The Major Arthropod Pests and Weeds of Agriculture in Southeast Asia:

Distribution, Importance and Origin

D.F. Waterhouse
(ACIAR Consultant in Plant Protection)

ACIAR
(Australian Centre for International Agricultural Research)

Canberra
AUSTRALIA

The Australian Centre for International Agricultural Research (ACIAR) was established in June 1982 by an Act of the Australian Parliament. Its mandate is to help identify agricultural problems in developing countries and to commission collaborative research between Australian and developing country researchers in fields where Australia has a special research competence.

Where trade names are used this constitutes neither endorsement of nor discrimination against any product by the Centre.

ACIAR MONOGRAPH SERIES

This peer-reviewed series contains the results of original research supported by ACIAR, or deemed relevant to ACIAR's research objectives. The series is distributed internationally, with an emphasis on the Third World.

Waterhouse, D.F. 1993. The Major Arthropod Pests an
Importance and Origin. Monograph No. 21, vi + 141pp

ISBN 1 86320 077 0

Typeset by: Ms A. Ankers
Publication Services Unit
CSIRO Division of Entomology
Canberra ACT
Printed by Brown Prior Anderson, 5 Evans Street,
Burwood, Victoria 3125

Contents

Foreword

ACIAR has, for some years, given strong support to efforts to promote biological control of pests and weeds as an alternative to ever more intensive use of chemical pesticides. There is mounting evidence of health and environmental problems caused by excessive application of pesticides and we believe that, in many cases, these could be greatly reduced or even eliminated by the natural alternative of biological control.

One of the first projects (undertaken by Dr D.F. Waterhouse, ACIAR Consultant in Plant Protection), was a concerted effort to increase the use of biological control in the oceanic South Pacific. Most of the important pests and weeds in that region have been introduced from overseas and there is great scope for their natural enemies also to be introduced to restore the balance. However, lack of knowledge was hindering practical implementation. The initial approach was therefore to undertake a comparative survey of South Pacific nations in order to establish which pests and weeds were present in each and what seriousness rating was given by each country. The results were put together in comparative tables, which appeared in the ACIAR publications "Biological Control: Pacific Prospects" (1987) and its Supplement 1 (1989). These reference works also contain individual chapters on the 38 invertebrate pests and 18 weeds rated as most important in the region as a whole. Each chapter describes a pest species, its habits and distribution, the damage it causes, its known natural enemies and the prospects for using these for biological control. These books have proved so useful as reference texts that, at the request of the region, a second supplement is to be published in 1993.

One particular advantage of this survey was that it gave donor agencies an overall perspective of the region's problems and prospects. ACIAR also helped to sponsor workshops and other meetings at which donor and country representatives could discuss and plan, and as a result of these activities there has been a very marked increase in biological control activities in the South Pacific.

"Biological Control: Pacific Prospects" and its supplement has aroused great interest in other parts of the world and especially in Southeast Asia. The record of biological control achievements in Asia is much poorer than that of the Pacific, and ACIAR supported the view that a similar operation for Southeast Asia would also stimulate biocontrol work there with vastly greater economic benefits than in the Pacific because of the enormously greater population. As a first step ACIAR has commissioned Dr D.F. Waterhouse (senior author of "Biological Control: Pacific Prospects"), to undertake a comparative survey of pests and weeds in the 10 Southeast Asian countries and their priority ratings in each. The results of this survey are presented in this volume.

G.H.L. Rothschild
Director
Australian Centre for International
Agricultural Research, Canberra

1. Abstract

The information assembled, which is summarised in 16 tables, is intended to provide a data base that will permit, inter alia, the selection of appropriate target pests for classical biological control.

Agricultural experts provided the raw data on the distribution and importance of the pests of most concern to the 10 countries comprising Southeast Asia. This enabled the identification of 455 major arthropod pests and 232 major weeds.

Of the 455 arthropod pests nominated, a subgroup of 150 species was rated as highly important. Of these, at least 24 are thought to be exotic to the region and are thus potential targets for classical biological control. Indeed, at least 8 of these species, have already been investigated elsewhere and some control successes have been reported.

The 5 highest scoring arthropod pests are *Bactrocera cucurbitae*, *B. dorsalis*, *Helicoverpa armigera*, *Heteropsylla cubana* and *Plutella xylostella*.

Of the 232 weeds, 140 were rated as highly important and 63 of these are believed to be exotic. Nine of the 63 have been targets elsewhere in successful or partially successful biological control projects.

The 5 highest scoring weeds are *Cyperus rotundus*, *Echinochloa colona*, *Eleusine indica*, *Imperata cylindrica* and *Monochoria vaginalis*.

Information is also summarised for each country on the occurrence of their most important pests in the major agricultural crops, on the areas planted to these and on the crop weights produced. The preferred scientific names of the pests are given, so as to encourage an up-to-date usage throughout the region.

Although it must be concluded that the majority of the major arthropod and weed pests are native to Asia, and many to Southeast Asia, there are nevertheless sufficient promising classical biological targets to justify a very substantial biological control activity in the region for many decades.

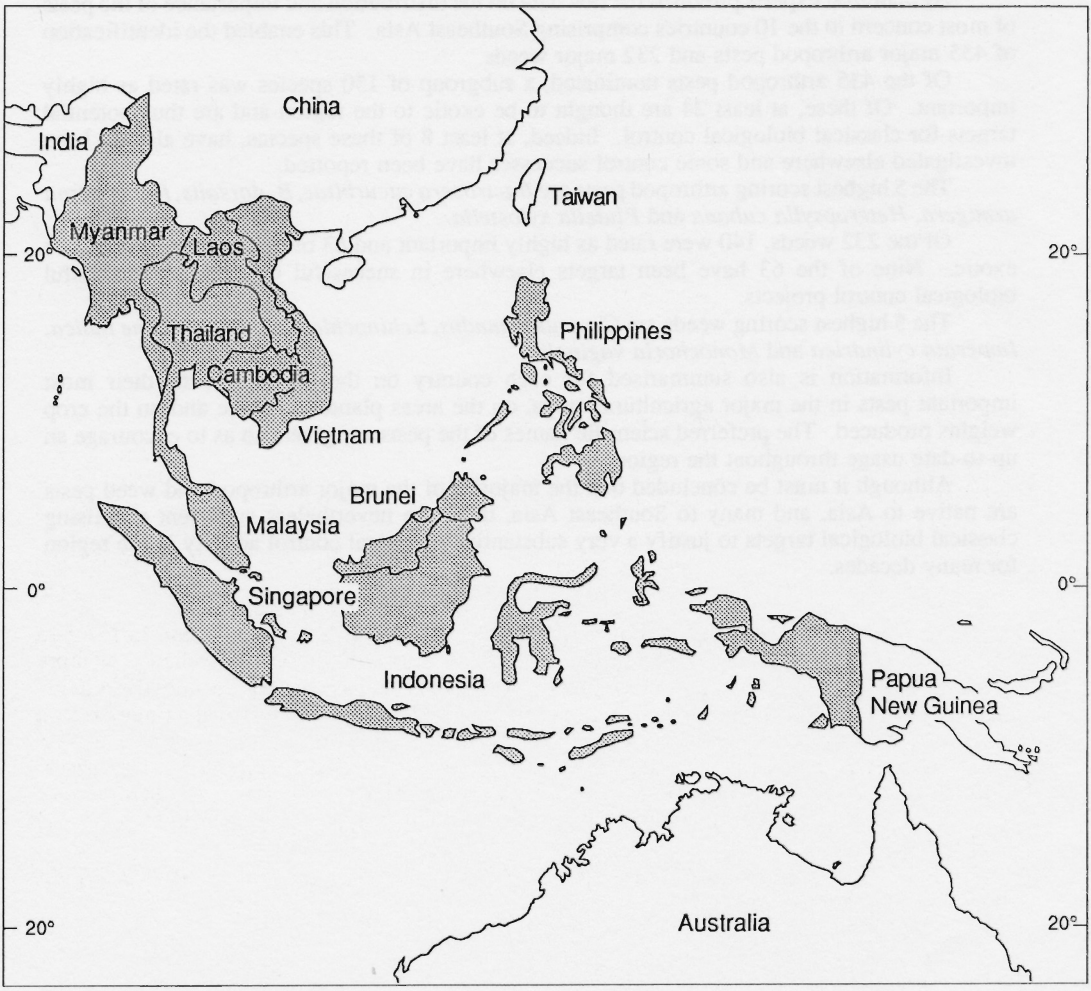

Figure 1. The ten countries comprising Southeast Asia.

2. Introduction

The data in this publication have been assembled to facilitate the selection of suitable target pests for biological control, although it is anticipated that a range of other purposes will be served as well. The 10 Southeast Asian countries are Myanmar (Burma), Thailand, Laos, Cambodia, Vietnam, Malaysia, Singapore, Brunei, Indonesia and Philippines.

The cost of a biological control project is much the same whether or not a pest is important so, for optimal use of resources, it is first necessary to establish which are the major pests; and, if a region as extensive as Southeast Asia is being considered, what their distribution is within it.

Secondly, for classical biological control (the introduction of selected natural enemies from the region where the target exotic pest originated), it is necessary to establish which of the major pests are introduced and from where. The present tables deal, inter alia, with these two aspects.

The third step is to identify those pests where there is unlikely to be conflict of interest in using biological control. Such conflict arises where control of an organism is desirable in one situation, but undesirable in another and arises because natural enemies of a pest are most unlikely to distinguish between these two situations (for example, a major crop weed that is, at the same time, a valuable pasture or lawn grass).

The final step in preparing the groundwork for the selection of suitable target pests is to assemble all available information for each major introduced pest, of its natural enemies and the prospects for using these for biological control, including whether or not this has been tried or achieved elsewhere. These third and fourth steps will be covered in a later publication.

For all countries in the region where this has been possible, information on the distribution and importance of arthropod pests and weeds has been generously supplied by plant protection specialists (acknowledged in section 3) nominated by their respective Directors of Agriculture. This information has been supplemented in some instances with data from other experts and occasionally also from the literature. Thus, the validity of the records and their completeness depends largely upon information supplied by country experts, although this has been cross-checked on the limited number of occasions where this has been possible.

It is expected that errors of omission will far exceed those of commission in the data supplied. Perceptions of the importance of individual pests will undoubtedly change as more is learnt about each of them, as agricultural practices change and as changes occur in the relative values of the crops affected. For such reasons, the tables must be regarded primarily as a preliminary data base, which will require (initially) correction of unintentional errors and then continuous updating. I would, indeed, be most grateful if errors and omissions can be drawn to my attention; also of additional ways in which the information might be assembled, so that it can best serve its main purpose of focussing attention on promising targets for classical biological control.

Correspondents were asked to supply information on pest seriousness (and distribution) on a very simple rating system:

+++	very widespread and very important
++	widespread and important
+	important locally
•	present, but not important

The last entry (•) has also been used when the presence of a species in a country is mentioned in the literature, but without sufficient information to assign a rating of pluses. Experience in the Pacific showed that any more sophisticated system requires more information than is generally available in most countries and, furthermore, would attempt to achieve a degree of accuracy greater than that required for the present purpose.

Although a simple rating system based on personal assessments of the extent of spread and the degree of importance of a pest has a very large subjective component, it nevertheless contains a quantitative element. In examining whether use can be made of this element, it is necessary to be aware of inherent limitations of the system:

(i) it has only a small number (four) of not-well-separated categories

(ii) although the extent of infestation can generally be established fairly accurately, importance is far more difficult to evaluate. It is influenced mainly by cost of existing control measures and by reductions in yield or value of the product

(iii) different experts in a country sometimes rate pests differently, because of varying perceptions of the damage caused.

Nevertheless, some advantages of the system are that:

(i) it requires country experts to attempt a relative value judgement (sometimes for the first time) of a large number of pests

(ii) it enables these experts to compare their perceptions with those of nearby countries, in the process exposing real or apparent anomalies whose resolution may be revealing (and rewarding)

(iii) it highlights regional problems which may benefit from collaborative action (perhaps with multilateral donor support)

(iv) it directs attention to a pest of particular significance to an individual country, but not to adjacent countries, thereby focussing action on bilateral donor support.

