and make our own compost. Our gardener, Mr. Kaingu Gona, has recently set up a worm farm. We are all members of the Kenya Horticultural Society Malindi/ Kilifi branch. I am also the Hon. Secretary of the Malindi Museum Society and we contribute reference material to the Webb memorial library, a free reference library set up in the Malindi museum by MMS and NMK that is used by many young readers. We would like to receive two copies of *The Organic Farmer*; we can place one copy in the library. Any back issues would also be very useful to library users. We can assure you that each copy will be read by several people, keen to learn more about organic and environmentally friendly farming.

Mrs S. A. Robertson, P.O Box 162, Malindi

Please consider us

We have once written to you requesting to be placed on your mailing list as recipients of your magazine but all in vain. We are writing again hoping this time round you will consider sending us your monthly magazine. We are a group of farmers in Webuye. Our activities are bee-keeping, amaranth production and tissue culture banana farming.

We are twenty members and we would be grateful if you could be sending us at least four copies of the magazine monthly to be shared by our members. Joseph E. Lyomu, Afya Njema Group, P.O Box 908, Webuye

Dear Joseph, we are sorry that you do not get the magazine. We have noticed several reasons for this: Actually we include farmers' groups on our mailing list and send them TOF, but sadly enough it never reaches them. We do update our mailing list regularly. At times, the magazine disappears during postage and sometimes the owner of the rental box, which is shared by many people keeps all the TOFs to himself. Payment for the rental box is not renewed on time. This is the reason why farmers should send us an SMS in case they do not receive their copies of the magazine.

Order your CD

New CD is ready

Farmers, would you like to share the experience of more than 200 agronomists and 480 books on agriculture? This is what you will get if you buy the new Infonet-Biovision CD that has just been released. The updated version now has all information on animal and plant health, disease and pest control as well as human and environmental health. It is easy to open and read from any computer with a CD-ROM drive (NOT with a VCD or ordinary video CD player). Interested farmers can send airtime worth Ksh. 200, either through our Safaricom line - 0721 541 590 or Zain 0738 390 715 and SMS us your full postal address. We will send the CD by registered post. All the farmers who bought the earlier version will receive the new CD free of charge.

SUBSCRIPTION FORM

Return this completed form to TOF, PO Box 14352 00800 Nairobi or info@organickenya.com

Name: _____

Postal Address: _____ Code: _____

Town: _____ District _____

Province: _____

Registration No.: _____

Number of active Members: _____

Chairpersons Name: _____

Chairpersons Tel.: _____

Areas of interest: _____

Registration type:

- Individual farmer
- Farmer Group
- Women Group
- Youth Group
- College
- School
- Church Group
- Extension Officer
- NGO
- CBO
- Other

The right size for brooders

What is the length, height or width of a brooder for 200 chicks? And how long should chicks stay in a brooder? Tel. 0724 104326

Broiler chicks stay in a brooder for approximately 3 weeks. Layers for longer as they develop slower, up to 5 weeks. A good size brooder for 200 broilers starts at 1 m x 2 m in size, gradually increasing to double this size at 3 weeks.

When to sell broilers

How long do broilers take to mature? Tel. 0726 549 931

Conventional broilers can take as little as 33 days. Organic regulations say organic chickens may not be slaughtered before 81 days.

Can I keep broilers and cockerels together?

Can one mix broilers and cockerels in one brood? Please give me enough details and methods. Ememwa 0733 527 771

I think the question means broilers and layers. During brooding yes they can mix. However eventually the broilers will be removed as they will be twice the size of the layers after 3 weeks, and ready to go onto a different diet. If they stay in the same place they will have space and feed complications. What you should know is that broilers are actually males (cockerels), not hens.

The right size of chicken house

How many chickens are supposed to be raised in that house on the model poultry house shown in TOF Nr. 31? Tel.0736 110 262

The model house had a floor space of 5 x 10 meters and can house 300 birds comfortably. If the birds are allowed outside into a run during the day time and the house is just for sleeping, then the density of birds can increase to 500. Ten chickens can be raised in a 2m x 2m house if they are kept indoors. If they are outside during the day and only sleeping, laying and feeding in the house it can be smaller, 2m x 1m.
Su Kahumbu

Ovarian cysts can be treated

What is the remedy for ovarian cysts in dairy goats? Local veterinary personnel in my area have no solution. David in Kitale. Tel. 0722 944750

Cystic ovarian disease in goats is an important cause of reproductive failure. The disease shows itself by short cycles with continuous oestrus (going on heat) without conception. When the goat is in season it will bleat (make noise) a lot and show nymphomaniac behaviour (wanting to mate all the time). Cystic ovarian disease has been proved to be linked to animals that graze clover and legumes in large quantities. The treatment is *1500 - 2500 iu humanchorionic gonadoprophin* (a drug which is not readily available in this country). An alternative treatment is prostoglandin F2alpha which is available in most agrovet shops.

The same disease in cattle manifests itself in two ways:
1) By the heifer not cycling, so an egg is not released which means that conception is impossible. The heifer will show nymphomaniac symptoms. The treatment is gonadoprophin.
2) The egg is released but becomes glutinised and the heifer will begin to manifest male characteristics and will be unable to conceive. The treatment is administering prostoglandin F2alpha.
Valerie Corr

Why is it wrong to use *maozo*?

Many farmers in my home area mostly use *maozo* (rotten maize) in feeding animals. Why do you disagree with this and yet we have not seen any side effects so far? 0726 348 767

It is true that most farmers use rotten maize to feed their animals without knowing that it is harmful to the animals and even themselves. The effect of feeding *maozo* is mainly attributed to mycotoxin poison in them.. The range of effects of mycotoxins includes reduced efficiency in the digestive system, reduced intake, reduced production and slowing of life (hypobiosis). Some of these effects can be transmitted through the products and by consumption of the products; human beings can also be infected. Depending on the load of poisoning, the effects can be acute or slow and therefore seen after a long time of incubation on the body systems and resistance level of the host animals.

The international trade policy of good agricultural practice does not allow trade on livestock products from animals fed on such products. In this respect the use of maozo can have negative economic consequences to the producer. Unaware of such policies and of the negative consequences on human life, most farmers in the developing countries do feed products like maozo to their animals. This practice should be discouraged in all categories of domestic animals (pigs, poultry, cattle etc.). **William Ayako**

Is this plant harmful?

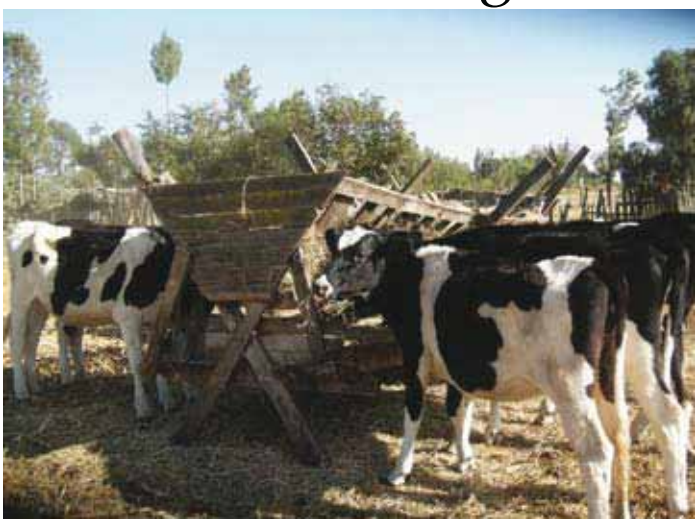
Is it dangerous to feed Wandering Jew to my rabbit? Carol Bhachu, Ngong 0722 798 820

Wandering Jew (*Tradescantia fluminensis*) is a very common garden plant, as well as a wild plant. It comes in many colours and can cause irritation to the skin of humans and domestic pets. I cannot find any information as to whether this plant would be poisonous to rabbits if ingested, and have noted that our goats will eat the wild variety if they find it. If your rabbits are eating it with no ill effect, all is well and good. If you are thinking of introducing it as a feed, include it with caution and increase the quantity slowly. **Valerie Corr**

tips and bits

from farmers for farmers

A feed rack can reduce wastage of fodder



As we mentioned in our last issue, farmers lose a considerable portion of hay and other crop residue because of the way they store and feed their animals. In most dairy farms, the hay is often thrown to the ground for the animals to eat. The animals only eat a small portion of the hay while they step and trample on the rest. This is great waste especially considering that the farmer work for many hours to collect the feed;hay is not easy to get during the dry season. A good cattle feed structure can help save a lot of fodder. One of these structures that can save the fodder is a cattle rack which is very simple for any farmer to construct. A cattle rack is a simple structure made of two X frames that support two troughs, one in the upper section and the other in the lower section. The hay is placed on the V- shaped upper trough is made of vertical grid of timber or just ordinary wood. There is enough space between the timber for the cows to put in their muzzles (mouth) and pull the hay. One advantage with this type of rack is that when the animals pull the hay to chew, some of it falls into the lower trough where they continue feeding from. When they have had enough, all the left over hay is again collected from the lower trough and returned to the upper trough. In this way the animals will continue feeding until all the hay is completely finished.

Another advantage is that the feed requires very little labour, one farm worker can put in the fodder in the morning and come back occasionally to return the unfinished fodder to the upper trough. The rack therefore saves a lot of fodder which would otherwise have been wasted if it was thrown to the ground. Farmers who have made the feed save a lot of time and money. The full utilisation of hay means that they can get more milk and income. The feed rack is also more hygienic because the animals cannot be able to trample and urinate on it, which increases chances of infections. **TOF**

Issue 7, January 2009

The Farmers Classified

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 50 July 2009

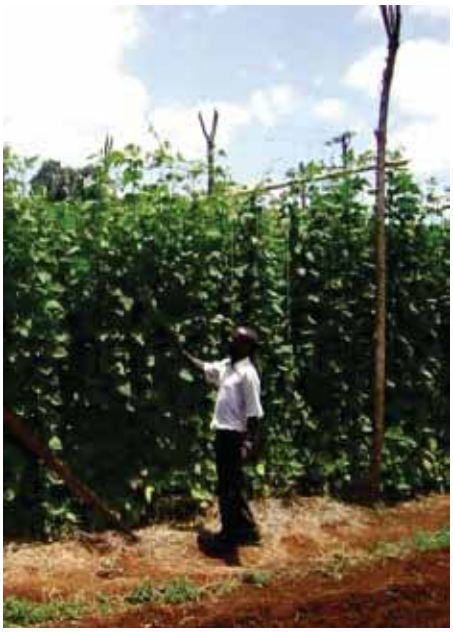
Climbing beans, double yields

A lot of beans on a small place:
This is the benefit of climbing beans.
And they are easy to harvest!

The Organic Farmer

A large section of the Kenyan population is unable to afford high protein food with adequate proteins, such as meat and eggs. This is where beans play a very important part; they are a cheap source of proteins. Unfortunately, the production of beans in most parts of the country is declining. The problem is the lack of good seeds . A survey by *The Organic Farmer* at the beginning of March this year indicated that most of the seed companies did not have any of the popular bean seeds. One reason for this could be that many farmers rely on their farm-stored beans for seed and hardly buy certified ones. What most of the farmers forget is that such beans pick up disease-causing bacteria, viruses and pests while in the shamba. These diseases are consequently spread in new fields when the same beans are replanted.

Due to the shrinking land sizes due to subdivision, farmers can no longer be able to produce enough beans to



feed the rapildy growing population. Researchers are therefore developing high-yielding varieties of beans that only need a small area to grow. In this issue we look at climbing beans – a variety that climbs and spreads on sticks and produce double the yield of local varieties. *See Page 5*

Farmers, use these telephone numbers

Many farmers are calling and sending SMS through our Tel. 0721 541 590; this is to inform you that this number is now out of service. Farmers should use the following numbers if they want to reach us:

SMS: All SMS should be sent to Tel. 0715 916 136

Calls

All calls should be directed to Tel. 0717 551 129 or 0738 390 715.

Our landline Tel 020 445 03 98 remains unchanged.

Email

E-mails are welcome, please address them to: info@ organickenya.org.

in this issue

i-TOF

Our new centres

The Organic Farmer, with support from its sponsor, BioVision, will open 4 information centres in the country in August this year. The centres will provide farmers with information and also organic inputs. The pilot project to be called *i-TOF* has selected the 4 centres in Kangundo in Eastern province, Gatuto in Central province, Molo in Rift valley and Buyangu in Western Province. An extension officer will be deployed in each centre to train farmers on organic farming. *Page 6*

Dear farmers,

To be a successful farmer, one needs to have knowledge and the appropriate skills. Additionally, in order to increase their yields and income, farmers require access to the right inputs. They should also be hard working and have a strong will to succeed. In the last few years The Organic Farmer *has provided you with a lot of information and practical tips on how to improve both crop and animal production. Every week, we receive 15 to 20 questions from farmers on various issues, most of which have to do with the issues we cover in our articles.*

This is indeed encouraging for it shows that farmers want to know more and even apply some of the technologies we introduce to them in their farming. But some of the questions relate to how farmers can buy the various organic inputs that we often recommend. We fully understand the problem; almost all agro-veterinary shops do not stock organic inputs. The truth is, if farmers have to realise the full benefits of organic farming, then they should be able to buy the necessary inputs at a shop near them.

Although farmers have at their disposal organic inputs such as plant extracts which they can prepare and apply on their crops when the need arises, others like diatomite, rock phosphate and other remedies for control of diseases and pests are altogether unavailable. Aware of this problem, The Organic Farmer *has taken an initiative to help farmers get access to these inputs. In the next few weeks, we will open four centres in various parts of the country where farmers can, not only get information through our TOF issues and the Infonet-biovision information platform, but can also purchase organic inputs.*

These centres will be stocked with some of the essential organic inputs that farmers need but have been unable to obtain from their local agrovet shops. This initiative, which is supported by BioVision Foundation, will be undertaken on a pilot basis (See our article on this page and also on page 6). Should the project succeed, more centres will be opened in other parts of the country. It is up to the farmers to make use of these centres to keep them going. We hope that you will utilise the facilities to improve production and gain the full benefits of organic farming.

Bloat can cause death if not treated on time

Bloat can be a problem when animals are introduced to lush green pastures.

William Ayako

Barely a month ago, most livestock keepers were so worried about the effects of prolonged drought on their animals. As a result of this, most livestock keepers incurred very high losses. Some pastoralists lost up to 50 % of their animals.

However, with the onset of the long rains, livestock keepers especially goat, sheep and cattle keepers are faced with yet another problem: Bloat. Bloat occurs when there is an abrupt nutritional change in the diet and especially when cattle feed on the lush green pastures causing the swelling of the rumen with gas.

Clinical signs of bloat

The left side of the abdomen behind the ribs becomes very swollen causing distressed breathing, and the animal altogether stops eating. Sometimes green froth comes out of the mouth and nose. Some animals may have diarrhoea. The rumen of cattle, sheep and goats is like a large vat in which a mixture of partly digested feed and liquid is continuously fermenting producing large quantities of gas. For example, an average cow can produce over a thousand litres of gas in a day. Some of the gas is removed by absorption into the blood stream, but most of it is removed by belching during 'cudding'. If for whatever reason the gas cannot escape, the rumen is literally overblown and the animal gets bloat.

The swollen abdomen is a typical sign of gassy bloat. Photo PD

Types of bloat

There are two types of bloat namely, frothy bloat and gassy bloat.

Animals get frothy bloat when the rumen becomes full of froth (foam) because the digestion is upset. Several animals in the herd get this type of bloat at the same time when they graze on a lot of wet, green pasture mixed with legumes in the field. Animals can also get it when they feed on ripe fruits or other feeds that ferment easily. Some poisonous plants can cause sudden and severe bloat. A sudden change in the type of food can also cause frothy bloat. Frothy bloat normally happens at the start of wet season when the diets of grazing animals abruptly change from dry feeds to wet lush pastures.

Animals get gassy bloat when the rumen fills with gas because the oesophagus is blocked. This type of bloat normally affects one or two animals in the herd at the same time. They get it when they choke on something or eat plastics or when they get a disease like tetanus that paralyses and hinders them from ruminating.

Treatment of bloat

Depending on the type of bloat, several methods of treatment can be applied:

- Do not feed the animal for several hours. Make them move around to exercise and improve on digestion.
- For less severe cases of frothy bloat, give 500 mls and 100 mls of any edible vegetable oil, solid cooking oil, butter oil, ghee or milk orally to large and small animals respectively.
- For more severe cases where the animal cannot swallow, you can tie a rope across the mouth of the animal to make it chew the rope to stimulate belching.
- For very severe cases of frothy and gassy bloat when the animal is distressed and cannot breathe, it is advisable to puncture the skin carefully and the rumen of the animal on the left flunk to let the gas out. Use a knife or any sharp thing, but the best instrument to use is the trochar and cannula. The hole should be made at a hands' width behind the last rib and a hand away from the edge of the backbone. Push hard because the skin is very tough. Gas and froth will come out when you make the hole. It helps to put a tube or cannula through the hole to keep the hole open. Pour some vegetable oil into the rumen through the hole to help stop further gas or froth formation. Do not carry out this procedure on your own. Contact a veterinary doctor.

Prevention of bloat

- Feed the animals with dry grass to fill them up before you put them on new wet lush pasture.
- Do not water the animals just before you put them on wet pasture.
- Do not graze the animals on wet green pasture early in the morning. Wait until when the pasture has been dried up by the heat of the morning sun.
- You should increase grazing hours of the animals on wet green pasture gradually for about a week.
- Avoid abrupt changes in the diet of animals and always give newly introduced feeds in small quantities.

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org
Editors Peter Kamau, Peter Baumgartner
Secretariat Lucy W. Macharia
Layout In-A-Vision Systems, 0720 419 584
Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe
Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

Foot rot is a problem in wet season

Due to reduced weight gain, foot rot can have negative economic consequences to farmers.

William Ayako

Foot rot is an infectious disease of cattle causing swelling and lameness in one or more feet. It can turn chronic if treatment is delayed. Weight gain is significantly reduced when grazing cattle contract the disease.

With the onset of long rains, foot rot becomes quite common among cattle, sheep and goats kept under extensive production systems. This is mainly because of the prevailing humid and warm weather conditions that are conducive to bacteria that cause foot rot infection. However, foot rot is also a problem under intensive dairy production systems where dairy cattle are kept for milk production e.g. zero-grazing. Other factors such as breed and housing are known to influence the occurrence and severity of the disease.

Under intensive systems where exotic breeds are kept for instance under zero grazing, the disease occurrence is more severe than in the extensive system where indigenous breeds are kept. It is caused by a strain of bacteria called *Fusiformis necrophorus* and others which are always present in the environment where animals are kept. The animals get the disease from the soil on which infected animals have stepped.

Clinical signs

The disease has negative economic consequences to the farmer because it hinders the animal from feeding, at a time when there is plenty of good feed.

A hoof of a cow infected with foot rot, between the hooves and at the back of the hoof.

•The animals become lame on one or more legs.

•There is swelling between the two claws and sometimes further up the leg. The flesh between the two hooves becomes damaged and crusty.

•Although the disease is not always severe, signs of fever and loss of weight are noted.

Treatment tips

•Isolate animals with severe infection to stop further spread of the disease to the other animals.

•Wash the foot especially the skin between the claws with hot water- as hot as you can put your hand in.

•Cut away or trim any decayed part of the hoof to remove the infection that is underneath it.

•Apply juice from euphorbia trees such as *euphorbia kibwezi* to cauterize some kinds of abscesses and secondary infections. The juice also stops the wound from bleeding.

•Move the animals across hot sand or drier places to control foot rot.

•Treat infected animals as above as soon as possible to avoid further spread of the disease to the rest of the cattle herd.

Dirty animal sheds harbour diseases

If you visit any homestead with dairy cattle in the country you will be appalled by the poor conditions under which the animals are kept. Most farmers are good at feeding their animals. But when it comes to maintaining hygiene in the cattle housing shed, they do very little to clean the sheds to make sure they are free of animal droppings and urine.

What happens in many households is that the animal waste is left to accumulate to a stage where the animal have to sleep and wade through their own muck. This is very unhygienic and has very devastating effect on the animals' health. Farmers should understand that animals are affected if left to stay in an unclean environment. Their health deteriorates including milk production. Dirty sheds are also breeding grounds for many disease-causing organisms. One of the most common diseases that affect cattle kept in unclean sheds is mastitis. Mastitis is very common in farms where animals sleep on floors littered with animal waste.

Animals need clean shelter Photo TOF

Another common problem that comes with poor sanitation in animal sheds is foot rot as we have explained elsewhere on this page. Any dairy farmer should know that an animal kept in such unhygienic conditions such as the one shown in the picture above cannot be productive. Animals should not only be kept in a clean environment, they also require some free space for movement in order to express their normal behaviour. Farmers often confine their animals in small enclosures due to lack of space and also for security reasons. However they should ensure that sheds are cleaned all the time to give the animals a clean and comfortable place to stay.

Deworming improves animal health

Animals infested with worms lose weight and face the risk of increased infections and even death.

The Organic Farmer

Grazing animals are always exposed to parasites and are thus constantly being reinfected. The levels of infection range from a few parasites to large numbers that can cause severe weakness (lost weight gains, poor feed conversion or increased infection) and even death. A serious pest control program in organic farming begins with a good understanding of parasites and the implementation of preventive measures. The ultimate objective of this is to develop an animal production system where parasites may be present in small numbers but do not affect the health or performance of herds. An animal that has not had worm infestation cannot develop resistance and is thus extremely vulnerable when exposed to parasites.

Adult animals are much less susceptible to most parasites. Young animals should preferably be put in new pastures where parasite levels are low so that they can slowly be immunized. Well-fed animals, living in good conditions, are better able to resist or tolerate internal parasites.

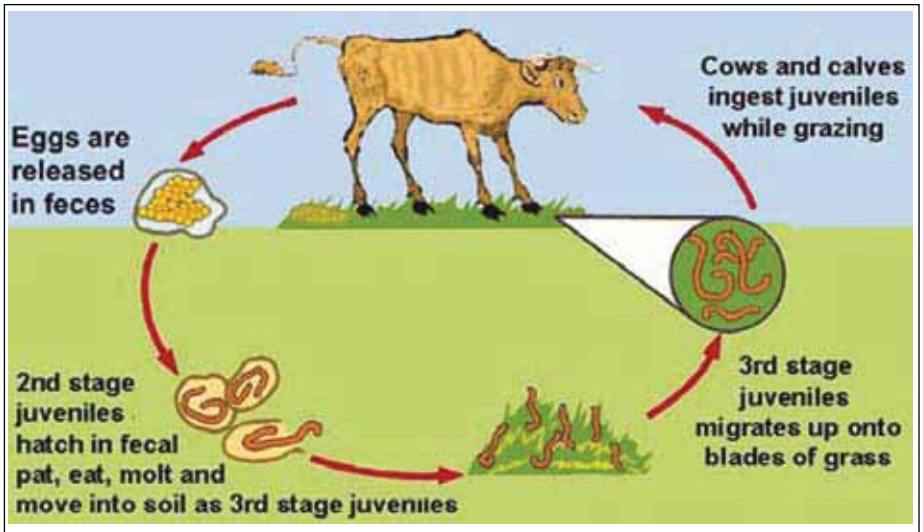
Preventive measures

• Animals should not be allowed to graze on wet pastures. The conditions that favour grass growth also favour parasite larvae growth.

Roundworms

Series on parasites

External and internal parasite infestation are a serious problem among livestock keepers. However there are various methods farmers can use to protect their animals against them. In the past issues we gave you tips on external parasites such as fleas and lice and featured the control of ticks in livestock. In this issue we give you tips on internal parasites.



Adult roundworms deposit their eggs in the animal's intestine. These eggs pass into the environment through cattle manure. After the eggs hatch and larvae moult, the infective roundworm larvae migrate up the forage and are ingested by grazing cattle. After ingestion, the roundworm matures in about 3 weeks. Adult roundworms do not multiply in the host animal; the eggs must pass into the environment to continue the parasite's life cycle. Adult life span is only a few months. Animals will rid themselves of the adult parasites.

• The animals should be kept in paddocks and not taken back into the same field until the risk of infection has diminished. Deworming treatments have little effect if the animals are returned to the same larvae-infested field.

• Overpopulation in paddocks increases the concentration of parasites.

• Harrowing pastures disperses and exposes the parasite eggs and larvae; it should be done at the beginning of a dry season in a field that the animals will not be returning to for quite some time.

• In barns, animals should be fed from feeders rather than directly from the ground to avoid contamination as a result of their mouths coming into contact with manure or bedding.

• Manure to be used for spreading may be filled with parasite eggs and larvae. Composting is a good way to clean manure because the larvae and eggs are destroyed.

Parasite control methods

The first step in a pest control program is to assess the situation with randomly selected faeces. This regular control is important, since certain parasites have developed resistance to chemical deworming products. When using a dewormer, a farmer should treat all the animals in the herd or group. For deworming treatments with natural products, animals should not be fed for a period of 12 to 48 hours before the treatment and another 6-hour period afterwards. Young animals should be exempted from the fast. In the case of milking dairy cows, it may be simpler to lighten their diet by not using silage or concentrates rather than to have them fast.

Liquid deworming treatments that animals do not willingly ingest can be administered using a funnel and a flexible tube put down the animal's throat.

Botanical dewormers

Several plants have antihelminthic properties, and were in fact a part of the traditional animal husbandry before synthetic dewormers were commonly adopted.

Garlic: Garlic is a common plant dewormer that is easy to find. It must be used, however, as prophylaxis. Garlic does not prevent the production of eggs but prevents the eggs of certain parasites from developing into larvae. It can be administered in several ways:

Fresh minced garlic has proved to be clearly more efficient than garlic extracts for controlling internal parasites. The leaves and bulbs may also be used. If the animals do not want to eat the leaves whole, they may be cut into small pieces, mixed with molasses and shaped into small balls.

Powder: The most practical way to administer garlic is to add powdered garlic to animal feed.

Wild ginger: Wild ginger or snakeroot (*Asarum canadense*) grows in wooded areas. The dosage per animal is 20 to 30 g of the aerial parts of snakeroot mixed with wet bran. Wild ginger also has antibacterial properties.

continued on page 8

Climbing beans provide more food

Due to land subdivision and declining soil fertility, farmers need high yielding bean varieties.

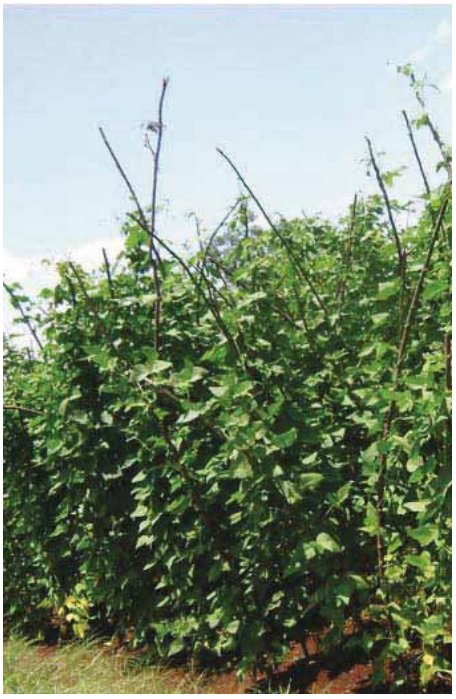
The Organic Farmer

Climbing beans is a variety of beans that requires support with stakes (sticks) to climb on when they are growing. The beans can grow up to a height of 3.5 metres. They require such support due to their imposing length and thin stems. The long stems of this variety of beans enable it to produce more pods as compared to normal bean varieties (bush beans). With good management, climbing beans can produce up to 4 tonnes per hectare (22 bags per acre). Conventional beans produce between 8 and 12 bags per acre. Due to their high yielding quality, climbing beans can be grown in densely populated areas where farmers possess small parcels of land. Farming areas around major towns are also appropriate production areas. The farmers should also have access to staking material; this is possible especially in areas where agroforestry is practised. The beans can do well in all areas that have an adequate rainfall of above 1000 mm. But they can also do very well in dry areas where irrigation is practised.

