



# PUBLICATIONS CATALOGUE 2003



Natural  
Resources  
Institute



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2000

## Natural Resources Institute

The Natural Resources Institute (NRI) of the University of Greenwich is an internationally recognized centre of expertise and consultancy in the environment and natural resources sector. The Institute carries out research and development and training to promote efficient management and use of renewable natural resources in support of sustainable livelihoods.

The Institute has a long history stretching back over 100 years to its origins as part of the Imperial Institute in 1894. During the following years it had many changes in name and organization before becoming NRI and its predecessors include:

Anti-Locust Research Centre (ALRC)  
Centre for Overseas Pest Research (COPR)  
Land Resources Development Centre (LRDC)  
Overseas Development Natural Resources Institute (ODNRI)  
Tropical Development and Research Institute (TDRI)  
Tropical Products Institute (TPI)

Prior to 1996 NRI was the scientific unit, and latterly the executive agency, of the UK Government's Overseas Development Administration (ODA), now the Department for International Development (DFID).

NRI became an Institute of the University of Greenwich in May 1996.

Further information about NRI, including details of its training courses, may be obtained by writing to the Director's Office, FAO Karen Morris, Natural Resources Institute, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Kent ME4 4TB, UK. Please do not use the book order form.

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## Crops and Crop Products

### Crop production

[See also Development Policy and Research p.7; Food Storage Technology p.23; Markets and Market Research p.30; Pest Management p.35; Training and Extension p.50]

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*NRI Bulletin 76*

R TRIPP, D J WALKER, F MITI, S MUKUMBUTA and  
M S ZULU

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*NRI Bulletin 68*

R TRIPP, D J WALKER, A OPOKU-APAU, A A DANKYI and  
L L DELIMINI

Seed management by small-scale farmers is an important aspect of national seed security in developing countries and a major consideration in agricultural development in the foreseeable future. It is estimated that up to 80% of seed is saved on farm from one season to the next. The role of the traditional farmer and the informal seed sector as a whole has not been well supported and has not been adequately understood. This Bulletin describes the findings of a field survey of small farmers and will be of interest to all those concerned with the role of small-scale farmers in managing their seed supply and quality.

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NRI
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1994  
£50.00  
2 Vols  
ISBN 0 85954 382-X
- Manual for Horticultural Export Quality Assurance**  
NRI
- Countries exporting produce to the European Union face a highly competitive market. They also have to meet the demands of strict legislation and customers' requirements for food safety and consistent good quality. Here is a practical do-it-yourself guide to the procedures and practices that will meet the requirements of both EU legislation and major customers. It introduces the concept of total quality management and will enable exporters to establish a basic quality assurance system suited to their own specific needs. As such it will be invaluable to anyone involved in the horticultural export business.  
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## Processing food crops

[See also Crop production p.1; Training and Extension p.50]

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B K DADZIE

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B K DADZIE

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A BRETT, D R S COX, D S TRIM, R SIMMONS and G ANSTEE

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This book brings together up-to-date techniques for the collection and management of environmental and socio-economic information. It describes practical decision-making tools for use at all levels from local to international, for rural communities, research services, the food industry and for institutional decision-makers.

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*NRI Socio-economic Series 14*

A GORDON

The value of growing trees on tropical farms for subsistence, commercial sale and environmental stability has been increasingly recognized in recent decades. However, there has been little research on the market potential for non-timber tree products (NTTPs). This publication aims to provide a background on markets and methodological issues in market assessment and how they affect agroforestry and forestry projects, with reference to recent research carried out by NRI in Cameroon on NTTPs. The specific characteristics of NTTPs which make the assessment of their market potential difficult are outlined, strategic options for their development are discussed and conclusions are drawn which stress the importance of informal methods. [See also *SES13 and SES11 below.*]

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N FEREDAY, A GORDON and G OJI

A summary of results of research carried out in Cameroon on the domestic market potential for non-timber tree products (NTTPs) from farms and rural communities in response to the growing concern that agroforestry projects were failing because of poor marketing strategies. (See *SES11*, below, for an inventory of products and identification of market chains.) Four case studies are used to explore issues related to value added, domestication and the role of NTTPs as sources of income. Conclusions are drawn and areas for future research are also highlighted in this booklet.

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**Livestock Production Extension: Issues, Case Studies and Policy Options**

*NRI Socio-economic Series 12*

J MORTON, R MATTHEWMAN and D BARTON

In this booklet the provision of livestock production extension is assessed with reference to case studies in Burkina Faso, Kenya and India. Existing systems are reviewed and their impact evaluated. Finally, the roles of different institutions and methodologies are evaluated, and lessons for the future are discussed.

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**Non-timber Tree Products: A Partial Inventory of Products Available in the Mount Cameroon Area**

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V PAPADOPULOS with A GORDON

The value of tree-growing on tropical farms for subsistence uses, commercial sale and environmental stability has long been argued, but failure of many agroforestry programmes has been attributed to 'market failures'. This inventory has been produced as part of a project in the highly biodiverse area of Mount Cameroon to explore domestic market potential from farms and rural communities, in response to the growing interest in non-timber tree products. Approximately 300 products are listed by their local name, with additional information on Latin names, end use, product source, seasonality, location of markets and availability in markets.

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Urban poverty is increasing alongside growing urban populations in sub-Saharan Africa. Women constitute a significant proportion of the urban poor, but their role is often neglected by development projects. This publication highlights the range of strategies that women have devised for themselves in order to cope with difficult economic circumstances in present-day Zambia. Natural resources figure prominently in urban women's activities, not only as a source of food and fuel, but as a source of income through trading activities. Ways in which women's livelihoods can be improved are also discussed.