Bearing in mind reservations that arise from the foregoing, it is instructive to examine whether some simple arithmetical clumping of the ratings will assist in a broad stratification of the pest problems in Southeast Asia.

In this exercise a heavy political and information bias is introduced. As to the political bias, the ratings for nations small in size and population (eg Singapore) are given the same weight as those for large nations (eg Philippines, Indonesia). As to information bias, the amount of detailed knowledge on pests held by any one of five countries (Thailand, Vietnam, Malaysia, Indonesia, Philippines) far exceeds that of the aggregate of information available in the remaining five countries. Nevertheless, if the sum of the ratings for the five foregoing countries is compared with that for the entire region a broadly similar picture of importance emerges, particularly for the most important pests.

It is not unusual for some pests to be known under different scientific names in different countries of the region or even in different areas of the same country. Difficulty has thus been experienced at times in establishing the most appropriate scientific name to be used. In such instances a preferred name has been adopted after advice from expert taxonomists and consultation with sources such as Wood (1989) and Moody (1989). For convenience, alternative names that have been dropped are cross referenced in the two main tabulations of preferred names, one for arthropods (table 15) the other for weeds (table 16).

Like the exercise in the Pacific, the Southeast Asian survey is proving to be a highly interactive process in which all of us who are involved are learning a lot. Some countries are now preparing their own detailed lists for publication and pest nomenclature is rapidly becoming more uniform. Furthermore, with steady encouragement, countries are continuing to revise their ratings as a result of more careful assessment of the damage each pest is causing, taking into account also assessments by experts in nearby countries of the damage caused there.

3. Contributors

This survey could not have been undertaken without access to the information supplied by a large number of plant protection specialists throughout the region. I am particularly grateful to those listed below (and their colleagues) for the time and patience displayed in collating information for their countries; also for following up the numerous requests made for clarification of nomenclature or of level of pest importance and for reviewing from time to time the steadily growing body of information for the region.

I would be most grateful to receive corrections, additions (and criticisms!) so that a subsequent edition of these tables can incorporate improvements. These should be addressed to me at Division of Entomology CSIRO, GPO Box 1700, Canberra, Australia, 2601, Fax (06) 246 4028.

Brunei Darussalam

Mrs Asmah B. Saman
Head, Crop Pest Unit, Research Division
Department of Agriculture
Ministry of Industry and Primary Resources
Kilinas Agriculture Research Centre
BRUNEI DARUSSALAM

Wong Khoon Meng
C/- Forestry Department
Bandar Seri Begawan 2067
BRUNEI DARUSSALAM

Cambodia

Dr K.L. Heong
IRRI - Cambodia Project
C/- PO Box 9-159 BKN
Bangkhen
Bangkok 10900
THAILAND

Dr H.J. Nesbitt
Entomology Division
IRRI
Box 933
Manila 1099
PHILIPPINES

Dr B. Rowell
C/- Church World Service
PO Box 2420
Bangkok 10500
THAILAND

Indonesia

Dr Ir Darwis SN
Director
Research and Development Centre for Industrial Crops
Jl. Cimanggu 1A
Bogor 16111
INDONESIA

Dr Roch Desmier de Chenon
Research Centre for Estate Crops
Marihat Ulu
PO Box 37 Pematang Siantar
Sumatera-Utara
INDONESIA

Ir Anton N Utomo
Director, Estate Crop Protection
Jl Letjen S Parman
73 Slipi, Jakarta 11410
INDONESIA

Dr Satta Nigenasantana
D/G. Food Crops Protection
Jl Ragunan, Pasar Minggu
Jakarta Selatan
INDONESIA

Dr Ir. Farid Achmad Bakar
Director
Research and Development Centre for Horticulture
Jl. Ragunan No 19
Jakarta
INDONESIA

Laos

Dr J.M. Schiller
Lao - IRRI Project
PO Box 4195
Vientiane
LAOS

Mr Thongsavanh Taipangnavong
Chief of Plant Protection Centre
Department of Agriculture & Extension
Ministry of Agriculture, Vientiene, Laos
C/- FAO Regional Office
PO Box 1640, Vientiene
LAOS

Malaysia

Dr Ahmad Anwar Ismail
Central Research Laboratories
MARDI
PO Box 12301
Kuala Lumpur 50774
MALAYSIA

Dr Baki B. Bakar
MARDI Negeri Sarawak
36 Rubber Rd
Kuching 93400
Sarawak
MALAYSIA

Luz G. Chan
Ancom Berhad
Persiaran Selangor
PO Box 10465
Kuala Lumpur 50714
MALAYSIA

Dr P.S.S. Durai
ASEAN - PLANTI
Post Bag 209, UPM Post
Serdang 43400
Selangor
MALAYSIA

Dr Lim Guan Soon
[Formerly of Central Research
Laboratories MARDI]
Kuala Lumpur
MALAYSIA

Dr P.A.C. Ooi
International Institute for Biological
Control
CABI Regional Office for Asia
PO Box 11872
Kuala Lumpur 50760
MALAYSIA

Tan Chai-Lin
Central Research Laboratories
MARDI
PO Box 12301
Kuala Lumpur 50774
MALAYSIA

E.B. Tay
Malaysian Cocoa Board
Wisma MUIS
Jalan Tunku Abdul Rahman
Beg Berkunci 211
Kota Kinabalu 88999
Sabah
MALAYSIA

Ms Rosie Liew
Department of Agriculture
Sabah
MALAYSIA

Dr Khoo Khay Chong
Fakulti Pertanian
Universiti Pertanian Malaysia
43400 Serdang
Selangor
MALAYSIA

Myanmar

N. von Keyserlingk
Burmese/GTZ Project
C/- Embassy of the Federal Republic of
Germany
PO Box 12
Yangon
MYANMAR

Dr G. Pierrard
Formerly, Pest and Pesticide
Management
FAO Regional Office
PO Box 101
Yangon
MYANMAR

Saw Ler Wah
Weed Scientist
Entomology Division
Ari, Yezin
Pyinmana
MYANMAR

Dr Tin Aung
Plant Protection Division
Myanmar Agriculture Service
Gyogon: Yangon
MYANMAR

Yan Lin
Department of Entomology
Institute of Agriculture
Yezin
Pyinmana
MYANMAR

Philippines

Dr J. Sumangil
Bureau of Plant Industry
Department of Agriculture
692 San Andres St
Malate
Manila
PHILIPPINES

Dr N. Aguilar
Ethno-Morpho Systematics Laboratory
Institute of Biological Sciences
College of Arts and Sciences
University of the Philippines at Los Banos
College
Laguna 4031
PHILIPPINES

Dr K. Moody
IRRI
PO Box 933
Manila 1099
PHILIPPINES

Singapore

Ong, Keng Ho
Head, Plant Health Branch
Agriculture Division
Primary Production Department
17 Km Sembawang Rd
SINGAPORE 2776

Ricky Ho
Head
Plant Production and Regulatory
Section
Plant Health Branch
Primary Production Department
17 Km Sembawang Rd
SINGAPORE 2776

Tay Eng Pin
Senior Research Officer
Botanic Gardens Division
National Parks Board
Ministry of National Development
Cluny Rd
SINGAPORE 1025

Thailand

Mrs Suarpa Disthaporn
Biological Department
Plant Protection Division
Department of Agricultural Extension
2143/1 Phaholyotin Rd
Khet Bangkhen
Bangkok 1090
THAILAND

Dr Banpot Napompeth
Executive Director
National Biological Control Research
Centre
Kasetsart University
PO Box 9-52
Bangkok 10900
THAILAND

Dr Anan Vattanatangum
Director
Planning and Technical Division
Department of Agriculture
Bangkhen
Bangkok 10900
THAILAND

Vietnam

Dr Nguyen van Cam
Vice Director
National Biological Control Research Centre
Plant Protection Research Institute
(Viên Báo Vê Thùc Vât)
Chèm-Tù Liêm
Hà ni
VIETNAM

Dr Hoang Anh Cung
Plant Protection Research Institute
(Viên Báo Vê Thùc Vât)
Chèm-Tù Liêm
Hà ni
VIETNAM

Dr Li Thi-Sen
Department of Plant Protection
Facultry of Agriculture
University of Can Tho
Can Tho, Han Giang
VIETNAM

Valuable advice on taxonomic problems has been received from a number of colleagues in the Division of Entomology, CSIRO Canberra including:

Dr M. Carver (Hemiptera)
Dr P. Cranston (Diptera)
Mr T. Edwards (Lepidoptera)
Dr B. Halliday (Acarina)
Dr M. Horak (Lepidoptera)
Dr K.H.L. Key (Orthoptera)
Mr T. Weir (Coleoptera)
Dr E.C. Zimmerman (Coleoptera)

from taxonomic experts in the International Institute of Entomology CAB, UK, especially

Dr G. Stonedahl
Dr M.R. Wilson

and from Mr L. Adams, Australian National Herbarium, Canberra

Continuing valuable support for the project has been provided by Dr P. Ferrar, ACIAR.

4. Results

The tables that follow (except Table 15 with production statistics) deal with the valid species that have been nominated since 1990 as major Southeast Asian pests by the Plant Protection specialists of the various Southeast Asian countries. Species that have only been listed as 'present but not important' and not been given a higher rating by any country have been omitted.

It is probable that many of the species occur far more widely than is shown in the tables, especially in Brunei, Cambodia, Laos and Myanmar where the amount of information available is limited. It is hoped that the gaps in the tables will stimulate the publication of additional records, or at least the provision of up-to-date information to ACIAR for inclusion when the tables are revised. It is entirely possible also that some of the •'s derived from the literature, unintentionally underrate the importance of a particular pest for that country.

Table 1 Major arthropod pests in Southeast Asia.

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Acanthocoris scaber (Linnaeus)	HEM	Coreidae		chilli, ipomoea
Acanthoscelides obtectus (Say)	COL	Bruchidae		pigeon pea
Aceria litchi (Keifer)	ACA	Eriophyidae	litchi gall mite	litchi
Aceria mangiferae (Sayed)	ACA	Eriophyidae	mango bud mite	mango
Aceria tulipae (Keifer)	ACA	Eriophyidae	onion mite	onion
Achaea janata (Linnaeus)	LEP	Noctuidae	castor semi-looper	castor, cocoa
Achaea melicerta	see *Achaea janata*			
Achaea pentasema	see *Achaea serva*			
Achaea serva (Fabricius)	LEP	Noctuidae		castor
Acherontia lachesis (Fabricius)	LEP	Sphingidae	death's head hawk moth	sesame, egg plant
Acherontia styx (Westwood)	LEP	Sphingidae	small death's head hawk moth	sesame, egg plant
Acontia transversa	see *Xanthodes transversa*			
Acraea issoria (Hübner)	LEP	Nymphalidae		ramie
Acrocercops cramerella	see *Conopomorpha cramerella*			
Acrocercops symbolopis Meyrick	LEP	Gracillariidae		noseberry
Acrocercops syngramma Meyrick	LEP	Gracillariidae	cashew leafminer	cashew
Acryptorhynchus frigidus	see *Sternochetus frigidus*			
Adoretus compressus (Weber)	COL	Scarabaeidae	rose beetle	polyphagous
Adoretus sinicus Burmeister	COL	Scarabaeidae	rose beetle	polyphagous
Adoxophyes privatana Walker	LEP	Tortricidae		groundnut, rambutan
Agrius convolvuli (Linnaeus)	LEP	Sphingidae		sweet potato
Agromyza phaseoli	see *Ophiomyia phaseoli*			
Agromyza sojae	see *Melanagromyza sojae*			
Agrotis ipsilon (Hufnagel)	LEP	Noctuidae	black cutworm	polyphagous
Agrotis segetum (Denis and Schiffermüller)	LEP	Noctuidae	common cutworm	brassicas, potato
Alcidodes sp.	COL	Curculionidae	shoor borer	mango
Alcidodes leeuweni (Heller)	COL	Curculionidae		kapok
Aleurodicus destructor Mackie	HEM	Aleyrodidae	coconut whitefly	star gooseberry
Aleurodicus dispersus Russell	HEM	Aleyrodidae	spiraling whitefly	papaya, guava
Aleurolobus barodensis (Maskell)	HEM	Aleyrodidae	sugarcane whitefly	sugarcane
Alissonotum impressicolle Arrow	COL	Scarabaeidae	black sugarcane beetle	sugarcane
Allocarsidara malayensis (Crawford)	HEM	Carsidaridae		durian
Amathusia phidippus (Linnaeus)	LEP	Amathusiidae	palm king	coconut
Amorphoidea lata Motschulsky	COL	Curculionidae		cotton
Amrasca sp.	HEM	Cicadellidae		soybean, mung bean