Varieties: There are four varieties of climbing beans; three of these varieties have been developed by the Kenya Agricultural Research Institute (KARI). These are the Medium Altitude Climber 13 (MAC 13) Medium Altitude Climber 34 (MAC 34) and the Medium Altitude Climber 64 (MAC 64). The advantages of these varieties is that they produce more grains and crop residue which can be incorporated back into the soil thus improving fertility and organic matter content.The residue can also be used as livestock fodder. The higher grain yield also means more food and income for the farmer.

How to grow climbing beans

Seed: Farmers are advised to use clean seed; preferably those produced by seed companies, research institutions, farmers' groups with good disease-free seed, non-governmental organisations and any certified seed producer. The only problem farmers may face is that currently, climbing beans can only be obtained from informal seed producers. The quality of these seeds is questionable. To overcome this problem, farmers' groups in various parts of the country are being trained on the production of clean seed that can be used by those interested in growing the beans.



Climbing beans require support

Land preparation: It is important to prepare the land during the dry season to reduce weeds and ensure the soil is fine. All perennial weeds such as grasses should be uprooted and exposed to sunlight to kill them. It is advisable to incorporate any crop residue back into the soil to build fertility.

Planting: Planting should be done at the onset of the rains.

Spacing: The beans should be planted at the rate of 2 seeds per hole, 75 cm between the rows and 25- 30 cm from one hole to the next. One support stick is adequate for 2 bean seedlings which helps to reduce the number of sticks used, other than when one stick is used to support only one seedling.

Fertilizer application: Climbing beans are heavy feeders and require adequate amounts of nutrients. A balanced supply of organic fertilizers or well-decomposed manure should be applied at planting time. These can be supplemented with organic foliar feeds.

Pest Control: Pest control should start early, just after germination. Use organic pesticides (Refer to our Plant extracts Special for the various plants that can be used to control pests). The most common pests are the bean-fly, ants, spider mites and aphids. Young bean tendrils, leaves flowers and young pods are vulnerable to bird damage. Scare birds away as you do with the other crops.

Disease control: Organic fungicides such as copper oxychloride can be used to control fungal diseases. A number of plant extracts such as those made from a mixture of African marigold, stinging nettle, garlic, rhubarb etc can effectively control fungal diseases.

Weeding: Like other beans, climbing beans should be weeded at least twice during the growth cycle.

Irrigation: Climbing beans do very well in dry areas if there is sufficient water for irrigation. They can also be grown under irrigation during the dry season in high potential areas.

Climbing beans need support

The beans must be supported while growing as they are very strong climbers. If left unsupported, they will crawl on the ground and will thus not produce good yields. They must be supported in order to grow upright and produce more grains. Support sticks of up to 3.5 metres high are economical for a fair and competitive yield. Support must be provided within 1 to 2 weeks after emergence from the ground to enable the young beans to climb and start producing branches early enough. In areas where maize is grown and support stakes may not be available, farmers are advised to grow the beans in the maize fields when the maize is about to mature, mainly around the month of August or September. The leaves of the maize can be plucked off and any weeds removed before planting. The climbing beans can then be planted at the base of each maize stalk which provides support to the climbers. When the maize is harvested, the stalks should be left standing in order to support the beans until they are ready for harvesting.

Farmers interested in buying climbing beans can contact KARI Embu, Call Alfred Micheni Tel.0720 705 625.

Request for climbing beans

"I am a regular reader of *The Organic Farmer* magazine (TOF). Please send me more information about climbing beans. Kindly also direct me to where I can get the seeds? Tel. 0711 754 542" This is one of the many questions we have received in the past few weeks on climbing beans. It seems that many farmers want to improve their yields by growing high yielding varieties.

Where are the *i-TOF* centres?

In the last issue of *The Organic Farmer* magazine, we wrote about our intention to open centres for information and organic inputs in various parts of the country, called *i-TOF*s. The idea came from the many questions we have been receiving from farmers regarding lack of training and inputs. Research done by TOF has confirmed that few agrovet shops are selling organic inputs.

After some research, we have decided to set up four *i-TOF* centres. Since this project is on a trial basis, we have identified two agricultural institutions and two active farmers' groups : Baraka Agricultural College, Molo ; Sustainable Organic Farming Development Initiative (SOF-DI), based in Buyangu, Ebunangwe and Mukumu; Kangundo Dairy Farmers CBO, Kangundo, and Amuka Farmers Self-Help Group, Gatuto.

i-TOF : The information centres

Each of the centres will be equipped with:
- The "farmers' toolkit", which consists of a laptop computer running the offline-version of the infonet-biovision information package
- An entire archive of *TOF* magazines since its launch in April 2005
- A variety of publications and books on organic farming
- Other information material deemed necessary for training farmers on sustainable agriculture.

SOF-DI, Kangundo and Gatuto: These centres host the *i-TOF* extension worker, a trained agronomist with experience in organic farming, value addition and marketing. This *i-TOF* extension officer will be responsible for training all farmers' groups in their respective region. Farmers' groups can book him/her for a one day training on specific areas. This service is free of charge.

Baraka/Molo: The Baraka agricultural college runs three outposts in Mau Summit, Kamara and Nyakinyua will be staffed with an extension worker. The three outposts will work as *i-TOF* centres. They are equipped with all the information material as mentioned above.

The telephone numbers of the *i-TOF* extension workers indicated below will be working from 20th of July. From that day, you can start making bookings directly with the *i-TOF* team members in your area. If you have questions about *i-TOF* before that or would like to reserve a date for a course at your place, please contact *TOF* at the usual phone number.

Organic inputs

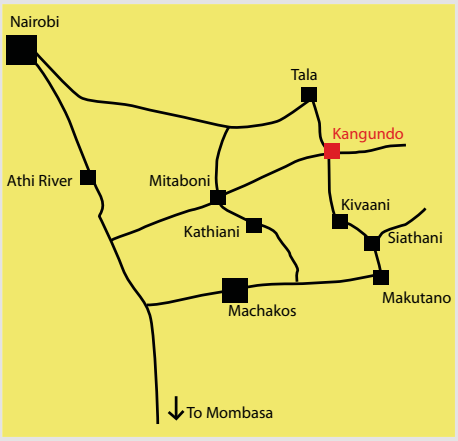
These inputs will include commercially available organic pesticides and fungicides and soil conditioner, and may include Neem products, Diatomite, E.M , Rock Phosphate (Minjingu), Flower DS etcc.

Since we are looking for the best ways to supply small-scale farmers with organic inputs, we chose different possibilities:
- Baraka will sell the inputs in the already existing shop at the Baraka Agricultural College.
- SOF-DI will have a small shop at the main centre in Buyangu.

>>

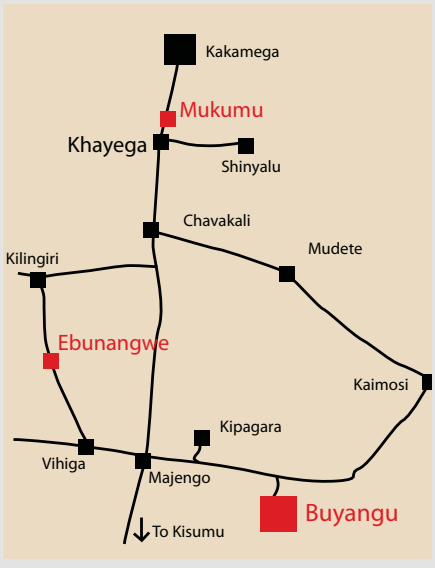
i-TOF centre, Kangundo, Eastern

Host: CBO Kangundo Dairy Farmers (KDF), running a milk bar
Location: KDF-milk bar in Kangundo Town
i-TOF information: Within the premises of KDF, equipped with the whole information package, run by the TOF-extension worker
Contact: 0724 331 405
i-TOF organic inputs Shop: Situated within the premises of KDF in Kangundo town.



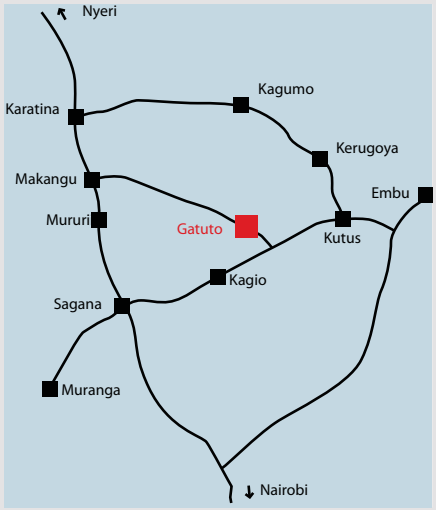
i-TOF centre, Buyangu, Western

Host: Main office of the Sustainable Organic Farming Development Initiative (SOF-DI), Buyangu
Location: (SOF-DI) Buyangu, in the compound of the Catholic parish
i-TOF info centre: Within the premises of SOF-DI, equipped with the whole information package, run by the TOF-extension worker
Contact: 0724 331 456
i-TOF organic inputs Shop: Situated within the premises of SOF-DI in the SOF-DI main office in



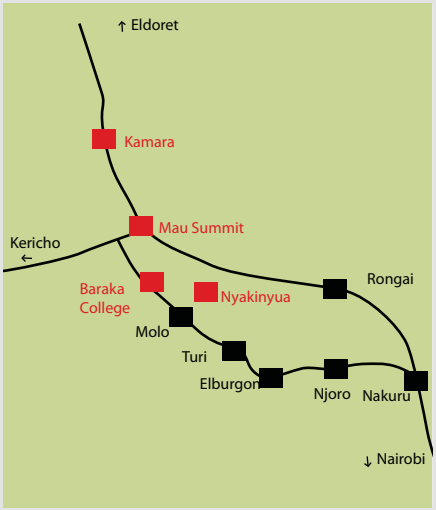
i-TOF centre Gatuto, Kerugoya

Host: Amuka Farmers Self-Help Group, Gatuto
Location: Meeting and education hall of Amuka Farmers Self Help Group, Gatuto
Location I-TOF information: Within this meeting hall; equipped with the whole information package, run by the TOF-extension worker
Contact: 0724 331 375
i-TOF organic inputs Shop: An agrovet shop in Kagio; to be named in the TOF August-issue and by direct mail to farmers' groups.



i-TOF centre Baraka College, Molo

Host: Baraka Agricultural College, Molo
Location: In the three Baraka outreach centres in Mau Summit, Kamara and Nyakinyua
i-TOF info centre: Within these three outreach centres in Mau Summit, Kamara and Nyakinyua; these three centres are equipped with the whole information package as mentioned above.
i-TOF organic inputs shop: Situated within the premises of Baraka Agricultural Centre, Molo.



>>> from page 6: i-TOF

• Amuka Farmers Self Help Group will co-operate with an agrovet shop in Kagio.
• Kangundo Dairy farmers will store and sell the organic inputs in their premises in Kangundo, next door to the *i-TOF* information office.

In the beginning, *The Organic Farmer* will assist the groups to source organic inputs. After that, it will be the responsibility of each centre to buy and market the inputs to farmers in their respective regions.

All farmers' groups in the respective regions of the 4 centres will be informed of the existence of these centres and are encouraged to make use of the facilities provided. *TOF* will make a regular assessment of these centres which will form the basis of any future expansion to other parts of the country.

i-TOF

Available training modules

1. Soil fertility and conservation
   - i) Composting
   - ii) Vermiculture
   - iii) Soil conservation
   - iv) Liquid composts
   - v) Green Manures
2. Crop Nutrition
3. Pest Management
4. Disease Management
   - i) Identification of diseases
   - ii) Disease management and crop hygiene
5. Water conservation and management
   - i) Harvesting
   - ii) New technologies, drip irrigation etc.
6. Animal production and health.
   - i) Feeding and housing in organic systems.
   - ii) Pasture management and storage.

i-TOF

Conditions

The following conditions apply to all groups that will undergo under the *i-TOF* training programmes:

- The training will be conducted free of charge to all farmers groups.
- The farmers have to identify a training venue and organise a demonstration plot where the training will take place.
- Training will be offered to farmers groups with at least 15 members and above.
- Each training session will take 4 to 5 hours.
- Farmers must observe punctuality.

Vaccination of chickens important

I want to know the most effective medicine that can protect my young chicks from diseases. Can the same be used for turkeys? Tel.0721 422 978

You have asked this question at the right time when the rains have just started. The wet season is a delicate time for poultry farmers due to the proliferation of diseases that can wipe out a whole flock of birds if preventive measures are not put in place. Young chicks are especially vulnerable to diseases. Diseases such as fowl typhoid are a serious problem that is very difficult to eradicate once they have attacked chickens. Sometimes they require the culling of the entire flock. Regular vaccination can protect your chickens against coccidiosis because the bacteria responsible are always present in the soil. The best way to keep these diseases at bay is to ensure the poultry sheds are kept as clean as possible at all times. Wash the floors regularly with organic acaricides such as neem powder. The following are important vaccinations that can prevent diseases on chickens:

Marek: This is an injection administered at the hatchery on young chicks.
Newcastle: These are inter-nasal drops applied to the eyes at 2 to 3 weeks and repeated at 18 weeks and after every 6 months.
Fowl Typhoid: This is applied as an intra muscular injection at 8 weeks in high risk areas and 18 weeks in low risk areas.
Gumboro: It is applied in drinking water from four to fourteen days.

Organic chickens are often reared vaccine-free because they are reared in a clean environment and are allowed to graze on free range. Organic farmers can make their own natural antibiotics that can protect chickens against disease. Extracts from plants such as aloe vera can control a number of infections in chickens if added to drinking water.

Maize varieties good for short rains

Which hybrid maize seeds can do well during the September – January period?

The weather has been rather unpredictable this year. Although the March –May long rains delayed somewhat, most parts of the country received adequate rains in May but dry conditions persisted in much of June, which has led to crop failure in most medium and low potential areas. In our March 2009 issue (Nr.45) we warned farmers that there was a possibility of depressed rains. Although you do not explain to us in which agro-ecological zone your farm is situated, we would recommend that you go for early maturing varieties. These include Katumani Composite, DHO1, DHO2, DHO4, DH09 or DH10. You can get these varieties from your nearest agrovet shop or any Kenya Seed Company agent near you.

My cow is eating clothes

My cow is eating clothes, soap, bones etc. I have tried to give a variety of mineral licks but the problem still persists. Please assist me get a solution to this problem. Tel 0726 071 136

Your cow could be suffering from a deficiency of some sort. Most of the salt licks available in local agrovet shops do not have sufficient composition of minerals salts that animals require. Try and buy imported ones. Some areas in the country lack particular minerals in the soil which can also affect the animals. You can also consult your local livestock extension staff to tell you if there is a deficiency of a particular mineral in your region. They can provide useful advice that may be of help to you. If this habit persists, consult a veterinarian

How can I attract bees to colonize my hive?

Peter Chikombe Saboti, (0728 209 456) is not the only farmer who has problems with attracting honey bees.

Jairus Lihanda

There are several reasons that prevent bees from colonizing a hive. One of them is pest infestation. Such pests may include ants, wasp, and rats. If the hive has rats nesting in it, it will definitely never be colonized. Rats also leave a bad smell even after they have been removed from the hive. So first, ensure the hives are free from any pests. If there are pests clean the hive. Secondly, have the hives waxed. In case you are using the Kenya Top Bar hives, wax the bars. For Langstroth hives, wax the frames well.

The second major reason is the apiary siting. If the apiary is sited in a dampy area, it is not a conducive site for bees. Bees need a site where they can maintain right moisture content in their honey.

A third reason would be the condition of the hive. If the temperatures are too high in the hive, bees may dislike such a hive. Hives should be sited under a shade.

Lastly, the positioning of the hives can keep the bees away because they do enter hives mostly during swarming seasons. However, bees have swarming routes. These routes are high up above buildings. Try placing your hives in catcher positions (on top of trees or buildings) or use a catcher box to catch bees and transfer them into the hives.

Pack the bees in the hives

If you try all these and bees still do not enter your hives, you can put them into the hives. There are different ways of doing this, but for this operation, it is best to seek help from an experienced friend. The swarm has a better chance of staying in its new hive during a nectar flow. Do not waste time with swarms smaller than a person's head as they cause more trouble than they are worth.

- First, prepare your hive by smearing it with some melted beeswax, so that smells nice for bees.
- Look for a swarm of bees clustering on a branch from where you can catch them. Wear your bee suit and smoke them very gently so as not to disturb them. (Do not smoke if you can avoid it!) Shake the bees into a catcher box or similar container, e.g., cardboard box. If the queen falls into the box, the rest of the swarm will follow. Wait for 20 minutes or so. If they return to their original site, repeat the procedure once more.
- Once you have the bees, leave the box in a shady place until evening. Make sure it does not become hot in the container by covering it with a damp cloth.
- In the evening, take the bees home and shake them into your empty hive.
- If you have other hives, take out a comb with some uncapped honey and a brood comb with eggs and give them to the bees to encourage them to stay on.

You can also colonize your hives by making colony divisions. Transfer comb with the queen cell, one other comb of brood, and two combs of food (honey and pollen) into a catcher box/ new hive. Include bees on all combs. Shake in bees from other combs as well. Remember to put brood combs in the middle and honeycombs on either side to insulate the brood nest.

Stingless bees

Is it true we have a new variety of bees that do not sting? If yes, how can a farmer get them and for how much? I am a farmer, now keeping rabbits. 0721 611 080.

Yes, it is true; there is a species of bees that do not sting because they are stingless. These bees colonize dark areas and are hard to try and domesticate. They produce less quantity of honey as compared to the stinging bees. However their honey is highly medicinal.

Keeping of stingless bees (meliponiculture) is not yet commercialized in Kenya. We advise interested bee keepers to concentrate on the honey Bee (*Apis Mellifera*). One of he major reasons that keep off interested beekeepers is fear, but just like you are used to your rabbits, you can get used to your bees.

First be careful, taking every precaution against the stings. Invite an experienced beekeeper to start you off. But the more you visit the hives, the more you get used to the bees. In fact, for an experienced beekeeper, the bee sting is healthy!

Jairus Lihanda

>>> from page 4: Worms

Cucurbits: Pumpkin seeds contain a deworming compound called cucurbitacin. The seeds may be fed directly to animals.

Lupin: A diet made up entirely of freshly cut, lightly salted lupin is a good dewormer. It is important not to allow free access to lupin; otherwise symptoms of poisoning may occur.

Other plants: Blackberries, raspberries, and nettle are also other plant species with deworming properties that should beaccessible in pastures. Fennel leaves and seeds are also used as dewormers.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 51 August 2009

Farmer wins prize from TOF*Radio*

Mrs. Grace Onyango, a small farmer from Malik Vilage, Kibabii receives a wheelbarrow she won in the TOF*Radio* competition from the TOF*Radio* producer John Cheburet. Listeners have a chance to win by answering a simple question. The competition comes after every two weeks. (Photo TOF*Radio*)

Hard times for potato farmers

Potatoes are the second important staple food ill Kenya.
But potato farmers are neglected.

The Organic Farmer

The crisis facing the potato industry in Kenya is getting worse by the day: There is a serious shortage of certified seed in the country which has forced farmers to go for uncertified potato varieties from neighbouring countries, which they are now using as seed. The new varieties which have spread to almost all potato growing areas of the country pose a serious problem of diseases. The use of uncertified potato seeds mainly sourced from Tanzania and Uganda has raised concern among government's regulatory agencies who fear that such seeds could threaten the entire industry if they are infected.

The country has not been able to meet its potato seed requirements for the last 18 years because land meant for production of basic seed, including multiplication, was grabbed by individuals in the government. Attempts to reclaim the 240 acres of KARI in Tigoni and another 12,000 acres in Molo have so far failed resulting in a critical shortage of potato seeds. But the question anyone would ask themselves is: "How can a government that pledges to meet the country's food requirements fail to resolve such a small issue as recovering land meant for seed production for almost two decades? And if the recovery of the land is difficult, are there no other ways that can be devised to ensure the country's capacity to produce potato seed is not compromised?" The potato seed shortage is a clear indication that we can no longer rely on the government to solve farmers' problems. *See page 2 & 3*

in this issue

Dear farmers,

The country is still in a precarious position with regard to food security. The long rains have once more failed. As the weather forecasts rightly predicted at the beginning of the year, the long rains have been inadequate in most of the food producing areas. The farmers' calendar started badly with very little rain reported in March, a time when most farmers often plant their maize. There were rains in late April in most areas, but they remained erratic in May, while June was the driest month, which led to crop failure. The country will experience a food deficit which may force the government to import food to bridge the production gap. This does not mean that farmers should give up; there are indications that the short rains may be much better in quantity and duration. Indeed, weather experts predict that the rains may extend into January next year. Therefore the government should chip in by giving free seeds and offering affordable fertilizers as they did at the beginning of the year. This will help resource-poor farmers to replant and perhaps recover some of their losses. Farmers should, on other hand, take advantage of the short rains to replant, not only to meet their food requirements, but also to have some food for sale. Although most farmers have abandoned planting traditional drought resistant crops such as millet and sorghum, this is the time to rethink and try out these crops. The climate change is affecting farmers' worldwide. It is only those farmers that are able to cope with the weather changes by use of emerging technologies, including growing crops that can withstand drought, that will survive these hard times. And African governments should empower the people to produce food instead of leasing prime land to foreign companies to do so.

i-TOF

Finally we are happy to inform you that the information and organic input (i- TOF) centres we promised you have started in four areas in the country. We encourage farmers near these centres to make use of them to get information, training and even buy organic inputs. (See page 6). The future of agriculture in Africa depends on well-informed farmers ready to adopt sustainable methods that improve food production and income.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

New potato variety becomes popular

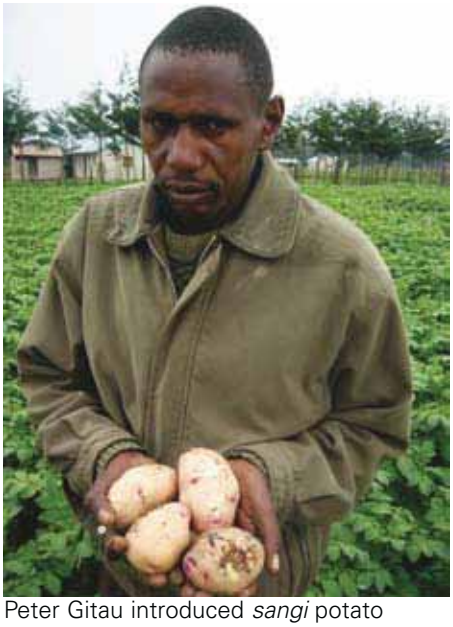
Potato varieties from unknown sources can spread bacterial and viral diseases.

The Organic Farmer

On one of his frequent trips to Wakulima Market where he occasionally delivers his potatoes for sale, Peter Njoroge Gitau saw a new variety of potatoes that had been brought from Tanzania. The sheer size of the potatoes made him curious and enquired from the owner what variety it was, but the traders did not have any idea. They told him that the potatoes were bought from Tanzania. They were not ready to sell him any as the entire consignment had already been bought by a trader. Desperate to get a few tubers, Gitau waited until the lorry was offloaded. As the lorry's conductor swept the trash after offloading, some tubers remained in the trash. Gitau managed to pick all of them, which he carefully wrapped in a polythene bag and took them home to his Kahuho village, in Karati, South Kinangop.

Variety has spread to many areas

When he got home he cut them into tiny pieces and planted them the following day. "After tending the potatoes for seventy-five days, I managed to harvest six bags of potatoes. I again prepared the six bags for seed and planted them in one acre. This time I got 90 bags. Impressed by these potatoes, everyone in my village wanted to buy them, but I was reluctant because I wanted to multiply them again. However I decided to sell some to a few farmers," he says. Within a year the new variety which he had now nicknamed Sangi had spread throughout the village and beyond. The variety is now the potato of choice in the potato growing areas of Nyandarua, Olkalou, Molo, Mau Narok, Timboroa, Kiambu, Murang'a and many other parts of the country. One important reason why farmers like the variety is that it can produce up to 100 bags an acre if it is well taken care of. The variety sets tubers when flowering and only needs seventy-five days to mature, with adequate rains, which is an advantage to commercial growers. It is however prone to frost, although it can still grow well with little rain.



Peter Gitau introduced *sangi* potato variety in Kenya from Tanzania. (TOF)

Unscreened varieties are dangerous

The popularity of *sangi* potato variety is not a new phenomenon among farmers in potato growing areas of the country. Having used the recommended certified seed varieties for many years; many farmers are now having a problem with these varieties because of declining yields brought about by viral diseases, including bacterial wilt. They are now going back to new varieties from neighbouring countries that are high yielding and which they claim are not prone to diseases.

Potato growers in Mau Narok and Nyandarua had earlier "discovered" two other varieties; one known as *Mugaruro* and *Thima Thuti* (the one that enables you to buy a suit). The origin of this varieties is not very well known, some farmers claim it originated from Mau Narok while others claim it was brought from Uganda or Tanzania. Like a bush fire, the new potato varieties have spread to all potato growing areas.

The National Value Chain Development Committee chairman George Bett, a member of the National Potato Task Force which was formed two years ago to look into problems facing the potato industry, has already raised the matter with the Ministry of Agriculture. In a letter addressed to the Agricultural Secretary Dr Wilson Song a, Bett says unscreened potatoes from neighbouring countries are being brought into the country and turned into seed by farmers, which raises the danger of introducing more diseases that could pose a serious threat to potato production in the country. Farmers like the new varieties Farmers give various reasons why they prefer the new varieties in place of certified seed. "I have tried Tigoni and Tana Kimande potato varieties but they take longer to mature. For Tigoni variety, it has to be delivered to the market immediately because it starts greening within a short period, says Njoroge Ng'ang'a. "This complicates its marketability because farmers have to have a ready market for it. For Mugaruro the other common variety in this region, the farmers say it is also productive but not as good as *sangi* and *thima thuti*, he adds. The potato farmer further explains that the main problem with mugaruro is that it produces many stolons (underground stems) during dry period but with tiny potato tubers that buyers do not like. As for thima thuti many say it was previously high yielding but now, with too much recycling of the seed, its yield has been declining due to the spread of bacterial wilt and viral diseases, which has forced many of them to abandon it and go for new varieties such as *sangi*.

Sangi potato tubers (Photo TOF)

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

Potato seed crisis now worsening

The govemmet's capacity to produce potato seed is overstreched.
Corrupt individuals have stolell land meant for seed multiplication.

The Organic Farmer

Many farmers are quite happy with the new potato varieties. However in the eyes of experts, this happiness may be short lived. According to the director of the National Potato Station KARl, Tigoni Dr. John Kabira, the spread of diseases is to blame for declining production of all potato varieties. Very few farmers practise crop rotation, which is responsible for the increase in diseases and potato yield in almost all potato growing areas of the country. This means that, whichever variety farmers may have at the moment, it cannot remain disease-free for long due to recycling of diseased seed.

Three reasons for the disaster

Land-grabbing: Even if farmers could afford to go for certified seeds every time they need to plant, the seed producers are overstretched. "The government had more than 12,000 acres of land for seed multiplication in various parts of the country of which only less than 500 are remaining", says Kabira. "Most of this land has been grabbed", he mourns.

Disruption of training of farmers: Three years ago, the government, with the support of Germany Technical Cooperation Agency (GTZ), started a programme to train agricultural extension officers who would then train selected farmers on seed production. It was hoped that after the training, the extension officers would recruit more farmers to go into seed production. But this did not happen. A few months after the farmers were trained; the Ministry of Agriculture effected mass transfers of extension officers across the country. The result was that more than 120 extension officers from potato growing areas who underwent training were moved to non-potato producing areas paralysing the whole programme.

Lack of certified seed and exploitation by traders has reduced farmers earnings.

Post-election violence: The violent displacement of many thousands of potato farmers from the main growing areas in Rift valley province in January 2008 made the problem worse: Potato seeds were destroyed in stores while those that had not been harvested were abandoned in farms. Dr. Kabira says the shortage of potato seeds coupled with the displacement of farmers led to poor production early this year when the price shot up to Kshs. 6,000 a bag. Because of the favourable prices, some of the farmers who had seed potatoes decided to sell them as commercial potatoes to traders who came from as far away as Mombasa.

Efforts for revival.

