

# The Organic Farmer

The newspaper for sustainable agriculture in Kenya



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 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

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### Layout

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# Requirements of a cowshed

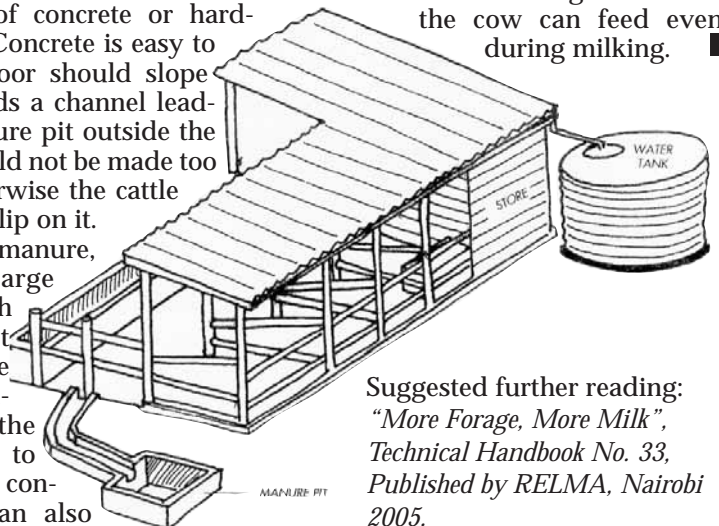
*Philomena Nyagilo*

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:

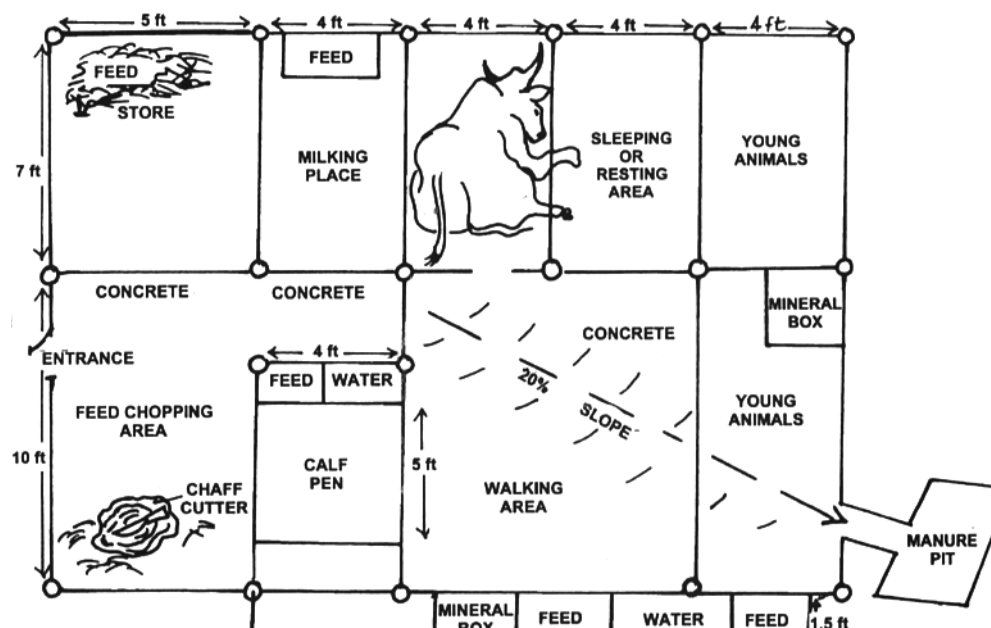
- The shed should be close to a reliable source of clean water, and if possible near your fodder farm.
- The roof can cover the whole pen or just animal cubicles and should slope away from the pen so rain-water doesn't fall into the pen. It should be high enough for a person to stand up.
- The walking 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**

"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



*Proper feeding and housing of dairy cows can increase their productivity (TOF)*

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 pas-

ture, 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



*Bare soil loses water faster...*

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.

## 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 compo-



*...than well covered soil. (Photos TOF)*

sition 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).













## 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		<p><b>Repellents:</b> African marigold, black jack, tephrosia, garlic, crotalaria, chilli and peppers, eucalyptus, tomato.</p> <p><b>Insecticides:</b> African marigold, black jack, tephrosia, lantana, garlic, tea, papaya, pyrethrum, crotalaria.</p> <p><b>Antibacterial:</b> African marigold, garlic, tea, tomato.</p> <p><b>Antifungal:</b> African marigold, garlic, papaya, crotalaria, tithonia, sweet potato, tomato, oleander, rhubarb.</p> <p><b>Nematicide:</b> Cassava, oleander, garlic, papaya.</p>	 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 habi-