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M BLOWFIELD

Recent policy reforms and technological innovations in perennial tree crop production have implications for smallholder labour strategies, but changes in these strategies are little understood. Modification in labour decision-making among four smallholder communities in Indonesia and Ghana is examined, and the consequences for policy and technology development are explored. The study concludes that there is a need to reassess the way the family is looked at: evidence suggests that the labour strategies are often enacted over a wide geographical area, and form a theme that is hidden by current research techniques used to inform planners and field workers. This publication will be of interest to agencies and individuals concerned with development issues and policy implementation.

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The concept of stakeholder analysis is illustrated by case studies from Cameroon and Thailand. The conflicts of interest which may arise between different stakeholder groups (small farmers, logging companies, government departments, institutions and conservationists) and the trade-offs which may have to be made between the objectives of a particular group are classified and discussed. The implications of the stakeholder approach are considered and will be of interest to anyone involved in environmental planning and research.

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**Indigenous Agroforestry in Latin America:  
A Blueprint for Sustainable Agriculture?**

*NRI Socio-economic Series 6*

D BARTON

This literature review outlines the merits of traditional agroforestry systems in the rainforests of Latin America. Possibilities and limitations to the adoption of these methods by new colonist farmers, as an alternative to large-scale forest destruction, are discussed. Research priorities are proposed for the development of sustainable agroforestry in the region from the wealth of indigenous knowledge. This booklet will not only be of interest to policy-makers and donor agencies, but also to those interested in the preservation of the rainforests.

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C MALENA

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in Socio-economic Studies**

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P DAPLYN, J CROPLEY, S TREAGUST and A GORDON

Geographical information systems (GIS) have found wide and growing applications, as digital remote-sensing data and computer technology have become more sophisticated, more easily available and less expensive. This report describes preliminary research recently undertaken by NRI into how GIS might be used to identify and potentially describe the non-physical, 'human' environment in which people make decisions relating to resource allocation. A number of general issues concerning the availability of suitable data sets, are highlighted in case studies. Recommendations are made about how data can be made more amenable to this type of application, and the criteria that should be applied in assessing the feasibility of projects involving the use of GIS in socio-economic studies.

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**The Allocation of Labour to Perennial Crops: Decision-making by African Smallholders**

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M BLOWFIELD

This literature review highlights the factors, particularly non-financial, affecting the choice and use of labour during the production of perennial crops. It includes the effects of kinship, gender, age, AIDS and natural disasters and emphasizes the importance of the decision-making process during policy planning.

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**Commercialization of Non-timber Forest Products in Amazonia**

*NRI Socio-economic Series 2*

E M RICHARDS

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A ORR, B MWALE, J M RITCHIE, J LAWSON-MCDOWALL and C S M CHANIKA
- This book reflects four years of intensive fieldwork by the Farming Systems Integrated Pest Management Project with resource-poor farmers in the the Blantyre Shire Highlands of southern Malawi. It reviews the major lessons learned and outlines an agenda for a follow-up project to address the smallholders' needs for food security, cash income and information about new technology. A publication which is relevant not only to those interested in Malawi but also to those concerned with the wider issues raised by the development of technology with resource-poor farmers.
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M BLOWFIELD, S GALLAT, A MALINS, B MAYNARD, V NELSON and D ROBINSON
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L NICOLAIDES, R COKER, P WAREING and M NAGLER
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J MORTON and R MATTHEWMAN
- The importance of conveying information on livestock production to farmers is increasing with growing demand for livestock products, new production techniques and possibilities for improved animal health. This clearly set-out book is based on first-hand research in developing countries, and examines the major types of institutions providing livestock production extension, for example, national extension systems, animal health services and special projects. Concrete recommendations are made for the planning of new services for crop livestock producers and for special target groups, and for the reform of existing institutions.
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ISBN 0 85954 483-4
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*NRI Bulletin 75*  
J BARRETT
- Trypanosomiasis is a significant disease of man and livestock, and in sub-Saharan Africa is transmitted exclusively by the tsetse fly. Apart from the suffering caused by the disease, trypanosomiasis and its control have many direct and indirect economic consequences. This Bulletin discusses investigations carried out in Zimbabwe and Zambia into the costs of four major techniques used for tsetse control. A methodology for cost comparison based on simple economic models is demonstrated. Of interest to planners and resource managers, and all those concerned with trypanosomiasis control and rural development in tsetse-affected areas of Africa.

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1997  
£10.00  
73pp  
ISBN 0 85954 478-8

**Mycotoxins and their Control: Constraints and Opportunities**  
*NRI Bulletin 73*  
R COKER

This Bulletin will be of special interest to policy-makers, researchers and those involved in the production of foods and animal feeds, and in the marketing of commodities, where the impact of mycotoxins on human health, animal productivity and international trade is significant. A 'systems' approach to the occurrence and control of mycotoxins is adopted, which recognizes the interactions occurring within and between conceptual models of the commodity, spoilage, mycotoxin and control systems. Mycotoxins of 'world-wide', 'regional' and 'future' importance are discussed, together with the metabolic fate of selected mycotoxins. Control measures and future research needs are also identified.

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[See also Training and Extension p.50]

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## Food Storage Technology

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[See also Crop production p.1; Grain After Harvest p.24; Training and Extension p.50]

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**Conducting Ethnobotanical Surveys: An Example from Ghana on Plants used for the Protection of Stored Cereals and Pulses**

*NRI Bulletin 77*

J R COBBINAH, C MOSS, P GOLOB and S R BELMAIN

Plants are well known for their medicinal and insecticidal properties, and considerable research around the world is conducted to screen plants for new compounds. Ethnobotanical surveys are often used to target research activity. Adding value to biological resources by establishing current indigenous knowledge systems could lead to financial gains and effective biodiversity conservation. In this Bulletin information is presented to show how ethnobotanical data can be used towards promoting research and conservation of indigenous plant species. It will be of special interest to those working in storage entomology, the control of insect pests, the medicinal and insecticidal properties of plant materials and indigenous knowledge system management.