The stakeholders in the potato sub-sector are now trying to revive the industry through the following measures:

- The Ministry of Agriculture will involve the private sector in the production of quality seed for sale to farmers.
- A quality assurance system would also be put in place to ensure contracted farmers produce quality seed.
- The immediate priority is to ensure that institutions such as KARl are equipped with adequate resources to produce quality basic seed from their stations in Tigoni, Molo, Njabini and KARl Ol Joro orok and Meru.
- The seed would then be given to companies and organised groups including individual farmers who will multiply it under the supervision of Kenya Plant Health Inspection Service (KEPHIS).
- KARl has taken most of the new varieties including *sangi* and is already

Continued on page 4

A flowering sangi potato prop.

Why farmers need certified potato seed

Potatoes need very good management if farmers expect to get good yields and control diseases. But the main problem that is causing rapid spread of diseases is the tendency by farmers to ignore advice given to them on field sanitation and choice of the right planting material.

Only clean certified seed should be used as seed. If a farmer has bought certified seed, the same can be planted up to three times if there are no signs of bacterial wilt or any other disease in the soil. Farmers should know that apart from bacterial wilt, early and late blight, potatoes are prone to a host of six viral diseases. These are Potato Virus X (PVX), Potato Virus Y (PVY), Potato Virus A, Potato Virus S (PVS), Potato Virus M (PVM) and Potato Leaf Roll Virus (PLRV). PVY and PLRV are spread from one plant to the other by aphids. Although it is easy to identify bacterial wilt symptoms, most of the viral diseases can only be identified by experts. This is one reason why farmers are always advised to use certified seeds, which are screened against all these diseases.

Peter Kinyae, a social economist from KARl, Tigoni says the main problem is that most farmers do not want to buy certified seeds. "We have had training programmes in places such as Meru where we showed them how to grow potatoes to control diseases, but after the training, the farmer's went back to their old practices of recycling seed some of which was diseased," he says. Whatever the experts say, the major problems facing the potato industry are poverty and ignorance among farmers which is made worse by corruption and poor planning on the part of the government.

Additional information: Miriam Mbiyu, Biotechnologist KARl, Tigoni.

Food for people, fodder for livestock

t5eetroot are not very common, but it is a healthy plant with many uses for humans and animals.

The Organic Farmer

Beetroot (*Beta Vulgaris*) is a highly nutritious vegetable grown for its roots that are good for people and even animal fodder. It is a good source of calcium, iron potassium and vitamin A and C. Beetroot can be stored for long if kept in a cool dry place. The common varieties cultivated are the garden beet, used as a vegetable, sugar beet which is a major source of sugar and the mangold which is used as fodder for livestock or the Swiss chard which is grown for its edible leaves.

In Kenya the most common types grown for the market are the Detroit, a small-sized sweet, round shaped root that is dark-red in colour, the Crimsom Globe and the flat Egyptian types. Mangold is also available for farmers who want to grow it as fodder.

Climatic requirements

Beetroot is a cool season crop although it may also be grown in warm climate. It prefers light freeable, rich soils with a pH of 6 to 6.8. It is slow to germinate, hence soaking the seed in water for 24 hours before planting helps to speed up germination.

Land preparation

The soil should be made fine and the seeds planted in rows. The row spacing should be 25-30 cm apart.

Planting

Seeds are planted at a depth of 1.5-2.0 cm. The seed-bed should be made firm and kept moist. Avoid planting in the soil which has been freshly manured. Germination takes about 1 to 2 weeks. The seedlings should be thinned out as soon as they canbehandled; planting them about 5-10 em apart in the rows. Stagger the crop by planting a row every month so that the crop is spread throughout the year. Planting during the rainy season exposes the seedlings to diseases.

Beetroot vegetable and tuber of the mangold variety (Photo TOF)

Fertilizer application

Rock phosphate or any other organic fertilizer can be applied along the rows before planting but farmers should avoid using farm yard manure on beetroot.

Weeding: Keep the field weed-free and well watered. Mulching can help to preserve soil moisture during the dry period. Beetroot is ready for harvest in 9 to 10 weeks. Yields range between 2.5 to 4.5 tonnes per acre. When harvesting, the plant should be lifted carefully to stop damage to the tap root or the beet. Twist off the leaves to stop them from bleeding.

"It saves my animal during the dry season"

Samuel Mungara, a farmer in Passenga village in Rurii location of Ol Kalou District, discovered the advantage of beetroot two years ago when he ventured into dairy farming. His father used to grow beetroot for the family's dairy cows in the 1970s, but it was abandoned because they had plenty of fodder from oat grass and other natural pastures on their farm. However, pasture on the farm has become scarce because of prolonged dry conditions that have affected most parts of the country. Two years ago, Mungara decided to try beetroot which most farmers in the region had neglected. He put a quarter of an acre under beetroot production for his 4 head of cattle. Today, he is full of praise for beetroot for saving his animals. He has increased the area under beetroot cultivation to half an acre. "Beetroot is wonderful fodder as well as a vegetable crop. Unlike most of the other crops it is not affected by frost that is common during the dry season. It retains a lot of water which is very important during the dry season when animals need water most. My animals maintained the same level of milk production during the last two dry seasons thanks to beetroot," he says.

Mungara uproots some of the tubers every January while leaving the rest on the farm for use as vegetables. The beetroot tubers are then stored and fed to the milking herd every morning and evening when the animals are milking. Each cow is fed about 4 kg of beetroot fodder daily which is combined with feed concentrates.

Long-term feed

"One big advantage of beetroot is that they can be stored for up to 4 months without rotting or losing essential nutrients which is very important during the dry spell when there is limited fodder on the farm," Samuel Mugara adds. Beetroot is drought resistant; come the dry season and it becomes the only vegetable that survives the dry spell, when other vegetables such as cabbages or sukumawiki wither and dry up. This is one reason why many farmers are now turning to beetroot growing, having realised its advantages over other vegetables.

The farmers in 01 Kalou are not the only ones who have changed to beetroot. In many parts of the country such as Nyandarua, Western Kenya and the Rift valley farmers are now growing beetroots for use as a vegetable and animal fodder. Beetroot seeds, especially the mangold variety, are now available in many agro-veterinary shops due to increased demand.

>>> from page 3

cleaning them of viruses to ensure farmers have clean seed from all the potato varieties.

There before, the government has had very good blueprints to improve various sectors but they have not been implemented. Whether these measures will work remains to be seen.

Meanwhile to speed up the production of potato seed, the United States Department of Agriculture (USDA) together with USAID is funding the establishment of an aeroponics potato breeding system. The potatoes do not come into contact with the soil, contaminated air or water. This prevents fungal and bacterial infections. Under this system, one tuber can produce up to 50 potato seeds, compared to the conventional system where one tuber produces 10 seeds.

The liver fluke causes serious damage

In most regions in Kenya, liver flukes are dangerous parasites, often ignored by farmers.

The Organic Farmer

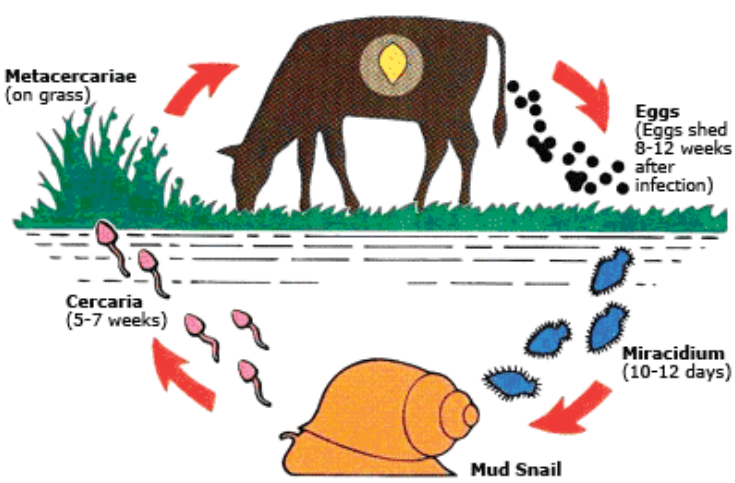
Liver flukes are strange parasites. The life-cycle of these microscopic creatures starts on a blade of grass and ends up in the liver of your cattle as large parasites known as flatworms. The flukes, can lay an astonishing 20,000 to 50,000 eggs a day, over a long period of time! The common liver flukes, *Fasciola hepatica*, have a bizarre life-cycle: The cattle ingest grass with an encysted stage of the fluke. After the cattle eat this contaminated grass, the microscopic juvenile flukes burrow through the lining of the intestine, escape into the abdomen and migrate into the liver. In the liver, they feed on blood, and over the next 6 weeks or even more, they find their way to the interior of the liver lodging themselves into the bile ducts from where they begin to lay their eggs. The fluke's eggs are thereafter shed through the manure of the cattle. These eggs then hatch and make their way to fresh water snails, which they infect and undergo further development. They at last emerge from the snail as young flukes and form a resistant coating on blades of grass. When cattle ingest them, the life cycle is completed.

Flatworms cause serious damage

Liver flukes mainly infect cattle and sheep but can nevertheless develop in many other animals including horses, pigs, goats and rabbits. Humans can also be infected with liver fluke when they eat watercress collected from contaminated streams, or use contaminated water on fruit and vegetable gardens.

The flukes' feeding behaviour causes serious damage to the liver and anaemia due to blood loss. This liver damage and anaemia lead to diarrhoea, loss of body weight and reduced milk production. Liver flukes are also dangerous for they can indirectly cause the deadly Red water sickness. Red water is caused by a bacterium called *Clostridium hemolyticum*, vhich colonizes the liver of susceptible cattle and produces protein toxins. They destroy the body's red blood cells, damage other organ systems md rapidly cause death. The migratng liver flukes damage local areas in he liver, causing low oxygen tension. !hese are good conditions for the Red ,vater bacteria; they grow rapidly in hese damaged areas. The vast majorty of affected cattle are usually found lead and bloated.

Another problem liver flukes seem to be associated with is decreased ferility. Studies published in USA have shown decreased pregnancy rates in replacement heifers and increased age to puberty in heifers infected with liver flukes.



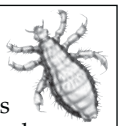
The lifecycle of liver flukes, left; the photo on the right shows the liver fluke

Remove liver flukes: There are drugs that extract flukes from animals, but farmers should choose a drug which kills both immature and adult flukes. Liver flukes may develop resistance. It is important that you follow the prescriptions of the label (see article below).

Reducing the number of snails: Snails prefer low-lying, wet, marshy areas. Draining these areas reduces snail habitats and snail numbers.

Area management: Fluke-prone areas are low-lying, swampy areas and areas of slow flowing water. You can identify fluke-prone paddocks with the help of your local animal health advisor. Fence off these areas. One major problem however is that the grass is too short, the cattle eat too deep down, as sheep normally do, reaching the lower blades where the flukes are normally anchored.

Series on parasites



With this article on liver flukes we close our series on parasites and how to protect livestock against them.

- **TOF Nr 48 May 09**: Parasites in livestock small but dangerous (treatment of lice, flea and mange)
- **TOF Nr 49 June 09**: Ticks pose a great danger to livestock
- **TOF Nr 50 July 09**: Internal parasites: Deworming improves animal health
- **Tof Nr 51 August 09**: Internal parasites: The liver fluke causes serious damage.

Garlic and pumpkins ...

The following recipe works against stomach and intestinal worms as well as against liver flukes. But it has to be carried out over a long period of time.

Garlic: Chop 250gm of garlic and pound them fine. Mix it with 4 litres of water and drench a half litre twice a day. This treats both worms and live flukes.

Pumpkin: chop whole pumpkins, inclusive of their seeds, into sttlall pieces then boil it until all water evaporates. Add a pinch of salt to encourage intake and feed adult cows with 1 kg. Goats and sheep should be fed on half a kilo.

... and fodder trees

Fascioliasis, caused by liver fluke parasites, is a major threat to livestock kept by resource poor farmers, since the disease effects are magnified by poor nutrition of the livestock. Scientists in UK and Nepal have found that diets with different protein and nitrogen contents have different effects on an animal's ability to withstand and to recover from infection with Fasciolasis.

They recommended that farmers should aim at feeding a diet containing up to 14% protein. Additional feeding of high quality protein feeds such as from tree leaves or from cheaply purchased urea/molasses feed blocks is one possible way to boost the protein level. Harvesting tree fodder has obvious cost advantages to a farmer, as it is often free to conect, as long as it does not promote environmental degradation through trees being cut down or killed. The best fodder trees are Leucaena, Sesbania, Callianda and Grevillea.

Here are the *i-TOF* centres

As you read this copy of *The Organic Farmer*, the four information and organic input centres (*i- TOFs*) which we had promised you in the past two months have been opened and are now operational. Farmers living near these centres can now be able to access information and also buy organic inputs that are environmentally safe and which will help reduce reliance on chemicals. The use of chemical products has been found to have damaging effect on soils, beneficial organisms and even human and animal health. Since this project is on a trial basis, we are working together with two agricultural institutions and with two active farmers' groups:

- *i-TOF* Baraka: Based in the Baraka Agricultural College, Molo, respectively in their outreach centres in Mau Summit, Kamara and Nyakinyua.
- *i-TOF* Western: MajengolBuyangu, in co-operation with the Sustainable Organic Farming Development Initiative (SOF-DI) in Buyangu, Ebunangwe, and Mukumu;
- ***i-TOF* Central**: Gatuto/Kagio, Kirinyaga district, in cooperation with the Amuka Farmers Self Help Group Gatuto;
- ***i-TOF* Eastern**: Kangundo, in cooperation with the Kangundo Dairy Farmers CBO, Kangundo.

i-TOFs for farmers

With the opening of the four centres, *The Organic Farmer* is moving closer to the farmers. The reason for this is that farmers have often made called us requesting to know if we can be able to visit them and offer training courses on organic farming. They have also made numerous enquiries to us asking to show them where they can buy organic inputs. For farmers' groups, eager to get more knowledge in their profession, it is easy: They can call the *i-TOF* extension workers in their respective region (the cell phone numbers given below) and book them for a one day training on specific agricultural areas. The extension workers are trained agronomists, equipped with a full information package.

The following conditions apply to all groups that will undergo the *i-TOF* training programmes:

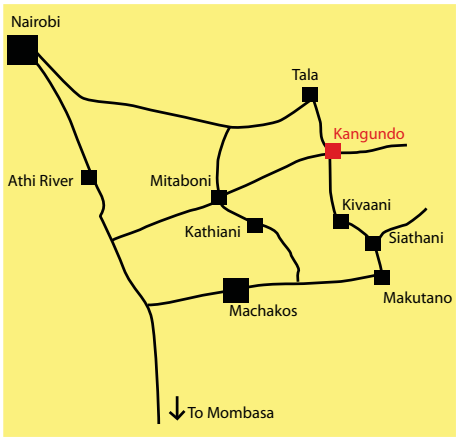
- The training will be conducted free of charge to all farmers groups.
- The farmers have to identify a training venue and organise a demonstration plot where the training will take place.
- Training will be offered to farmers groups with at least 15 members and above.
- Each training session will take 4 to 5 hours, farmers must observe punctuality.

Close monitoring

The *i-TOFs* are offering around 25 training modules in all areas of a sustainable agriculture to improve farming practices for increased yield and income. We shall monitor them closely. If we find that the farmers are gaining benefits from the information package including training by our extension officers, then the project will be extended to other farming areas of the country in order to benefit more farmers.

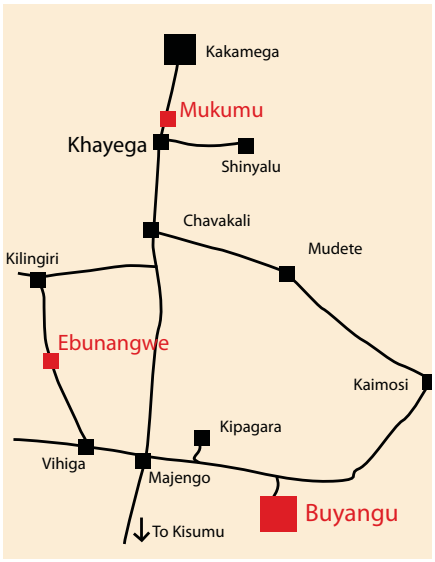
i-TOF centre, Kangundo, Eastern

Host: CBO Kangundo Dairy Farmers (KDF), running a milk bar
Location: KDF-milk bar in Kangundo Town
i- TO F information: Within the premises of KDF, equipped with the whole information package, run by the TOF-extension worker
Contact: 0724 331 405
i- TOF organic inputs Shop: Situated within the premises of KDF in Kangundo town.



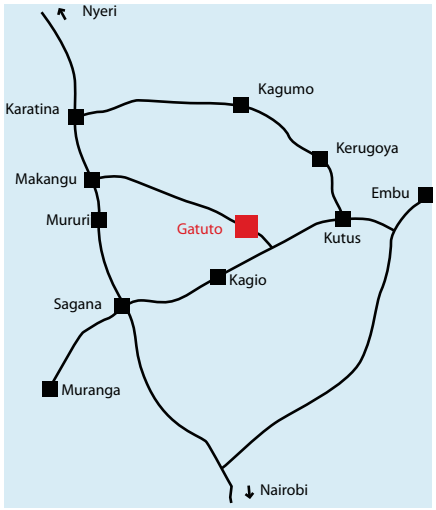
i-TOF centre, Buyangu, Western

Host: Main office of the Sustainable Organic Farming Development Initiative (SOF-DI), Buyangu
Location: (SOF-DI) Buyangu, in the compound of the Catholic parish
i- TOF info centre: Within the premises of SOF-DI, equipped with the whole information package, run by the TOF-extension worker
Contact: 0724 331 456
i- TOF organic inputs Shop: Situated within the premises of SOF-DI main office in Buyangu



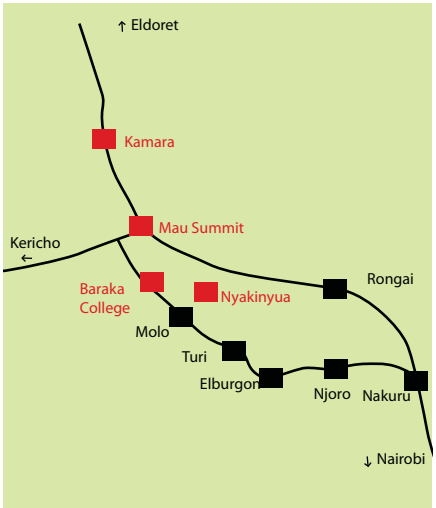
i-TOF centre Gatuto, Kerugoya

Host: Amuka Farmers Self-Help Group, Gatuto
Location: Meeting and education hall of Amuka Farmers Self Help Group, Gatuto
Location i-TOF information: Within this meeting hall; equipped with the whole information package, run by the TOF-extension worker
Contact: 0724331 375
i-TOF organic inputs Shop: An agrovet shop in Kagio; to be named in the TOF August-issue and by direct mail to farmers' groups.



i-TOF centre, Baraka College, Molo

Host: Baraka Agricultural College, Molo
i-TOF info centres: In the three Baraka outreach centres each staffed with an extension worker
Contact Kamara: 0725 507 038, 0720 041 556, 0725 665 781
Contact Mau Summit: 0723 778 688, 0725 854 197, 0726 714 708
Contact Nyakinyua/ Sirikwa: 0721107 981,0723 792 099, 0724 704 586.
i-TOF organic input shop: Located within Baraka Agricultural college.



Chaffer grubs not such a threat

I am a small-scale farmer in Bikeke Trans-Nzoia. My crop is badly affected by chaffer grubs. Please advice. Samuel Adema 0733 471 229

Chaffer grubs are creamy-coloured pests, about 1.5 em (0.6 inch) in length. They are normally found in the root systems of most plants and can be mistaken for other pests. Chaffer beetles lay their eggs on the grounds which hatch into chaffer grubs within two weeks. The chaffer grubs feed on plant roots. They later on dig themselves into the soil, only to appear as beetles again. It is very difficult to kill chaffer grubs with pesticides. But they can be controlled naturally by nematodes (*heterohnbitis lllegidis*). The nematodes look for chaffer grubs and attack them by entering natural body openings. Once inside, they release a bacteria that stops them from feeding, thereby killing them. They then reproduce inside the dead pest and release more nematodes which likewise go for the chatter grubs. Most farmers do not take any measures to control chaffer grubs because this natural control method seems to work perfectly. You will notice that the chaffer grubs do not stay for long on the affected area and will often disappear after a short period, causing less damage to crops, so it is wise to ignore them for the time being. **TOF**

Comfrey is a wonderful plant but….

I want to know more about comfrey and its uses? Njogu, Karatina

Comfrey is a fantastic plant. It has been in use since the 6th century mainly in wound healing, swellings, gout, ulcers and even gangrenes. Comfrey roots have been used to treat lung breeding, diarrhoea, dysentery, coughs, bronchitis, varicose veins, bum sores, sprains and many other conditions. In some parts of Kenya it is used in the making traditional dishes such as '*irio*' (Kikuyu traditional dish). It is said to be a great blood purifier and is also used to control rheumatic pain and arthritis. The plant is also used in teas, cooked as a vegetable, added to other foods and even as a compress on wounds. As a compress, the root is usually grated (about one cup full) and then tied over a wound and held in place for a few days at a time. It is used in the same way over closed wounds and bone fractures where it is believed to speed up the bone knitting process. In medieval times comfrey was called 'bone knit'.

However, recent scientific findings have discovered that the plant has compounds such as pyrrolizidine and alkaloids which are known to cause cancer and even liver damage. In view of these findings, comfrey should not be eaten but it should only be applied externally. Application of comfrey on broken skin should also be avoided. The US Food and Drug Administration (FDA) has banned the use of comfrey in USA. All comfrey root containing compounds are also banned in Canada. On the other hand comfrey is quite safe when used as a growth activator in crop production. Internal use of comfrey is therefore dangerous.

Su Kahumbu/TOF

Some legumes are dangerous for cattle

Which plants cause frothy bloat? 0722 989 681

Bloat is defined as a severe enlargement of the abdomen due to an over-accumulation of gasses trapped within the animal's stomach (see TOF Nr. 50, July 2009). Bloat can be classified as either frothy bloat, or the less frequent free-gas bloat. Consumption of legume forages in large quantities is one of the primary causes of frothy bloat; however, not all legumes cause frothybloat.

Bloat-causing legumes include Lucerne, sweet clover, red clover, ladino clover, white clover, and alsike clover. A preventive strategy against bloat is feeding a course hay prior to grazing bloat-prone legumes, and avoiding continuous grazing. **TOF**

...answers in brief

How can I buy this product?

Please advise me on where I can buy TwinN in Nyeri, Karatina or Nanyuki, Simon Tel. 0720 824 888.

You can contact Lachlan Kenya Ltd. On Tel. 020 207 3912/3/4 or Te1.0721 409 201. They can advise you on a dealer near you from where you can buy their products.

The value of tree tomato

I want to know more about tree tomatoes.

Tree tomato is a highly valuable commercial crop that has a ready market all year round, for farmers who like to diversify. We will send you copy of TOF Nr. 33 where we give farmers all they need to know about the fruit crop and even how to grow it. We hope this information will be useful to you.

Using water from a cow shed

Can I use water collected after washing my cow shed and use it for top-dressing my crops? Tel.0735 644 969 Yes you can, when you are not using chemicals while cleaning the cow shed. Cows have very good manure for crop production but the farmer has to make sure that once collected the manure is not exposed to the sun and rain because these lead to loss of nutrients.

Artificially bred birds vulnerable

Birds raised in a brood are of great loss to farmers because they easily fall prey to thieves and prey birds. Tel. 0720 063 460

This may be true in some cases because chicks raised by a mother bird learn a lot of survival tricks from her. This training by the mother is very useful to them when they grow up. Chicks reared in artificial brooders are slow in responding to danger. Such birds need protection from harm including predators.

Proper handling and storage keeps eggs fresh

Farmers invest heavily in poultry but incur losses when they do not take care of eggs.

The Organic Farmer

Eggs are perishable. They get spoilt easily if poorly stored. (Photo TOF)

An egg is an extremely fragile and a perishable product. It should therefore be handled with care after laying to ensure it does not get spoilt or broken. Most people buying eggs from the shops will admit that this commodity is either broken or rotten. The problem has to do with handling and storage while in the farm. Great losses can occur if eggs are not handled properly. To minimise loss, poultry farmers need to be cautious to ensure eggs reach the market while still fresh. Proper handling and storage protects eggs from harmful micro organisms such as bacteria, natural predators, loss of moisture, tainting and temperatures that cause deterioration and possible crushing during storage and even transport. Eggs, like other living organisms, need to breathe. The packaging crates should be kept in a room where there is free air circulation to provide oxygen. All the storage crates should be kept odourless and as clean as possible so as to prevent possible contamination and tainting. Eggs should also be protected from extreme temperatures and humidity.

Keep in a cool place

In the tropics, eggs can deteriorate very fast because of the high temperatures. Unless stored at low temperatures, the farmer may lose a large number of eggs before they reach the market. They should ensure the eggs are stored in a cool place that is not too dry because they may lose moisture very fast if kept in a dry place. The storage condition will depend on the number of days the farmer wishes to store the eggs. Experienced farmers have been able to store eggs for up to 6 or 7 months using refrigeration. Small-scale farmers on the other hand may need to store eggs for a shorter period until they get the desired number for incubation (never store eggs meant for incubation in a fridge).

Egg storage for incubation

Almost all local farmers use natural incubation method where the mother hen or a surrogate hen (hen that is given eggs from other birds such as guinea fowl to sit on) is used to incubate the eggs until they hatch. Indigenous hens are very good when used for brooding. However, for maximum hatchability, the farmer has to ensure that the hen is given only eggs with a higher probability for hatching.

One method farmers can use to determine the right eggs for incubation is the candling method. This is a selection method whereby the egg from a brood is held against bright light and observed to see the inside of the egg. Hold the egg vertically between the index finger and your thumb, then shine a bright light, preferably from a LED torch from the opposite direction. If the process is carried out correctly, the farmer can see the veins, including the developing chick, and decide if the egg should be discarded or retained for brooding purposes. This form of examination ensures that only fertile eggs with a high chance of hatching are selected for brooding.

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 52 September 2009

Farmers should always ensure there is adequate fodder for the dry season.

Fodder shortage hits dairy farmers

The price of milk has already gone up due to low production caused by shortage of fodder.

The Organic Farmer

With the failure of the long rains in most parts of the country, one category of farmers who are hard hit by the prevailing dry conditions are livestock keepers. Dairy farmers have experienced a sharp decline in milk production due to lack of pasture while pastoralists in Northern parts of the country have already lost thousands of livestock due to lack of pasture and water.

With modern weather forecasts, dry conditions are predictable and farmers should devise ways of coping with such conditions. Although most of the weather forecasts by experts do not come to pass, drought cycles have become so common that farmers need to plan ahead to ensure they have adequate fodder at all times. Most dairy farmers are spending a lot of money to buy hay and any type of fodder available. Milk prices have gone up due to low production caused by fodder shortage.

But the current dry spell should be a lesson to most farmers that they need to plan for their fodder needs on time. In previous issues of *The Organic Farmer* we have showed how farmers can prepare hay and even silage for use during the lean times. Despite the advice, we would like to ask one question: How many farmers prepare hay or silage for their livestock?

More milk with green manure legumes

Green manure legumes improve not only the quality of soils, but are also valuable protein supplements for animal feed rations. According to studies carried out by KARI, lactation performance with Jersey and Friesian cows in coastal part of Kenya (Mucuna, Clitora, and lablab) and North-Western Kenya (mucuna and lablab) was improved greatly on supplementation with green manure legumes. In coastal Kenya, the green manure legume effects on milk production were equivalent to those realized with gliricidia, the recommended legume supplement in dairy rations. In semi-arid Eastern Kenya, siratro, glycine, lablab and mucuna were shown to be as effective in inducing weight gain in goats as Leucaena leaf meal. *See page 3*

in this issue

Dear farmers,

The government is once again crying for assistance from Western countries, and it has once again announced a countrywide relief operation to save more than 10 million Kenyans who face starvation in various parts of the country. To put it mildly, nothing has really changed in our country. The food crisis is yet another indicator that the country has been unable or lacks the political will to put into action concrete measures that can provide adequate food to its people.

Understandably, the erratic weather and the after effects of last year's post-election violence had an influence on food shortage. But the real problem is purely lack of planning – a result of corruption and inefficiency. Good examples of this failure are the many policy papers prepared for donors to raise funds for revival of agriculture, which are never implemented. The money raised through these blueprints often disappears.