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Amrasca biguttula	see *Amrasca devastans*			
Amrasca devastans (Distant)	HEM	Cicadellidae	cotton leafhopper	cotton
Amritodus atkinsoni (Lethierry)	HEM	Cicadellidae	mango leafhopper	mango
Amsacta lactinea (Cramer)	LEP	Arctiidae	red tiger moth	groundnut
Anomala spp.	COL	Scarabaeidae		groundnut, jackfruit
Anomala antiqua (Gyllenhal)	COL	Scarabaeidae		groundnut, castor
Anomala cupripes (Hope)	COL	Scarabaeidae		cloves, potato
Anomala pallida (Fabricius)	COL	Scarabaeidae		rubber, cowpea, cocoa, coconut
Anomala varians (Olivier)	COL	Scarabaeidae		groundnut
Anomis flava (Fabricius)	LEP	Noctuidae	cotton semi-looper	cotton
Anoplophora chinensis (Forster)	COL	Cerambycidae	citrus longhorn beetle	citrus
Antigastra catalaunalis (Duponchel)	LEP	Pyralidae	sesame webworm	sesame
Anua coronata	see *Ophiusa coronata*			
Anua tirhaca	see *Ophiusa tirhaca*			
Aonidomytilus albus (Cockerell)	HEM	Diaspididae	cassava scale	cassava
Aphis craccivora Koch	HEM	Aphididae	cowpea aphid	groundnut, legumes
Aphis glycines Matsumura	HEM	Aphididae	soybean aphid	soybean
Aphis gossypii Glover	HEM	Aphididae	cotton aphid, melon aphid	cotton
Apion collare Schilsky	COL	Apionidae		jute
Apion corchori Marshall	COL	Apionidae	jute stem weevil	jute
Apoderus crenatus Jekel	COL	Curculionidae		mango
Apoderus notatus (Fabricius)	COL	Curculionidae		mango, cloves
Apogonia sp.	COL	Scarabaeidae		tea
Apogonia cribricollis Burmeister	COL	Scarabaeidae		oil palm
Apriona germari (Hope)	COL	Cerambycidae	longhorn stem borer	mulberry
Aproaerema modicella (Deventer)	LEP	Gelechiidae	groundnut leafminer	groundnut
Aproaerema nerteria	see *Aproaerema modicella*			
Aprosterna antiqua	see *Anomala antiqua*			
Araecerus fasciculatus (De Geer)	COL	Anthribidae	coffee bean weevil	coffee
Arbela dea Swinhoe	LEP	Metarbelidae	bark borer	jackfruit
Archips machlopis (Meyrick)	LEP	Tortricidae		cocoa
Archips micaceanus (Walker)	LEP	Tortricidae	soybean leafroller	soybean, breadfruit
Archips tabescens (Meyrick)	LEP	Tortricidae		groundnut, jackfruit
Argyrogramma signata (Fabricius)	LEP	Noctuidae	green semi-looper	brassicas
Ariadne ariadne (Linnaeus)	LEP	Nymphalidae		castor
Artogeia canidia	see *Pieris canidia*			
Artona catoxantha	LEP	Zygaenidae	coconut leaf moth	oil palm

Table 1 (continued)

Table 1 (continued)

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Asota spp.	LEP	Noctuidae		fig
Aspidiotus destructor Signoret	HEM	Diaspididae	coconut scale	coconut
Aspidomorpha furcata (Thunberg)	COL	Chrysomelidae	tortoise beetle	sweet potato
Aspidomorpha miliaris (Fabricius)	COL	Chrysomelidae	spotted tortoise beetle	*Ipomoea aquatica*
Aspongopus fuscus	see *Coridius fuscus*			
Asterolecanium ungulatum Russel	HEM	Coccidae		durian
Atherigona exigua Stein	DIP	Muscidae	rice seedling fly	
Atherigona oryzae Malloch	DIP	Muscidae	rice seedling fly	maize
Atherigona soccata Rondani	DIP	Muscidae	sorghum shoot fly	sorghum
Attacus atlas (Linnaeus)	LEP	Saturniidae	atlas moth	custard apple, avocado, cinchona, rambutan
Aulacaspis mangiferae	see *Aulacaspis tubercularis*			
Aulacaspis tegalensis (Zehntner)	HEM	Diaspididae	sugarcane scale	sugarcane
Aulacaspis tubercularis Newstead	HEM	Diaspididae	mango scale	mango
Aulacophora femoralis (Motschulsky)	COL	Chrysomelidae		cucurbits
Aulacophora flavomarginata Duvivier	COL	Chrysomelidae		curcubits
Aulacophora foveicollis (Lucas)	COL	Chrysomelidae		cucurbits
Aulacophora frontalis Baly	COL	Chrysomelidae		cucurbits
Aulacophora lewisii Baly	COL	Chrysomelidae		cucurbits
Aulacophora similis (Olivier)	COL	Chrysomelidae		cucurbits, watermelon, yard-long bean
Bachytrupes sp	ORT	Gryllidae		oil palm
Bactrocera spp.	DIP	Tephritidae		avocado
Bactrocera cucurbitae (Coquillett)	DIP	Tephritidae	melon fly	cucurbits
Bactrocera dorsalis (Hendel)*	DIP	Tephritidae	oriental fruit fly	many fruits
Bactrocera hageni	see *Bactrocera tau*			
Bactrocera tau (Walker)	DIP	Tephritidae		melons
Bactrocera latifrons (Hendel)	DIP	Tephritidae		capsicum
Bactrocera umbrosa (Fabricius)	DIP	Tephritidae		breadfruit, jackfruit
Basilepta subcostatum Jacoby	COL	Chrysomelidae		banana
Basilepta viridipenne (Motschulsky)	COL	Chrysomelidae		banana
Batocera albofasciata	see *Batocera rubus*			
Batocera hercules (Boisduval)	COL	Cerambycidae		nutmeg
Batocera rubus (Linnaeus)	COL	Cerambycidae		breadfruit, jackfruit, rubber
Batocera rufomaculata (De Geer)	COL	Cerambycidae		cashew
Bedellia somnulentella (Zeller)	LEP	Lyonetiidae		sweet potato
Bemisia sp.	HEM	Aleyrodidae		castor, mulberry

* This is a complex of several economic species in SE Asia

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Bemisia myricae	see *Parabemisia myricae*			
Bemisia tabaci (Gennadius)	HEM	Aleyrodidae	tobacco whitefly cotton whitefly	tobacco, cotton
Biloba subsecivella	see *Aproaerema modicella*			
Bostrychopsis parallela Lesne	COL	Bostrichidae		bamboo
Brachmia trianuella Herrich-Schaffer	LEP	Gelechiidae		sweet potato
Brachyacma palpigera (Walshingham)	LEP	Gelechiidae		pigeon pea, soybean
Brevicoryne brassicae (Linnaeus)	HEM	Aphididae	cabbage aphid	brassicas
Bruchophagus mutabilis Nikolskaya	HYM	Eurytomidae		corkwood tree
Bruchus analis	see *Callosobruchus analis*			
Bruchus chinensis	see *Callosobruchus chinensis*			
Bruchus obsoletus	see *Acanthoscelides obtectus*			
Cacoecia machlopis	see *Archips machlopis*			
Cacoecia micaceana	see *Archips micaceana*			
Cacoecia tabescens	see *Archips tabescens*			
Cadamustus typicus	see *Stephanitis typica*			
Caliothrips indicus (Bagnall)	THY	Thripidae		groundnut, soybean, legumes
Calliteara horsfieldii (Saunders)	LEP	Lymantriidae		tamarind, cashew, cocoa, oil palm
Callitettix versicolor (Fabricius)	HEM	Cercopidae	sugarcane spittlebug	sugarcane
Callosobruchus sp.	COL	Bruchidae		pea
Callosobruchus chinensis (Linnaeus)	COL	Bruchidae	cowpea bruchid	cowpea, beans
Caloclytus sp.	COL	Cerambycidae		acacia
Carpophilus hemipterus (Linnaeus)	COL	Nitidulidae		sorghum, maize
Cataenococcus hispidus (Morrison)	HEM	Pseudococcidae	citrus mealybug	citrus, custard apple, rambutan
Catochrysops cnejus	see *Euchrysops cnejus*			
Cephonodes hylas (Linnaeus)	LEP	Sphingidae	coffee hawkmoth	coffee
Ceratia frontalis	see *Aulacophora frontalis*			
Ceratovacuna lanigera Zehntner	HEM	Aphididae	white sugarcane aphid	sugarcane
Ceresium sinicum White	COL	Cerambycidae		mulberry
Ceroplastes rubens Maskell	HEM	Coccidae	pink wax scale	citrus, mango
Chelidonium sp.	COL	Cerambycidae		citrus
Chelidonium argentatum (Dalman)	COL	Cerambycidae		citrus
Chilo spp.	LEP	Pyralidae		sorghum
Chilo auricilius Dudgeon	LEP	Pyralidae	stalk borer	rice
Chilo infuscatellus Snellen	LEP	Pyralidae	yellow top-borer	sugarcane

Table 1 (continued)

Table 1 (continued)

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Chilo polychrysus (Meyrick)	LEP	Pyralidae	darkheaded rice borer	rice
Chilo sacchariphagus (Bojer)	LEP	Pyralidae	sugarcane stem borer	sugarcane
Chilo suppressalis (Walker)	LEP	Pyralidae	striped rice borer asiatic rice borer	rice, corn
Chilotraea infuscatellus	see *Chilo infuscatellus*			
Chilotraea polychrysa	see *Chilo polychrysus*			
Chionaspis papayae	see *Phenacaspis papayae*			
Chlorophorus annularis (Fabricius)	COL	Cerambycidae	bamboo longhorn	bamboo
Chlumetia transversa (Walker)	LEP	Noctuidae	mango shoot borer	mango
Chondracris rosea (De Geer)	ORT	Acrididae		soybean
Chromatomyia horticola (Goureau)	DIP	Agromyzidae		bean, brassicas, radish, lettuce
Chrysodeixis chalcites	see *Chrysodeixis eriosoma*			
Chrysodeixis eriosoma (Doubleday)	LEP	Noctuidae	corn semi-looper	maize, legumes
Chrysomphalus aonidum (Linnaeus)	HEM	Diaspididae	purple scale ceriulae black scale	citrus, coconut, papaya
Chrysomphalus ficus	see *Chrysomphalus aonidum*			
Chunra niveosparsa	see *Idioscopus niveosparsus*			
Citripestis sagittiferella (Moore)	LEP	Pyralidae	citrus fruit borer	citrus
Clania variegata	see *Cryptothelia variegata*			
Cnaphalocrocis medinalis (Guenée)	LEP	Pyralidae	rice leaffolder	rice
Coccus viridis (Green)	HEM	Coccidae	soft green scale	coffee
Colasposoma dauricum (Motschulsky)	COL	Chrysomelidae		sweet potato
Conogethes punctiferalis (Guenée)	LEP	Pyralidae	castor borer	castor, rambutan, ginger, carambola
Conopomorpha cramerella (Snellen)	LEP	Gracillariidae	cocoa podborer	cocoa, rambutan
Conopomorpha sinensis	LEP	Gracillariidae		litchi, longan
Coptosoma japonicum Matsumura	HEM	Plataspidae		corkwood tree
Coptotermes curvignathus Holm	ISO	Rhinotermitidae		coconut, rubber
Coptotermes havilandi Holmgren	ISO	Rhinotermitidae		sugarcane
Coptotermes javanicus	see *Coptotermes havilandi*			
Coridius fuscus (Westwood)	HEM	Dinidoridae		curcubits
Cosmophila flava	see *Anomis flava*			
Cosmopolites sordidus (Germar)	COL	Curculionidae	banana weevil	banana
Cossus sp.	LEP	Cossidae		litchi, longan
Crematopsyche pendula Joannis	LEP	Psychidae		oil palm
Cricula trifenestrata (Helfer)	LEP	Saturniidae		avocado, cashew
Crocidolomia binotalis	see *Crocidolomia pavonana*			