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J BRICE, L CURRAH, A MALINS and R BANCROFT

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M C GOUGH

In the marine transport of hygroscopic durable foods such as cocoa beans, from tropical and sub-tropical to temperate climatic zones, quality can deteriorate because of climatically induced moisture increases. The likelihood of deterioration occurring is assessed in this Bulletin for durable foods transported in bulk, bags and by box container. Interpretations are based upon the principles of heat and moisture transfer and on experimental observations. General recommendations for good practice are included. Of interest to commodity exporters and importers, those involved with cargo insurance claims, and scientists and engineers concerned with food quality.

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**Food Storage Manual**

D J WALKER (ed.)

This completely updated fourth edition, designed for easier use in the field, provides comprehensive information on procurement, handling, storage and distribution of food-aid commodities.

**Grain after harvest**

A new organization, *PhAction* – The Global Post-harvest Forum, has been formed from GASGA (Group for Assistance on Systems relating to Grain After harvest). *PhAction* has a wider remit, now including perishable crops as well as durables, and a wide membership, now including several international agricultural research centres. The new forum will raise the profile of post-harvest research and development and accomplish greater impact in the post-harvest sector. The GASGA Newsletter has now become *PhAction News* and can be accessed at the INPhO website (<http://www.fao.org/inpho/index-e.htm>) and the GASGA seminar series will continue but under the heading of *PhAction*.



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## Forestry

### General

[See also Development Policy and Research p.7;  
Land Resources, Soils and Water p.27; Termites p.41]

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### Silvicultural Manual for the Solomon Islands

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W HAWTHORNE

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## Forest products

[See also Development Policy and Research p.7; Markets and Market Research p.30; Rural Technology and Biomass Energy p.47]



## Land Resources, Soils and Water

[See also Development Policy and Research p.7; Forestry p.25; Training and Extension p.50]

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J J W COPPEN and G A HONE

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This report highlights the significance of forests to local people and provides a necessary first step towards the development of forest management for products other than timber. It will be of interest to foresters, extension workers and policy-makers in Ghana, and all those concerned with the true significance of forests for rural people in any developing country.

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J PENDER, A P MILLS and L J ROSENBERG

The second part of a study which examines changes in land cover from 1972 to 1993, particularly human-dominated land use in this area of Zimbabwe, using remote sensing imagery. Seven land use cover classes were derived, and the pattern of change between the Communal Lands and between the Communal and State Lands over the period of tsetse control operations is discussed. With 19 colour figures and maps, this book will be valuable to scientists, planners and resource managers interested in the agricultural development of the area.

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K MORSE

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## Markets and Market Research

[See also Crops and Crop Products p.1;  
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P A CLARKE, K B PALIPANE, L HAMMOND and  
J SHERINGTON

As grain markets become more liberalized, quality and price become more important for producers and traders in securing market share. Previously, NRI Bulletin 55 reported methodology and quality/value relationships for raw paddy. This publication describes the evaluation of quality/value relationships for parboiled rice. Of use to researchers in developing countries looking to evaluate these relationships and to influencing cost-effective quality improvements, and also directly to processors wishing to raise the quality of their products.

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P MAGRATH
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**The Market for Dried Fruit in the United Kingdom, the Federal Republic of Germany and France**

*NRI Bulletin 34*

G HARMAN and N ANAND

This review covers dried fruits such as bananas, pineapples, papaya, apricots, figs, prunes, dates and vine products.



## Pest Management

[See also Crop production p.1; Development Policy and Research p.7; Training and Extension p.50]

### Integrated Pest Management

Pests are responsible for enormous losses in crop production worldwide. Synthetic pesticides however, as well as being harmful to human and animal health and damaging the environment, are very costly for farmers in developing countries. Integrated Pest Management (IPM) is a strategy which keeps pests at an economic threshold level by the integration of a number of control techniques. As such, IPM is the most suitable strategy for resource-poor farmers.

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### IPM for Smallholders: A Researcher's Case Book from Malawi

J LAWSON-MCDOWALL, S ABEYASEKERA, B MWALE, J M RITCHIE, A ORR and C CHANZA

A collection of fifteen selected methods used over the project lifetime to identify and quantify pest problems, to test and evaluate pest management technologies, to identify recommendation domains and to estimate likely benefits for different socio-economic groups. The book is primarily for those undertaking agricultural research with and for Malawian farmers. However, together with its sister publication *Learning and Livelihoods: The Experience of the FSIPM Project in Southern Malawi*, it will be of interest to all those involved in working with farmers in sub-Saharan Africa.

**NEW**



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**IPM Implementation Workshop for Central America and the Caribbean: Workshop Proceedings San José, Costa Rica, 1994**

NRI

A record of the proceedings of the third in a series of workshops worldwide, which brought together pest management specialists and policy-makers to discuss IPM implementation issues in this region.

**Pre-harvest pests of tropical crops**

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**Workshop on Research Priorities for Migrant Pests of Agriculture in Southern Africa**

R A CHEKE, L J ROSENBERG and M E KIESER (eds)

Brown locusts, African armyworm moths and red-billed quelea birds are the most damaging migrant pests affecting agricultural production in southern Africa. If the reasons underlying their apparently sporadic outbreaks could be better understood, then their occurrences could be more accurately predicted and better means of controlling them devised. In March 1999, more than 60 scientists and development specialists met in Pretoria to discuss the issues involved at a Workshop on Research Priorities for Migrant Pests of Agriculture in Southern Africa. This volume contains the papers presented at the workshop. The content will be of interest to specialist entomologists and ornithologists, and to those interested in migratory animals and how they interact with their environments.