All of us remember what happened at the beginning of the year when food meant for the country's strategic food reserve at the NCPB was sold to individuals who later sold it at exorbitant prices to millers and even managed to export it to Southern Sudan, where a bag of maize was selling at Ksh 6000. Subsidised fertilizer meant for poor farmers was bought from the board and sold to traders at high profits by corrupt officials. Consequently, our farmers are a neglected lot; up to now many who delivered their produce to NCPB last year are yet to be paid.

Ironically, whenever we have a bumper harvest, the government has let down farmers by not buying the surplus produce forcing them to sell it to middlemen at throw away prices, only to import the same commodity the following year when the rains fail.

Our farmers have the capacity and the will to produce enough food for the country if they had access to cheap credit and a reliable marketing system. Better infrastructure would make it easier to transport food from one part of the country to the other. Strategic institutions such as the NCPB should be restructured to ensure they are properly managed. There should be resources to buy enough food to last the country for two or three years. Any government can achieve these goals – if it is really concerned with the welfare and the plight of its people.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

It is good to know your animals' weight

Weight data of animals can help the farmer to plan for feeding, drug dosage and marketing.

The Organic Farmer

Many farmers will admit that they have never bothered to know the weight of each of their animals. Establishing the weight of your dairy cows, bulls, sheep and goats, rabbits or even chickens is very important.

A farmer can use the information on animal weight to make a number of vital decisions that affect the health of their livestock – and the projected income!

Useful information

Feed weight: Feeding a cow without knowing its weight will result in either underfeeding or even overfeeding; an animal can only be properly fed if the feed corresponds to its weight; so farmers especially the ones who rear beef cattle should know how much their animals weigh.

This helps to ensure that the animals are disposed off immediately they attain the desired weight; it is uneconomical to continue feeding animals when they have already attained the marketable weight.

Drug dosage: Treatment is another area that needs weight monitoring; any dosage administered to an animal should take into account its weight.

Marketing: If a farmer is willing to sell an animal it is wise to know the animals' weight; otherwise, there is always the danger of being exploited by crafty buyers. This happens every day at the market place. Middlemen will always take advantage of the farmers' ignorance. They pay less for the animal and rake in hefty profits selling the animals to the butchers and slaughter houses.

Determining an animal's weight does not cost much. All a farmer needs is a tape measure and the weight chart printed on this page. Measure the circumference of the chest also known as heart girth. Measure from the point slightly below the shoulder blade, down over the front ribs and under body behind the elbow.

Large animals

Live weight of large ruminants can be estimated by measuring the chest with a tape measure or a calibrated string. Approximate weight can be calculated using the table below; cm (Centimetre) stands for heart girth and kg (kilogramme) for the weight.

cm	kg	cm	kg	cm	kg
65	35	115	134	165	360
70	40	120	150	170	392
75	45	125	170	175	429
80	50	130	190	180	467
85	59	135	210	185	508
90	69	140	230	190	552
598	75	145	252	195	598
100	89	150	272	200	648
105	103	155	295	205	698
110	118	160	325	120	748

Small animals

Measure the heart girth of small ruminants (goats or sheep) using a tape measure or string. Pull the tape tight. Use the table below to estimate the weight; cm (Centimetre) stands for heart girth and kg (kilogramme) for the weight.

cm	kg	cm	kg	cm	kg
27.3	2.3	52.7	15	78	40.8
28.6	2.5	53.9	15.9	79.4	42.2
29.9	2.7	55.3	16.8	80.7	44
31.1	3	56.5	17.7	81.9	45.8
32.4	3.2	57.8	19.1	83.2	47.6
33.7	3.6	59.1	20.4	84.5	49.9
34.9	4.1	60.3	21.8	85.7	52.2
36.2	4.5	61.6	23.1	87	54.4
37.5	5	62.9	24.5	88.3	56.7
38.7	5.4	64.1	25.8	89.5	59
40	5.9	65.4	27.2	90.8	61.2
41.3	6.8	66.7	28.6	92.1	63.5
42.7	7.7	67.9	29.9	93.4	65.8
43.8	8.6	69.2	31.3	95.9	70.3
45.1	9.5	70.5	32.7	97.2	72.6
46.4	10.4	71.7	34	98.4	74.8
47.6	11.3	73	35.4	101	79.4
48.9	12.2	74.3	36.7	102.2	81.6
50.2	13.2	75.6	38.1	103.5	83.9
51.4	14.1	76.8	39.5	104.8	86.2

Source: Veterinary Research Institute, Sri Lanka

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

Use the right dosage of drugs!

Treating sick animals is a challenging task. Farmers need not only to buy the right drug; it is important to choose the correct dosage depends on the weight of the animal and the severity of a disease.

Larger and heavier animals usually require a higher dosage than younger and lighter animals. In most cases, what matters is the amount of the active ingredient in the drug. The active ingredient is the substance that actually does the work of curing or preventing the disease. Some drugs have more than one active ingredient e.g. penicillin and streptomycin. For liquid medicines, the concentration is usually given in milligrams per millilitre of the medicine (mg/ml). For tablets and capsules, the concentration is normally given in milligrams per tablet or capsule. Antibiotics and vitamins are sometimes given in special units called International Units (IU) instead of milligrams. Because of these variations, it is not possible to direct a general rule on what dosage to use.

However it is important that farmers stick to the following guidelines:

1. Read the label carefully. Follow the directions on dosage, how to apply it and how often to repeat the treatment.
2. The medicine's label might direct you on how to apply a certain amount of

Continued on page 8

Rabies: a highly fatal disease we ignore

People in rural areas are often not well informed about rabies. The law demands vaccinations for dogs.

William Ayako

Rabies, also known as Hydrophobia (fear of water), is a highly serious viral infection. There are an estimated 55,000 human deaths annually from rabies worldwide, with almost half of them (24,000) occurring in Africa. Two cases of rabies related deaths have been confirmed recently in Nyanza province. The deaths were reported in Kombura location of Kadibo division between the months of May and July 2009.

The problem has been compounded by the increase in number of stray rabid dogs as well as by people's ignorance about appropriate control measures of rabies. Once infected, the public often resorts to traditional healers who are equally ignorant about the dangers of the disease. Some people think that religion or magic can protect them and their animals from rabies. This is indeed a dangerous belief, which ignores well-known medical facts and may lead to loss of life caused by the disease.

The disease is relatively common in rural than in urban areas. Most rural folk is not aware of the dangers associated with rabies which is often transmitted by dogs. Dogs are regarded as a source of security in the rural areas and are present in almost every homestead. Its occurrence is also attributed to the social attachment to the local dogs kept and regarded as pets by the youth. Vaccination against rabies is possible but expensive, and therefore hardly practised.

Dog owners queuing to have their dogs vaccinated against rabies in the Mara.

Efforts in Kadibo division

In Kadibo division, the department of veterinary services, in collaboration with provincial administration and ministry of education, organized a mandatory vaccination campaign for all domestic dogs in the division as a control measure against the spread of rabies. The public was informed of this plan by the provincial administration through the local schools.

The first vaccination was done in Kombura location on 9th July 2009 at Kombura location chief's camp. About 200 dogs were vaccinated at a cost of Kshs. 50/- per dog, and their owners were issued with a vaccination certificate. Three more control campaigns are planned to cover the remaining locations. After completing the campaign in the division, all unvaccinated dogs will be killed by the veterinary department to eliminate further chances of transmission by dogs.

We appreciate the overwhelming publicity support by the chiefs of Kombura, Katho and Kochieng locations. The clinical support by the veterinary department of Kisumu east district was great. Lastly the cooperation and response from members of the public in Kadibo was very positive. W.A.

How rabies is spread

The virus affects humans, all warm blooded wild and domestic animals with the exception of birds. Dogs are regarded as the main transmitters of the disease but other domestic animals such as cats, cattle, sheep and goats can also transmit the disease among themselves as well as to humans.

Transmission happens when an infected animal bites another animal or a human being and the saliva containing the virus enters into the blood stream through the fresh wound. The virus then spreads from the location of the bite along the nerves to the brain, the spinal chord and the salivary glands. The infection may take between two weeks and several months to show symptoms. It is only after this period the typical signs of rabies are recognized.

The symptoms in animals

The inflammation of the brain caused by the disease results in unusual behaviour: Over excitement, mania and an attack complex by the infected animals. The disease can last for as few as two days to about a week, after the onset of the first clinical signs.

- The first sign is change of behaviour which may take two to three days in dogs.
- The next stage is the excitement stage whereby the animal displays the typical signs of rabies: Restlessness, aggressiveness and voice changes. Depending on the species of the infected animal, the voice changes may include howling, roaring and bleating.
- In the stage referred to as "furious rabies", dogs often make unprovoked attacks on other animals or objects. This stage lasts for about four days. It is the most dangerous stage of transmission from dogs to humans.
- The infected animal then develops paralysis from the rear limbs and refuses to eat or drink while profusely salivating. This paralytical phase is often referred to as 'dumb rabies'.
- Death then quickly follows.

Prevention and control

The Kenyan law requires that all dogs be vaccinated against rabies. It is a fatal disease for infected animals and humans and there is no cure once the symptoms have started. Therefore, any suspected case of rabies must be reported immediately to the veterinary department.

There is only one way to survive an infection with rabies: Immediately after a bite from a rabid animal, getting immediate medical attention. Only an anti-rabies vaccine can prevent the virus from progressing.

The cost of anti rabies vaccine for human immunization is expensive. The cheapest of this costs about Kshs. 10,000/- in public hospitals, or more in private hospitals. Therefore, it is cheaper to vaccinate a dog at a cost of Kshs. 50/- per year! This protects your dog from getting or transmitting rabies to you or to other animals.

Warning!

Remember always that there is no cure for rabies and it is not advisable to try to treat an animal infected with rabies due to the dangers posed by handling such an animal.

Identify a market before going organic

Many farmers are interested in organic farming. The challenge however is finding a market for their products.

Su Kahumbu

Many farmers are inquiring from TOF about organic markets. Their questions usually centre on the themes of products for organic markets, the requirements of the organic market and the domestic organic markets.

A strawberry producer in Nyeri wishes to convert to organic strawberry production. He asked us to give him advice on organic markets. Using him as an example, I would suggest the following procedure.

1. Locate the market first.

Ask yourself:

- Where and to whom can I sell my organic strawberries?
- At what price shall I sell my commodity?
- How much can I deliver, how often can I supply?
- Who are my competitors? Are there farmers or farmers' groups in the region who are already successfully producing organically?

2. Experimental production.

When you are sure that you will be able to sell the organic strawberries, experiment with a small area under organic production at first. Produce for both markets while you get used to organic production. The diseases that afflict strawberries are quite difficult to manage organically, and you risk loosing an entire yield. Alternatively, look at simple value addition of the strawberries (like making strawberry jam?)

In short, when growing any products for a market, the first step is always to identify the markets and the buyers. It has to be clear where and to whom you can sell your product before you start producing!

Other factors you have to consider include: distance to the market, prices at the market, production costs of your product, and the shelf life of the product (this is the period within which you have to sell the product, before it deteriorates). In the case of strawberries, shelf life is very short, and you have to identify the market long before the harvest.

3. Organic market requirements

Organic products can be produced either for export or for domestic markets.

The export market and formal mainstream markets usually require certified and labelled products. 'Certified' means that an independent company has controlled the producer and has verified that the product has been produced within certain rules, 'an Organic Standard'. This standard describes in detail how a product must be produced in order to be labelled and sold as organic.

In other words, if you found a buyer who purchases certified organic products, you will have to follow precise production rules, the storage of the commodity controlled and you will also have to pay certification costs.

In Kenya, we have the 'National Organic Standards of Processing and Production' recognised by the Kenya Bureau of Standards, as well as the 'East African Organic Standards'. Usually, certified organic products can be sold at a higher price than the same conventionally produced products. Certification and labelling act as insurance against unscrupulous conventional producers who may claim their products are organic. A label gives a certain guarantee that a product has really been produced organically.

Less formal markets, institutions etc. may not be as strict. Home grown domestic markets may not require certification at all but rather a simpler more cost effective form of verification (see point 5: Domestic organic markets).

4. Change to organic

Any farmer wanting to convert from conventional to organic production should know what 'Organic Production' means and entails. Many people believe it is simply the none-use of chemicals. But organic production goes beyond zero use of artificial fertilizers, herbicides, fungicides and pesticides. It is a way of life, a style of producing healthy products by understanding, valuing and respecting the integrity of the people and the environment in which we live.

For small-scale farmers, conversion to certified organic production is a challenge. They have to fulfil a long list of requirements, including some which are quite different from traditional or conventional farming practices. Knowing the requirements, as well as an understanding of the allowed substances for pest and disease control, is imperative.

Some companies which export organic products contract farmers' groups for organic production, and they usually offer them training. Because of the high costs for certification, which has to be repeated every year, small-scale farmers have to be organized in contractable producer groups. In a group, the certification fee is divided between the members.

5. Domestic organic markets

Many farmers would like to sell organic products on the local market. Is there really no demand for them? In the urban setting of Nairobi, organic products can be marketed successfully. Green Dreams (GD), which started as a little farm producing organic products for mainstream markets, is a good example of it. By using certification and symbols, consumers can be convinced of the integrity of the organic products.

Last year, the Kibera Youth Reform Group (KYRG) started an organic farm in Kibera which today markets and sells organic produce in Kibera. Each day the youth place their freshly harvested products out on a table beside the farm and educate their consumers about the high value of their production.

What if we tried to imitate this countrywide? Rural organic producers should make an effort to let their buyers in local markets know of the value of their produce. This can be done through word of mouth, with fliers, etc. Be self-confident! Let your buyers know what you have, and why they should buy from you!

Legumes are a valuable source of protein

Livestock fed on green manure legumes give more milk and produce highly valuable manure.

The Organic Farmer

Green manure legumes such as mucuna, clitoria, purple vetch, leucaena, lablab, Glycine and jackbean are not just used for improving soil fertility. Studies done by KARI found out that legumes are a valuable source of protein for cattle fed on low quality basic diets. The studies were carried out in coastal, semi-arid and North-Western Kenya to evaluate the potential of green manure legumes for improving the performance of livestock.

Increased feed intake …

Coastal Kenya: The studies evaluated the lactation performance of Jersey cows fed on a basic diet of either Napier grass or maize stalks. The legumes (mucuna, clitoria and lablab) were shown to significantly increase dry matter digestibility by 13% and feed intake by 24% in cows fed on maize stalks as basic diet. For cows fed on Napier grass, which had higher concentration of nitrogen than maize stalks, legume supplementation had no effect on digestibility and intake.

North-Western Kenya: In cows fed on a basic diet of Napier grass, the supplements with mucuna or lablab had no significant effect on the intake of the basal diet. However, total intake increased by 23% while dry matter digestibility went up by 9%. In each of the studies there were no significant differences between the legumes.

…and higher milk production

In coastal Kenya: Jersey cows supplemented with clitoria or mucuna produced 30% more milk than those fed on Napier grass alone. At the same site, cows fed on a basic diet of maize stalks and supplemented with clitoria or mucuna produced 15% more milk than those fed on maize stalks only.

In North-Western Kenya: mean milk yield of Friesian cows supplemented with mucuna or lablab was 15% more than the milk yield of cows fed on Napier grass alone.

Goats in semi-arid Kenya fed on a mixture of natural pastures and Napier grass lost 23.8 g daily while those supplemented with siratro and soya glycine gained 4 and 16.4 g daily, respectively.

High quality manure

Green manure legume supplements improve animal performance as well as the quality of manure produced by cattle and goats. Although manure output of Jersey cows in coastal Kenya was not affected by legume supplementation, supplementing the basic diet with clitoria or mucuna increased the nitrogen concentration in the manure by over 70% and reduced its phosphorus and potassium concentration. A similar trend was evident in the nitrogen concentration of manure from goats fed on green manure, which was 51% higher than that of goats fed on the basic diet only.

NOTE: Farmers who need to buy seeds or seedlings of green manures mentioned above should seek assistance from KARI stations or extension workers near them.


Lablab


Jack beans


Canavalia

Other uses of green manure legumes

For farmers who grow green manure legumes, it is like killing two birds with one stone. Almost all farmers who keep animals also grow crops. One advantage of green manure, legumes is their contribution to soil fertility. The use of green manures as we have mentioned before is one of the methods used in sustainable agriculture to maintain soil fertility.

Since all green manures are leguminous plants, they help fix nitrogen into the soil. This nitrogen enriches the soil and feeds all plants that may be planted in the same soil. Research shows that green manures can fix about 40 to 60 per cent nitrogen which is ready for use by any plant that is planted on rotation. For example, a purple vetch crop that accumulates 90 kg of nitrogen per acre will leave 45 kg nitrogen per acre that can be used by any other cereal or vegetable crop planted later on the same land. This amounts to increased yields. Indeed green manures boost crop yields for the next two or three growing seasons.

Provide more manure

Apart from providing nitrogen, green manures also help to suppress weeds and protect the soil from erosion, wind, water and direct sunlight. Green manures penetrate the soil with their roots, bind nutrients and support the infiltration of water into the soil. Their contribution of organic matter to the soil from a green manure crop is comparable to the addition of 9 to 13 tonnes per acre (0.4 ha) of farmyard manure. The soil cover they provide reduces soil crusting, and surface water runoff during raining seasons. However, the following tips are important for farmers who grow green manures:

- Those using green manure crops to provide fodder and soil improvement need to balance their needs to ensure that they have enough to feed their livestock and reserve part of the green manure residue for incorporation into the soil.
- If you grow green manures in rotation, the time of sowing must be chosen such that the growing plants can be cut down and worked into the soil before the next crop is sown.
- If legumes and green manures are grown in a field for the first time, innoculation of the crop with specific rhizhobia is necessary for one to benefit from nitrogen fixation. (Rhizobium is available for sale at the University of Nairobi, Kabete campus or Kenya Seed Company stores).
- Green manures can be worked into the soil easily, while still young, just before flowering.
- Green manures should be incorporated near the surface of the soil, between 5 to 15 cm deep in light soils, 10 cm to 20 cm in all other types of soils. **TOF**

Here are the *i-TOF* centres

The four *i-TOF* centres that we opened in various parts of the country are now busy providing information and training to farmers in the selected regions (see maps below). Our extension workers are receiving requests for training, information and organic inputs on a daily basis. Farmers are making calls, sending text messages and letters asking questions relating to sustainable agriculture and organic farming. This is a clear indication that farmers want to learn more to improve on their farming methods and practises. It is also meeting one of the main objectives of *The Organic Farmer*, which is to move closer to the farmers and solve their problems in a more practical way. The project will be reviewed periodically and the findings will form the basis for the continuation of the *i-TOFs* and for a possible expansion to other areas.

Observe punctuality

The *i-TOFs* have started very well. There are only two problems:

- Most farmers are not keeping time, forcing our extensionists to waste a lot of time, which would have been utilised in training. Are farmers not really interested? Coming half an hour or even one hour too late is an indication that some farmers do not take the programme seriously. We urge the farmers group leaders to ensure that they encourage members to keep time on training days.
- Some farmers groups are bothering our extension workers with requests for financial assistance to be able to implement various projects within their groups. We understand their wishes. But *The Organic Farmer* as well as our radio programme and the *i-TOFs* are concentrating on the information and sharing of knowledge and skills within the small-scale farming community. We do not offer any form of credit. Farmers' groups in need of credit facilities can make their own arrangements for these with the various institutions that offer credit in their respective regions.

Our training conditions

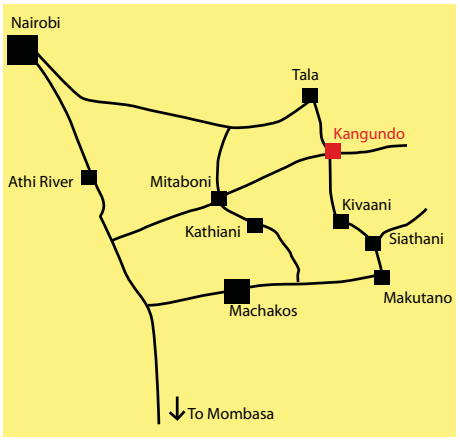
Farmers interested in training have to fulfill the following conditions:

- The training will be conducted free of charge to all interested farmers groups.
- The farmers have to identify a training venue and organise a demonstration plot where the training will take place.
- Training can only be provided to farmers with a least 15 members or more.
- Each training session will take 4 to 5 hours. Farmers are therefore requested to be at the training venue on time.

The *i-TOF* programme is offering training modules in all areas of sustainable agriculture and organic farming to help farmers improve their farming practises which will help them increase yields and income. The farmers are also expected to use ecologically sound farming methods that utilise the available resources in a way that protects the environment.

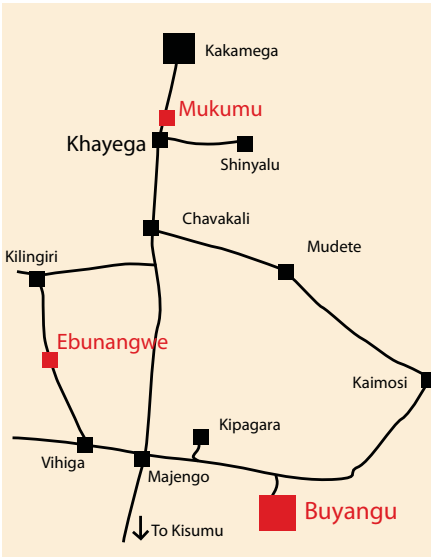
i-TOF centre, Kangundo, Eastern

Host: CBO Kangundo Dairy Farmers (KDF), running a milk bar
Location: KDF-milk bar in Kangundo Town
i- TO F information: Within the premises of KDF, equipped with the whole information package, run by the TOF-extension worker
Contact: 0724 331 405
i- TOF organic inputs Shop: Situated within the premises of KDF in Kangundo town.



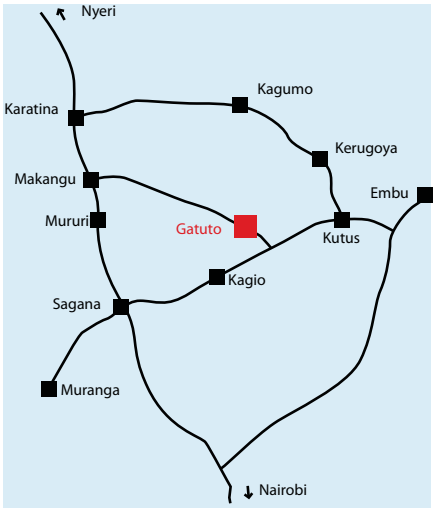
i-TOF centre, Buyangu, Western

Host: Main office of the Sustainable Organic Farming Development Initiative (SOF-DI), Buyangu
Location: (SOF-DI) Buyangu, in the compound of the Catholic parish
i- TOF info centre: Within the premises of SOF-DI, equipped with the whole information package, run by the TOF-extension worker
Contact: 0724 331 456
i- TOF organic inputs Shop: Situated within the premises of SOF-DI main office in Buyangu



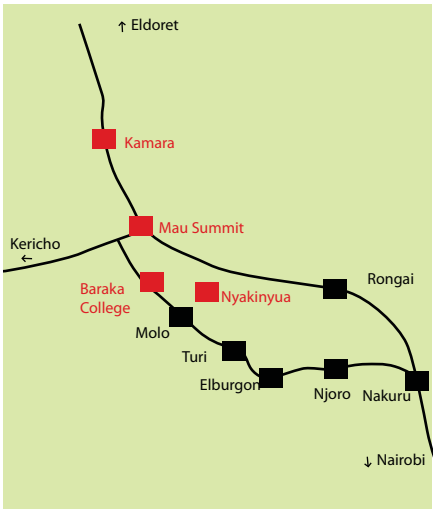
i-TOF centre Gatuto, Kerugoya

Host: Amuka Farmers Self-Help Group, Gatuto
Location: Meeting and education hall of Amuka Farmers Self Help Group, Gatuto
Location i-TOF information: Within this meeting hall; equipped with the whole information package, run by the TOF-extension worker
Contact: 0724331 375
i-TOF organic inputs Shop: An agrovet shop in Kagio; to be named in the TOF August-issue and by direct mail to farmers' groups.



i-TOF centre, Baraka College, Molo

Host: Baraka Agricultural College, Molo
i-TOF info centres: In the three Baraka outreach centres each staffed with an extension worker
Contact Kamara: 0725 507 038, 0720 041 556, 0725 665 781
Contact Mau Summit: 0723 778 688, 0725 854 197, 0726 714 708
Contact Nyakinyua/ Sirikwa: 0721107 981,0723 792 099, 0724 704 586.
i-TOF organic input shop: Located within Baraka Agricultural college.



Green houses profitable but initial costs high

Many crops can do well in a green house. But pests and diseases can be a problem.

The Organic Farmer

Every month, **TOF** receives volumes of questions from small-scale farmers concerning greenhouse food production. The farmers' quest is to establish whether putting up a greenhouse would be a better option for them or not. Indeed, greenhouse food production system can be profitable. It has been encouraged in recent years by the Horticultural Crops Development Authority which offers free technical training on the same. Additionally, some banks offer credit facilities to farmers willing to put up greenhouses.

Greenhouse food production has been developed to prolong the growing season in cooler regions of the world, mainly for crops like tomatoes, peppers, chillies or cucumbers, which require high temperatures for growth. Greenhouses also protect the crops from rainfall, especially tomatoes, which do not like rain at all.

Greenhouse production is usually combined with a drip irrigation system, which allows for efficient use of water resources. If water management is well organized, it is possible to prolong the growing season in dryer areas. Greenhousing is also seen as a way of intensifying production for farmers who own small pieces of land.

In Kenya, greenhouse technology is being mainly practised around Naivasha in the flower industry, where higher temperatures and prolonged daylight are required. Industrial greenhouses use complicated techniques for temperature and moisture control and for fertilizer supply. Greenhouses of this type are not suitable for small-scale farming: they are too expensive and difficult to maintain.

Promises and problems

Less complicated greenhouse systems are now being advocated for tomato production (*see box*). Farmers are attracted by the information that tomato yields in greenhouses could be ten times higher compared to tomatoes grown in open fields. It is also claimed that labour input is low, and that less water and chemicals are needed.

However, there are several pitfalls for this technique. It is not easy to handle, especially for small-scale farmers who have littele experience.

1. High initial investments are required. If you fail, you will end up heavily indebted. Check seriously whether you are able to carry this risk before you set up a greenhouse.
2. Labour requirements should not be underestimated. You will have to control irrigation continuously. Important as well is to keep a keen eye on the climate in the greenhouse permanently, otherwise your crop will easily do poorly. Very high temperatures for example reduce growth and fruit set.
3. Due to the higher temperature and moisture in greenhouses, pests and diseases develop very fast. Spidermites and fungal diseases (early and late blight for instance) and bacterial wilt need greater attention and most probably treatment with chemicals. This is a contradiction to the claims that are made by some people promoting greenhouses.
4. The best greenhouse will not fulfil the high expectations raised by agricultural advisors if the crop is not fertilized adequately and managed with attention. Tomatoes thrive in soils rich in organic matter, therefore it is an advantage if you are able to supply manure or compost.
5. If you grow tomatoes in your greenhouse season after season, diseases will quickly accumulate in the soil. This will result in high disease levels within a short time. The only way to avoid this would be to move your greenhouse to another location as soon as you discover that diseases are becoming serious.

Greenhouses and organic farming

We do not discourage you from building a greenhouse. But you should carefully consider the risks involved. This is especially so if you do not want to apply chemicals and cannot get a good premium for tomatoes which have been grown naturally (without chemicals). In this case, greenhousing is not exactly what you should try to do - unless you have the resources.

Greenhousing can be challenging

Required materials:

- Woodwork for the construction of the frame (depending on the size, from Ksh 40,000 upwards)
- **Polyethylene sheets**: new ones are expensive
- Irrigation system (from Ksh 7,000 for 300 plants upwards)

Crop care

- **Temperature control**: When the sun is shining, temperatures in the greenhouse will go up very fast. Cooler air from outside must immediately be allowed to circulate in the greenhouse. You have to think of an adequate ventilation system. During colder periods (at night and in cloudy or rainy weather), you need to close the greenhouse.
- **Control of diseases**: The warm, moist climate in the greenhouse promotes not only the growth of the crop, but also fast multiplication of pests and diseases. Most probably you will not be able to control them without the use of chemicals.