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Crocidolomia pavonana (Fabricius)	LEP	Pyralidae	cabbage cluster caterpillar	brassicas
Cryptophlebia sp	LEP	Tortricidae	starfruit borer	carambola
Cryptophlebia encarpa (Meryrick)	LEP	Tortricidae	cocoa huskborer	cocoa
Cryptorhynchus goniocnemis	see *Sternochetus goniocnemis*			
Cryptorhynchus gravis	see *Sternochetus gravis*			
Cryptorhynchus mangiferae	see *Sternochetus mangiferae*			
Cryptothelea variegata (Snellen)	LEP	Psychidae		clove, polyphagous
Cylas formicarius (Fabricius)	COL	Apionidae	sweet potato weevil	sweet potato
Cyrtacanthacris tatarica (Linnaeus)	ORT	Acrididae	yellow-backed grasshopper	maize
Cyrtopeltis tenuis Reuter	HEM	Miridae		tobacco, tomato
Dacus spp.	see *Bactrocera* spp.			
Dacus hageni	see *Bactrocera tau*			
Darna diducta (Snellen)	LEP	Limacodidae		oil palm
Darna furva (Wileman)	LEP	Limacodidae		oil palm
Darna trima (Moore)	LEP	Limacodidae		oil palm
Dasineura mangiferae	see *Erosomyia mangiferae*			
Dasychira horsfieldii	see *Calliteara horsfieldii*			
Dasychira mendosa	see *Olene mendosa*			
Dasynus piperis (China)	HEM	Coreidae	large pepper berry bug	pepper
Delia antiqua (Meigen)	DIP	Anthomyiidae	onion fly	onion, garlic
Deporaus marginatus Pascoe	COL	Curculionidae	mango leaf-cutting weevil	mango
Diacrotricha fasciola Zeller	LEP	Pterophoridae		carambola
Diaphania caesalis	see *Glyphodes caesalis*			
Diaphania indica (Saunders)	LEP	Pyralidae	cucumber moth	cucurbits
Diaphania pulverulentis	see *Glyphodes pulverulentalis*			
Diaphorina citri Kuwayama	HEM	Psyllidae	citrus psylla	citrus
Dichocrocis megillalis (Walker)	LEP	Pyralidae		gambir
Dichocrocis punctiferalis	see *Conogethes punctiferalis*			
Dicladispa armigera (Olivier)	COL	Chrysomelidae	rice hispid	rice
Diconocoris hewitti (Distant)	HEM	Tingidae	pepper lace bug	pepper
Diconocoris nepalensis (Distant)	HEM	Tingidae	pepper lace bug	pepper
Dorylus orientalis Westwood	HYM	Formicidae	oriental army ant	groundnut
Dorysthenes buqueti (Guérin-Méneville)	COL	Cerambycidae		sugarcane, cassava
Dysdercus cingulatus (Fabricius)	HEM	Pyrrhocoridae	cotton stainer bug	cotton
Dysmicoccus brevipes (Cockerell)	HEM	Pseudococcidae	pineapple mealy bug	pineapple, ginger, oil palm
Dysmicoccus neobrevipes Beardsley	HEM	Pseudococcidae		monkeypod
Earias fabia	see *Earias vittella*			
Earias vittella (Fabricius)	LEP	Noctuidae	rough bollworm, shoot and fruit borer	cotton, okra

Table 1 (continued)

Table 1 (continued)

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Elasmognathus nepalensis	see *Dinocoris nepalensis*			
Elymnias hypermnestra (Linnaeus)	LEP	Satyridae	common palm butterfly	coconut
Empoasca sp.	HEM	Cicadellidae		cotton, legumes
Empoasca biguttula	see *Amrasca devastans*			
Empoasca devastans	see *Amrasca devastans*			
Empoasca flavescens (Fabricius)*	HEM	Cicadellidae		tea, soybean, egg plant
Empoasca formosana	see *Jacobiasca formosana*			
Eotetranychus cendanai Rimando	ACA	Tetranychidae		citrus
Epepeotes uncinatus Gahan	COL	Cerambycidae	mulberry stem borer	mulberry
Ephestia cautella (Walker)	LEP	Pyralidae	tropical warehouse moth	soybean
Epicauta gorhami Marseul	COL	Meloidae	small blister beetle	soybean, hemp
Epicauta maklini Haag-Rutenberg	COL	Meloidae	blister beetle	groundnut
Epicauta waterhousei Haag- Rutenberg	COL	Meloidae		egg plant
Epilachna diffinis Eydoux and Souleyet	COL	Coccinellidae		egg plant
Epilachna indica Mulsant	COL	Coccinellidae		watermelon, egg plant, bean, cucumber
Epilachna vigintioctopunctata (Fabricius)	COL	Coccinellidae	28. spotted ladybird	egg plant, potato
Erionota thrax (Linnaeus)	LEP	Hesperiidae	banana skipper	banana
Eriophyes boisi	see *Eriophyes doctersi*			
Eriophyes doctersi Nalepa	ACA	Eriophyiidae		cinnamon
Eriophyes mangiferae	see *Aceria mangiferae*			
Erosomyia mangiferae Felt	DIP	Cecidomyiidae		mango
Etiella cautella	see *Ephestia cautella*			
Etiella zinckenella (Treitschke)	LEP	Pyralidae	pea pod borer	legumes
Eublemma abrupta (Walker)	LEP	Noctuidae		rambutan
Eublemma brachygonia Hampson	LEP	Noctuidae		rambutan
Eublemma versicolor (Walker)	LEP	Noctuidae		rambutan
Euchlora cupripes	see *Anomala cupripes*			
Euchrysops cnejus (Fabricius)	LEP	Lycaenidae	bean blue	legumes
Eudocima salaminia (Cramer)	LEP	Noctuidae	fruit piercing moth	citrus
Euproctis spp.	LEP	Lymantriidae	tussock moth	cashew
Euproctis pseudoconspersa Strand	LEP	Lymantriidae		tea
Eurema hecabe (Linnaeus)	LEP	Pieridae	common grass yellow	corkwood tree
Eurydema pulchra (Westwood)	HEM	Pentatomidae	cabbage bug harlequin bug	brassicas
Eutetranychus africanus (Tucker)	ACA	Tetranychidae	citrus brown mite	citrus, durian
Eutetranychus cendanae	see *Eotetranychus cendanai*			
Eutetranychus orientalis (Klein)	ACA	Tetranychidae	oriental red mite	papaya, rambutan

* Taxonomic identity unclear

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Euthalia aconthea (Moore)	LEP	Nymphalidae		mango
Eysarcoris guttiger (Thunberg)	HEM	Pentatomidae	two spotted sesame bug	sesame
Ferrisia virgata (Cockerell)	HEM	Pseudococcidae	striped mealybug	polyphagous
Ferrisiana virgata	see *Ferrisia virgata*			
Frankliniella spp.	THY	Thripidae		soybean, flowers
Frankliniella occidentalis (Pergande)	THY	Thripidae		rose, chrysanthemum
Frankliniella williamsi Hood	THY	Thripidae		maize, sugarcane
Glyphodes caesalis (Walker)	LEP	Pyralidae		jackfruit
Glyphodes pulverulentalis Hampson	LEP	Pyralidae		mulberry
Gryllotalpa africana (Palisot de Beauvois)	ORT	Gryllotalpidae	African mole cricket	potato
Gryllotalpa orientalis Burmeister	ORT	Gryllotalpidae	mole cricket	rice
Gynaikothrips ficorum (Marchal)	THY	Phlaeothripidae		figs
Haplothrips floricola	THY	Phlaeothripidae		curcubits
Hedylepta diemenalis	see *Lamprosema diemenalis*			
Hedylepta indicata (Fabricius)	LEP	Pyralidae	soybean webworm	legumes
Hedythia suturalis	see *Medythia suturalis*			
Helicoverpa armigera (Hübner)	LEP	Noctuidae	cotton bollworm	polyphagous
Helicoverpa assulta (Guenée)	LEP	Noctuidae	tobacco budworm	tobacco
Heliothis sp.	LEP	Noctuidae	army worm	chilli
Heliothis armigera	see *Helicoverpa armigera*			
Heliothis assulta	see *Helicoverpa assulta*			
Heliothrips haemorrhoidalis (Bouché)	THY	Thripidae	greenhouse thrips	avocado
Hellula undalis (Fabricius)	LEP	Pyralidae	oriental cabbage webworm	brassicas
Helopeltis sp.	HEM	Miridae		tea
Helopeltis bradyi Waterhouse	HEM	Miridae	tea mosquito	tea, cashew, cocoa, cinchona
Helopeltis theivora Waterhouse	HEM	Miridae	tea mosquito	tea, cashew, cocoa, cinchona
Helopeltis theobromae Miller	see *Helopeltis theivora*			
Hemerophila atrilineata	see *Menophra atrilineata*			
Henosepilachna vigintioctopunctata	see *Epilachna vigintioctopunctata*			
Herse convolvuli	see *Agrius convolvuli*			
Heteropsylla cubana Crawford	HEM	Psyllidae	leucaena psyllid	leucaena
Hexamitodera semivelutina (Heller)	COL	Cerambycidae		clove
Hidari irava (Moore)	LEP	Hesperiidae	coconut skipper	coconut
Hieroglyphus banian (Fabricius)	ORT	Acrididae		sugarcane
Hippotion celerio (Linnaeus)	LEP	Sphingidae		taro
Hispa armigera	see *Dicladispa armigera*			

Table 1 (continued)

Table 1 (continued)

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Holotrichia bidentata (Burmeister)	COL	Scarabaeidae		rubber
Holotrichia sinensis Hope	COL	Scarabaeidae		sugarcane
Homona coffearia (Nietner)	LEP	Tortricidae	tea tortrix	tea
Hyblaea puera (Cramer)	LEP	Hyblaeidae		teak
Hydrellia sp.	DIP	Ephydridae	rice whorl maggot	rice
Hydrellia philippina Ferino	DIP	Ephydridae	rice whorl maggot	rice
Hymenia recurvalis	see *Spoladea recurvalis*			
Hyperaeschrella dentata	see *Hyperaeschrella insulicola*			
Hyperaeschrella insulicola Kiriakoff	LEP	Notodontidae		rambutan, cashew
Hypomeces squamosus (Fabricius)	COL	Curculionidae	green weevil	polyphagous
Hyposidra talaca (Walker)	LEP	Geometridae		mangosteen, cinchona
Hypothenemus hampei (Ferrari)	COL	Scolytidae	coffee berry borer	coffee
Hypothenemus psidii Hopkins	COL	Scolytidae		guava
Hysteroneura setariae (Thomas)	HEM	Aphididae	grass aphid	wheat
Icerya pulchra (Leonardi)	HEM	Margarodidae		durian
Icerya purchasi Maskell	HEM	Margarodidae	cottony cushion scale	citrus
Icerya seychellarum (Westwood)	HEM	Margarodidae		citrus
Idiocerus clypealis	see *Idioscopus clypealis*			
*Idiocerus niveosparsus**	see *Idioscopus niveosparsus*			
Idioscopus clypealis (Lethierry)	HEM	Cicadellidae	mango leafhopper	mango
Idioscopus nigroclypealis	see *Idioscopus clypealis*			
Idioscopus nitidulus (Walker)	HEM	Cicadellidae		mango
Idioscopus niveosparsus (Lethierry)	HEM	Cicadellidae		mango
Jacobiasca formosana (Paoli)	HEM	Cicadellidae		castor, cassava
Japanagromyza sp. nr *angustifrons* Spencer	DIP	Agromyzidae		mung
Japanagromyza tristella (Thomson)	DIP	Agromyzidae		soybean
Laccifer javanus	see *Kerria javana*			
Lampides boeticus (Linnaeus)	LEP	Lycaenidae	pea blue butterfly	legumes
Lamprosema diemenalis (Guenée)	LEP	Pyralidae	bean leaf roller	legumes
Lamprosema indicata	see *Hedylepta indicata*			
Latoia lepida	see *Parasa lepida*			
Lawana imitata (Melichar)	HEM	Flatidae		clove
Lepidiota bimaculata Saunders	COL	Scarabaeidae		jackfruit
Lepidiota discedens Sharp	COL	Scarabaeidae		sugarcane
Lepidiota stigma (Fabricius)	COL	Scarabaeidae		sugarcane, cassava
Lepidosaphes beckii (Newman)	HEM	Diaspididae	purple scale	
			mussel scale	citrus
Leptocorisa acuta (Thunberg)	HEM	Alydidae	paddy bug	rice