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**Pest Control in Groundnuts**

NRI

An updated edition of this comprehensive crop protection manual for groundnut growers. It covers all aspects of pest control including insects and mites, nematodes, weeds, diseases and aflatoxins.

Order code PSTC5  
1993  
£12.50  
80pp  
ISBN 0 85954 331-5

**Millet Pests of the Sahel: An Identification Guide**

M MATTHEWS and N D JAGO (eds)

This useful pocket-sized booklet uses clear colour coding and pictogram summaries to re-inforce the diagnostic descriptions and full colour illustrations of the pests and their characteristic damage. Enables researchers and extension specialists to make initial, on-the-spot identifications.

*Also available in French (order code PSTC5F).*

Order code PSTC6  
1993  
£10.00  
66pp  
ISBN 0 85954 349-8

**Millet Pests of the Sahel: Biology, Monitoring and Control**

N D JAGO

A companion volume to PSTC5, it collects together up-to-date information on all factors relating to millet pests. An evaluation of pest damage in the context of other production constraints leads to a discussion of safe and effective control methods.

*Also available in French (order code PSTC6F).*

Order code OB46  
1991  
£15.00  
116pp  
ISBN 0 85954 294-7

**Diseases and Pests of Sweet Potato**

*NRI Bulletin 46*

J M LENNÉ

This popular Bulletin reviews information on biotic factors affecting the production of sweet potato in three main regions – SE Asia, the Pacific and East Africa. The most important diseases and pests are identified; the current status of sweet potato research is reviewed; and specific recommendations are made for future research.

Order code PANS7  
1986  
£7.50  
109pp  
ISBN 0 85135 143-3

**Pest Control in Tropical Onions**

NRI

The popular comprehensive guide for onion growers in tropical regions in the *Pest Control* series. It covers weed control, diseases, nematodes, insects and mites and storage.

Order code PANS6  
1983  
£5.00  
130pp  
ISBN 0 85135 136-2

**Pest Control in Tropical Tomatoes**

NRI

The popular comprehensive guide for tomato growers in tropical regions in the *Pest Control* series. It covers weed control, fungal, bacterial and viral diseases, nematodes, insects and mites and storage.

Order code PANS5  
1981  
£5.00  
206pp  
ISBN 0 85135 113-1

**Pest Control in Tropical Grain Legumes**  
NRI  
The popular comprehensive guide for pulse growers in tropical, subtropical and semi-arid regions of Africa, Asia and Central America in the *Pest Control* series. It covers weed control, rodent pests, storage, diseases, nematodes, insects and mite pests.

### Insects

Order code OB71  
1997  
£10.00  
114pp  
ISBN 0 85954 470-2

**Flight Behaviour and Migration of Insect Pests: Radar Studies in Developing Countries**  
*NRI Bulletin 71*  
D R REYNOLDS and J R RILEY  
Knowledge of the flight behaviour of migrant insect pests is essential for an understanding of their population dynamics, which in turn determine the design of efficient management strategies. This Bulletin provides a detailed review of the development of radar entomology, spanning the last 30 years, and its contribution to the study of major insect pests of agriculture and human health in the developing world. Pests include grasshoppers and locusts, the African armyworm, rice brown planthopper and other rice pests, the Old World bollworm and some mosquito vectors of human diseases.

Locusts and grasshoppers

Order code OB54  
1992  
£15.00  
154pp  
ISBN 0 85954 305-6

**A Revision of the Grasshopper Genus *Orthochtha* and its Allies (Orthoptera: Acrididae: Acridinae)**

*NRI Bulletin 54*

G B POPOV and L D C FISHPOOL

Members of the large grasshopper genus *Orthochtha* are widely distributed throughout the Afrotropics with some representatives in India and the Far East. The taxonomy of the genus has, however, long been recognized by acridologists to be unsatisfactory. This publication provides a thorough revision of *Orthochtha* together with seven allied genera, of which three are erected here. In all, 36 species and 11 subspecies are treated, of which 16 species and 5 subspecies are described here as new. All taxa are diagnosed, illustrated, keyed, mapped and their affinities discussed. The biogeography of the group is considered and a synopsis of the available information of the biology, ecology and economic importance given for each species. This book will be of use both to taxonomists and to agricultural field workers, particularly in Africa.

Order code B10  
1990  
£30.00  
204pp  
3rd edition  
ISBN 0 85954 281-5

**Locust Handbook**

A STEEDMAN (ed.)

This fully illustrated ringbound manual is a 'must' for locust and grasshopper control staff everywhere. Covers the desert locust, other African locusts, Sahelian grasshoppers and SE Asian locusts giving descriptive accounts of life cycles, taxonomy and distribution including colour plates and maps. Locust reporting and control are also fully covered with illustrations and diagrams. (*Available in French from the Canadian International Development Agency only.*)

Order code B7  
1990  
£5.00  
46pp  
2nd edition  
ISBN 0 85954 276-9

**The Desert Locust Pocket Book**

NRI

A colourfully illustrated pocket-sized booklet aimed at field workers to aid in the task of locust reporting. It gives full descriptions of the desert locust, including the stages in its life cycle and its distribution, followed by sections on reporting of outbreaks and control measures.