Grow maize varieties compatible with the short rains

Failure to adapt to the inadequate rains by farmers has led to food shortage. This harsh condition can however be overcome.

The Organic farmer

Most Kenyan farmers do not like growing drought resistant crops. They prefer dealing with those that they have grown for decades. But with the problem of climate change, most of the crops may not do well at all.

Farmers have already witnessed what has happened this year; the rains which were expected in mid-March delayed until late April.

The farming community needs to look for varieties that can do well in their regions. Most seed dealers do not tell farmers the truth when they go to buy seeds; they will often advise a farmer to buy a particular variety that they want to sell, not the one that does well in the particular region where the farmer comes from. The other problem is that all farmers have abandoned traditional crops that used to withstand changes in weather, pests and even diseases. Most of these crop varieties now referred to as "orphan crops" hold the key to food security in Kenya and many other African countries. It is time that farmers started thinking about them in view of the changing climatic conditions. Below we give you some of the drought resistant crop varieties that can do well in most areas without adequate rains.

Sorghum

Sorghum is Africa's oldest food crop. Although it is often referred to as the continent's food for the poor, it holds the answer to Kenya and Africa's food security. Sorghum is not only drought-resistant; it is also adaptable to most of Kenya's climatic zones and soils. It is full of energy-giving nutrients, unlike other cereal crops such as maize

and wheat. The high concentration of potassium and starch in sorghum, its less acidifying effect and the fact that it is easily absorbed and well-tolerated makes it ideal food for those who are sick, diabetics, adults and children. Bakers use it to add flavour and colour to bread and other bakery products. Traditionally, sorghum is used to make ugali or fermented porridge. In Kenya, sorghum is grown in areas with as little as 250 mm of rainfall although it can do better in areas with an average rainfall of about 600 mm. Local varieties of sorghum are less prone to bird damage compared to hybrid ones. To get a good yield, farmers should buy seed varieties suitable to their climatic zones. They can get advice from agricultural research station or extension personnel near them.

Cassava

Cassava is an important food crop especially in Western Kenya which produces and consumes more than 60 per cent of the national cassava production. It produces tubers between 6 months and 3 years depending on the variety. It has the ability to withstand poor environmental conditions such as low rainfall and infertile soils. Cassava is a major source of carbohydrates for poor families because of its high starch content. It can grow well with little management, a reason why it becomes the main source of food in times of war

or natural calamities. Its leaves can also be eaten as a green vegetable. In some African countries, cassava flour has replaced wheat in making bread. Cassava Mosaic Disease outbreaks in 1994/95 threatened cassava production in the country but new varieties resistant to the disease have now been developed. The migyera variety is the most popular as it is CMD resistant.

Pigeon peas

Pigeon peas are a nutritious leguminous plant whose ripe seeds are made into flour while the green seeds can be used as a vegetable. The plant is drought resistant and grows well in dry areas with as little as 650 mm of rainfall. It can produce up to 8 bags

per acre. New varieties which mature in 4 months have been developed. In Kenya, four of the new varieties have been developed by the International Research Institute for Semi Arid Tropics (ICRISAT) which is giving free seeds to farmers. Farmers in Eastern province have abandoned maize production in favour of pigeon peas.

Choose right maize variety for the short rains

Below are some of the maize varieties that can do well in the short rains:

Katumani composite: The variety does well in both high potential and low potential areas. It matures between 3 and 4 months. It can be re-used as seed for up to three seasons, without affecting the yield. It can produce about 12 bags an acre.

H511 and H12: These two varieties do well in high altitude areas with moderate rainfall. They mature between 4 and 5 months. They can produce between 16 and 18 bags an acre. Other varieties that do well in depressed rains are DH01, DH02, DH03, DH04, DH09 DH10 and PH4 (suitable for coastal areas. Seeds for all these varieties are available in agro-veterinary shops and Kenya Seed Company stores.

>>> from page 2

medicine for every kilogram of weight. Use the weight chart to estimate this. If you are not sure, ask a veterinarian, experienced livestock farmers or the owner of the agrovet where you bought the drug. Note that applying too much or too little of a drug is dangerous as it can kill the animal. It might also fail to cure the disease. In addition, the disease organism might also become resistant to the drug which makes the disease more difficult to treat. **TOF**

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION

Nr. 47 April 2009

Turkeys need proper care

Turkeys are difficult to rear. Many farmers who have tried to bring up young chicks have ended up being frustrated after the chicks died. This is one reason why it is rare to find a farmer who is rearing them. Turkeys require good management. They eat more than chicken, mainly to maintain their big body size. Before rearing them, farmers should explore potential markets because maintaining them after maturity is costly. Page 5

How you can reach *The Organic Farmer*

In order to improve our services, we have introduced a few changes in the way we receive feedback from farmers. From now on, farmers should use the following contacts when sending their messages:

SMS

All SMS should be sent to Tel. 0716 618 189

Calls

All calls should be directed to Tel. 0721 541 590 or 0738 390 715

Our landline number Tel. 020 445 03 98 remains unchanged.

E-mail

E-mails are welcome, they should be addressed to: info@organickenya.org

in this issue

Top-dressing works faster on plants

After planting, the big challenge that follows for the farmer is how to maintain their crop healthy and growing normally. For farmers who did not use enough fertilizer at planting time, it is always wise to add foliar feed after 3 to 4 weeks. Instead of buying expensive foliar feeds, farmers can prepare their own using various plants that contain essential nutrients. Liquid manures and other foliar feeds are absorbed by plants 20 times faster than granular fertilizers and even well done compost. *Page 3*

Dear farmers,

When we started the publication of The Organic Farmer magazine in April 2005, we were aware of the many challenges we would face, like producing well-researched articles every month or how to distribute TOF to the farmers. One of our major worries was whether the information we gave was relevant to farmers. As we commemorate four years of publication, we can say, the magazine has become one of the major sources of information for farmers in the country. It is also a major reference material for agricultural institutions, extension personnel and even schools.

Going by the hundreds of SMSs, calls and even e-mails we receive every month, it is easy to tell that farmers heavily rely on the magazine to improve their knowledge on farming and especially organic farming. The end result of this has been the transformation of the farming community in the country into one that is familiar with ecologically sound crop and livestock production methods, as well as the environment. Farming as it is being practised at the moment in Africa and elsewhere in the world, has led to the depletion of our soils and even biodiversity; it is also partly to blame for climate change. Farmers can reverse this by adopting sustainable farming methods that help us to eat healthy food and protect the environment.

In the last 4 years, we have increased the number of TOF copies from 10,000 to 18,000 that are now being distributed in Kenya and even in the neighbouring countries. The TOF radio programme has enabled us to reach the rural population, many of whom cannot read and write. Apart from KBC, we are now using vernacular FM radio stations in the country to ensure the message reaches as many farmers as possible. Our new Internet Information platform and the infonet-biovision CD, enable farmers across the world to access the magazine.

All these achievements would not have been possible without the input of scientists and experts in various fields in agriculture who have availed their research findings and are ready to share their experience with farmers. Our special thanks go to the Swiss Foundation BioVision, which has continued to fund the production of the magazine since its inception in April 2005. We look forward to BioVision's continued support.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0721 541 590, 0738 390 715, Email: info@organickenya.org

Charles Munyari, a tireless *TOF* distributor

Even after four years of distributing TOF on foot, Mzee Charles Munyari still likes his job

Felix Mbitu Murimi

"At the second week of every month, streams of farmers knock at my door seeking to get a copy of The Organic Farmer (TOF) magazine," says Mr. Charles Munyari. What might look like a complain is quickly translated into a note of achievement and pride when Mr. Munyari talks about his experiences as TOF-distributor – with a lot of satisfaction.

Charles Munyari, *TOF* distributor in Subukia valley, works on his compost. (Photo TOF)

Pushing groups ahead

Since the inception of TOF in 2005, Charles Munyari, an organic farmer in Subukia Valley, has been a successful distributor of TOF in his area. His mode of distribution for the magazine is his legs or route 11 as it is popularly known. The energetic and focused man (66) has defied limitations of his age, rough terrain and severe weather conditions that are characteristic of this part of the Great Rift Valley to distribute TOF to so many farmers' groups and schools. "I feel happy when the magazines reach the targeted people," quips Mr. Munyari. "Furthermore, it is quite gratifying to see farmers discussing TOF articles, supporting each other and eventually adopting organic farming," boasts the distributor.

Despite ensuring that the magazine reaches farmers, over the years, Charles Munyari has helped in the formation of farmers' groups in his area. Through these groups, members have been able to educate themselves on various aspects of organic farming, sustainable agriculture and environmental management. "I have learnt to make compost, shifted form conventional to organic farming, and I will never go back!" declares the organic farmer with a distant look at his farm that is an exhibit of his success in organic farming. Taking a walk around the farms in this area, it is evident that Charles Munyari is not the only one practicing organic farming but quite a number of farmers are.

Some challenges

At times, the activities of the organic farmers in Subukia Valley suffer from some setbacks. Firstly, the Agricultural Extension Officers in the area, who visit farmers on their farms, tend to emphasize on conventional methods of farming as opposed to the organic ones. This trend, regrets Charles Munyari, might water down the efforts of farmers' groups because such government officers are always seen as having much authority and knowledge. The only contradiction in this situation is that the same Agricultural Officers often ask for copies of TOF and use them as reference material on farming.

Unavailability of most of the organic farm inputs usually proposed by TOF is yet another hurdle that farmers in this area have to overcome. Finally, just as in any other area, farmers in Subukia Valley would wish that they have enough copies for each one of them every month.

All these hurdles aside, Charles Munyari is convinced that the future is bright for organic farmers in his area. His wish is summarised in a proposal for a meeting of all organic farmers in the country. This forum, he argues, would offer farmers a chance of sharing ideas and expertise on organic farming, ecological balance and environmental protection. More to that, farmers would have a chance to interact with their counterparts in looking for solutions to some of the challenges they face in organic farming.

The answer to our question, on whether he will continue with the distribution of TOF comes very fast: "Of course!" He shouts amidst some laughter. "For me it is a good way of meeting farmers and sharing with them, " he explains. "I hope I can do this for many years to come." ■

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98,
0721 541 590, 0738 390 715
e-mail: info@organickenya.org,
www.organicfarmermagazine.org

TOF celebrates fourth birthday

In April 2004, we launched your magazine, *The Organic Farmer*. In view of the commemoration of this event in April, we published a short series on farmers' groups in Subukia valley as an example of all the farmers' groups we are dealing with. How has *TOF* influenced their farming methods and their social life? And what is the experience of Charles Munyari, a *TOF* distributor since the inception of the magazine?

In this third and last article on this page, we feature the work of Charles Munyari, TOF distributor and organic farmer from Subukia valley.

Turkeys bring profit – and challenges

Before rearing turkeys farmers should do correct timing to ensure there is a ready market when the birds mature.

The Organic Farmer

Several farmers have requested us to show them how to rear turkeys. Most of them who are beginners often fail to bring up young turkeys to maturity because of lack of proper management. It is important to note that turkeys are the most delicate birds one can rear. Young chicks are especially susceptible to cold weather conditions. They should therefore be kept in warm housing and be properly fed. Most farmers lose all chicks within a few weeks after hatching. Feeding is especially a challenge to farmers. Because of their body size, turkeys need more feed than chickens; therefore the farmer should be able to provide them with adequate feed and water to maintain their health and normal growth. It is important to ensure that young chicks are kept separately from their mother; if kept together, the mother often tramples on the young chicks and kills them in the process. To bring up turkeys successfully, it is important to observe the following management practices.

John Mbuthia feeding his turkeys. The birds require extra care. (Photo TOF)

Breeding

Turkeys breed when they are about 1 year old and can lay about 20 eggs before going broody (wanting to sit on their eggs). A hen makes its own nest but a farmer can make a nest in a well-protected area. Turkeys only need one mating for the entire egg laying period. The eggs hatch within 25-28 days.

Housing

Immediately after hatching, young turkeys (also called poults) should be separated from their mother and put in a brooder (house for chicks), preferably where the temperature is controlled. Farmers who have access to electricity can use an electric heater to keep the brooder warm. In rural areas where there is no electricity, farmers can line the walls of the brooder with blankets or even sisal gunny bags to keep the chicks warm. They should stay in the brooder for up to two weeks and provided with adequate feed and water. Adult turkeys should be kept separately from other birds since they tend to bully them and keep them away from the feeders. Separating them also stops cross-infection by diseases. Adult turkeys should be kept in a fenced off area but a portion of the housing should be thatched to protect them from rain. In a homestead without trees, perches should be provided to ensure the birds stay in their natural surrounding.

Hygiene and disease control

Turkeys require a very clean environment. Their house should be cleaned daily and all droppings removed; the birds can eat their own waste which exposes them to diseases. Feeders and water troughs should be constantly cleaned to keep them free from diseases. Young chicks are especially prone to diseases such as pneumonia and stomach infections.

Turkey farmers are advised to use only treated water. Vaccination against diseases is also important since turkeys are also affected by the same diseases that attack chickens such as New Castle disease. Without adequate water turkeys are prone to choking and also suffer from hard stools which make bowel movement difficult.

Feeding

Turkeys take the same type of feed as chickens. Feed for young turkeys should contain more proteins, preferably a protein content of 27 percent from birth to six weeks, this can be reduced to 18 per cent as they grow older. If farmers use chick mash for feed, they should add a high protein source such as fishmeal. Turkeys reared in free range reduce feed cost. ■

Turkey farmer tried it and succeeded

Although he had no previous experience, John Mbuthia, a turkey farmer near Njoro town, had a burning ambition to rear turkeys. So in the year 1992, he started with a male and female turkeys on a trial basis, "I did not even know how to feed or even house them, but I would observe their behaviour and soon discovered a lot about them", he says. His first observation was that the young chicks were very vulnerable to changes in weather. "I realised that to keep them alive, I had to isolate and put them in a brooder where it was warmer", he adds. Mbuthia's turkeys multiplied fast; he bought more hens, and within the next two years the number had increased to 120 turkeys.

In a short while, he was a major supplier of turkeys to many parts of the country. His buyers included farmers, local and tourist hotels, expatriate families in Nakuru, Naivasha, Nairobi and even Mombasa. They made orders for Christmas and Thanksgiving days. "An adult turkey would go for upto Ksh 1,500, sometimes I could sell more than 100 at a go, in a year I could make upto Ksh 500,000", he says. "To meet the increasing demand, I was forced to contract other farmers to rear turkeys and I would buy from them whenever I got an order." However, demand for turkeys declined in 1998 following the terrorist attack on the American embassy when the number of tourists coming to the country declined. He now rears a few turkeys for sale to some of his regular customers and also buys from fellow turkey breeders.

Mbuthia advises farmers who wish to go into turkey rearing to identify potential markets first. One reason for this is that turkeys are heavy feeders and should be disposed off, when they have attained the age of 4 to 6 months. If kept longer, feeding costs will be very high which is a loss to the farmer. For more advice, contact Mbuthia, Tel. 0723 340 475. ***TOF***

Urea can be used to improve fodder

A lot of fodder goes to waste because It is very hard for the animals to chew urea can soften it.

The Organic Farmer

Crop residues on the farm that are given as fodder for livestock especially during the dry season are often wasted. One of the reasons for this wastage is that the animals find it unpalatable, because the fibre in the residue is hard to chew. Some farmers, in an attempt to make the fodder soft, often apply or immerse it in water. But a better solution is to apply urea (the one that farmers use as fertilizer). Urea especially combined with mollasses helps to soften fodder, making it easy for the animals to chew and to digest. In this article we fetaure various methods farmers can use to improve the quality of their fodder by adding urea.

Softening stovers

Chop up dry old maize stalks or other low quality straw, for instance old grass. Dig a pit and line it with plastic or use the silage bags, then fill in the chopped material. The recommended ratio for treating the residue is 60 grams of urea for every 1 kg of dry fodder. The water should be in the same ratio as the fodder being treated; for example if you have 400 kg of maize stalks, use 400 litres of water and add 24 kg of urea (see the illustration on this page). After 3 weeks the chopped and treated material will be much more palatable to cows, goats, and all other animals. In milking cows, it has been proved to boost milk production. There is no danger of poisoning in this method, as the urea will have been absorbed by the maize stalks and the straw, which are now more accessible to the animals as well as giving them energy.

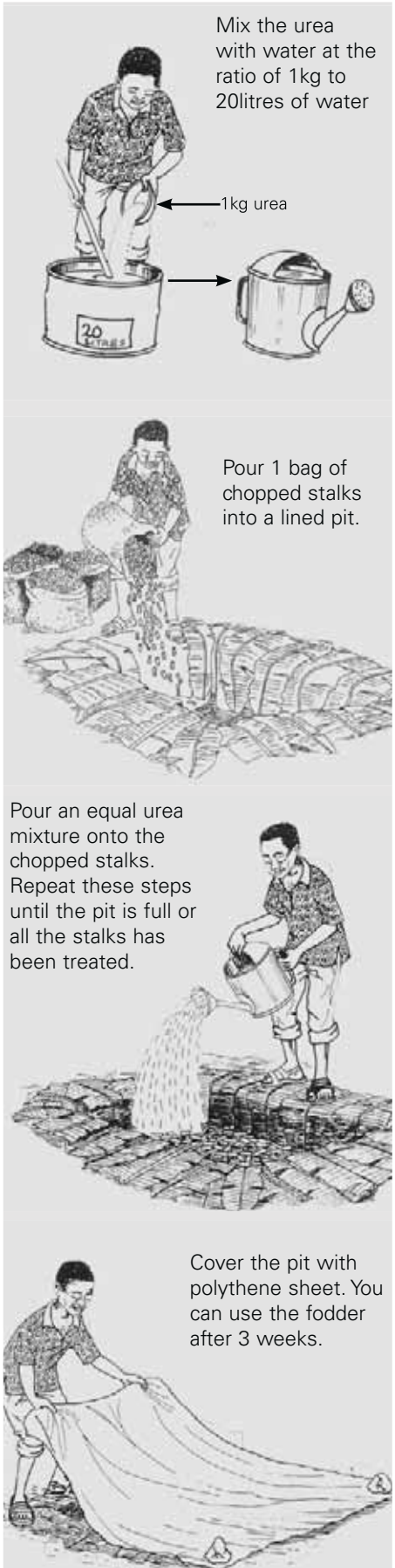
It can be used on feeds too

Urea can also be mixed with other animal feeds. But this should be done carefully so as not to overdose the animal. The farmer has to make sure that not too much urea is used. The recommendation is that urea should not be given in excess of 30% of digestible crude protein.

Let us take as an example a cow of 500 kg bodyweight. The cow feeding recommendations list requires 290g of DCP (digestible crude protein) per day. Not more than 30 percent of this amount can be fed in form of urea, in our example this 30 percent are 87 grams. But urea contains high concentrated DCP: 1 kg urea equals 2.81 kg crude protein. This means that in order to supply your cow with 87g/day in the form of urea, you can not just use 87g of urea. Instead, you have to count as follows: 2.81 kg divided by 87 is equal to 31g urea per cow.

You can see how easy it is to overdose with such a small amount of urea. One tablespoon contains about 15g, so we are speaking of 2 tablespoons for every cow mixed with grains and supplemented by molasses in order to keep the rumen pH below 6. Cows can gradually get used to a slightly higher proportion of protein being fed in the form of urea, but if a farmer values their cows it should be done very slowly. The antidote for urea poisoning is vinegar.

NOTE: All farmers should know that if wrongly used, urea can actually kill a cow, so it is essential that farmers be very careful when adding urea to the feeds. ■



Source: More forage, more milk. Technical Handbook No. 33, World Agroforestry Centre, Nairobi 2005

"Urea technology in fodder works"

Julius Kang'ee is a farmers in Sagana. Sometime ago he wrote us a letter giving his experience on the use of urea:

You mentioned the use of Urea in your last issue of TOF. This can assist our farmers during times of drought. Our cows will survive the drought, continue producing milk and be of good health. I have used it since 2000 to date without any poisoning as many farmers fear. I am in an area where the dry spells are longer than the wet ones. Fodder does not grow well without irrigation. I have been forced to use maize stalks and rice straws to feed my Holstein Friesian cows and Kenyan Alpine dairy goats. Both species are doing quite well. I have excellent literature on the use of Urea.

I recommend that farmers in similar environments adopt the use of urea for their livestock. Urea not only breaks the lignin in the maize stalks and straws but also adds protein to the low quality dry agricultural by-products. Breaking lignin eases digestion hence boosting production and good health. Interested farmers may contact me through the address given below:

Julius Kang'ee P.O. Box 209, Sagana, Cell, 0722 893 428 or 0736 111 801

Your crops do well with organic dressings

Liquid manure are cheap; their nutrients can be absorbed faster than those of other fertilizers.

The Organic Farmer

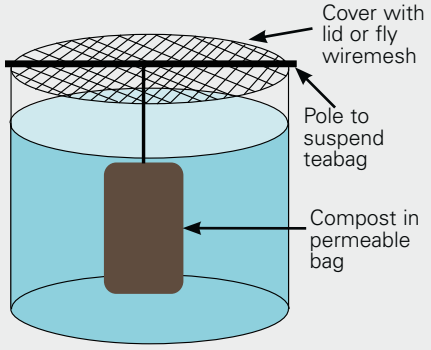
One of the problems farmers are going to face after planting are nutrient deficiencies in the soils which is a problem to the crops. Nutrient deficiency is the lack of essential nutrients that plants need for healthy growth. Soils may lack important nutrients due to a number of factors. One of these factors is sustained mono-cropping. This happens when the same crop is grown on the same piece of land year after year as is the case with maize, in this way depleting particular nutrients from the soil, reducing its fertility.

Another reason may be the problem of increased rains. They wash away the fertilizer that is used at the time of planting. Leaching is another challenge, which occurs when the fertilizer is driven deeper into the soil following increased rains. This makes it difficult for plant roots to reach it. Due to the recent increase in fertilizer prices and the present economic hardships, most farmers are not able to buy enough fertilizer. What most farmers do is to use very little fertilizer during planting or none at all. The result is that the farmers will end up with very poor yields unless they take measures to correct nutrient deficiencies early enough.

Apart from the nutrient deficiencies, another major problem are pests which attack the crop at this stage in their growth. The pest pressure increases normally in warm and wet weather conditions.

Farmers can overcome these problems. There are many plants available on the farm which can be used to prepare plant extracts that contain both nutrients and insecticidal properties. To get the desired results, they should select particular plants, some containing essential nutrients, others having the ability to control pests. Mix them well for spraying on the desired crop. This can be done by making Fermented Plant Extracts (FPE) as outlined below.

How to make liquid fertilizer or compost tea



Useful plants for plant extracts


Tomato leaves


African marigold


Stinging nettle

To make Fermented Plant Extracts (FPE) requires some effort, but they are easy to produce, are cheap, and have a big impact.
Ingredients: 1 litre of molasses, 1 litre of EM1
Get 4 kg of different plants which contain various nutritional and insecticidal properties e.g. stinging nettles, neem, African marigold, Adams apple, tithonia, comfrey, onions, moringa, blackjack, chilli, pyrethrum, lantana, garlic, tomato leaves or any other plant in your area which can improve plant health.
Preparation: Mix the mollases with EM1 (you can buy mollasses and EM1 in any agrovet shop) and add 5 litres of water. Chop up the plants into small pieces and add to the jerry can. Fill the jerry can to the brim with water and close completely to stop air from escaping (airtight). Let it remain in this state for up to 14 days.

Filter the solution after 14 days. Dilute it at a ratio of 1 litre FPE to 100 litres of water (1:100) and use as a spray. When using a knapsack sprayer it is important to filter the solutions through a piece of cloth to ensure tiny particles from the plants do not block the nozzles of the sprayer.

Attention! Fermented plant extracts do not work in the same way as chemicals. To get the desired results, the farmer has to spray the crop more frequently, say, 2 to 3 times a week depending on the state of the crop including pest pressure. This ensures that the crop has adequate nutrients and is protected from pests and diseases.


Neem


Lantana


Comfrey

Liquid fertilizers

Liquid manures are a good source of foliar feed for top-dressing. They are prepared by soaking various manures, suitable plants or a mixture of the two in a drum of water for 10 to 15 days. The nutrients are dissolved in the water.

The fresh plants or manure should be collected in a sack and tied securely. The sack is then suspended from a stick into the water in the drum (see sketch). The quantity should be 30 to 50 kg of manure to 200 litres of water. Move the stick up and down every 5 days to stir the mixture and quicken the release of nutrients. The solution has a strong smell because the excess nitrogen turns to ammonia; therefore it is important to cover the drum. Once the smell is gone, the liquid is ready for use. The water also turns brown to show the mixture is ready for use. The mixture is in concentrated form, it has to be diluted before use.

Advantages of foliar feeds

- Liquid manures are in a more concentrated form than compost, so less in volume and high in nutrients.
- In liquid form, nutrients are less likely to burn roots or foliage (leafs).
- Any manure (goat, cow or poultry) can be used to prepare liquid manure.
- If there is no manure, various plants rich in nutrients can be used (see box "How to prepare 20 litres of FPE").
- Nutrients in plants become available after the plant has decomposed; with liquid manure you do not have to wait because the nutrients are readily available.

Tithonia, full of nitrogen

Tithonia is a common shrub that grows wildly in most parts of the country. But very few people know that it is one of the most valuable plants on the farm. Farmers will always uproot it when found growing on the farm. Tithonia is one of the most important shrubs that could change farming in the country because it is rich in minerals that can

continued on page 6

> > > from page 5: Top dressing

improve soil fertility and improve crop yields drastically. Tithonia contains 80 percent more phosphorus than beans or any other legume. It also has enough nitrogen and potassium to provide plants with adequate amounts of these nutrients. Tithonia can therefore be used to replace chemical fertilizers and give the same crop yield. Five tonnes

of green tithonia foliage put into one hectare of land is equal to 159 kg of nitrogen, 10 kg of phosphorus, 161 kg of potassium, 18 kg of calcium and 22 kg of magnesium. When making compost, farmers can mix freshly cut tithonia leafs with dry plant material to produce very high quality organic fertilizer. They can also cut and work it into the soil.

How to make tithonia foliar feed

Chop tithonia leafs and branches into small pieces and soak in water at a ratio of 1 part in 4 parts water. Let it stand in a tightly covered container for 7 days. Apply within 5 days, diluting it with equal amounts of water and spread at the root base of the target crops.

Advantages of tithonia

- Tithonia is rich in nutrients.
- It grows fast to supply quality material throughout the season.
- It has ability to regrow after cutting which ensures continuous supply of vegetation. It grows wildly, so farmers do not have to tend it like other trees and shrubs.
- It decomposes very fast because of its succulent tissue.
- It is easy to handle and cut.
- It grows vegetatively (through stem cuttings) which makes its establishment easier.
- Goats like it as fodder.
- Tithonia attracts beneficial insects such as bees and wasps, which assist in cross-pollination.
- When fully grown, it can form a thick hedge. Tithonia allows other plants near the hedge to grow without interference.
- It contributes to beauty in your garden with its nice flowers. ■

farmers forum

020 445 03 98 0721 541 590 0738 390 715

I have discovered TOF

Habari zenu, I have just discovered through a friend about your magazine, *The Organic Farmer*. I have read it and it is is very impressive. I am wondering if i can get all the past issues and also to be in your monthly mailing list. I do small-scale free range dairy keeping and wish to convert to zero-grazing in the near future.I have been specifically impressed by the topic "Feeding and housing a dairy cow."
John Kipkorir Koech, P.O.Box 806, 20406, Sotik, Tel. 0722897098

I want to go organic

We are a small growing group by name Mwimenyi Nutrition Self-Help Group in Mutira location, Kirinyaga district doing nature agriculture on our coffee farms under Mt. Kenya Nature Agriculture. I came across one of your issues and it was very informative and I am interested in becoming an organic farmer, may you kindly send us *The Organic Farmer* magazines.
Daniel Munene Karubiu, P.O Box 81, Kerugoya

We need full addresses

We receive many questions from farmers every month. Many farmers may not be aware that we have featured some of the issues they want us to answer. To assist such farmers in a better way, we would request them to give us their full address including telephone numbers. If we have their contact details, it is easier to send you copies of the magazine which will give the relevant information. For those farmers with access to a computer, a good source of information is the new infonet-biovision CD, it contains comprehensive information on human, plant and animal health and even the environment. Most of the problems that face farmers are addressed in the new CD.