* *Idiocerus niveosparsus* may prove to be a synonym of *I. nitidulus*

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Leptocorisa oratorius (Fabricius)	HEM	Alydidae	rice ear bug	rice
Leptocorisa varicornis	see *Leptocorisa acuta*			
Leptoglossus australis	see *Leptoglossus gonagra*			
Leptoglossus gonagra (Fabricius)	HEM	Coreidae	squash bug	cucurbits, citrus
Leptoglossus membranaceus	see *Leptoglossus gonagra*			
Leucania unipuncta	see *Mythimna separata*			
Leucinodes orbonalis Guenée	LEP	Pyralidae	brinjal fruit borer	egg plant
Leucopholis irrorata (Chevrolat)	COL	Scarabaeidae		polyphagous
Leucopholis rorida (Fabricius)	COL	Scarabaeidae		cashew, rubber, cassava
Lipaphis erysimi (Kaltenbach)	HEM	Aphididae	turnip aphid	brassicas
Liriomyza brassicae (Riley)	DIP	Agromyzidae	cabbage leafminer	brassicas
Lohita grandis (Gray)	HEM	Pyrrhocoridae		tea, longan
Longiunguis sacchari	see *Melanaphis sacchari*			
Lophobaris piperis Marshall	COL	Curculionidae	pepper bark weevil	pepper
Lymantria lunata (Stoll)	LEP	Lymantriidae	tussock moth	carambola
Lymantria monacha (Linnaeus)	LEP	Lymantriidae	tussock moth	guava
Lyonetia sp	LEP	Lyonetiidae		brassicas
Macroceroea grandis	see *Lohita grandis*			
Macrotermes spp.	ISO	Termitidae		bamboo, tea, sugarcane
Macrotermes gilvus (Hagen)	ISO	Termitidae		bamboo
Mahasena corbetti Tams	LEP	Psychidae	coconut case caterpillar	oil palm
Margaronia bivatralis	see *Glyphodes bivatralis*			
Margaronia indica	see *Diaphania indica*			
Margaronia pulverulentalis	see *Glyphodes pulverulentalis*			
Maruca amboinalis (Felder and Rogenhofer)	LEP	Pyralidae		mung
Maruca testulalis (Geyer)	LEP	Pyralidae	legume pod borer	legumes
Medythia suturalis (Motschulsky)	COL	Chrysomelidae		mung, cowpea
Megalurothrips usitatus (Bagnall)	THY	Thripidae		mung, groundnut, soybean
Megymenum brevicornis (Fabricius)	HEM	Dinidoridae		egg plant, cucumber
Melanagromyza phaseoli	see *Ophiomyia phaseoli*			
Melanagromyza sojae (Zehntner)	DIP	Agromyzidae	soybean stem miner	soybean, mung
Melanaphis sacchari (Zehntner)	HEM	Aphididae	yellow sugarcane aphid	maize, sorghum
Menophra atrlineata (Butler)	see *Phthorardria atrilineata*			
Meridarchis scyrodes Meyrick	LEP	Carposinidae		jujuba
Metanastria hyrtaca (Cramer)	LEP	Lasiocampidae		cashew, quinine
Metatetranychus bioculatus	see *Oligonychus coffeae*			
Metisa plana Walker	LEP	Psychidae		oil palm

Table 1 (continued)

Table 1 (continued)

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Microtermes pakistanicus Ahmad	ISO	Termitidae		tea
Microtermes pallidus	see *Microtermes pakistanicus*			
Mictis longicornis Westwood	HEM	Coreidae		mango
Monolepta signata (Olivier)	COL	Chrysomelidae		groundnut
Mudaria magniplaga (Walker)	LEP	Noctuidae	fruit borer	durian
Mudaria variabilis Roepke	LEP	Noctuidae	kapok pod moth	kapok
Mycterothrips setiventris (Bagnall)	THY	Thripidae		tea
Mylabris phalerata (Pallas)	COL	Meloidae	yellow-banded blister beetle	groundnut, hemp
Mythimna sp.	LEP	Noctuidae	cutworm	maize
Mythimna separata (Walker)	LEP	Noctuidae	paddy armyworm	rice, maize, sorghum
Mythimna venalba (Moore)	LEP	Noctuidae		rice
Myzus persicae (Sulzer)	HEM	Aphididae	peach aphid	tobacco, tomato, potato
Naranga aenescens Moore	LEP	Noctuidae	green rice semilooper	rice
Neostauropus alternus (Walker)	LEP	Notodontidae		acacia
Nephopterix piratis Meyrick	LEP	Pyralidae		cashew, ciku
Nephotettix spp.	HEM	Cicadellidae		rice
Nephotettix apicalis	see *Nephotettix nigropictus*			
Nephotettix bipunctata	see *Nephotettix virescens*			
Nephotettix impicticeps	see *Nephotettix virescens*			
Nephotettix nigropictus (Stål)	HEM	Cicadellidae	rice leafhopper	rice
Nephotettix virescens (Distant)	HEM	Cicadellidae	green leafhopper (GLH)	rice
Nezara viridula (Linnaeus)	HEM	Pentatomidae	green vegetable bug	polyphagous
Nilaparvata lugens (Stål)	HEM	Delphacidae	brown planthopper (BPH)	rice
Nipaecoccus nipae (Maskell)	HEM	Pseudococcidae	spike mealybug	coconut
Niphonoclea spp.	COL	Cerambycidae		avocado
Niphonoclea albata (Newman)	COL	Cerambycidae	twig borer	mango, cocoa
Niphonoclea capito (Pascoe)	COL	Cerambycidae	mango twig borer	mango
Nodostoma viridipenne	see *Basilepta viridipenne*			
Nomadacris succincta (Linnaeus)	ORT	Acrididae	Bombay locust	maize
Noorda albizonalis Hampson	LEP	Pyralidae	red banded borer	mango
Nothopeus fasciatipennis Waterhouse	COL	Cerambycidae	clove stem borer	clove
Nymphula depunctalis	see *Paraponyx stagnalis*			
Nysius sp.	HEM	Lygaeidae		sesame
Odoiporus longicollis (Olivier)	COL	Curculionidae	banana stem weevil	banana
Odontotermes sp.	ISO	Termitidae		groundnut
Oebia undalis	see *Hellula undalis*			
Olene mendosa Hübner	LEP	Lymantriidae		castor, groundnut
Olenecamptus bilobus (Fabricius)	COL	Cerambycidae		mango, fig

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Olethreutes discana	see *Statherotis discana*			
Oligonychus coffeae (Nietner)	ACA	Tetranychidae	tea red spider mite	tea, cassava
Oligonychus mangiferus (Rahman and Sapra)	ACA	Tetranychidae	mango red spider mite	mango
Omphisa anastomosalis (Guenée)	LEP	Pyralidae	sweet potato stem borer	sweet potato
Ophiomyia phaseoli (Tryon)	DIP	Agromyzidae	bean fly	legumes
Ophiusa coronata (Fabricius)	LEP	Noctuidae	fruit piercing moth	citrus
Ophiusa janata	see *Achaea janata*			
Ophiusa tirhaca	LEP	Noctuidae	fruit piercing moth	citrus
Oregma lanigera	see *Ceratovacuna lanigera*			
Orgyia postica (Walker)	LEP	Lymantriidae		polyphagous
Orgyia turbata Butler	LEP	Lymantriidae		durian, groundnut, cocoa, coconut
Orosius albicinctus	see *Orosius orientalis*			
Orosius orientalis (Matsumura)	HEM	Cicadellidae	sesame jassid	sesame
Orseolia oryzae (Wood-Mason)	DIP	Cecidomyiidae	rice gall midge	rice
Orthocraspeda trima	see *Darna trima*			
Oryctes rhinoceros (Linnaeus)	COL	Scarabaeidae	rhinoceros beetle	coconut, oil palm
Oryzaephilus surinamensis (Linnaeus)	COL	Silvanidae	saw toothed grain beetle	nutmeg, stored products
Ostrinia furnacalis (Guenée)	LEP	Pyralidae	Asian corn borer	maize, sorghum
Ostrinia nubilalis (Hübner)	LEP	Pyralidae	European corn borer	maize
Othreis fullonia (Clerck)	LEP	Noctuidae	fruit piercing moth	many fruits
Oxya spp.	ORT	Acrididae	rice field grasshopper	rice
Oxyodes scrobiculata (Fabricius)	LEP	Noctuidae		rambutan, durian
Pachydiplosis oryzae	see *Orseolia oryzae*			
Palpita indica	see *Diaphania indica*			
Papilio demodocus	see *Papilio demoleus*			
Papilio demoleus Linnaeus	LEP	Papilionidae	lime butterfly	citrus
Papilio polytes Linnaeus	LEP	Papilionidae	common mormon	citrus
Parabemisia myricae (Kuwana)	HEM	Aleyrodidae		cucurbits, tomato
Paraponyx stagnalis Zeller	LEP	Pyralidae	rice case bearer	rice
Parasa lepida (Cramer)	LEP	Limacodidae	blue-striped nettle grub	mango, tea, coconut, rubber, cassava
Parasaissetia nigra (Nietner)	HEM	Coccidae		rubber, cassava
Pareba vesta	see *Acraea issoria*			
Parlatoria ziziphi (Lucas)	HEM	Diaspididae	leaf black scale	citrus
Parnara guttatus (Bremer and Grey)	LEP	Hesperiidae	rice skipper	rice
Patanga succincta	see *Nomadacris succincta*			
Pectinophora gossypiella (Saunders)	LEP	Gelechiidae	pink bollworm	cotton

Table 1 (continued)

Table 1 (continued)