tats 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





<p><b>African marigold / Mbangimwitu (<i>Tagetes erecta</i>)</b>  <b>Inazuia:</b> Bacteria, fungi, nematodes,  <b>Wadudu:</b> Ants, beetles and many other insects.  <b>Kutayarisha:</b>  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.</p>	
<p><b>Blackjack / Kishonanguo (<i>Bidens pilosa</i>)</b>  <b>Inazuia:</b> Insects  <b>Wadudu:</b> Repels aphids, ants, beetles, cabbage root fly, caterpillars, crickets, mites, termites and whitefly.  <b>Kutayarisha:</b>  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.  <b>Maelezo zaidi:</b> Kiasi kingi cha dawa hii chaweya kuyadhuru baadhi ya maua ya mimea.</p>	
<p><b>Cassava / Muhogo (<i>Manihot esculenta</i>)</b>  <b>Inazuia:</b> Nematodes and aphids.  <b>Kutayarisha:</b>  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.  <b>Maelezo zaidi:</b> Mizizi ya muhogo iliyo chungu ina sumu, kwa hivyo lazima iondolewe kabla kuliwa.</p>	
<p><b>Castor oil plant / Mbariki, Mbono (<i>Ricinus communis</i>)</b>  <b>Inazuia:</b> Panya, fuko na mchwa pamoja na magonjwa ya Ukungu (fungi)  <b>Kutayarisha:</b>  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 iliyoondwa 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:  <b>Maelezo zaidi:</b> Matawi yenye shina nyekundu yana matokeo mazuri kuliko yale yenye shina ya kijani kibichi.</p>	
<p><b>Chilli and Sweet pepper / Pilipili kichaa, pilipili hoho (<i>Capsicum frutescens</i>)</b>  <b>Inazuia:</b> Mchwa na wadudu wengine  <b>Kutayarisha:</b>  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.  <b>Maelezo zaidi:</b> Inazuia virusi aina ya mosaic na kukinga virusi vinginevyo.</p>	
<p><b>Crotalaria / Marejea (<i>Crotalaria Juncea</i>)</b>  <b>Inazuia:</b> Huzuia magonjwa ya Ukungu (fungal diseases)  <b>Wadudu:</b> Huzuia wadudu aina nyingi.  <b>Kutayarisha:</b>  1. Panda mmea mahali na wakati tofauti ili kuwafukuza nematodes na wadudu wengine kutoka kwa mimea yako.  2. Weka sehemu ya mmea uliopoondwa ndani ya maji kuunda kinyunyizo  <b>Onyo:</b> Ni sumu kwa ngombe kwa kiasi cha chini. Usiweke mbegu kwenye chumba ambacho watu wanamoishi.</p>	

**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 vilivyo-pondwa 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 mbevu 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.**Rhubarb (*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.











<p><b>Sweet Potato / Kiazi kitamu (<i>Ipomea batatas</i>)</b>  <b>Inazuia:</b> Rice brown leaf spot, rice blast and other fungi.  <b>Wadudu:</b> Aphids  <b>Kutayarisha:</b>            1. Ponda na ulowe majani kwa maji, nyunyiza            2. Maji yanayo wanga mzito baada ya kupika yanaweza kunyunyizwa kwa wadudu wadogo kama aphids.</p>	
<p><b>Tea / Chai (<i>Cammelia sinensis</i>)</b>  <b>Inazuia:</b> Magonjwa ya ukungu.  <b>Wadudu:</b> Woolly aphid, squash bug, konokono na mchwa.  <b>Kutayarisha:</b>            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.</p>	
<p><b>Tomato / Nyanya (<i>Lycopersicon esculentum</i>)</b>  <b>Inazuia:</b> Bacteria, fungi  <b>Wadudu:</b> Aphids, ants, asparagus beetle, cabbage, worms, diamondback moth, cockroaches, mites, nematodes, whitefly na magonjwa ya ukungu.  <b>Kutayarisha:</b>            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 kabaji 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.  <b>Onyo: Matawi ni sumu kwa binadamu.</b></p>	

## 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.

<p><b>Ladybirds</b></p> <p>Ladybirds are really good biological control agents. Adult ladybirds will prey on greenfly and blackfly and especially on aphids.</p>		<p><b>Lacewing</b></p> <p>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.</p>		<p><b>Spider</b></p> <p>All spiders are predatory on insects. Their catching system varies, and not all spiders use webs as traps.</p>	
<p><b>Ladybird larvae</b></p> <p>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.</p>		<p><b>Wasps</b></p> <p>Wasps are good biological control agents. Adult females lay eggs in other insects and the wasp larvae develop as parasites, killing the host.</p>		<p><b>Centipedes</b></p> <p>Centipedes are in general ground-based predators, feeding on slugs, slug eggs and soil-dwelling insects.</p>	



# 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**

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 repellent 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,



*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)*

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 pro-

duced 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.

## 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.

*continued on page 7*

## 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

### 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



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.

### 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 water-borne 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 remain 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



*Erythrina abyssinica*

(TOF)

months. It is advisable to administer this mixture before any outbreak.

*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](mailto: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