Order your CD

New CD is ready
Farmers, would you like to share the experience of more than 200 agronomists and 480 books on agriculture? This is what you will get if you buy the new Infonet-Biovision CD that has just been released. The updated version now has all information on animal and plant health, disease and pest control as well as human and environmental health. It is easy to open and read from any computer with a CD-ROM drive (NOT with a VCD or ordinary video CD player). Interested farmers can send airtime worth Ksh. 200, either through our Safaricom line - 0721 541 590 or Zain 0738 390 715 and SMS us your full postal address. We will send the CD by registered post. All the farmers who bought the earlier version will receive the new CD free of charge.

TOF will improve farming methods

I am a student from Baraka college now out for my attachment, your monthly magazine about organic farming has really helped me as far as the course I am taking is concerned. The few copies I got have been taken by the farmers in my area where by they are asking for more. The farmers told me that the magazine had helped them a lot.
Patita M. Shunkur, Box 81, Ololulunga

SUBSCRIPTION FORM

Return this completed form to TOF, PO Box 14352 00800 Nairobi or info@organickenya.com

Name: _____

Postal Address: _____ Code: _____

Town: _____ District _____

Province: _____

Registration No.: _____

Number of active Members: _____

Chairpersons Name: _____

Chairpersons Tel.: _____

Areas of interest: _____

Registration type:

- Individual farmer
- Farmer Group
- Women Group
- Youth Group
- College
- School
- Church Group
- Extension Officer
- NGO
- CBO
- Other

Pumpkins are an important crop

I am a farmer in Lutacho. What can I do to get high pumpkin yields? I also want to know if there is any mushroom training centre in Western Kenya. Benard Khaemba Kakai.

Pumpkins belong to a family of plants called cucurbits. They are one of the most important crops in this family because they can be stored for several months and can withstand transportation hustles without getting damaged. To get good yields, the land on which they are to be planted should be prepared early in the season preferably around January and hills made. Plant 2 seeds on the hill at a spacing of 2.4-3 m between the rows and 1.2-18 cm between the plants. Add 1 debe of well-composted manure per planting hill together with any other organic fertilizer such as rock phosphate during the planting time. Cover the seeds with 3 cm of soil. Weeding should be done from the time the plants sprout until the vines spread and cover the soil. Organic plant teas such as tithonia together with other plant extracts (see page 3) should be applied regularly to the crop to maintain a healthy growth. The farmer should add more soil to the hills as the plants grow to ensure roots are well covered by the soil. Pumpkins are usually ready in 3½ to 4 months after sowing. Harvest the fruits when they are fully mature and have changed colour to orange or yellow and the skin has become hard. At this stage the fruit sounds hollow when slapped by hand. Leave about 2.5 cm of leaf on the fruit for handling.

A pumpkin can stay for up to 6 months if stored in a cool dry place.

Mushroom production

Regarding your second question, training on mushroom production is very technical and would require people who have extensive experience. Many farmers who have tried to do mushroom production without proper training have ended up failing. We would advise you to get proper training from a competent institution. The Jomo Kenyatta University of Agriculture and Technology (JKUAT) has an outreach training programme for farmers. The institution charges a minimal fee if farmers are trained as a group. The trainers will visit and train you in your village.

Mobilise other interested farmers in your area and contact the institution on Tel. 067 52420, 0721 167 244.

How can I get good quality seeds?

I do not know the right type of seeds small-scale farmers can buy as we await the onset of the rains. Fake seeds have led to crop failure among many farmers because we rush to buy without seeking for advice. Tel 0722 066 250.

Selection of the right seeds is a major weakness among farmers. Every hybrid seed developed is suitable for a particular climatic region in the country. Farmers are advised to seek for advice from agricultural extension officers in their regions before buying maize seeds. The Kenya Plant Health Inspectorate Service (KEPHIS) has launched an information service for farmers who want to know the right varieties for their regions. Just write an SMS in the following format: maize/ name of your division then send the SMS to 2964 through your safaricom, Zain or Telkom lines. If the response shows that your division is not in their data base, you can call or SMS KEPHIS personnel and give them your details. You can contact them on the following numbers- Tel 0722 516 221 or 0733 874 274. Also read TOF Nrs.45 and 33 of March 2009 and February 2008 respectively). The two issues have a lot of information on maize varieties and areas where they can do well. **TOF**

...answers in brief

Ornamental fish

I would like to get more information on rearing ornamental fish.

William Kiama is an experienced ornamental fish farmer in Sagana who can give you more information on this area. Call him on Tel. 0722 899 904.

Cow for sale

I have a dairy cow for quick sale. Interested farmers can call me on Tel.0724 210 474

Rabbits in Nyandarua …

I am a farmer in Southern Nyandarua. Where can I get hybrid rabbits for breeding? Tel. 0724 210 474

To get hybrid rabbits please call Godfrey Gichuhi, Karatina (Tel.0720 406 195), he will assist you. You can also read our articles on rabbit keeping (TOF Nr. 26 July 2007 and Nr. 42 November 2008)

… and rabbits in Kitui

I want to start rabbit keeping. Where can I get them in Kitui? I want the New Zealand White. Gabriel, Tel. 0727 237 502

Just talk to your Divisional Livestock Extension Officer to identify any farmer near you, who could be rearing rabbits. You can also call Godfrey Gichuhi on the contact given above. He may be of assistance to you.

Writing for TOF

How can I submit an article for publication in your magazine?

Just write the article and send to: The Editor, *The Organic Farmer* Magazine, P.O.Box 14352, 00800. You can also e-mail the article to us at info@organickenya.org.

Seedlings for planting

Where can I get seedlings and seeds for the following: Moringa, Tissue culture bamboo and *muiri* indigenous trees?

The Kenya Forestry Research Institute (KEFRI) Muguga and their outstations produce various tree seed varieties for sale to farmers and other interested institutions. Call William Mucheke on Tel. 0722 801 539, he will assist you.

Huge interest for biogas units

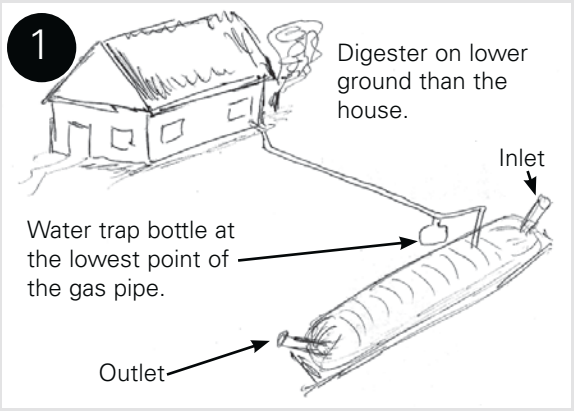
Our article on biogas (TOF Nr.45 February 2009) has attracted a lot of interest from farmers. We have received dozens of calls, SMS and even e-mails from farmers who want to put their own units in their farms. Erastus Kiruiro, the KARI scientist who is training farmers on the new biogas technology, was also overwhelmed by calls from interested farmers across the country (Erastus allowed us to give his phone contact to farmers in our article). The response shows that farmers are eager to embrace appropriate technology especially if it addresses critical areas that affect them such as energy, and if this technology is affordable. A group of farmers in Kakamega even went ahead and put up their own units following the instructions we gave them in the article. Any farmer group willing to put up their

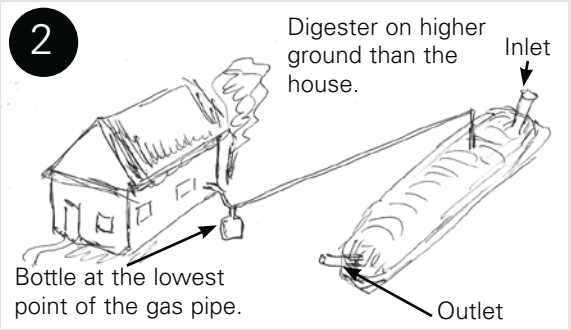
own units can get in touch with Kiruiro (Tel 0722 30 38 81). He is willing to offer advice but the farmers should be able to meet his transport costs and cost of materials to be used for the units.

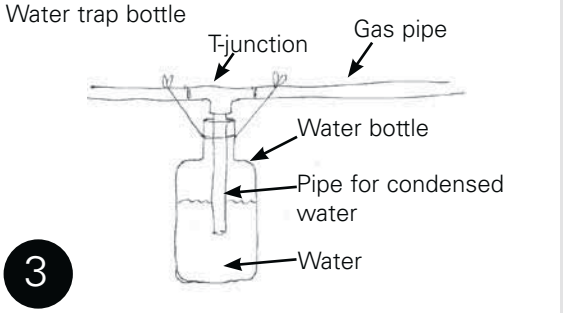
Trap the condensed water in the gas pipe

According to the feedback from farmers, we have noted another problem with farmers who are making their own biogas units. Biogas carries wit it some vapour that condenses inside the gas pipe during cold times (especially at night or during cold weather). If this water is not trapped in a container, it will block the gas from flowing to the kitchen, hence the gas is blocked by the water from reaching the kitchen. To solve this problem, farmers can fix a bottle at the lowest part of the pipe. All they need is a T-junction for the pipe and a transparent water bottle, as the sketches shown In this page illustrate.

The water trap should preferably be a transparent plastic bottle (3 or 5 litre jerry can) so that one can see the level of the water. If the lowest point of the gas pipe is near the kitchen (sketch 1), this is the point to fix the water bottle. On the other hand, if the lowest point is near the digester, then the bottle should be installed about a metre away from the digester (sketch 2). A T-junction should be fitted at the point where you decide to install the bottle. At the same time, a 12 cm long pipe, fixed into the T- junction, should lead into the bottle that is half-filled with water (sketch 3). The end of this pipe has always to be in the water. This stops the gas from escaping. If the condensed water fills the bottle, it will overflow – and the pipe will always allow the gas to flow uninterrupted from the digester to the kitchen.







Good opportunities for organic farming

Organic farming offers Africa the best chance of breaking the cycle of poverty and malnutrition it has been locked in for decades, according to a major study from the United Nations. The head of the UN's Environment Programme, Achim Steiner, said the report "indicates that the potential contribution of organic farming to feeding the world maybe far higher than many had supposed".

The research conducted by the UN Environment Programme suggests that organic, small-scale farming can deliver the increased yields which were thought to be the preserve of industrial farming, without the environmental and social damage which this form of agriculture brings with it.

An analysis of 114 projects in 24 African countries found that yields had more than doubled where organic, or near-organic practices had been used. That increase in yield jumped to 128 per cent in East Africa.

The study found that organic practices outperformed traditional methods and chemical-intensive conventional farming. It also found strong environmental benefits such as improved soil fertility, better retention of water and resistance to drought. And the research highlighted the role that learning organic practices could have in improving local education. Promoters of GM foods insist that a technological fix is needed to feed the world. But this form of agriculture requires cash to buy the patented seeds and herbicides – both at record high prices currently – needed to grow GM crops.

Regional farming experts have long called for "good farming", rather than exclusively GM or organic. Better seeds, crop rotation, irrigation and access to markets all help farmers. Organic certification in developed countries still presents a high barrier to most African exporters, the report points out. It calls for greater access to markets so farmers from developing countries can get the best prices for their products. **TOF**

The Organic Farmer

The magazine for sustainable agriculture in Kenya

biovision

Nr. 58 March 2010

Armyworms

Armyworms invaded farms in parts of the country following heavy rains in December and January. Farmers can use organic methods to control them instead of using chemicals.
Page 8

Milk problems at a very wrong time

Milk processors claim their capacity is already overstretched.

TOF The regeneration of pasture after the good rains in December 2009 and January this year has led to increased milk production. But the local milk processing companies are unable to buy and process the excess milk; so farmers cannot sell all their milk. As a result the retail prices have gone down by between Ksh 3–5 a litre. Although the consumers are happy about this situation, farmers are counting losses.

The cause of this situation is the fact that the New KCC, the largest and the only milk processor with the capacity to make powdered milk and Ultra Heat Treated (UHT) milk is unable to process the surplus milk. They have been talking about expansion to increase their capacity in the last 4 years.

Lack of forward planning seems to be the main problem. The scenes we have witnessed of farmers disposing of milk is very sad. This is happening exactly at a time when the dairy industry was just beginning to recover from the effects of post-election violence two years ago. Farmers should now look for ways to sell their milk in the informal sector or even do value addition as we have explained elsewhere in this issue. The New KCC should work much more aggressively to expand its operational capacity and reclaim its former export markets that it lost due to lack of adequate supplies. It can also explore other markets within the region to save our dairy industry. *Page 2*

Tired soils cannot give good yields

In Latin America, the indigenous population has an interesting habit when they drink a cup of milk or a glass of beer: Before they take the first sip they pour a little bit on the soil – somehow as a sacrifice to *pachamamma*, the mother earth. With this habit they pay tribute and respect to the soil which produces everything that humans need to live.

Agriculture would be much better off if we would have more respect for the soil and would take more care of it. After relying on chemical fertilizers for more than 40 years, the soil is tired, the crop yields have started declining despite the use of increased amounts of fertilizers.

Organic inputs available

The only way out is to improve the soil structure with organic matter such as farmyard manure, green legumes and crop residues. More over, there are new organic products in the market that farmers without adequate amounts of organic matter can use to increase their soils's productivity. *Page 5*

in this issue

Dear farmers,

The World Bank, as you may know, has in the past failed to reverse the poverty situation in African countries with its strict lending conditions and policies. On the other hand, the World Bank is a keen observer of the economic situation in Africa and the rest of the world.

In a report released in December 2009, the World Bank looks at the food crisis in Kenya 2008 and 2009. As you know, in November 2008 the Government introduced a generalized maize subsidy scheme to help millers and traders sell maize at a subsidized price. It was a total failure. According to the World Bank, the Kenyan public lost an estimated sum of Ksh 23.4 billion in subsidies and taxes while corrupt government officials pocketed these funds.

According to the World Bank document approximately 60 percent of all farming households in Kenya are net buyers of food, meaning that they buy more maize than they sell. Therefore the Bank is against the high pricing policy of the National Cereals and Produce Board and concludes: "The current maize production structure is in such a way that only 2 per cent of maize farmers account for over 50 per cent of the sales. This supports the view that expenditures on the development and dissemination of improved agricultural technology, provision of credit for small farms, and investments in rural infrastructure would more directly benefit small-holder farmers and contribute more to rural poverty reduction than the current maize producer price support."

We agree with this opinion. For several years now, your magazine, The Organic Farmer, *has been looking for ways to give access to credit for small-scale farmers. We can only repeat what we have been saying so many times on this page: It is time that the small-scale farmers take their fate in their own hands.*

They have the opportunities – in forming farmers' groups, in working together, in assisting each other, in selling their products as a group instead of being misused by middlemen, in crop diversification – and in the care of the soil as we describe on page 3. This allows you to produce more. Together with the other above mentioned measures, a higher crop production is the basic factor needed for your improvement.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

Why not try homemade yoghurt?

Many farmers are asking us for a yoghurt recipe. With good reason: it is good and easy to make some.

The Organic Farmer

Homemade natural yoghurt is delicious at any time of the day, as a light addition to breakfast, or as a healthy dessert mixed with fruit and honey later in the day. When eating yoghurt, you also benefit from the friendly bacteria which help to boost your digestion.

Homemade yoghurt is more nutritious than ready-made yoghurt, yet it is easy and satisfying to make – even in small quantities at home and without a commercial yoghurt maker which has an electrically heated base.

What you need

Ingredients

- 1 litre of fresh milk
- A fresh plain yoghurt (without fruits or flavours) as starter, or special yoghurt starter cultures

Equipment Required

- A clean pot for heating the milk
- A container in which you can keep the fermenting yoghurt warm for incubation. It should have a lid. Do not use aluminium, but pottery, glass, stainless steel, or plastic. Clean this container carefully and rinse it with boiling water before use
- If you can get it, use a cooking thermometer

How to make yoghurt

1. Heat the milk to 85°C or near to boiling. Be sure to monitor the milk constantly, stirring all the while. If you do not have a thermometer, 85°C is the temperature at which milk starts to froth.
2. Remove it from the heat and allow it to cool to approximately 45°C. A cold water bath will quickly and evenly lower the temperature and requires only occasional stirring. At 45°C, the pot will feel warm and slightly over body temperature. Avoid temperatures above 45°C at all times, as this will kill the yoghurt bacteria.
3. While you are waiting for the milk to cool, let the starter yoghurt sit at room temperature. This will prevent it from being too cold when you add it to the milk.
4. Add the starter yoghurt or the starter cultures (*see box*) and stir well, if possible with a wire whisk. A yoghurt starter of 150 g will be enough for up to 2 litres of milk.
5. Pour the mixture into the clean container you prepared for incubation. Cover it and keep it warm to encourage bacteria growth (as close to 42°C as possible).

If you do not have an easy-to-regulate oven, do it this way: Put the container into a bigger cooking pan filled with warm water. If the water temperature goes below body temperature, place the cooking pan with the water nearer to the fire. Again, make sure the water does not get too warm.

If you do not have time to look after the yoghurt pot for hours, wrap the covered container tightly with thick warm blankets from all sides, also on top. Leave it undisturbed for several hours.

6. Control it for 4 to 5 hours; if you wait too long, the yoghurt may get too sour and you might not like it. Leave it until it has become thick.
7. The yoghurt will last for up to one week if you refrigerate it. If you can not cool it, you should consume it within one day.
8. Add fruits and sugar according to availability and your taste.

Starter Culture

Let us make a few comments about the starter. You may use some of your homemade yoghurt as a starter to make your next batch. But it is not possible to do this more than a few times since the bacteria will deteriorate. It is recommended to use fresh plain store bought yoghurt to start each batch, or to buy special yoghurt starter cultures if you chose to make yoghurt regularly and in larger quantities. Distributor for yoghurt starter cultures: Promaco Ltd, Tel: 883586/884576; Location: No. 115 Windy Ridge, Karen; they also sell flavours and colours.

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development. www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

Other delicious products made from milk

Apart from yoghurt there are many more products that can be made from milk and its by-products – in this way adding value to your milk.

Sour milk (*mala*) : *Mala* or *Maziwa lala* is sour milk made from milk by adding lactic bacteria, which is active at temperatures of between 25-35°C (or room temperature for those who do not have a thermometer). When making *mala*, the choice of the right starter culture is important because cultures affect the taste, texture and consistency of the product.

Milk-shake: This is a sweet-cold beverage made from milk. Milk shake is made by adding fruit flavours such as vanilla, strawberry or mangoes into milk and colour before whipping the mixture in a blender until it produces a froth. It is then sweetened and stored in a refrigerator. No culture is added.

Home-made ice cream: Ice-cream is another high value product that can be made from milk. When the milk is boiling, fetch one cup and let it cool, then mix with custard while stirring until it forms a smooth paste. Mix the paste with the boiling milk and continue stirring until it thickens like porridge. Remove from the fire and add sugar to sweeten it. Flavour it with the desired flavour. Pack in ice-cream cups and refrigerate immediately.

Marketing goat meat: what you need to know

Prices of meat goats are influenced by many factors, most of which a farmer has control over.

By John Cheburet

Goats can bring good income if farmers understand their production and market.

Meat goat production is one of the oldest farming practices in Kenya. Communities in rural areas have kept goats for subsistence and for slaughter during traditional festivities. Goat milk is highly nutritious and supplements cow milk in most households, especially during the dry season. This has given the goat an almost guaranteed presence in every family farm. Nevertheless, the development of goat meat production has largely remained inferior compared to beef production.

The big question for many farmers is how they can fetch better prices than they are presently making. Mr Frank Chesingei, a goat trader in Mogotio says that a thorough understanding of the economics around goat meat production and awareness of the market dynamics is important for people who raise meat goats and want to make more money from the enterprise. This includes knowing what characteristics buyers look for in live-goats and the qualities consumers look for in goat meat.

Valuable tips

Market: Begin with the market in mind. This could be local butcheries, hotels, schools, restaurants in major towns or supermarkets. It is a wide market but that depends on the quality and quantity of goat meat. With that information, you then devise a breeding plan that will enable you to meet the demand of the market segment you are targeting

Middlemen: Farmers fetch the best prices for their sheep and goats when they sell directly from the farm to the consumers. If you cannot sell directly to the consumer, then, sell to the butchery. The bottom line is to try as much as possible to eliminate the middleman because the more the middlemen in the marketing chain, the less the money for the farmer.

Meat quality: More muscle means more meat and more meat means money. A random sampling of customer preferences in major towns reveals that consumers prefer meat that is tender - easy to chew, with less fatty tissues. Tenderness is a very important factor when it comes to meat quality. Factors that influence tenderness are: the animal's age at slaughter, the amount of fat and connective tissue. Goat's meat is tender when the animals are slaughtered between 5-8 months of age.

Demand: There is high demand for meat during the Christian and Muslim festivities; Easter, Christmas, Ramadhan, Eid-Ul-Fitr, Eid-Ul-Adha and New Year. These festivities are never complete without goat meat to feed family and guests. Time the kidding of your animals such that they are ready for sale during these high seasons. For instance, if you plan to sell kids at 4-5 months, then the does should be served 9-10 months before the time of sale.

Breeding: Animals for breeding purposes are more expensive than animals for slaughter. One of the emerging market niches for meat goats in Kenya is animals for breeding stock. More farmers are becoming aware of the need to improve the quality of their animals. This is evidenced by the number of farmers making inquiries about breeding practices at the animal sections of agriculture shows countrywide. Raising animals with superior characteristics will give you an edge in this growing niche for improved and better animals. However, breeders should strive to ensure high standards and consistent quality.

Marketing: There is more clout in numbers. Farmers keen on far and bigger markets like Kenya Meat Commission (KMC) can organize in cooperatives or informal marketing groups. Such groups cut transport costs and enable consistency in the number of animals supplied by pooling animals together. With such a group marketing strategy, farmers can invite buyers to the farm, in the process eliminating the risks and costs associated with transportation. Though it can be time consuming, this approach could be highly beneficial to farmers. ■

Nutrient composition of goat and other types of meat (per 100g of cooked meat)

Nutrient	Goat	Chicken	Beef	Pork	Lamb
Calories	122	162	179	180	175
Fat (g)	2.6	6.3	7.9	8.2	8.1
Saturated Fat (g)	0.79	1.7	3.0	2.9	2.9
Protein (g)	23	25	25	25	24
Cholesterol (mg)	63.8	76.0	73.1	73.1	78.2

Goat meat offers more nutritional value, greater health benefits, and is an ideal choice to be considered as "the other red meat." As the health benefits of goat meat becomes more widely known, the demand will continue to increase.

Contact the Kenya Stud Book

If you are interested in raising goats for meat or for breeding or a combination of the two, meat goats and goat meats are here to stay. The market is expanding. With a market in mind, good breeding practices are essential; selection, cross-breeding, proper record keeping and interested farmers can register their pure or cross breeds and also get breeding guidelines from The Kenya Stud Book based at Nakuru show grounds. Tel: 051 221 69 96. ***TOF***

Causes of retained placenta in dairy cows

Retained placenta after giving birth, if not treated properly, can weaken or kill your cow

William Ayako

Retained placenta is one of the complications associated with delivery in dairy cows and other livestock species such as pigs, goats, sheep, horses and donkeys. Under normal circumstances, the placenta should be expelled within 24 hours of giving birth, especially in dairy cows. There is reduced uterine contraction (the reduced force to push it out) 24 hours after calving, which results in retained placenta. It may take several days before the placenta attachment to the uterus decomposes to allow it to drop.

In a herd of dairy cows, cases of retained placenta should not exceed 10% of all calving cows; figures above that indicate that there is a serious problem within the herd. A farmer with one cow may experience the problem of retained placenta after his cow has calved up to ten times. The condition is easy to recognize since part of the placenta can be seen hanging from the birth canal after a cow gives birth. In some cases, the whole placenta may remain inside the uterus thereby making it difficult to notice the problem. However, a keen farmer who observes their cow well during calving would know that the cow has not dropped the placenta.

Danger posed by retained placenta

In dairy cows, retained placenta may be the cause of serious economic loss to the farmers due to the following reasons:

• Cows with retained placenta may develop bacterial infection and become ill and thus reduce production. Some may even die.

• Milk from cows with retained placenta is unfit for human consumption and therefore cannot be sold.

The fertility of dairy cows is affected when most cows in the herd suffer from retained placenta. This causes a direct loss to the farmer due to delayed calving leading to a lengthy period between births (calving intervals) and hence low milk production. It is unhygienic to milk a cow with a decomposing afterbirth hanging on it.

Causes of retained placenta

The problem is caused by the following factors:

• Abortions and premature calvings. The birth may occur normal but the placenta may not detatch itself from the uterus lining thereby causing the problem of retained afterbirth.

After delivery observe carefully to ensure that the cow drops the placenta (TOF)

• When the cow produces twin calves, the uterus becomes weak, causing retained afterbirth.

• In cases of milk fever, the lack of muscle power can weaken the animal and reduce its ability to push out or expel the placenta.

• Difficult calving may also stress the uterus after the calf has been delivered.

• Dirty cattle shed may lead to early infection of the placenta that may cause inflammation and hence delay or reduced chances of placental separation and expulsion. It is important to note that it is unnecessary to assist a calving cow before it is confirmed that the cow cannot give birth on its own.

• Lack of Vitamin E or selenium deficiency may lead to reduced muscle power in the uterus during calving.

• Other conditions such as poor feeding, liver flukes and copper deficiency may lead to general weakness and hence retained placenta.

Treatment requires a qualified vet

A farmer should always bear in mind that the uterus should always be hygienic since it is the house of a future calf and determines the future milk yield. Therefore whenever there is a problem of retained afterbirth, the affected cow should be attended to by a qualified veterinary doctor.

•The vet first removes the placenta, then administers the right treatment. When removing the placenta, care should be taken not to tear the placenta or leave pieces in the uterus. Most vets would leave the animal for three to four days without treatment to allow the placenta to decompose. However, this would depend on the health of the cow.

• Antibiotic tablets are inserted through the birth canal into the uterus to stop infection.

• Depending on the level of sickness and the presence of a large volume of stinking fluid, a veterinary surgeon may drain the uterus using a length of tubing with warm saline water.

• Full treatment with the use of injectable antibiotic may help the animal to recover quickly.

• However, for effective control, proper recording of all calvings would assist the farmers to establish the cause of high incidences of retained afterbirth in their animal herds. ■

Dairy cow management after birth

Apart from the problem of retained placenta, dairy cows that have just given birth could develop infections. About 90 per cent of the animals have some form of bacterial infections during the first week of delivery. Some animals with a strong immune system can resist bacterial infections of the uterus after delivery. Others require antibiotic treatment.

Although the use of antibiotics can solve the problem in some animals, studies show that some animals can still overcome the problem without treatment through proper diets that restore their health. Milk from animals under treatment should not be consumed for a period of upto 72 hours. Some antibiotics such as oxytetracycline can persist in the animal's body for longer periods. ***TOF***

Organic fertilizers maintain soil's health

Organic farming opens many ways to restore soil fertility and to improve income for small-scale farmers.

The Organic Farmer

It is now a common experience by almost all farmers that crop yields are declining every year. This is so despite the use of all the required inputs, such as certified seed and chemical fertilizers in adequate and recommended amounts. There are many reasons for this development. Unfortunately, most farmers do not even know how to identify the problem: They lack facilities (or cash) for soil tests and technical advice.

The only solution for farmers is to restore soil fertility according to the organic farmers' slogan: "Feed the soil to feed the plants." There are various organic methods which we have often emphasized in past TOF-issues.

Manures

Farmyard and liquid manures are a good source of nutrients for all crops.