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Pentalonia nigronervosa Coquerel	HEM	Aphididae	banana aphid	banana
Phaenacantha saccharicida (Karsch)	HEM	Colobathristidae	sugarcane bug	sugarcane
Phenacaspis papayae Takahashi	HEM	Diaspididae		papaya
Phenacoccus iceryioides	see *Rastrococcus iceryioides*			
Philosamia cynthia	see *Samia cynthia*			
Phragmataecia castaneae (Hübner)	LEP	Cossidae		sugarcane
Phthorardria atrilineata (Butler)	LEP	Geometridae		mulberry
Phthorimaea heliopa	see *Scrobipalpa heliopa*			
Phthorimaea operculella (Zeller)	LEP	Gelechiidae	potato tuber moth	potato
Phyllocnistis citrella Stainton	LEP	Phyllocnistidae	citrus leafminer	citrus
Phyllocoptruta oleivora (Ashmead)	ACA	Eriophyidae	citrus rust mite	citrus
Phyllotreta sp.	COL	Chrysomelidae		brassicas
Phyllotreta chotanica Duvivier	COL	Chrysomelidae		brassicas
Phyllotreta cruciferae (Goeze)	COL	Chrysomelidae		brassicas, groundnut
Phyllotreta flexuosa (Illiger)	COL	Chrysomelidae		brassicas
Phyllotreta sinuata Redtenbacker	see *Phyllotreta vittata*			
Phyllotreta sinuata (Stephens)	see *Phyllotreta flexuosa*			
Phyllotreta striolata (Fabricius)	COL	Chrysomelidae	cabbage flea beetle	brassicas
Phyllotreta vittata (Fabricius)	COL	Chrysomelidae		brassicas
Phytometra signata	see *Argyrogramma signata*			
Phytomyza atricornis	see *Chromatomyia horticola* or *C. syngenesiae*			
Pieris canidia (Sparrman)	LEP	Pieridae	small cabbage butterfly	brassicas
Pieris rapae (Linnaeus)	LEP	Pieridae	cabbage white butterfly	brassicas
Piezodorus hybneri (Gmelin)	HEM	Pentatomidae	red banded shield bug	legumes
Piezodorus rubrofasciatus	see *Piezodorus hybneri*			
Pinnaspis aspidistrae (Signoret).	HEM	Diaspididae		pepper
Plagideicta sp.	see *Mudaria* sp.			
Planococcus citri (Risso)	HEM	Pseudococidae	citrus mealybug	citrus, custard apple, rambutan
Planococcus hispidus	see *Cataenococcus hispidus*			
Platymycterus sieversi Reitter	COL	Curculionidae		groundnut, soybean, mulberry
Plesispa reichei Chapuis	COL	Chrysomelidae	coconut hispid	coconut
Plocaederus ferrugineus (Linnaeus)	COL	Cerambycidae		cashew
Plocaederus fulvicornis (Guérin-Méneville)	COL	Cerambycidae	mango bark borer	mango
Plocaederus obesus Gahan	COL	Cerambycidae	cashew stem borer	cashew
Plocaederus pedestris (White)	COL	Cerambycidae		mango

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Ploneta diducta	see *Darna diducta*			
Plusia chalcites	see *Chrysodeixis eriosoma*			
Plusia eriosoma	see *Chrysodeixis eriosoma*			
Plusia signata	see *Argyrogramma signata*			
Plutella xylostella (Linnaeus)	LEP	Yponomeutidae	diamondback moth	brassicas
Poecilocoris latus Dallas	HEM	Scutelleridae	tea shield bug	tea
Polyphagotarsonemus latus (Banks)	ACA	Tarsonemidae	broad mite, yellow tea mite	cotton, chilli, legumes
Porthesia scintillans Walker	LEP	Lymantriidae		corkwood, carambola, rambutan
Prays endocarpa Meyrick	LEP	Yponomeutidae		citrus
Proceras infuscatellus	see *Chilo infuscatellus*			
Proceras venosatus	see *Chilo sacchariphagus*			
Promecotheca cumingii Baly	COL	Chrysomelidae		oil palm
Pseudaletia separata	see *Mythimna separata*			
Pseudaulacaspis pentagona (Targioni Tozzetti)	HEM	Diaspididae		mulberry
Pseudococcus sp.	HEM	Pseudoccidae		potato, coffee
Pseudococcus citri	see *Planoccus citri*			
Pseudococcus nipae	see *Nipaecoccus nipae*			
Ptecticus cingulatus Loew	DIP	Stratiomyiidae		citrus
Pterolophia bigibbera Newman	COL	Cerambycidae		carambola
Pyrameis indica	see *Vanessa indica*			
Pyrausta nubilalis	see *Ostrinia nubilalis*			
Raodiplosis orientalis Felt	DIP	Cecidomyiidae		mango
Rapala pheretima (Hewitson)	LEP	Lycaenidae		rambutan
Rastrococcus iceryioides (Green)	HEM	Pseudoccidae		cocoa
Rastrococcus spinosus (Robinson)	HEM	Pseudococcidae		mango
Recilia dorsalis (Motschulsky)	HEM	Cicadellidae	zigzag leafhopper	rice
Rhaphidopalpa sp. poss. *chinensis* Weise	COL	Chrysomelidae		cucurbits
Rhaphidopalpa similis	see *Aulacophora similis*			
Rhipiphorothrips cruentatus Hood	THY	Thripidae		cashew
Rhopalosiphum maidis (Fitch)	HEM	Aphididae	maize aphid	maize, sorghum
Rhopalosiphum padi (Linnaeus)	HEM	Aphididae	oat aphid, wheat aphid	maize
Rhynchocoris poseidon	HEM	Pentatomidae	spined fruit bug	citrus
Rhynchocoris serratus Donovan	see *Rhynchocoris poseidon*			
Rhynchophorus ferrugineus (Olivier)	COL	Curculionidae	Asiatic palm weevil	coconut
Rhynchophorus schach (Fabricius)	COL	Curculionidae	red stripe weevil	coconut
Rhynchophorus vulneratus (Panzer)	COL	Curculionidae	Asiatic palm weevil	coconut
Rhyncocoris serratus Donovan	HEM	Pentatomidae		citrus

Table 1 (continued)

Table 1 (continued)

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Rhytidodera simulans (White)	COL	Cerambycidae	mango branch borer	mango
Riptortus spp.	HEM	Alydidae		legumes
Rivula atimeta (Swinhoe)	LEP	Noctuidae		rice
Saccharicoccus sacchari (Cockerell)	HEM	Pseudococcidae	sugarcane mealybug	sugarcane
Saissetia coffeae (Walker)	HEM	Coccidae		coffee
Saissetia nigra	see *Parasaissetia nigra*			
Schoenobius bipunctifer	see *Scirpophaga incertulas*			
Scirpophaga excerptalis (Walker)	LEP	Pyralidae		mango
Scirpophaga incertulas (Walker)	LEP	Pyralidae	yellow rice stemborer	rice
Scirpophaga innotata (Walker)	LEP	Pyralidae	white rice stemborer	rice
Scirpophaga monostigma	see *Scirpophaga excerptalis*			
Scirpophaga nivella (Fabricius)	LEP	Pyralidae	sugarcane top borer	sugarcane, rice
Scirtothrips dorsalis Hood	THY	Thripidae	chilli thrips	chilli, cotton, citrus, tea, groundnut
Scopelodes anthela Swinhoe	LEP	Limacodidae		banana
Scopelodes testacea Butler	LEP	Limacodidae		banana
Scotinophara sp.	HEM	Pentatomidae		rice
Scotinophara cinerea (Le Guillou)	HEM	Pentatomidae		rice
Scotinophara coarctata (Fabricius)	HEM	Pentatomidae	black rice bug, Malayan black bug	rice
Scotinophara vermiculata	see *Scotinophora cinerea*			
Scrobipalpa heliopa (Lower)	LEP	Gelechiidae	tobacco stemborer	tobacco
Sepiomus sp.	COL	Curculionidae		sugarcane
Sesamia sp.	LEP	Noctuidae		sugarcane
Sesamia inferens (Walker)	LEP	Noctuidae	pink rice borer	rice, sorghum, sugarcane, maize
Setora nitens Walker	LEP	Limacodidae	coconut nettle caterpillar	coconut, cinchona
Sexava spp.	ORT	Acrididae		coconut, cinchona
Sogatella furcifera (Horváth)	HEM	Delphacidae	white backed planthopper (WBPH)	rice
Spodoptera spp.	LEP	Noctuidae		maize
Spodoptera exempta (Walker)	LEP	Noctuidae	black armyworm	ginger
Spodoptera exigua (Hübner)	LEP	Noctuidae	lesser armyworm	cotton, brassicas etc
Spodoptera litura (Fabricius)	LEP	Noctuidae	cluster caterpillar rice cutworm	polyphagous
Spodoptera mauritia (Boisduval)	LEP	Noctuidae	rice armyworm	rice
Spoladea recurvalis (Fabricius)	LEP	Pyralidae		groundnut, watermelon
Statherotis discana (Felder & Rogenhofer)	LEP	Tortricidae		longan

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Staurops alternus	see *Neostauropus alternus*			
Stenachroia elongella Hampson	LEP	Pyralidae		sorghum
Stenchaetothrips biformis (Bagnall)	THY	Thripidae	rice trhips	rice
Stephanitis typica (Distant)	HEM	Tingidae		banana
Stephanoderes hampei	see *Hypothenemus hampei*			
Stephanoderes psidii	see *Hypothenemus psidii*			
Sternochetus frigidus (Fabricius)	COL	Curculionidae	mango weevil	mango
Sternochetus goniocnemis (Marshall)	COL	Curculionidae		mango
Sternochetus mangiferae (Fabricius)	COL	Curculionidae	mango stone weevil	mango
Stibaropus molginus (Schiödte)	HEM	Cydnidae		tobacco
Stomopteryx subsecivella	see *Aproaerema modicella*			
Susunai exigua	see *Spodoptera exigua*			
Syllepte derogata (Fabricius)	LEP	Pyralidae	cotton leaf roller	cotton
Taeniothrips sp.	THY	Thripidae		cucurbits
Taiwania circumdata (Herbst)	COL	Chrysomelidae		sweet potato
Tarophagus colocasiae (Matsumura)*	HEM	Delphacidae	taro planthopper	taro
Tarophagus proserpina	see *Tarophagus colocasiae*			
Tenaphalara malayensis	see *Allocarsidara malayensis*			
Tessaratoma javanica (Thunberg)	HEM	Tessaratomidae		longan
Tessaratoma papillosa (Drury)	HEM	Tessaratomidae	litchi stink bug	litchi
Tetramoera schistaceana (Snellen)	LEP	Tortricidae	sugarcane shoot borer	sugarcane
Tetranychus spp.	ACA	Tetranychidae		cotton, cucurbits
Tetranychus cinnabarinus (Boisduval)	ACA	Tetranychidae		papaya
Tetranychus hydrangeae Pritchard and Baker	ACA	Tetranychidae		sweet potato
Tetranychus kanzawai Kishida	ACA	Tetranychidae		groundnut, soybean
Tetranychus pierci McGregor	ACA	Tetranychidae		groundnut
Tetranychus telarius	see *Tetranychus urticae*			
Tetranychus truncatus Ehara	ACA	Tetranychidae		castor, cassava
Tetranychus urticae Koch	ACA	Tetranychidae	two spotted mite	cassava, legumes
Thosea spp.	LEP	Limacodidae		mango, coconut
Thosea biguttata	see *Thosea vetusta*			
Thosea sinensis (Walker)	LEP	Limacodidae		coconut, citrus, quinine
Thosea vetusta (Walker)	LEP	Limacodidae		coconut
Thrips flavus Schrank	THY	Thripidae		egg plant, mustard, cotton
Thrips hawaiiensis (Morgan)	THY	Thripidae		okra, maize
Thrips palmi Karny	THY	Thripidae		cotton, solanaceae, cucurbits, legumes
Thrips parvispinus (Karny)	THY	Thripidae		papaya, watermelon

Table 1 (continued)

* Unclear whether it is this species or *T. persephone* (Kirkaldy) or a mixture

Table 1 (continued)

Scientific Name	Order	Family	English Common Name	Principal Crops Attacked
Thrips tabaci Lindeman	THY	Thripidae	onion thrips	onion, potato, cotton etc
Tiracola plagiata (Walker)	LEP	Noctuidae	plague caterpillar	capsicum, rubber
Tirathaba spp.	LEP	Pyralidae		coconut
Tirathaba mundella (Walker)	LEP	Pyralidae		rambutan, oil palm
Tirathaba rufivena (Walker)	LEP	Pyralidae		coconut
Toxoptera aurantii Boyer de Fonscolombe	HEM	Aphididae		citrus, coffee, tea, cocoa
Toxoptera bradyi	see *Toxoptera aurantii*			
Toxoptera citricidus (Kirkaldy)	HEM	Aphididae	brown citrus aphid	citrus
Trialeurodes ricini (Misra)	HEM	Aleyrodidae	castor whitefly	castor
Trichoplusia ni (Hübner)	LEP	Noctuidae	cabbage semi-looper	brassicas
Tryonymus sacchari	see *Saccharicoccus sacchari*			
Tryporyza incertulas	see *Scirpophaga incertulas*			
Tryporyza innotata	see *Scirpophaga innotata*			
Tryporyza nivella	see *Scirpophaga nivella*			
Urentius hystricellus (Richter)	HEM	Tingidae		eggplant, tomato
Utetheisa pulchelloides Hampson	LEP	Arctiidae		hemp
Valanga nigricornis (Burmeister)	ORT	Acrididae	Valanga grasshopper	maize
Vanessa indica (Herbst)	LEP	Nymphalidae		ramie
Xanthodes transversa Guenée	LEP	Noctuidae		okra
Xylaplothrips sp	THY	Phlaeothripidae		cocoa
Xyleborus sp.	COL	Scolytidae		cocoa
Xyleborus apertus Schedl	COL	Scolytodae	trunk borer	durian
Xyleborus fornicatus Eichoff	COL	Scolytidae		tea
Xyleborus morstatti	see *Xylosandrus compactus*			
Xyleutes ceramicus Walker	LEP	Cossidae	teak beehole borer	teak
Xylosandrus compactus (Eichoff)	COL	Scolytidae	black coffee twig borer	coffee, cocoa, tea
Xylotrechus quadripes Chevrolat	COL	Cerambycidae	coffee stem borer	coffee
Xylotrupes gideon (Linnaeus)	COL	Scarabaeidae		coconut
Zeuxippa catoxantha (Hampson)	see *Artona catoxantha*			
Zeuzera coffeae Nietner	LEP	Cossidae	red branch borer	coffee, cocoa

Table 2 The distribution and importance of major Southeast Asian arthropod pests (450 species).