- Order code B9  
1982  
£10.00  
690pp  
ISBN 0 85135 120-4
- The Locust and Grasshopper Agricultural Manual**  
NRI  
This manual brings together in a single hardback volume information on over 500 species of pest locust and grasshoppers in developing countries worldwide. Aimed at agriculturalists and extension workers, there are fully illustrated sections on identification, life cycle, ecology and behaviour, distribution (including maps), and assessment of damage/economic importance of each species. A comprehensive bibliography is also included, plus species, genera and geographical indexes.
- Order code B5  
1977  
£5.00  
613pp  
ISBN 0 85135 072-0
- Grasshoppers and Locusts: A Handbook of General Acridology (Volume 2)**  
B UVAROV  
Volume 2 only available of this major hardback book, covering behaviour, ecology, biogeography and population dynamics of locusts and grasshoppers worldwide.
- Moths (armyworm, bollworm, stemborer, etc.)
- Order code PSTC32  
2000  
£20.00  
323pp  
ISBN 0 85954 523-7
- The African Armyworm Handbook: The Status, Biology, Ecology, Epidemiology and Management of *Spodoptera exempta* (Lepidoptera: Noctuidae)**  
D J W ROSE, C F DEWHURST and W W PAGE  
The African armyworm, *Spodoptera exempta* (Walker) (Lepidoptera: Noctuidae) is a serious migratory pest of cereal crops and grasslands. It can impact upon the livelihoods of farmers in many countries of sub-Saharan Africa, Yemen, some Pacific islands and parts of Australia. Containing as much up-to-date information as possible on the biology, ecology, epidemiology and management of this pest as well as containing an extensive list of useful references, this handbook will be of interest to those working in the agricultural sector, particularly those responsible for the control of migrant pests.

- Order code PSTC24  
1998  
£7.50  
19pp  
ISBN 0 85954 485-0
- Laboratory Culture of the African Armyworm, *Spodoptera exempta***  
S C SMITH  
The African armyworm is a serious pest of cereal crops and rangeland in eastern Africa. However, it is notoriously difficult to rear in the laboratory, being highly susceptible to a nuclear polyhedrosis virus (NPV). From techniques developed at NRI, this handy A5 ring-bound manual is designed to help those who need to maintain a healthy culture for research purposes. Includes recipes for artificial diets, notes on recognition of disease and a list of equipment suppliers.
- Order code OB58  
1993  
£10.00  
70pp  
ISBN 0 85954 346-3
- Weather and the Epidemiology of the African Armyworm (*Spodoptera exempta*)**  
*NRI Bulletin 58*  
M R TUCKER  
Summarizes work carried out in the African armyworm seasons during 1972–88 in relation to frequency of outbreaks and weather conditions. The use of trajectory analysis in estimating the migration paths of windborne moths during the season is discussed together with the importance of rainstorms in concentrating the moths to cause an outbreak. Of interest to those working in the field of predictive techniques in migration research, and those planning control operations against this serious pest.
- Termites (Isoptera) and ants (Hymenoptera)
- Order code PSTC14  
1997  
£10.00  
52pp  
ISBN 0 85954 455-9
- Laboratory Culture and Experimental Techniques using Termites**  
M PEARCE  
Several species of termites have become serious pests of crops, forestry and buildings. In order to find methods for controlling termites it is important to be able to culture them successfully in the laboratory for testing. Termites are also used as an important bioassay tool, e.g. for testing construction materials for their durability and new pesticides or other compounds for their environmental effects. This manual gives an introductory guide to the setting up, maintenance and use of termite colonies in the laboratory. It will be of great value to researchers into termite control and behaviour, and to pest control agencies wishing to carry out simple screening tests.

Birds

Order code PSTC20  
1997  
£25.00  
191pp  
ISBN 0 85954 464-8

**The Grain-eating Birds of Sub-Saharan Africa: Identification, Biology and Management**  
R G ALLAN

Although birds are not normally viewed as pests, in the case of cereals and soft fruits both resident and migrant species can cause significant losses to farmers. This handbook provides the background information needed for an understanding of the birds which cause the damage, their identification, biology and feeding habits. It also presents the variety of techniques necessary to assess the likelihood and extent of crop damage and so facilitate the choice of cost-effective methods and levels of control. A comprehensive reference book for policy-makers and extensionists, and also to all public and private sector management staff who are involved in loss assessment and the implementation of control methods in cereal production.

Plant diseases

Order code PSTC28  
2000  
£10.00  
100pp  
ISBN 0 85954 513-X

**The Current Pandemic of Cassava Mosaic Virus Disease in East Africa and its Control**  
G W OTIM-NAPE, A BUA, J M THRESH, Y BAGUMA, S OGWAL, G N SSEMAKULA, G ACOLA, B BYABAKAMA, J COLVIN, R J COOTER and A MARTIN

Cassava is an important food staple in much of sub-Saharan Africa, in part because of its resistance to drought. Cassava mosaic virus disease (CMD) occurs in all the major cassava-growing areas. However, the incidence of the disease has increased dramatically in recent years in many parts of Uganda, and most recently in Kenya and Tanzania, causing severe food shortages and necessitating emergency relief. This publication summarizes the recent history of CMD in Uganda, western Kenya and north-western Tanzania. It describes the main features of the pandemic and the various approaches to its control. It discusses the lessons learned from these control programmes and also assesses the threat to other parts of Kenya and Tanzania and elsewhere in sub-Saharan Africa.

Order code PSTC23  
2000  
£15.00  
50pp  
ISBN 0 85954 476-1

**Bacterial Wilt: Laboratory Detection of *Ralstonia (Pseudomonas) solanacearum***  
S SEAL and A ROBINSON-SMITH

Bacterial wilt is one of the most destructive and widely spread diseases of a large range of crops in the tropical and warmer regions of the world. This fully illustrated laboratory booklet describes the traditional isolation procedures for *R. solanacearum*, a serological enzyme-linked immunosorbent assay and a polymerase chain reaction test for the extremely sensitive detection of this pathogen. The latter two methods are suitable for direct detection of *R. solanacearum* in plant material. A valuable manual for researchers in suitably equipped laboratories, which includes choice of method and comparative costs, step-by-step protocols, results interpretation and lists of equipment suppliers.