A soil test kit, unfortunately it is not available locally (Photo PR)

Fertile soils bring good crop yields and income for the farmer (Photo PR)

Various manures such as slurry and plant extracts such as that made from Tithonia provide nutrients that can be applied in diluted form to growing plants. These can effectively meet the nutrient requirements of any crop and can be used to replace chemical fertilizers, in the long term. Farmers can also make Fermented Plant Extracts (FPE). Plants with various nutritional values such as stinging nettles, neem, comfrey etc, are mixed with EM1 and molasses to make a solution. It can be applied on crops to feed and protect them from diseases and pests (*See TOF Nr. 24 May 2007*).

Cover crops and green manures

Green manures are crops planted for the purpose of soil improvement. When they are slashed and incorporated into the soil or left as mulch before planting, they raise the humus levels of the soil rapidly. If you interplant a leguminous cover crop like pigeon pea, lablab, or sun hemp (crotalaria) into the main crop of the previous season, the subsequent crop will profit from the nitrogen, phosphorus, potassium, and other nutrients accumulated by the legume. Leave it to grow in the field after harvesting time, even during the dry season, and slash it and incorporate the residues into the topsoil about one to two weeks before planting. This can have the same effect as the addition of 10 to 20 tonnes per acre of farmyard manure.

Tithonia

Tithonia is a very good source of nutrients that does not cost the farmer anything. Tithonia is a quick source of

Continued on page 6

Environmentally-friendly products for soil improvement

There are organic products in the market which can improve soil quality very fast while reducing acidity. Most agrovet shops in major towns stock these products:

Humic and fulvic acids

Humic and fulvic acids (also called humates) are effective in improving the quality of all types of soils which do not contain adequate amounts of organic matter. Humic substances determine the structure and the fertility of the soil; they are formed when organic matter such as crop residues or farm yard manure decomposes. The two acids are extracted and processed in highly concentrated form and sold to farmers who do not have adequate compost or farmyard manure for application.

Humic substances store nutrients and stimulate soil microorganisms which are important for nutrient release from organic matter. They increase assimilation of all plant nutrients that would otherwise be washed out or locked up in the soil. Humic and fulvic acids allow improved water retention which is especially important in sandy soils, and deeper root development. They allow the easy penetration of nutrients and water into plant roots. Therefore, humates are not fertilizers; they only improve the absorption of plant nutrients and soil structure.

Humic and fulvic acids can be used in combination with both organic and chemical fertilizers to improve nutrient uptake by plants. Humic acid is available in the shops under different brand names; one of them is Humax. A 500 g pack of Humax goes for Ksh 1,500, enough to make 200 litres of solution that can be applied on 3,000 plants.

Black majik or black earth

Black majik and black earth contain three compounds, humates, potassium and ulmic acid. It reduces the acidifying effect of chemical fertilizers in soils, in the process increasing the effectiveness of fertilizers in promoting plant growth. 1 kg of Black majik costs Ksh 300. Farmers can mix 50 grams of Black majik or Black earth in 20 litres of water and spray it directly into the soil or planting holes.

Earthlee

This is a compound containing 80 per cent humus and carbon. It reduces the need to use large amounts of organic manure for farmers who do not have it at the time of planting. Farmers who are using chemical fertilizers are advised to mix 1 kg of earthlee or Black majik with 50 kg bag of DAP, CAN or NPK to reduce the acidic effects of these fertilizers on the soil. 1 kg costs Ksh 500.

TOF

>>> from page 5

Soil

nutrients including nitrogen that fast growing crops require, for instance *sukumawiki*. There are many tithonia bushes, even by the roadsides. Use it in high-value-crops and plant Tithonia along your field borders to have it near the place where it is needed. Tithonia can give you the same crop yield as you would get when using chemical fertilizers - and at no cost!

Tithonia green manure and mulch: Chop young Tithonia shoots and work this material into the soil one week before transplanting. Use 4 to 5 kg Tithonia per square metre. A good layer of chopped Tithonia can be added as mulch to established plants regularly. Tithonia decays quickly and releases its nutrients within a short time. In contrast to synthetic fertilizers, Tithonia mulch increases soil organic matter and improves soil fertility in general.

Tithonia-tea: Chop tithonia leaves and branches into small pieces and soak them in water at the ratio of 1 part tithonia to 4 parts water. Put it into a container, sealing it tightly to stop nitrogen from escaping. Let it stand for 7 days. Sieve it using a piece of clothing if you intend to use a knapsack sprayer to stop particles from blocking the nozzles. Spray it within 5 days at the root of the plants. Repeat this after every 2 weeks.

Rock phosphate: Mijingu rock phosphate is a slow release organic fertilizer; this means that it releases phosphorus slowly. One way to improve phosphorus supply is to incorporate humic acid; it is available in most agroveterinary shops.

Another good option is mixing generous amounts of rock phosphate into the compost heap when preparing compost. If you apply rock phosphate together with organic matter such as maize and bean residues to your crops regularly, this will produce natural humic acids that help make phosphorus available to all plants including heavy feeders like *sukumawiki*.

Unfortunately, *mijingu* rock phosphate is not easy to get in most farming areas. It is however advisable that farmers ask for it in agrovet shops. If the shop keepers realize that there is a market for *mijingu* rock phosphate, they will stock it.

Compost: Try to make use of all organic wastes and prepare compost from them. Compost is a valuable soil amendment which increases soil organic matter and soil fertility. ■

farmers forum

020 445 03 98 0717 551 129 0738 390 715

Fruit drying centres set up in Western Kenya

As part of MATF's Fresh Fruit Processing Project, fruit drying centres opened for business last month and are now fully operational in three districts in West Kenya.

Small-scale fruit farming is a key economic activity in West Kenya. However, it is estimated that over 60% of all the fruit produced in West Kenya perishes, as farmers cannot readily access the fresh fruit market.

High demand for fresh fruits

The Fresh Fruit Processing Project aims to directly improve the livelihoods of 600 local fresh fruit farmers located in the Busia, Homa Bay and Vihiga Districts by establishing fruit drying centres where they can dry their fruits to sell at good prices to supermarkets in cities. This simple solar-drier technology will help small-scale farmers to process their fruits and guarantee a market that will pay cash-on-delivery. Currently, there is a high demand for dried fresh-fruits in the local supermarket chains in Nairobi and other major towns.

More farmers to benefit

The 600 farmers involved in the project will also take part in field days and local exchanges where they will pass on the fruit drying and marketing skills they have learnt to other farmers. As a result, the project will impact an additional 2,400 other farmers in West Kenya.

The fresh fruits currently being processed are bananas (in Busia and Vihiga districts) and pineapples (in Homa Bay district). These fruits are locally available and there is plenty of sun to facilitate the drying process.

Gilbert Muhanji is MATF's Communication Officer.

Contact him at

FARM-Africa, Studio House, 4th Floor, Argwings Kodhek Road, Hurlingham,
P.O. Box 49502-00100 GPO, Nairobi, Kenya.
Tel: +254 20 2731664/2044/2203;
Cell: +254 721 576531/734 721208; Fax: +254 20 2732086
e-mail: gilbertm@maendeleo-atf.org
Websites: www.farmafrica.org.uk and www.maendeleo-atf.org

Good response to farmers competition

We will have a difficult task of selecting the winner to the farmers competition, which we launched last month to mark the 5 years since we started publication of *The Organic Farmer*. This is due to the large number of entries that we have received. By mid-February we had received more than 40 entries. The first winner will get a plastic water tank worth Ksh 18,000. Other prizes include a drip irrigation pump, milk can, a knapsack sprayer and a Money Maker pump.

Buying and Selling

Green Pepper: I am looking for green pepper. Anyone with 200 kgs can contact me on Tel. 0722 848305. Leonard Saitoti.

Capsicum market: I have organic yellow and red capsicums. Is there anyone who can buy these products? Frank Muriungi Tel. 0722 218 058

Chaff cutter: I have 5 head of cattle and require a chaff-cutter. If you have one for sale please contact me. Peter Wachira Tel. 0722 341 718, Meru.

Dairy goats: We are looking for pedigree dairy goats to provide high quality milk for HIV/AIDS patients to be able to boost their immune systems and nutrition. Please give us their milk production rates and let us know if they can do well in South Rift Valley highlands. Joseph Koskei, Rural Projects Support Facility, CBO, email: e08kitur@yahoo.com

Cassava, bananas for sale: I have cassava and bananas for sale.
Any farmer who needs these products can get in touch with me. Tel. 0718476260/ 0727502903, Oliver Wetete Masungo. email-olivermasungo@gmail.com.

Tetanus affects all animals, not only donkeys

In your reply to a farmer's query (Nr. 53, Oct. 09, page 7) you stated that donkey dung is good for manure. Isn't there any problem with tetanus and how do we go around this problem? B. W. Oduor, P.O.Box 279, Ngiya, Cell. 0722 833 701

Tetanus is a life threatening disease. The tetanus-bacterium can live in the intestinal tract of all warm-blooded creatures. When it is excreted, it can survive in the soil for many years. The bacterium enters the body through open wounds.

If a wound has been infected, susceptible animals will show symptoms and die from the toxin produced by the bacterium within a short time. But as long as animals (or humans) are healthy, there is no problem with their dung.

What we would like to emphasize is: This problem is not at all restricted to donkeys! Cattle, goats, sheep, pigs, dogs; birds are equally affected. But man and horses (donkeys belong to the horse family) are more sensitive and will die from tetanus more easily.

Useful vaccination

To protect yourself and your animals from tetanus, do the following:

- Vaccinate your family and your donkey against tetanus. A donkey can work for more than 20 years if it is kept healthy - the services it provides during its lifetime is worth the vaccination fee many hundred times!
- Make sure your animals do not acquire open wounds from tethering, standing on dirty ground (leading to foot diseases), from working with inadequate harnesses or other practices.

How to make peanut butter

Hi, is it possible for me to get a full recipe of peanut butter preparation as it went on air on 2. 7. 2009? Andrew Wemali, Box 169, Kakamega, 0711 810368

The recipe is simple: For every 500 g of roasted shelled peanuts, you need about one small tablespoon salt and about 50 g of good vegetable oil. This mixture must be blended or ground into a smooth paste. You would need something like a blender for this. For crunchy peanut butter, stir one cup of chopped roasted peanuts into the paste. Ensure that the peanuts and oil are of good quality.

Aphids affect cabbage

Why do cabbage heads that have just started forming get deformed heads and leaves in the presence of aphids? Farmer, Buyangu

The presence of aphids and other pests may lead to reduced and stunted growth and therefore to poor head formation, especially if they appear in high numbers and feed from the heart of the plant. The heart is the centre of growth and the place where new leaves are formed. Aphids should therefore be controlled early. Use a neem or pyrethrum product. In light cases, a soap solution may be sufficient. Aphids are usually a problem if plants lack nutrients but also where too high amounts of fertilizers are being used.

Supply sufficient water

Other factors that can affect head formation even more than pests are:

- Water stress; must be avoided during this period!
- Nutrient deficiency, especially nitrogen (excess nitrogen also causes the problem). Cabbage is a heavy feeder, and during head formation, nutrient requirements are high. Plant cabbage after a legume, incorporate 10 to 20 tonnes of manure per acre before planting. Two weeks after transplanting, you may start to give side-dressings at weekly intervals (manure, slurry, plant teas).
- High temperatures during head formation; this may lead to loose heads.

Apples can be grown in Kenya

How long do apples take to mature into a fruit after seedling transplant? How many fruits can one harvest from a single apple tree? How many harvesting seasons does an apple have in a year? What is the average gross margin of a single apple tree? What is the average life span of an apple tree? Peter Okwany from Kapenguria, 0737 334 386

Although apples are fruits of cool temperate regions, there are some areas in Kenya which are suitable for their production. However, some requirements are difficult to fulfil and the skills needed to overcome these constraints should not be underestimated. Apple trees need a cold period before their buds open and leaves and blossoms start to grow. A hot period is required to produce fruits of good quality. Some commonly used manipulations in tropical regions include defoliation, application of certain chemicals, and drying. You will have to learn correct pruning techniques. Try to get information on cultivars which are best adapted to your local environment.

Seedlings are usually grafted on rootstocks which also make sure that apple trees remain relatively small for ease of work. Fruiting starts around the third year after planting. Between year 4 and 6 years, you may harvest between 2 and 10 kg apples per tree and per year; later, this may go up to around 15 kg. There are two main picking seasons in Kenya: In February and August. Usually, the trees are removed after 15 years, or when their yields have declined markedly. Gross margins will depend on your skills and care, and on the prices in the market. Keep in mind that most apples consumed in Kenya are imported from regions where climatic conditions are less demanding for apple production.

Recommended literature:
Griesbach J. (2007) Growing Temperate Fruit Trees in Kenya. World Agroforestry Centre, Nairobi. 128pp. The book can be found on: http://www.worldagroforestry.org/downloads/publications/PDFs/b15496.pdf

Biological methods can control armyworm

Armyworms are not a threat except during an outbreak. Then, you have to take immediate action.

The Organic Farmer

The African armyworms cause damage to cotton, barley, oats, wheat, maize, millet, sorghum, soya bean, sugar cane, grasses, citrus plants, beans, okra, cabbage, cucumbers, marrows, potatoes and tomatoes; they attack foliage, growing points and young stems. Some maize varieties are more susceptible to attack than others, e.g. Katumani, a dry land variety grown widely in Eastern Kenya. These varieties are most at risk where probabilities of armyworm infestation are high.

Normally, only small numbers of this pest invade pastures. However, periodically, the populations increase dramatically covering many thousands of square kilometres. Outbreaks often follow late rains in the hot season. The armyworms travel from field to field in great numbers, hence the name "armyworm". The first armyworm outbreaks appeared in Tanzania and in Kenya. In nine years out of ten, they have been known to cause 90 percent of crop and pasture loss in their worst years. In 2001 alone, they covered 157,000 hectares of crops and pasture.

Natural enemies

Many animals, birds and insects prey on the African armyworm at different stages of its lifecycle. These natural enemies should be encouraged to thrive by maintaining natural surroundings with plenty of breeding places for them, including trees and shrubs. Night birds and bats feed on the African armyworm moths. Lacewings, wasps, parasitic wasps and spiders consume the caterpillars.

A maize stalk infested with armyworms

First step: Monitoring

To monitor the presence of armyworms, conduct a visual inspection by going around all your fields. Armyworms feed at night and hide under debris during the day. However, they can be checked in late evening or early morning as they may still be actively feeding. Regular monitoring is vital for timely action. A recommendation for doing this is to examine 100 plants at random by sampling 20 plants from five locations.

Second step: Fight them

There are quite a number of plant extracts which can be used successfully against armyworms. To make these extracts work, follow carefully the given instructions. It is advisable to add soap, since soap acts like a glue, so that the plant extracts stick well on the leaves. Spray thoroughly on the infested plant, preferably early in the morning.

Neem (*Azadirachta indica***):** Remove the flesh from fallen fruits and dry them carefully in airy conditions (in sacks or baskets), to avoid formation of mould. When dry, the seeds are shelled, finely grated, then soaked overnight in a piece of cloth suspended in a barrel of water. There should be 2 to 50g of powder per litre of water. This solution is then sprayed on infested plants.

Pyrethrum (*Chrysanthemum cinerariaefolium***)**: The white flower heads possess insecticidal properties. Pyrethrum is most productive at altitudes of above 1600 meters and ideally in semi-arid conditions. On richer soils the insecticidal properties are reduced. Pick the flowers on a warm day when the flowers are fully open, dry them carefully and store them in an airtight container in the dark. Light reduces the effectiveness of the flowers.

Pyrethrum powder: Grind flowers to a dust. Use it pure or mix with a carrier like talc or lime. Sprinkle over infested plants.

Pyrethrum liquid: Mix 20g pyrethrum powder with 10 litres of water. Soap can be added to make the substance more effective but it is not vital. Apply immediately as a spray.

Use of garlic against armyworms is effective

Garlic has anti-feedant properties (stops insects from feeding) as well as bacterial, fungicidal, insecticidal, nematicidal and repellent properties. It is non-selective, has a broad-spectrum effect and can kill beneficial insects as well. Therefore it should be used with caution. The best time to spray is early in the morning.

Garlic bulb extract I: It is used against the following pests and diseases:
African bollworm, African armyworm, onion thrips, root knot nematodes, anthracnose, downy mildew and rice blast.

You need:
85 grams of chopped or crushed garlic
50 ml of mineral oil (vegetable oil)
10 ml of liquid dish soap
950 ml of water
Strainer
Bottle container

Preparation:
Add garlic to vegetable oil; allow mixture to stand for 24 hours. Add water and stir in the soap. Store it in the bottle container.

How to use:
- Dilute 1 part of the emulsion with 19 parts of water (for example, 50 ml of emulsion to 950 ml of water).
- Shake well before spraying.
- Spray thoroughly on the infested plant, preferably early in the morning.

Garlic bulb extract II: It is used against the same pests and diseases as:
African bollworm, African armyworm, onion, thrips, root knot nematodes, anthracnose, downy mildew and rice blast

You need:
100 g garlic cloves,
0.5 litres of water
10 gm soap
2 teaspoons mineral oil

Preparation:
Soak the finely grated garlic for 24 hours in the mineral oil. Dissolve the soap in the water, mix the infusion of garlic and mineral oil, stir well together and filter through a fine cloth. Before use, dilute this solution with 20 parts of water.

Fruit trees:
The following preparation is successful against caterpillars in fruit trees: Two finely grated garlic bulbs and two spoon chilli peppers are stirred into four litres of hot water in which a nut-sized piece of soap has been dissolved.

Source: infonet-biovision, HDRA

The Organic Farmer

The magazine for sustainable agriculture in Kenya

biovision

Nr. 59 April 2010

TOF celebrates, hongera wakulima!

By the Editors

Five years ago, we started our magazine *The Organic Farmer*. We are still very much active and eager to continue with TOF in order to serve our fellow small-scale farmers with information on sustainable agriculture.

However, we cannot fulfill our earlier promises, to publish in the names of the winners of the competition marking 5 years of TOF. Not that we are lazy, to the contrary! We are just overwhelmed by the big response: More than 150 farmers took part in the competition! So we raised the number of the first prizes from 5 to 15, as an appreciation of the interest farmers have shown towards the competition.

But we are serious people too. All entries went through a strict vetting process by our hawk-eyed judges. And we found some pretenders, for instance a lady "farmer", who wrote us a touching article of how she used information from TOF to put up a biogas unit. Visiting her farm, we discovered the article was actually written

by a man using the name of his Standard 8 daughter, and of course, there was no biogas-unit!

So, farmers, be patient and give us more time! In our May issue, we will include the names of the winners. To celebrate the 5 years, we can only say Hongera TOF! *Page 4 & 5*

Damaging fruit flies

This insect is the fruit fly *Bactrocera invadens*. It not only attacks mangoes, but also other cultivated fruits such as oranges, tomato, banana, guava, custard apple and avocado. *Page 2*

Photo courtesy Georg Goergan

Discover the benefits of neem trees

TOF – In the first issue of *The Organic Farmer* we wrote an article on the neem tree. In subsequent years, many times we have mentioned neem products as useful for organic farming. Neem has a lot of different effects on a wide range of plant-feeding pests.

In the last few weeks we got a good number of questions from farmers on this wonderful tree, we tell you how to make your own extracts from neem and how to use them. *Page 3*

Neem tree with ripe fruits

in this issue

Dear farmers,

When we launched The Organic Farmer *in 2005, we had only one target: To reach farmers who lack information on sustainable agriculture in order to broaden their knowledge and to improve their income and livelihood.*

Five year down the line, we can confidently declare that we have fulfilled this mandate. Every week we receive an average of 50 questions which we answer directly by phone calls, SMS or through the magazine. Farmers work hand in hand with us because they have used our information and seen that it works. They therefore trust us. We are also available to them when they need us; they call us early in the morning or late in the evening and over the weekends.

To cater for a growing readership, we have raised the number of copies from 10,000 in 2005 to 20,000 by the end of last year – and these are still inadequate. Farmers not only impatiently await the issues of TOF; agricultural extension staff, schools and NGOs rely on the magazine as a highly valued resource material for training. Our two additional programmes, TOFRadio (on Thursdays, 8.15 pm on KBC Kiswahili Service) and the i-TOF information and input centres, have the same target as TOF: To offer and spread knowledge on organic farming and sustainable agriculture. We are grateful to Biovision, the donor, and icipe, the publisher, for their continued support.

One question remains: Is this knowledge really applicable for farmers, and do they actually adopt and practise what we teach them? We can clearly tell from farmers' enquiries, from questions and from the entries we received for our farmers' competition that quite a good number of farmers are using technologies that we promote.

As you can see, we have done some little changes in the design. But the content remains the same, TOF remains TOF: A source of information that helps you to ensure successful organic farming at all times.

TOF P.O. Box 14352, Nairobi 00800, Tel: 020 44 50 398, 0717 551 129, 0738 390 715, Email: info@organickenya.org

What can farmers do against fruit flies?

Fruit flies cause huge losses in mango production. There are various methods of controlling these pests.

***Sunday Ekesi** **

Mango production is continually gaining recognition for its potential as a major source of income especially for small-scale farmers. The total area under mango production in Kenya alone is estimated at 16,000 ha. Mango exports from Africa are estimated at 35-40 thousand tons annually and worth around Ksh 3 billion (US $ 42 million). The EU remains the largest destination market for exports from Africa. The biggest threat to mango production is the fruit fly; the female flies lay their eggs under the skin of mango fruit. The eggs hatch into whitish maggots that feed on the decaying flesh of the fruit. Infested fruit rot quickly causing considerable losses.

Traditionally, yield loss on mangoes in Kenya, Tanzania and Uganda due to the fruit fly can range between 30-70% depending on the locality, season, and variety. This problem has been aggravated by the invasion of the fruit fly *Bactrocera invadens* with damage increasing to 40-80% especially in lowland areas where it is now the dominant fruit fly pest. Quarantine restrictions on fruit fly-infested fruits is severely limiting export of fruits to large lucrative markets in South Africa, Europe, the Middle East, Japan and USA, where fruit flies are considered as quarantine pests.

Various types of fruit fly

Different species of fruit flies are responsible for mango damage across Africa but the 4 most important ones are:

Bactrocera invadens

Bactrocera invadens: Currently the most important. In addition to mango (which is the primary host), the insect also attacks other cultivated fruits such as oranges, tomato, banana, guava, custard apple and avocado.

Ceratitis cosyra: Also cause significant damage on guava, custard apple and marula. The insect has been gradually

Continued on page 6

* *Dr. Sunday Ekesi is senior scientist at icipe - African Insect Science for Food & Health; Head, Plant Health Division & Leader, African Fruit Fly Programme.*

Insects as biological control agents

The wasp *Fopius arisanus*

One of the methods of controlling fruit flies is the use of beneficial insects or parasites also called parasitoids. One of an efficient biological control agent is the wasp *Fopius arisanus* which is very effective at controlling the fruit fly *Bactrocera invadens*. It attacks the eggs of the fruit fly and develops through the larval stages of the fruit

The wasp Fopius arisanus

fly thus killing it. It is therefore highly efficient against the control of the fruit fly and can be used together with other control measures to reduce damage to mangoes.

icipe together with KEPHIS, KARI and the Ministry of Agriculture have started releasing the parasitoid across Kenya. The parasitoid is self perpetuating, works for free and does not require additional input from the grower. However, for the parasitoid to work effectively, the growers must minimize cover spray of pesticides in their orchard or the parasitoids will be killed.

Weaver ants

The weaver ant *Oecophylla longinoda* can be used to protect mango and citrus fruits from damage by fruit flies. The weaver ant has been known to disrupt the fruit fly from laying eggs on the fruits, thereby reducing fruit fly damage. To be effective, the ants have to be effectively conserved in the in the mango orchard by reducing the use of chemical pesticides that can kill the predator or use of less harmful pesticides. Host trees must have food for ants such as homopterans honeydew or plant nectar that the ants feed on.

To retain the weaver ant during the dry season, farmers can provide dried fish, which the ants can feed on, to meet their energy and nutritional requirements. Farmers can tie ropes between mango trees in an orchard to facilitate the movement of the ants from one tree to the next. Existing weaver ant colonies can also be harvested and introduced to other trees in the orchard where they are not present. The weaver ants technology are being promoted in many countries of West Africa, in Tanzania and in Asian countries. (***Sunday Ekesi***)

Weaver ants on a mango tree
(photos courtesy Georg Goergen)

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development.
www.biovision.ch

Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720 419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekesi, icipe

Address *The Organic Farmer*
P.O. Box 14352, 00800 Nairobi, KENYA
Tel: +254 20 445 03 98, 0738 390 715, 0717 551 129, info@organickenya.org
www.organicfarmermagazine.org

Neem protects your crops against pests

Products from the neem tree are important insecticides in organic farming worldwide.

Theresa Székely

The drought-resistant neem tree (*Azadirachta indica*) grows in semi-arid to sub-humid areas of the tropics including Kenya. It can reach a height of up to 40 m and an age of 200 years. Over 100 compounds with pesticidal properties have been detected in the neem tree. The best known, azadirachtin, is found in all parts of the tree, but it is most concentrated in the fruit, especially in the seeds. A neem tree may yield up to 50 kg of fruit per year.

How do neem products work?

Neem has a wide range of different effects on a wide range of plant-feeding pests. As a broad-spectrum repellent, it makes plants unpalatable to insects. As an insect poison, it makes insects loose their appetite and stop feeding. As an insect growth regulator, it hampers the insects' ability to moult and lay eggs, or causes deformities in the insects' offspring.

Neem extracts can even be taken up by plants through their roots and leaves into the plant tissues. Neem can therefore help control pests like leaf miners feeding inside leaves, which are usually not affected by sprays applied on the leaf surfaces.

In spite of their broad-spectrum action, neem products generally do not harm natural enemies seriously.

Important: Insect pests are not killed immediately, and the effects are often visible only 10 days after application. For satisfactory results, neem extracts should therefore be applied at an early stage of pest attack.

Ground neem seeds or kernels

- Ground neem seeds or kernel powder (before or after oil extraction) are effective against nematodes.
- Neem dust applied to the soil where plants are growing can protect crops like grains, sugar cane, tomatoes, cotton, or chrysanthemums from insect damage for several weeks, even during heavy rains.
- Neem powder can protect stored roots and tubers against the potato moth for several months.

Plant extracts

Plant extracts from seeds and leaves are excellent against beetle larvae and caterpillars, and good against stalk borers and adult beetles.

Products with oil content

Oil-based neem products can be toxic to plants and cause burnings. They should therefore be applied with restriction.

- They are effective against aphids, whiteflies, bugs, beetles, leafhoppers, grasshoppers and others.
- Neem oil protects stored beans, cowpeas, and other legumes effectively.
- Neem oil based emulsions or extracts can also have a preventive effect against plant diseases such as mildews and rusts.

Neem pesticides in Kenya

- Neemros® and Neemroc® : Saroneem Biopesticides Limited. Babadogo road, opposite Catholic Church. P. O. Box 64373-00620 Nairobi. 0728 592 478 Email: saroneem@yahoo.com

- Achook: Made in India, available in Agrovet shops.

A fully grown neem tree can produce upto 50 kg of seeds in a year.

Prepare neem water extracts

1. Collect fallen neem fruits from underneath the trees.
2. Remove the flesh from the seeds and wash away any remaining shreds.
3. Dry the seeds and store them in a dark and airy place to avoid mould formation.
4. For the preparation of extract, shell the seeds.
5. Grind 500 g of neem seed kernels in a mill or pound them in a mortar or grate them finely. Mix the crushed neem seed with 5 to 10 litres of water. Soak them overnight.
6. Strain the liquid before use.

Application of neem water extracts

- Spray the neem water directly onto the plants using a sprayer or straw brush.
- Neem works fastest during hot weather. Heavy rains may wash off the protective cover of neem on plants. Repeat the treatment if pest infestation is high.
- Neem water will remain effective for 3 to 6 days if it is kept in the dark. All neem preparations loose their power rapidly when exposed to sunlight.

Take precautions!

Leaf or seed extracts can easily be prepared by small-scale farmers. Although they are almost non-toxic to mammals, seeds or seed extracts are poisonous when consumed. Therefore, take the following precautions:

- Place neem extract out of reach of children and pets while preparing, using and storing it.
- Avoid direct contact with the extract at any time.
- Do not use utensils and containers for food preparation and for drinking for the preparation of neem extract.
- Clean all the utensils well before and after use.
- Always wash your hands after handling the plant extract.
- Always test the plant extract on a few infested plants first before going into large scale spraying.
- Use protective clothing when applying the solution.