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Acanthocoris scaber					++	•	•		•	
Acanthoscelides obtectus	+	•				•				
Aceria litchi		+								
Aceria mangiferae		++								
Aceria tulipae		+			+++					++
Achaea janata	+	++	+	++	+	+			•	
Achaea serva			+			•			•	
Acherontia lachesis	•	+	+	+	+	•		•	•	
Acherontia styx	•	+	+	+	•	•			•	
Acraea issoria					+					
Acrocercops symbolopis		+								
Acrocercops syngramma		+							•	
Adoretus compressus		•			+	+	+	•	+	
Adoretus sinicus		+			++	+				
Adoxophyes privatana					•	•	+		•	
Agrius convolvuli	•	+		+	++	+		•	++	
Agrotis ipsilon	+	+		+	+	++	+		++	++
Agrotis segetum	+				•	•			•	
Alcidodes sp.	•							+++		
Alcidodes leeuweni								++	++	
Aleurodicus destructor		+			+	+	+		+	
Aleurodicus dispersus	++	+++	++		+++	+++	+	+++	++	+++
Aleurolobus barodensis	•	+							•	
Alissonotum impressicolle	•	+			++				•	
Allocarsidara malayensis		++				++	+		•	
Amathusia phidippus		+			+	+	•	•	•	
Amorphoidea lata									•	+
Amrasca sp.		+				•			+++	
Amrasca devastans	+++	++	+		+++				+++	+++
Amritodus atkinsoni	++	+++								
Amsacta lactinea	•	•	•		+	•			•	
Anomala spp.	+++				++					++
Anomala antiqua	+++	+			+	•			+	
Anomala cupripes		+			+	+	+			

Table 2 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Anomala pallida		•				+	+		•	
Anomala varians	++									
Anomis flava	•	+		+	+++	++			•	++
Anoplophora chinensis					++					
Antigastra catalaunalis	•	+							++	
Aonidomytilus albus		+								
Aphis craccivora	+	+	+	+	+++	+	+	++	++	++
Aphis glycines		+			++				•	
Aphis gossypii	++	+++	+	++	++	++	+	+	++	+++
Apion collare					+					
Apion corchori	++									
Apoderus crenatus		++								
Apoderus notatus		++			++					
Apogonia sp.					++					
Apogonia cribricollis						•	+			
Apriona germari			+		+					
Aproaerema modicella	++	+	++	+++		+			+	+
Araecerus fasciculatus		+				+	+		+	++
Arbela dea					+					
Archips machlopis						+				
Archips micaceanus	•	+	++		++	+	+			
Archips tabescens						+				
Argyrogramma signata		+	+			•			•	•
Ariadne ariadne					++					
Artona catoxantha		+	•		•	++	•		++	
Asota spp.						•			+	
Aspidiotus destructor	•	+		+	+	+	+	•	+	+
Aspidomorpha furcata				•	+		+			
Aspidomorpha miliaris		+			++	•		•	+	
Asterolecanium ungulatum						•	•	++		
Atherigona exigua						•			++	
Atherigona oryzae	•				+	•			++	+
Atherigona soccata	•	++			++					
Attacus atlas		+			+	+	+	•	+	
Aulacaspis tegalensis		+							+	
Aulacaspis tubercularis					++					

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Aulacophora femoralis	+				++					
Aulacophora flavomarginata						++		+	•	
Aulacophora foveicollis	+	+				++				
Aulacophora frontalis		+	+		+		+			
Aulacophora lewisii					+	+				
Aulacophora similis		+	+		+++	+		+	++	
Bachytrupes sp.					++	•				
Bactrocera cucurbitae	+	+++	++	+++	+++	+++	+	+++	+++	+++
Bactrocera dorsalis *	++	+++	++	++	+++	+++	++	+++	+++	+++
Bactrocera latifrons		+				++		++	+	
Bactrocera tau		+	•			+		+		
Bactrocera umbrosa		+				++	+	++	+	++
Basilepta subcostatum					++					
Basilepta viridipenne		+								
Batocera hercules									+	
Batocera rubus		+			+			•	•	++
Batocera rufomaculata	+	+								
Bedellia somnulentella		+								
Bemisia sp.					+					
Bemisia tabaci	•	+++			+	+	+++		++	
Bostrychopsis parallela										++
Brachmia trianuella					+					
Brachyacma palpigera						+				
Brevicoryne brassicae		+			+++					++
Bruchophagus mutabilis					+++					
Caliothrips indicus		+								
Calliteara horsfieldii		•				+		•		
Callitettix versicolor	•	+		•	•	•				
Callosobruchus spp.	++				++					
Callosobruchus chinensis	+	+			++	++	+	•	+	
Carpophilus hemipterus		+			++	•	•		•	
Cataenococcus hispidus		+				+				
Cephonodes hylas			•		•	+	+		•	
Ceratovacuna lanigera	•	+			++	+		•	•	
Ceresium sinicum					+					
Ceroplastes rubens		+			+	+			•	

* Includes at least 4 closely related species

Table 2 (continued)

Table 2 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Chelidonium sp.		+								
Chelidonium argentatum					++					
Chilo spp.	•				++		+			
Chilo auricilius	•	•			+				++	
Chilo infuscatellus	•	+	+	++	•				+	+++
Chilo polychrysus	•	+	+	++	+	+		•	+	++
Chilo sacchariphagus		+	+	+	+++	++	+	•	+	
Chilo suppressalis	•	+	+	+	++	+		++	+++	++
Chionaspis papayae		++							+	
Chlorophorus annularis					•	•		•	•	++
Chlumetia transversa	•	++				++	+		++	+
Chondracris rosea					+	•				
Chromatomyia horticola						+++				
Chrysodeixis eriosoma	•	•		+	+	+		•	•	++
Chrysomphalus aonidum	+	+			+	•			•	
Citripestis sagittiferella		+				++	+	+	+	
Cnaphalocrocis medinalis	+	•	•	++	+++	++	•	+++	+++	++
Coccus viridis	•	+	•	+	++	•	+	•	++	
Colasposoma dauricum					+					
Conogethes punctiferalis	•	+	+	+++	+++	++		•	+	++
Conopomorpha cramerella		+				+++			+	++
Conopomorpha sinensis		+								
Coptosoma japonicum					+					
Coptotermes curvignathus		+				++		•	+	
Coptotermes havilandi		•				•		•	+	
Coridius fuscus	•		•		++	•	•		•	•
Cosmopolites sordidus	?	+		•	+++	++	+	++	++	++
Cossus sp.		+				•	•			
Crematopsyche pendula						+	+		•	
Cricula trifenestrata	•	+		+	•				++	
Crocidolomia pavonana	+	+		+		+		+++	++	
Cryptophlebia sp.						++				
Cryptophlebia encarpa						+				
Cryptothelea variegata					+	•			•	
Cylas formicarius	•	+++	++	+++	++	++	+	+++	+++	+++
Cyrtacanthacris tatarica					+					

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Cyrtopeltis tenuis	•				+					
Darna diducta		+				+			•	•
Darna furva		+								
Darna trima		++				+			+	
Dasynus piperis						+		•	++	
Delia antiqua										++
Deporaus marginatus	++	++				+	+			
Diacrotricha fasciola						+				
Diaphania indica		+	•	+	++	+	+	+	•	
Diaphorina citri	•	•			++	+	+		++	++
Dichocrocis megillalis									+	
Dicladispa armigera	+	•	•	•	+	•			•	•
Diconocoris hewitti								•	++	
Diconocoris nepalensis		+			++					
Dorylus orientalis	•	+								
Dorysthenes buqueti		+								
Dysdercus cingulatus	+	+	+	+	++	+	+	•	++	++
Dysmicoccus brevipes				+	+++	++		•	++	++
Dysmicoccus neobrevipes		+								
Earias vittella	++	++	+	+	++	++	+	++	++	
Elymnias hypermnestra		•			+	•		•	•	
Empoasca sp.		++		+++		+	+			
Empoasca flavescens	+	•			+++	+			++	
Eotetranychus cendanai		+++								
Epepeotes uncinatus	+									
Ephestia cautella		•				+	+	•	•	•
Epicauta gorhami					+					
Epicauta maklini		+								
Epicauta waterhousei		+								
Epilachna diffinis								+		
Epilachna indica						•	+			
Epilachna vigintioctopunctata	++	++	•		++	+			+	
Erionota thrax	•	•	+	+	+	+	+	+	•	+
Eriophyes doctersi									+	
Erosomyia mangiferae		+								
Etiella zinckenella	•	+			+++	+			++	+

Table 2 (continued)

Table 2 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Eublemma abrupta		+				+				
Eublemma brachygonia		+				+				
Eublemma versicolor		+				+			•	•
Euchrysops cnejus	•					+	+			+++
Eudocima salaminia		•			++			•		
Euproctis spp.	•					•	•			+
Euproctis pseudoconspersa					+					
Eurema hecabe					+	•	+	•	•	
Eurydema pulchra	•	+	+		•			•	•	
Eutetranychus africanus		+++								
Eutetranychus orientalis		+								
Euthalia aconthea					+	+		•	•	
Eysarcoris guttiger	+					•				
Ferrisia virgata	•	+	•	+		•	•	•	•	++
Frankliniella spp.		+			+				+	
Frankliniella occidentalis						+				
Frankliniella williamsi		+								
Glyphodes caesalis					+++	+	+	++	•	
Glyphodes pulverulentalis					++	+				
Gryllotalpa africana		+			•	+		+	•	++
Gryllotalpa orientalis	+				+				•	
Gynaikothrips ficorum		+								
Haplothrips floricola		++								
Hedylepta indicata	•	+	++		++				•	++
Helicoverpa armigera	+++	+++	++	+++	+++	+++	+	++	+++	+++
Helicoverpa assulta	•	+	+		++	+	•		++	
Heliothis sp.					++					
Heliothrips haemorrhoidalis		+		+	++				•	
Hellula undalis	•	+	+	+	+	++	+++	++	+	
Helopeltis sp.		+					•		+	
Helopeltis bradyi						•	•		+	
Helopeltis theivora					++	+++	•		++	++
Heteropsylla cubana	+	+++	+++	+++	+++	++	+	+++	++	++
Hexamitodera semivelutina								•	++	
Hidari irava		•				+		•	++	
Hieroglyphus banian	•	+	+	+	+					