Order code PSTC27  
1997  
£10.00  
108pp  
ISBN 0 85954 433-8

**Epidemiology and Management of Rice Tungro Disease**  
T C B CHANCELLOR and J M THRESH (eds)

The outcome of the Rice Tungro Disease Management Workshop held 11–14 November 1993 at Alor Setar, Malaysia, where researchers (including representatives from five major rice producing countries) met to discuss the present status of the disease and the progress of research into its management. This publication outlines current options for integrated management of tungro and critically reassesses vector control strategies. Of interest to scientists and officials from national agricultural departments who have to make decisions on the management of this important disease.

Order code PSTC25  
1997  
£35.00  
308pp  
ISBN 0 85954 488-5

**Proceedings of an International Workshop on Lethal Yellowing-like Diseases of Coconut, Elmina, Ghana, November 1995**  
S J EDEN-GREEN and F OFORI (eds)

Comprehensive accounts of the present distribution and impact of this group of diseases are presented in this publication, along with leading contributions on aspects of disease diagnostics, physiology and epidemiology of phytoplasmas. A full account of the discussions and recommendations for future actions is also provided. The Proceedings will be of particular interest to those researchers, policy-makers and palm enthusiasts worldwide who value the coconut palm for its role in sustainable agriculture, and also for its contribution to amenity and landscape plantings.

- Order code PSTC22  
1997  
£10.00  
37pp  
ISBN 0 85954 475-3
- Detection of Sigatoka Leaf Spot Pathogens of Banana by the Polymerase Chain Reaction**  
A JOHANSON
- This booklet describes the background to the Black and Yellow Sigatoka diseases (causal agents *Mycosphaerella fijiensis* and *M. musicola* respectively) and the traditional method of diagnosis by fungal isolation. A new, laboratory-based molecular biological technique is presented, which gives rapid and sensitive identification of the pathogens, directly from infected banana leaves. The method, developed at NRI, is based on the amplification of fungal DNA by the Polymerase Chain Reaction (PCR). Protocols for DNA extraction and PCR are given, together with details of reagents and their availability. Suitable for use in plant pathology laboratories equipped for basic molecular biology by researchers who require accurate identification to species level for these pathogens of significant economic importance.
- Order code PSTC15  
1996  
£10.00  
31pp + disk  
ISBN 0 85954 438-9
- Bactid: Bacteriological Identification System for Resource-poor Plant Pathology Laboratories**  
R BLACK, J HOLT and A SWEETMORE
- The Bactid system has been developed to provide an accessible approach to bacteriological identification in plant pathology laboratories which are not equipped for, or used to, routine bacteriology work. The system comprises the Bactid scheme, the Bactid kit and the Bactid program. This publication provides the 'expert system' program on diskette and a manual describing the Bactid system and worked examples using the expert system which help in the identification of bacteria from test results. The hypertext in the expert system software also provides full details of media and reagents and instructions on how to do the tests. The Bactid software can be used in conjunction with the PlantClinic system (see PSTC12).
- Order code PSTC13  
1995  
£7.50  
41pp  
ISBN 0 85954 397-8
- Plant Quarantine: A Primer for Development Workers**  
R BLACK and A SWEETMORE
- Designed primarily for non-specialist crop scientists, foresters and administrators in development projects, this publication provides briefing on the essentials of plant quarantine. It contains a discussion of both the principles and practical steps involved in planning and executing projects in order to avoid the potentially disastrous effects of pest introductions.

- Order code PSTC12  
1995  
£10.00  
ISBN 0 85954 396-X
- PlantClinic: A Training System for Decision-making and Resource Management in Plant Disease Diagnostics**  
R BLACK, A SWEETMORE and J HOLT
- The PlantClinic software system (disk + explanatory text) takes the user through the diagnostic process using data from real and imaginary pest management problems. This 'expert system' emphasizes logistical and budgetary factors, and includes additional hypertext guidance. PlantClinic is designed mainly for students in crop protection courses and for working diagnosticians who desire self-instructions or who are receiving in-service training. It will also be of value to managers and administrators involved in the provision of crop services.
- Order code OB63  
1994  
£10.00  
168pp  
ISBN 0 85954 356-0
- Bean Common Mosaic Virus and Related Viruses in Africa**  
*NRI Bulletin 63*  
N J SPENCE and D G A WALKEY
- A review of current research, including the results of an identification survey throughout the main bean-growing areas. Findings on the interaction between transmission rates and new viral strains with host range and resistance lead to a discussion on the implications for control practices.
- Post-harvest pests of stored food**  
[See also Food Storage Technology p.23;  
Grain after harvest p.24; Training and Extension p.50]
- Order code OB64  
1994  
£10.00  
58pp  
ISBN 0 85954 386-2
- Controlling Insect Pests of Stored Products Using Insect Growth Regulators and Insecticides of Microbial Origin**  
*NRI Bulletin 64*  
M J DALES
- Reviews the progress of research into alternative substances for the protection of durable foodstuffs against insect pests following concerns (such as insect resistance, residues, cost and environmental contamination) over the use of synthetic contact insecticides. Promising substances and new areas of investigation are identified, with results from laboratory and field trials outlined. A comprehensive bibliography covering relevant publications over the past 20 years is also provided. Of interest to workers in the field of storage entomology, research students and those involved in the control of pests of durable products in both tropical and temperate climates.

## Pesticides

[See also Grain after harvest p.24; Pre-harvest pests of tropical crops p.36; Post-harvest pests p.45;

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2002  
£45.00  
288pp  
86 method sheets  
ISBN 0 85954 543-1

**NEW**



### **Ecological Monitoring Methods for the Assessment of Pesticide Impact in the Tropics**

I F GRANT and C C D TINGLE (eds)

This handbook and accompanying method sheets aim to assist developing countries build their capability in ecotoxicological monitoring. This useful binder brings together the knowledge of pesticide impact and monitoring specialists to provide guidance on the measurement, analysis and interpretation of change in animal populations and key soil functions. This handbook will be of primary interest to those in government, development agencies, donors and non-government organizations who carry responsibility for the environment, agriculture and public health. Academics and students of ecotoxicology in developing countries should find both the specialist chapters and the field methodology useful.