Most farmers take the tree Melia Azedarach (left) which grows in most highland areas in Kenya for the neem tree (right). The two trees are different–so be careful when buying seedlings.

A lively exchange with farmers

Use of simple language in explaining technologies has made TOF popular.

The Editors

We always smile when farmers write to the "TOF management". We are actually a tiny office with three people, two editors, and an office assistant who does all the paper work and the distribution. In close cooperation with the producer of TOF*Radio* we plan the issues of TOF, with assistance from a few contributors who write for us some of the articles, for instance Su Kahumbu, William Ayako, Anja Bengelstorff or Theresa Székely. We also rely on the creative work of our Graphic designer James Wathuge and the printing company Regal press, which prints the high quality magazine.

Copies not enough

Gradually, we have increased the number of copies to 20'000, reaching around 170'000 readers per month. To ensure copies are fairly distributed, only registered farmers' groups now qualify for free copies of the magazine; we reach about 1900 farmers' groups whose members share the magazine.

We know, of course, that all farmers would like to keep their own copy, but this is not possible for financial reasons, (as you can see in the box below). Still we are unable to meet the demand – many farmers' groups are on the waiting list. By the way, this focus on farmers' groups has nice social side-benefits: We know that hundreds of groups are meeting once per month to discuss the articles in TOF and to share their experiences; and we know as well that nearly 200 farmers' groups have been founded with the aim getting a magazine; these farmers are now working together in starting and sustaining organic farming.

Farmers show great interest

Are we successful in the sense that farmers do adopt our ideas? It is difficult to measure this. When we started the magazine in April 2005, one of the questions at the back of our minds was if it would bring any change to the way agriculture is practised in the Kenya and in East Africa. Looking back we can say, with certainty that TOF has achieved its main objective of educating farmers on ecologically sound methods of crop and animal production, which has improved farm productivity and income for the majority of the farmers.

Production of a magazine of this nature is a very demanding task. First, we have to research for relevant material, which we have to explain in simple language that farmers can understand and apply. Second, we also strive to answer all questions sent to us by farmers through letters, SMS, direct calls and even e-mails. This kind of interactive dialogue with our fellow farmers is not only very interesting, it is also fruitful in the sense that many of their questions enable us to write articles about this or that subject that are relevant to farmers' needs.

Solidarity

In the farmers' competition, one farmer wrote to us: "I am proud to be an organic farmer and to belong to you fellows". This is a compliment well said, and we can only reply: We are proud to serve the ever-growing organic farmers' community with our magazine. It gives us a good feeling to share information with farmers.

A good investment

A lot of financial resources have been invested in this project: TOF costs around Kshs. 12,5 million per year. In this regard we would like to thank Biovision Foundation who have continued to support us for the last five years. Their money has been put to good use as demonstrated by the success of the project.

More and more farmers would like to get their own copy and are willing to pay for it. The annual subscription fee is Ksh 980. At the same time we would like to request our fellow farmers to report to us any change of address. It is very discouraging when we send out the magazine and the Post office staff send it back with the remark: Return to sender; Box not paid and closed.

A future for all

By Andreas Schriber,
CEO Biovision Foundation, Switzerland

Whenever people ask me how we are progressing in our promotion of ecological development in Africa I am tempted to quote an African proverb: "Grass doesn't grow faster if you pull it!"

But since I am a science-journalist by training, I usually stick to tangible facts. And often, I proudly present the results that derive from The Organic Farmer, Kenya's most resourceful agricultural paper!

It is globally recognised that crucial tasks and services literally lie in the hands of small-scale farmers. But when it comes to the field of information dissemination among those who work the land, the need to enhance information flow is obvious. I am very proud and glad that the Biovision Foundation has essentially assisted in the launch of TOF and has sustained this amazing venture ever since.

TOF responds to a demand expressed by farmers who want to know more about how to run their enterprises in a sustainable way. E-Mails, SMS, letters and phone calls from readers reach the editorial team on a daily basis. This shows, metaphorically speaking, that the grass is growing! – Not because it is being pulled, but because the message is finding its way to the roots.

Biovision's focus on strengthening knowledge-sharing about ecological methods for the 'small farmer' community in Africa means that we are dedicated to maintaining our contribution to appropriate farmer communication in the years to come. And whatever media may prove to be right channel for this –TOF magazine is the foundation which will anchor more bridges that connect people and their knowledge – towards a future for all, naturally.

Biovision – Foundation

for ecological development, is a Swiss based non-profit organisation, founded by Dr Hans Rudolf Herren. For over ten years, the Foundation has been promoting the development, dissemination and application of ecological methods so that people in developing regions may improve their livelihoods by their own means. TOF has been funded by the Biovision Foundation since its inception in 2005.

"It is finally time to organize ourselves!"

By Su Kahumbu

After going through the responses from the TOF competition (see page 1) I gain the impression TOF has had considerable contribution to agriculture in the country the past five years. Testimonials from farmers are pouring in about the progress they are making using the new technologies recommended by the magazine. It is seems that the organic wheels are turning and organic production is picking up in the countryside.

However, it is sad that the sector, though developing in the field, is not making the same sort of progress at a national level. Policies and awareness in both the private and Government sectors are still lacking. From where I stand, the bigger part of development of the organic sector looks like it is driven by donors in a top-down approach.

Organic mark not necessary

To some extent, this situation leads to confusion in the industry. One issue in mind is the 'Kilimohai Mark' (a national label for local organic products). It has been already forced upon the organic industry without thought as to whether the industry needs it or is even ready for it at this stage of its development. We are being told it is good for us even though we cannot see how it is anything else other than an additional costs. No farmer needs additional costs if they can avoid it.

Confusion in organic sector

In normal circumstances, stakeholders are expected to table their proposals, which are then taken up by the bodies mandated to do so. But what happens when the stakeholders are spread over an entire nation, disconnected by communication and distance? The challenges of representing a scattered stakeholder network are enormous. This results in a situation where both the stakeholders and their representatives do their own things without any coordination. This is a waste of time and turning around in circles and I feel that it is not a good representation of the organic sector in Kenya.

But in order to change this unfortunate situation, we have to recognize what needs to be done. The sector has to be driven through a bottom-up approach where the farmers develop a platform from which they can speak, since they are the core of this sector.

Need for an association

It all comes back to the formation of an association. An individual cannot be able to convince the government to take notice of problems on any sector. This is especially for small-farmers who in the eyes of many have no say. However, once we are organised and represented as a serious organisation we will have some power. We will be able to influence those that hold office in our interest to perform their duties. We will be able to eradicate the 'theory of assumptions' that currently develops programs for our industry. We will be able to take the responsibility ourselves and pride in driving the industry forward.

Well-informed farmers improve their livelihoods. Our picture shows a group of farmers after a TOF training

Organic sector will develop

TOF started with 10,000 copies 5 years ago and currently prints and dispatches 20,000 copies all over the country, it runs a radio program and information centres. This is a milestone in the development and support of small-scale organic farmers in Kenya. With a clear focus and drive, the organic sector can develop into a movement recognised at the household, national and at international level. To reach this target needs only one thing: Your commitment.

TOF is a good teacher

Amos Guadaru changed to organic farming in May 2005 – after reading the first issue of The Organic Farmer in April 2005. Mzee Amos, 67, lives in Subukia Valley. "TOF has helped me a lot: I built sheds for my goats and sheeps, I am keeping bees, I control all pests with plant extracts, I feed the soil with compost, and eat healthy food", explains Mzee Amos. "And who was teaching me all these? TOF!" He is proud that he belongs to the first readers of a magazine "which has trained thousands of farmers", he adds, "and I do hope that it will go on in this way".

TOF for our training

Daisy Rono, Agricultural Coordinator, Catholic Diocese of Nakuru. The Catholic diocese of Nakuru receives 500 copies of TOF that go to the six districts of Nakuru, Koibatek Baringo, Kericho Buret and Bomet. "The diocese has tailored its agricultural curriculum on the contents of *The Organic Farmer*, which follows the farmers' yearly calendar", Daisy Rono says, "since the magazine's topics cover every aspect of farming with all details that her extension staff need to train farmers; they are now making compost, pest and soil management as we have trained them."

"TOF contains all a farmer needs"

Mary Wanyonyi, Farm manager NYS-Centre, Turbo

Mary Wanyonyi came was given a copy of The Organic Farmer by an official from Etang (K) Ltd. She immediately applied and uses the five copies for training NYS recruits and farmers in the surrounding areas. The magazine has become an important reference material in her training programme. Mary Wanyonyi is happy that some of the farmers have adopted sustainable agriculture. "TOF covers every aspect of the agricultural enterprise from planning, budgeting and even the expected gross profit margins", Mary says.

TOF makes our work easier

William Ndirangu, District Agricultural Officer, Rongo District, came across the magazine in the year 2006, when he worked as the deputy DAO, Kisii district. Ndirangu distributes 100 magazines in Gucha, Kisii, Gem and Rongo district. "Farmers often come to my office with diseased plants and pests seeking solutions, which I can solve using the infonet-biovision CD and TOF." The magazine has enabled him to know many farmers groups who now consult him on various problems. About 20 agricultural extension officers from the 4 districts use the magazine to train farmers on different agricultural ventures.

>>> from page 2 fruit flies

displaced at lowland areas by *Bactrocera invadens* but they remain a threat to mango production in the highlands.

Ceratitis rosa and its close relative *Ceratitis fasciventris*: Attack a broad range of cultivated and wild fruits in addition to mangoes.

Control methods

There are several methods of controlling fruit flies. African Insect Science for Food and Health (icipe) promotes a combination of methods through the use of Integrated Pest Management (IPM) technique. The primary management techniques are:

Baiting techniques

The traditional method of fruit fly control is based on use of food baits mixed with a pesticide. The bait attracts the fruit flies from a distance to the spot of application, where the flies feed on the bait, ingest the pesticide and die. The bait after mixing is normally applied to 1 square meter spot on the canopy (away from the fruit) or on the trunk of each tree in the orchard on a weekly basis starting from when the fruits are about ½" in size and continues till the very end of the harvest.

A couple of commercial baits are available in the market such as Mazoferm, NuLure, Buminal and Solbait that can be mixed with pesticide such as Spinosad and applied as above. Another commercial product is GF-120 (success). This bait is already pre-mixed with pesticide (Spinosad) and can be applied using the on-label information on the container.

Although pesticides are not permitted in organic farming, the principle of pot application either on the canopy away from the fruit or tree trunk permeate the principles of organic farming.

Research at icipe has shown that a protein bait from brewer's yeast obtained as industrial by-products when applied in low volumes as spot spray to 1 square metre of mango canopy or to mango trunk provided good control of mango infesting fruit flies. Research is however continuing at formulating the bait to enhance it attractiveness to fruit flies and should be available as alternative to imported product in the very near future.

Orchard sanitation

Poorly managed or abandoned orchards and a variety of wild hosts can result in high population build up of fruit flies.

An augmentorium attracts fruit fly predators

Orchard sanitation, which entails the collection and destruction of all unwanted fruits containing fruit fly maggot on the tree and on the ground, can contribute significantly to reduction in damaging fruit fly population in the orchard. This is a very laborious exercise but can be quite effective if the fruits are collected regularly and destroyed twice a week for the entire season. The collected fruits should be placed in an Augmentorium (*See picture*).

The Augmentorium which can be locally made serves the dual purpose of field sanitation and conservation of natural enemies of fruit flies. It is a tent-like structure that confines fruit flies that emerge from fallen rotten fruits that are collected from the field and deposited in the structure while at the same time conserving their natural enemies by allowing parasitoids to escape from the structure through a fine mesh at the top of the tent.

Mechanical fruit protection

Wrapping or bagging of individual fruits with newspaper or plastic bags to prevent adult fruit flies from laying eggs on the fruits is also a practice of producing fruits that are free from fruit flies. To be effective, the fruits must be wrapped or bagged well before fruit fly attack, at least one month before harvest. Although laborious, it is an effective method for expensive fruit species produced for export or fruits produced in backyard gardens for family use.

Inoculate with fungal pathogen

During development mature maggot of fruit flies drop from the fruits to the ground, burrow into the soil and form a resting stage called the puparia. An important part of fruit fly suppression research at icipe includes soil treatment with fungal pathogens to kill the mature maggot and puparia. The active ingredient in the granules is a fungus called *Metarrhizium anisopliae*, a naturally occurring fungus that is used worldwide as a biological pesticide for controlling different kinds of insect pests. The fungus is formulated as granules and can be manually distributed by hand and then raked into the soil under the mango canopy. Application is usually done once in the season at the onset of fruiting and the fungus can persist in the soil for over one year. Icipe is discussing with a commercial company that may be willing to commercialize the fungus in the near future.

Dr Sunday Ekesi & M.K. Billah have produced a book on the control of the fruit fly and related pests: A Field Guide to the Management of Economically Important Tephritid Fruit Flies in Africa (icipe)- ISBN 92 9064 209 2 (Nairobi, 2010).

Answers in brief

Dry season Sukumawiki

Please advise me on a variety of Sukumawiki seeds that can withstand dry season. Edwin Okello, Fort Ternan 0713 458 363.

Most varieties of sukumawiki require water to grow well. Perhaps you can try Kale 1000 head that has some tolerance to drought.

Spacing for pawpaws

I would like to grow pawpaws. What is the best spacing? Wellington Njeru Tel. 0720 996 322.

The planting holes should be 60 cm x 60 cm. Spacing will determine the number of plants to be planted. 2.5 m x 2.5 will accommodate 1600 plants. 2.5 m x 3 m will take 1332 plants and 3 m x 3 m, 1110 plants. Well-composted manure should be mixed with the topsoil and the holes filled with this soil mixture when planting.

Tissue culture bananas

I would like to grow Cavendish tissue culture banana varieties where can I get seedlings? Tel 0722 926 631

The common varieties being produced under the tissue culture method are the Giant Cavendish, Chinese Cavendish, Dwarf Cavendish. Farmers interested in buying these tissue culture bananas can contact the following organisation: Africa Harvest, P.O.Box 642 -00621, Nairobi, Tel.020 7124083/1/6/5/2.

Effective use of diatomite

Can diatomite be applied to grains already affected by weevils or any other pests and work effectively.

No chemical or biological control agent can kill pests already inside the grain. Once the pests get in, it is difficult to kill them until they come out. Diatomite and even the other chemicals used to control pests work by contact with the pest. So only grains that are not affected by pests are protected. But once the pest leaves the grain it is immediately killed. So you are advised to apply diatomite early enough before the pests set in.

Diatomite does not expire

Does diatomite expire in cereals? Shining Star S.H.G

Diatomite does not expire when applied in cereals. A farmer can keep cereals as long they like, some have managed to preserve cereals for as long as 3 years.

Using moisture bottle

Can we use any type of a bottle for testing moisture in grains or do we have specific one for this practice?

Both plastic and glass bottle can be used to test moisture in cereals; but it must be transparent so that one can see through the bottle to determine if there is any moisture in the grain to be stored

Use composted manure!

Is it advisable to use poultry manure directly to plant potatoes or any other crop? Peter Thiongo 0710 858 317

All fresh animal manures contain high amounts of ammonium which may cause "burning" of crops. Fresh manures may also contain pathogens that are dangerous for people. Composting eliminates both these risks and it is more pleasant to apply composted material. If you apply fresh manure, use only small amounts and spread it thinly on the soil surface around plants that are already established. Composted manure can be used for everything, e.g. for seedlings and at planting, and should be mixed into the topsoil.

Lablab and *dhania* related?

Does lablab share anything with dhania (coriander)? They both produce a similar scent.

There is no scientific proof that the two belong to the same species. So it is difficult to say if they have anything in common. Lablab is a leguminous plant, a bean, while coriander belongs to the Apiaceae family (together with parsley, carrots, and celery). These are two completely different plant families. But plants do not have to be related to have common properties. It may be possible that lablab and coriander produce a similar scent but this does not in any way show they are the same.

Use of avocado and Aloe Vera extract

Give us more information on the uses of avocados and Aloe Vera plants. They do well here in Bomet. John Koech Kenfap. Tel. 0725 033 900.

tsz – Avocado has many uses due to its high nutritional benefits. Like all fruits, it is rich in minerals and vitamins. It is recommended as a high-energy food for diabetics and people with high blood pressure. It contains a very beneficial and easily digestible fat.

Avocado cannot be cooked but should be eaten raw on bread and salads together with lemon juice, salt and pepper and sugar. It is also used as a flavouring in the preparation of ice creams, milk shakes and soups. Avocado oil is also widely used in products for skin and hair care and other cosmetics.

Aloe vera on the other hand has many medicinal properties. It is widely used in herbal medicine and beauty products because of its many benefits. In medicine, it is used to speed up healing of burns. It is also said to control heartburn, arthritis, rheumatism, swelling and even asthma. Aloe vera is said to be a good laxative, antifungal, immune system stimulant, antiviral, anti-bacterial as well as a nutritional supplement. Many poultry farmers in the counctry mix a few drops of Aloe vera gel with chicken drinking water to prevent poultry diseases.

NOTE: Pregnant women should never take aloe vera as it causes uterus contraction, which can create complications. Young children should also not be allowed to take it internally.

Recipe for a tasty avocado spread

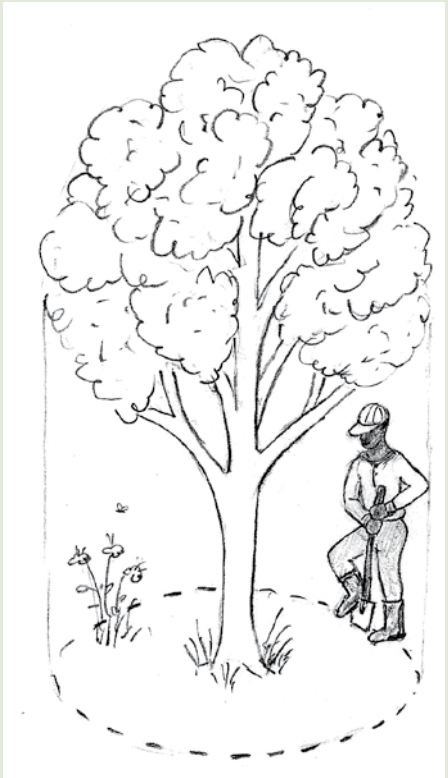
2 large ripe avocados
12 boiled eggs
Juice of 2 – 4 lemons
Salt, pepper, parsley, coriander etc, according to taste.
Remove the shells from eggs and avocados, mash and mix them together with the lemon juice. Add salt and spices to taste.
Spread generously on bread, fill into tomato halves, eat with potatoes etc.

Stimulate the trees - but not too much!

I heard that you can hammer a nail into a fruit tree to force it bear fruits. Is it true? Farmer in Buyangu

A young tree will always try to realize its full vegetative potential and to grow as much as possible before it starts to bear and be reproductive. It may sound puzzling, but the more fertile the soil and the more favourable the conditions, the longer it will take until a tree bears fruits. Whereas a moderate supply of nutrients, or injuries (e.g. from nails) limit the vegetative growth of trees and they start to bear earlier. However, heavy injuries and very poor nutrient supply will have adverse effects: they reduce growth and tree size, promote diseases and shorten the lifetime of trees. So you have to be careful! Small, diseased and short-lived trees will not be able to give their owners a large harvest.

Therefore next time, before you lose your patience and nail a tree, try the following: Cut the roots of the tree all around its drip-line, where the tree canopy ends. Do this with a sharp spade or with the panga, about 20 cm deep. This will heal better than the wounds from nails driven into the tree trunk and has the same effect. You may also bend and fix upright side-branches into a more horizontal position. This will as well stimulate flowering. ***Theresa Székely***



Stinging nettle

Can I use stinging nettle for plant tea?

tsz – Yes you can. Stinging nettle is one of the most preferred plants for making plant tea, as it has soft leaves and releases its nutrients quickly while decomposing. It can be used as top dressing or as foliar feed. Nettle tea is also used as a spray against aphids.

Nettle is a good natural remedy for many health problems. Nettle tea is a diuretic drug (it cleans bloods).

What is the English name for *cong'e*?

If *Oxygonum sinuatum* is *cong'e*, what is its English name and also names in other languages?

tsz – The English name for *cong'e* is double thorned weed. It is a common plant in Kenya, as the various names in local languages show:

Kiswahili: *Kindri*
Giriama: *Kimbiri*
Kamba: *Song'e*
Kikuyu: *Cong'e*
Luhya: *Namawa*
Luo: *Okuru*
Maasai: *Enkaisijoi*

Photo: Hyde, M.A. & Wursten, B. (2010). Flora of Zimbabwe

Rabbit keepers need knowledge on feeding, housing, breeding and also a market

Rabbit keepers are frustrated

Many farmers have gone into rabbit keeping without verifying the market's needs.

The Organic Farmer

When a farmer makes a good return from a particular farming enterprise, most farmers rush into the same expecting to make good money only to end up being frustrated when the commodity floods the market. This reduces prices. Unfortunately, many farmers sometimes do not make any research before going into production. Market research is a very important aspect of any business.

This is exactly what has happened to rabbit production. Many Kenyans now face scarcity of land; rabbit keeping should be an ideal venture as they do not require a lot of space and initial capital to rear. They can also be a cheap source of protein in many rural households. It is therefore important that farmers who keep rabbits only rear a small number they can sell to fellow farmers and also use for home consumption. They can only produce in commercial quantities at such a time that they can find a reliable market.

Awareness creation important

The market for rabbit meat is not yet well established in Kenya. In many communities rabbits are still considered unfit for consumption, in such communities only children are allowed to keep rabbits and eat them. Most consumers of rabbit meat can only be found in urban areas, and this is a minority. Selling rabbit meat and skins is therefore a bit tricky and needs some bit of planning on the side of the farmer.

A big awareness campaign is needed to educate Kenyans on the benefits of eating rabbit meat. It is a white meat that has no cholesterol and is therefore considered healthy. A large number of people would consume rabbit meat if they knew of these benefits, thereby increasing demand and a ready market for local rabbit keepers.

Not enough for export

A number of companies especially from China have expressed interest in buying rabbit meat and even skins from Kenya. However, rabbit keepers lack adequate quantities for a consistent supply to the external markets. Therefore rabbit breeders in every region need to work together to be able to raise enough rabbits whenever there is a market opportunity.

According to a prominent rabbit keeper, Godfrey Gichuhi, most farmers do not have the technical knowledge on how to prepare rabbit skins in the right way to maintain the required quality. He says most of the skins being offered by farmers are poorly done and therefore cannot get buyers locally, leave alone the export market.

It is important that farmers explore the possibility of selling their rabbits to fellow farmers in their area for the time being. From there they can explore potential markets and only rear the number of rabbits, which they can be able to sell. Gichuhi advises farmers to work in groups, this is one way they can share their experience and even be able to raise enough rabbits when the markets are established. There is a rabbit slaughterhouse in Gilgil but they only buy rabbits when they have orders. Farmers can contact the slaughterhouse on 0724 856 878, ask for Alice.

The ministry of Livestock and Fisheries Development has plans to start educating people on rabbit breeding, but the programme is yet to start.

In the May issue: More about skin preparation and breeding.

farmers forum

020 445 03 98 0717 551 129 0738 390 715

Green Pepper: I am looking for green pepper. Anyone with 200 kgs can contact me on Tel. 0722 848 305. Leonard Saitoti.

Capsicum market: I have organic yellow and red capsicums. Is there anyone who can buy these products? Frank Muriungi Tel. 0722 218 058

Chaff cutter: I have 5 head of cattle and require a chaff-cutter. If you have one for sale please contact me. Peter Wachira Tel. 0722 341 718, Meru.

Biogas units: If you have from 1-16 cows and have thought of installing biogas, now is the time to get it done. GTZ is offering various subsidies for construction of permanent small-scale biogas plants during the year 2010. The subsidies vary from contributions of Ksh 30,000 for the smallest plant to Ksh 55,000 for a plant with gas storage capacity of 7 cubic meters. In some cases this is as much as 30% of construction costs depending on the material used. The models are permanent in the sense that they are guaranteed to work for a minimum of about 50 years. One condition is that a GTZ-trained technician has to supervise the construction. Farmers can contact one of the technicians promoting this system, please call Mr Kamande from Thika Tel 0724 394 699 for details.

Dairy goats: We are looking for pedigree dairy goats to provide high quality milk for HIV/AIDS patients to be able to boost their immune systems and nutrition. Please give us their milk production rates and let us know if they can do well in South Rift Valley highlands. Joseph Koskei, Rural Projects Support Facility, CBO, email: e08kitur@yahoo.com

Cassava, bananas for sale: I have cassava and bananas for sale.
Any farmer who needs these products can get in touch with me. Tel. 0718476260/ 0727502903, Oliver Wetete Masungo.
email-olivermasungo@gmail.com

Rabbit Posters: Get to know the various rabbit breeds and their best commercial use e.g. meat, skins and for exhibitions. Get an A2 size poster for only Ksh 200 and a free rabbit management handbook. Farmers interested can contact James Wathuge 0720 419 584, 0733 893 300

Organic produce wanted: Green Dreams / Food Network East Africa Ltd is urgently looking for organic produce for its Nairobi stores. Farmers with vegetables, fruits, grains, etc can contact Triza on 0721 793 411 or Mwaniki on 0726 283 866 or email: info@organic.co.ke

Text Formattierungen

paragraph

```
[paragraph]
... text ...
[/paragraph]
```

oder

```
[p]
... text ...
[/p]
```

ein paragraph ist ein einfacher abschnitt, oben und unten wird ein wenig platz gelassen.

list

es wird ne normale liste dargestellt mit jeweils nem - vor jedem eintrag.

```
[list]
      [listitem]item 1[/listitem]
      [listitem]item 2[/listitem]
      [listitem]item 3[/listitem]
[/list]
```

title

es wird ein titel gesetz, das heisst der text ist fett und wird wie ein paragraph behandelt.

```
[title]Dies ist ein Titel[/title]
```

b

der text wird fett dargestellt. für titel besser den title-tag benutzen.

```
[b]ich bin fett[/b]
```

br

es wird ein zeilenumbruch gemacht. wenn möglich paragraph benutzen.

```
[br]
```

link

es wird ein link erstellt.

```
[link XXX YYY]text[/link]
```

es gibt verschiedene links sie werden durch den oben mit XXX markiertn wert unterschieden. YYY ist jeweils die adresse.

web

es wird ein normaler link erstellt welcher auf die angegebene seite verweist.

```
[link web http://www.google.ch]link zu google[/link]
```

email

es wird mailto link erstellt

```
[link email spam@spam.com]mail me some spam[/link]
```

document

es wird ein dokument aus dem documents bereich verlinkt. die angegeben nummer ist die id des dokumentes und kann im dokumente bereich rausgefunden werden.

```
[link document 32]ein dokument[/link]
```

local

es wird ein lokaler link angesprungen, der lokale link muss über einen target tag definiert worden sein. die links gehen nur auf der gleichen seite.

```
[target]hallo[/target]
[link local hallo]ein lokaler link[/link]
```

image

es wird ein bild angezeigt. es kann eine der drei folgenden formen verwendet werden.

```
[image id]
[image id type]
[image id type width height]
```

"id" ist die id des bildes, sie kann bei dem bildupload rausgefunden werden.

"type" ist der typ des bildes, im augenblick ist nur "default" möglich. so wird das bild ganz normal eingefügt ohne textfluss rechts oder links.

"width" und "height" geben die maximale breite und höhe des bildes an. standardmässig sind 300x200 pixel eingestellt.

tabelle

tabellen werden wie folgend definiert:

```
[table xxx yyy]
      [row]
            [cell]spalte 1 zeile1[/cell]
            [cell]spalte 2 zeile1[/cell]
      [/row]
      [row]
            [cell]spalte 1 zeile2[/cell]
            [cell]spalte 2 zeile2[/cell]
      [/row]
[/table]
```

"xxx" steht für "left", "top" oder "leftTop" oder nichts oder "none". wenn left angegebn wird, wird die erste spalte als header markiert, wenn top angegebn wird wird die erste zeile als header markiert. bei "leftTop" werden beide als header markiert. yyy steht für das lyout. im augenblick gibt es nur "simple" welches keine umrandungen hat, gegenüber dem default layout welches erscheint wen gar nix angegeben wird.