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### **DDT in the Tropics: The Impact on Wildlife in Zimbabwe of Ground-spraying for Tsetse Fly Control**

R J DOUTHWAITE and C C D TINGLE (eds)

Contrary to its present insignificant use in the developed world, DDT remains a commonly used insecticide in many tropical countries. This publication presents the results of the first detailed tropical studies on the impact of DDT on wildlife, crucial to an assessment both of its general environmental impact and of the rationale for its continued use.



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44pp  
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## Rural Technology and Biomass Energy

[See also Development Policy and Research p.7; Forest products p.26]

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P REUPKE and A S TARIQ

Wood or other biomass is often used as a fuel for the process heat for drying agricultural products such as tea and coffee. This book describes existing biomass-fired systems giving an outline of different air heaters commonly in use. The design procedure for a more efficient air heater with an output in the range of 300 to 400 kW is described. The performance and costs of this improved heater are compared with a traditional system. By providing a basic design rationale for efficient drying systems, this book will be of interest to engineers in agricultural processing industries in developing countries.

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1994  
£10.00  
62pp  
ISBN 0 85954 385-4

### **Biomass Combustion Systems: A Guide for Monitoring and Efficient Operation**

A S TARIQ, P REUPKE and G SARWAR

The second in a series of publications which will be of interest to plant operators and researchers in the field of biomass combustion, and students of engineering. It is part of a continuing effort to improve the efficient use of fuelwood and where possible, to encourage replacement of fuelwood with agricultural and forestry residues such as rice husks and sawdust.

Order code ENG7  
1993  
£7.50  
15pp  
ISBN 0 85954 341-2

### **The Development of a Multi-chambered Brick-built Furnace Fuelled by Sawdust**

A S TARIQ, R J LIPSCOMBE and A P ROBINSON

Describes the development work on the combustion of sawdust in a furnace designed to be built using local materials and skills. Potential use of the system would be in sawmills and furniture workshops, where sawdust is generated and there is a process heat requirement.

- Order code ENG6  
1993  
£7.50  
18pp  
ISBN 0 85954 328-5
- A Timber-drying System Fuelled by Sawdust**  
A P ROBINSON, R C MARDER and H C COOTE  
Describes the successful application of a particulate wood waste burner to a 16 m<sup>3</sup>-capacity timber drying kiln. Of interest to sawmillers and wood processors who have a timber drying requirement and a supply of particulate wood waste.
- Order code ENG5  
1993  
£7.50  
18pp  
ISBN 0 85954 324-2
- Survey of Equipment for Small-scale Motive Power and Electricity Generation from Wood and Agricultural Residues**  
E A WILLIAMS and A P ROBINSON  
Summarizes a world-wide survey to assess the availability of commercial steam engines, steam turbines and Stirling engines providing up to 150 kW electrical or mechanical power output and suitable for use in conjunction with a biomass-fuelled system.
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ISBN 0 85954 326-9
- Review of the Activated Carbon Industry and Scope for Oil Palm Kernel Shell as a Raw Material**  
P REUPKE and A DUFF  
Examines the different raw materials, types and applications of activated carbon, plus the processes involved in the production of various carbons. The scope for the use of oil palm kernel shell as a potential feedstock for activation is considered in detail. A critical examination of the market potential of the new product is recommended.
- Order code ENG4  
1992  
£5.00  
14pp  
ISBN 0 85954 304-8
- Biomass Combustion Systems: Flue Gas Losses and Equipment Efficiency**  
G R BREAG, P J JOSEPH and A S TARIQ  
This book contains easy-to-use graphical methods to evaluate the gas losses. It will be of use to plant operators and researchers in biomass combustion.
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£5.00  
20pp  
ISBN 0 85954 306-4
- Wood Carbonization Unit: Design and Development of a Prototype with Recovery of Waste Heat**  
G R BREAG, A C HOLLINGDALE, R KRISHNAN, A P ROBINSON and J COULTER  
Conventional methods of charcoal production lose about half the energy in the conversion process. This publication details a carbonization unit which enables both efficient recovery of waste heat and realistic performance predictions to be made for its use in associated processes.

- Order code ENG1  
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£5.00  
24pp  
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- Wood and Agricultural Residue Combustion Systems: Survey of Commercially Available Equipment**  
G SARWAR, G A WILLIAMS and A P ROBINSON  
Intended as a guide for existing and prospective users of biomass combustion equipment in developing countries in the initial stages of equipment consideration, selection and procurement. Includes descriptions of types of systems available and their operation.
- Order code RTG17  
1992  
£7.50
- Heat Production from Sawdust: Construction and Operation of a Suspension Burner for Applications in Forest Industries**



## Training and Extension

[See also Development Policy and Research p.7;  
Grain after harvest p.24; Pest Management p.35;

### Crop production

Order code CRG4  
1995  
£10.00  
131pp  
ISBN 0 85954 421-4

#### **Crop Production Workbook for Arid and Semi-arid Lands** V GIBBERD

This publication documents one of the first farmer-participatory applied research projects based entirely in Kenya's marginal lands. Designed for easy use in the field by extension workers, teachers, students, development workers and anyone with basic secondary school science, this A5 ring-bound handbook includes a simple theoretical background to the topics researched, as well as suggestions on how to take the work forward to provide the best solutions for increased crop yield. Useful tips on how to set up an adaptive research programme, along with clear diagrams, are presented in easy-to-read, jargon-free language.

#### **Onion Newsletter for the Tropics**

For more information contact Food Management and Marketing Group at NRI (see page ii for address). Please do **not** use book order form.

Order code EXT13  
1997  
£20.00  
ISBN 0 85954 456-7

### Processing food crops

#### **Village-Level Cassava Processing: Distance Learning Package** Z BAINBRIDGE, K WELLINGS and A WESTBY

Cassava is an important staple food crop for many millions of people in tropical countries. However, the presence of cyanide-containing compounds (cyanogens) in the roots can lead to health problems. Cyanogens can be removed by efficient processing to produce safe food products. This distance learning package provides practical and detailed information on efficient, low cost village-level processing methods. It includes one Tutor's Manual, which is intended for trainers of extension workers, and 10 Field Packs (each with eight flash cards highlighting the most important steps in the process) for extension workers to use when conveying information to cassava farmers and processors.

Order code CRP5  
1996  
£25.00  
215pp  
ISBN 0 85954 400-1

#### **Methods for Assessing Quality Characteristics of Non-grain Starch Staples**

Z BAINBRIDGE, K TOMLINS, K WELLINGS and A WESTBY (eds)

Non-grain starch staple foods, such as cassava, sweet potato, banana, plantain, yam and cocoyam, provide many people with their basic food supply. This laboratory manual in four parts provides a description of the methods necessary to evaluate the characteristics of these staples, and their processed products.

### Fisheries

Order code F7  
1996  
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89pp  
ISBN 0 85954 440-0

#### **Maintaining Fish Quality: An Illustrated Guide**

S JOHNSON and I CLUCAS

This spiral-bound manual sets out to explain from basic principles the main causes of deterioration and loss of fish after capture and ways of preventing them. It illustrates simple steps that can be taken to maintain the overall quality and hence the selling price of fish. Stages are covered in detail from capture, landing and processing through to storage and marketing. The straightforward text with cartoon illustrations has been designed for use by fishermen, processors and extension workers, but would be of interest to anyone concerned with producing good quality fish for sale in hot climates.

## Food storage technology

Order code V4  
1997  
£20.00\*

**Sealed Bagstacks for Better Grain Storage**  
NRI  
Video illustrating the construction of sealed bag stacks, a technique that improves the quality preservation of grain stocks in long-term storage.

Order code V2  
1996  
£20.00\*

**Good Practice for Phosphine Fumigation: A guide to phosphine fumigation in warm climates**  
NRI  
This video is about good practice when using the gas phosphine to fumigate durable products in hot climates. It is intended for use as a training aid to inform both pest control personnel and their managers about safe and effective technique.

## Land resources, soils and water

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**Managing the Weather**  
NRI  
This short NRI video describes how meteorological organizations can improve their services to clients using readily available environmental information. Weather forecasts can be improved and focused towards key sectors. Remotely sensed data can enhance environmental change monitoring and natural resource management via the development of applications of real and immediate use to managers and decision-makers in developing countries.

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\* UK customers add VAT

## Pest management

Order code PSTC26  
1997  
£7.50  
57pp  
ISBN 0 85954 490-7

**Pest Management in Farm Granaries [with special reference to Africa]**  
R BOXALL, P GOLOB and R TAYLOR  
This spiral-bound, fully illustrated A5 manual is intended to help extension officers in giving the best advice to individual farmers on the safe storage of grains and pulses in the light of changing storage requirements and marketing needs. It gives guidance on how to analyse farmers' storage problems; provides information on the major causes of spoilage; gives a summary of the principles of good storage practice and descriptions of the more common methods of storing grains and pulses on the farm in Africa.

Order code V3  
1996  
£20.00\*

**From Dust to Maize: Overcoming the Larger Grain Borer in Africa**  
NRI/FAO  
This video is about the Larger Grain Borer, a serious beetle pest of farm-stored maize and cassava. It has been prepared to encourage policy-makers, quarantine and phytosanitary officials and all those responsible for national and international grain movements to take suitable precautions against this pest. [*French and Portuguese language versions obtainable from FAO only.*]

Order code EXT6  
1993  
£5.00

**Millet Pests of the Sahel – Poster set**  
M MATTHEWS, A KREMER and J GRUNSHAW  
Comprises one large poster indicating intensity and timing of pest attack on the crop, plus 12 smaller posters individually illustrating the most important pest species. *Also available in French (order code EXT6F).*

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\* UK customers add VAT

Order code MSC21  
1991  
£25.00  
246pp  
2nd edition  
ISBN 0 85954 282-3

**Insects and Arachnids of Tropical Stored Products: Their Biology and Identification (A Training Manual)**

C P HAINES (ed.)

Updated and revised, this manual includes identification keys and information on the basic biology and recognition for all the major tropical storage insect and mite pests, plus those of lesser importance. Apart from its role as a training aid, this manual will be invaluable as a reference book for researchers and those concerned with the management of pests in tropical stored products.



## European Consortium for Agricultural Research in the Tropics

*ECART was launched in May 1992 in response to the need for a concerted effort from the international scientific community to meet the diverse and complex demands of developing countries in natural resources management. It exists both to offer European research skills and expertise in a more accessible manner, and to encourage more effective coordination of research activities within Europe.*

*ECART's six members are:*

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2000  
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**ECART/ASARECA/CTA Workshop on Impact Assessment of Agricultural Research in Eastern and Central Africa, Entebbe, Uganda 16–19 November 1999**

This workshop brought together representatives from the international research community, managers and scientists from national research and donor organizations. It was to provide a forum for a rich exchange of experiences on ongoing Impact Assessment activities, and to find out in which way Impact Assessment is or could be integrated and accepted as a regular process within the organizations' routines.

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