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Hippotion celerio	•	+						•		++
Holotrichia bidentata						+			•	
Holotrichia sinensis		+			++				•	
Homona coffearia					+	+			+	
Hyblaea puera	++	++	++		+					
Hydrellia sp.					++					
Hydrellia philippina		•		+	+	+		++	•	++
Hyperaeschrella insulicola		+				•				
Hypomeces squamosus	+	+	++	+	++	++	+	+++	+	
Hyposidra talaca						+		•	+	
Hypothenemus hampei		+	+		++	++		+	++	+++
Hypothenemus psidii										+
Hysteroneura setariae	•					•	+			
Icerya pulchra						+	•		•	
Icerya purchasi		+			+	+	+		•	
Icerya seychellarum		+				•		•	•	
Idioscopus clypealis	+	+++		+	•	•	+		+	+++
Idioscopus nitidulus						++			•	+++
Idioscopus niveosparsus	+	+++	+++	+	+++	++		•	+	+++
Jacobiasca formosana		+				+	+			
Japanagromyza sp. nr *angustifrons*				++						
Japanagromyza tristella					++					
Lampides boeticus		+			++	+	+	•	•	
Lamprosema diemenalis	•	+	+			+	+		•	
Lawana imitata					+					
Lepidiota bimaculata					+					
Lepidiota discedens		+								
Lepidiota stigma		+				•			++	
Lepidosaphes beckii	•	•			+	•	+	++	+	
Leptocorisa acuta	•	+	•	+	++	++	•		+++	++
Leptocorisa oratorius	++	+	•		+	+	•	+++	+	•
Leptoglossus gonagra	•	+	•		•	+	•	++	•	++
Leucinodes orbonalis	++	+	+	++	+++	++	+	+++	•	
Leucopholis irrorata										+++
Leucopholis rorida						•			+	
Lipaphis erysimi	+	+	+			+	+		•	

Table 2 (continued)

Table 2 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Liriomyza brassicae		+		++		•	+			
Lohita grandis		+								
Lophobaris piperis		+			++	++			++	
Lymantria lunata										++
Lymantria monacha					++					
Lyonetia sp.			+							
Macrotermes spp.	+				+	+	+		•	
Macrotermes gilvus						•				++
Mahasena corbetti	•	++				++	+		•	
Maruca amboinalis		+							+	
Maruca testulalis	+	+	+	+++	+++	++	+	+++	+	+
Medythia suturalis	+		+							
Megalurothrips usitatus		+				+				+
Megymenum brevicornis	•				+	+			•	
Melanagromyza sojae		+			+++				+	
Melanaphis sacchari	•	+				+	+		•	
Menophra atrlineata					++					
Meridarchis scyrodes		+								
Metanastria hyrtaca		+				•			•	
Metisa plana						++	+		+	
Microtermes pakistanicus						+	+			
Mictis longicornis						+	+	+	•	•
Monolepta signata			•	+	•	•				
Mudaria magniplaga		•				++				
Mudaria variabilis			++						+	
Mycterothrips setiventris			•		++					
Mylabris phalerata	•	+			+					
Mythimna sp.	+				+	•				
Mythimna venalba								+		
Mythimna separata	++	+	++	++	•				+	•
Myzus persicae	•	+	+		+++	++	+		++	++
Naranga aenescens		•			+					++
Neostauropus alternus					•				++	++
Nephopterix piratis						•			+	
Nephotettix spp.		+								
Nephotettix nigropictus	•	+	•	++	+	+	+	•	+++	•

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Nephotettix virescens	+	+	•	•	+	+++		•	+++	++
Nezara viridula	++	+	+	+	++	+	+	•	+	•
Nilaparvata lugens	•	+++	++	+++	+++	+++	+	+	+++	++
Nipaecoccus nipae		+			++					
Niphonoclea spp.										++
Niphonoclea albata										++
Niphonoclea capito										++
Nomadacris succincta		++	++		++					
Noorda albizonalis		+						•	•	++
Nothopeus fasciatipennis									++	
Nysius sp.		+				•			•	
Odoiporus longicollis	•	+		+	++	+			•	
Odontotermes spp.		+							•	
Olene mendosa				+		+	•	•		++
Olenecamptus bilobus		•			+			•		
Oligonychus coffeae	•	++			+++				•	
Oligonychus mangiferus	•	+++					+			
Omphisa anastomosalis		+	+	++	+	+	+	•	•	
Ophiomyia phaseoli	+	+	++		++	++	+	•	+++	++
Ophiusa coronata		+			++					
Ophiusa tirhaca					++					
Orgyia postica		+	+		+	+		•	+	++
Orgyia turbata	•	+			•	+				
Orosius orientalis	++									
Orseolia oryzae	++	+	+	+++	++				+++	•
Oryctes rhinoceros	•	++	++	+	+++	++	+	+	+++	++
Oryzaephilus surinamensis	•	•	•	•	•	•	+	•	+	
Ostrinia furnacalis	•	+	•	++	+++	+++		+++	++	+++
Ostrinia nubilalis		+			+				+++	
Othreis fullonia	•	+			++	+		++	•	•
Oxya spp.	•	+	+		+	•	+		•	
Oxyodes scrobiculata		+				•				
Papilio demoleus	+	+	+	•	+	+	+			
Papilio polytes		+	•		+	+	+	•	•	+
Parabemisia myricae					+					
Paraponyx stagnalis	+	•		+	++	•		+++	+++	++

Table 2 (continued)

Table 2 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Parasa lepida	•	+			+	+		•	++	++
Parasaissetia nigra						+	•	•		
Parlatoria ziziphi	•		•	+	+	•	•		•	
Parnara guttatus	++				+			•		
Pectinophora gossypiella	++	+	+	+	+				++	++
Pentalonia nigronervosa	•	+	+		+	•	+		•	++
Phaenacantha saccharicida		+				+				
Phragmataecia castaneae						+			•	
Phthorimaea operculella	++	+			+++				+	
Phyllocnistis citrella	+	+++	++	++	++	+	+	+	+	++
Phyllocoptruta oleivora		+++				+				
Phyllotreta sp.			•	++				+++		
Phyllotreta chotanica		+								
Phyllotreta cruciferae						+	+			
Phyllotreta flexuosa		+	+			+				
Phyllotreta striolala	+		•		+++		+			
Phyllotreta vittata		•							+	
Pieris canidia	++	+				•	+			
Pieris rapae	++				+		+			
Piezodorus hybneri		+		+	+	•			•	+
Pinnaspis aspidistrae						+				++
Plagideicta sp.								++		
Planococcus citri	•	+			+++	+		+	+	•
Platymycterus sieversi					++					
Plesispa reichei		+				+	+		•	
Plocaederus fulvicornis	+							•		
Plocaederus ferrugineus		+							•	
Plocaederus obesus	+				+					
Plocaederus pedestris		+								
Plutella xylostella	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Poecilocoris latus	•				+					•
Polyphagotarsonemus latus	+	+				+	++		+	•
Porthesia scintillans		+			+	+				
Prays endocarpa						++	+		•	
Promecotheca cumingii		+				+	+		•	•
Pseudaulacaspis pentagona						•	+		•	

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Pseudococcus sp.		+			++	•				
Ptecticus cingulatus		+				•				
Pterolophia bigibbera										+
Raodiplosis orientalis	+		+							
Rapala pheretima						+				
Rastrococcus iceryioides						++			•	
Rastrococcus spinosus		+	•			+		•	•	
Recilia dorsalis	•	+			+	•		•	+	•
Rhaphidopalpa sp. poss. *chinensis*				+						
Rhipiphorothrips cruentatus		+								
Rhopalosiphum maidis	•	+	+	+	++	+	+	•	•	++
Rhopalosiphum padi			+			•				
Rhynchocoris poseidon	•	+	•	+	++	+	•		•	
Rhynchophorus ferrugineus	•	++		++	+++		+		+	+
Rhynchophorus schach		++				++	•		•	
Rhynchophorus vulneratus		+						•		
Rhyncocoris serratus								+		
Rhytidodera simulans	+					+	+	+	+	
Riptortus spp.		+		•	+	•		•	+	
Rivula atimeta								+		
Saccharicoccus sacchari		+			+	+	+		•	+
Saissetia coffeae	•	+	•	•	•	+	•	•	•	
Scirpophaga excerptalis	•	+			++		•			
Scirpophaga incertulas	++	+	•	++	+++	+		++	+++	++
Scirpophaga innotata					+				+++	•
Scirpophaga nivella	•	+			+			•	•	++
Scirtothrips dorsalis	++	++				+			•	
Scopelodes anthela					++			•		
Scopelodes testacea					++	•				
Scotinophara sp.					+				•	
Scotinophara cinerea		•				•			+++	
Scotinophara coarctata	•	+			++	++		+	•	++
Scrobipalpa heliopa	•	•		++	+	+	+		•	
Sepiomus sp.		+								
Sesamia sp.					++					
Sesamia inferens	+	+	•	+	+	+		++	+++	++

Table 2 (continued)

Table 2 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Setora nitens *	•	+	+		+	+	+	+	•	
Sexava spp.									+++	
Sogatella furcifera	++	+		•	++	++		+	+++	++
Spodoptera spp.										+
Spodoptera exempta									•	++
Spodoptera exigua	•	++			+++	•			•	
Spodoptera litura	+++	++	+	++	+++	+++	++	++	++	++
Spodoptera mauritia	+	+	•	+	++	++	+	•	+++	•
Spoladea recurvalis				+						
Statherotis discana			+							
Stenachroia elongella		•			++					
Stenchaetothrips biformis	+	•		•	++	•			•	
Stephanitis typica	•	+			+	•	+	•	•	•
Sternochetus frigidus	•	+				+	+	+++	•	
Sternochetus goniocnemis				+					•	
Sternochetus mangiferae	•	+			•	+			•	
Stibaropus molginus		+								
Syllepte derogata	+	+	•	+	+	+	+	•	•	•
Taeniothrips sp.					+++	•				
Taiwania circumdata					+					
Tarophagus colocasiae		•				•			•	+++
Tessaratoma javanica		+			•				•	•
Tessaratoma papillosa		++				+				
Tetramoera schistaceana					++		+		•	
Tetranychus spp.	+				++	+	+	+		++
Tetranychus cinnabarinus		•				+	+		•	
Tetranychus hydrangeae		+								
Tetranychus kanzawai						+				
Tetranychus pierci				++						
Tetranychus truncatus		++								
Tetranychus urticae		+			++	++	+		+++	++
Thosea spp.						•	+			++
Thosea sinensis †		+	+		+	•			•	++
Thosea vetusta						+	•	•	•	
Thrips flavus		+								
Thrips hawaiiensis						+				

* Probably includes several species

† Probably includes several species: true *T. sinensis* is not known from SE Asia

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Thrips palmi	+	++				+++	+	+	+	+++
Thrips parvispinus		+				+			+++	
Thrips tabaci	+	++			++		+		++	+++
Tiracola plagiata		+			•	+		•	•	
Tirathaba sp.									+	•
Tirathaba mundella						+			•	
Tirathaba rufivena		+				+			•	
Toxoptera aurantii	•	+	•	•	•	++	+		•	++
Toxoptera citricidus	+	+		+	+	+	+	•	•	•
Trialeurodes ricini	•	+		+						
Trichoplusia ni	++	++		++	+				•	
Urentius hystricellus				++		•	•			
Utetheisa pulchelloides	•	•			++	•		•	•	
Valanga nigricornis		•			•	+	++	•	•	+
Vanessa indica					+					
Xanthodes transversa					•	+		•	•	
Xylaplothrips sp.						+				
Xyleborus sp.	•				+	•		•		
Xyleborus apertus								++		
Xyleborus fornicatus		•				+			•	
Xyleutes ceramicus		+						•		
Xylotrechus quadripes		+	+		+++					
Xylotrupes gideon	++	•			++	•		•	•	
Zeuzera coffeae	•	++			++	++			•	++
Xylosandrus compactus	•			•	++	•			•	

Table 2 (continued)

Table 3 The distribution and importance of the most important Southeast Asian arthropod pests (159 species).

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Aceria tulipae		+			+++					++
Achaea janata	+	++	+	++	+	+			•	
Agrius convolvuli	•	+		+	++	+			++	
Agrotis ipsilon	+	+		+	+	++	+		++	++
Alcidodes sp.	•							+++		
Alcidodes leeuweni								++	++	
Aleurodicus destructor		+			+	+	+		+	
Aleurodicus dispersus	++	+++	++		+++	+++	+	+++	++	+++
Allocarsidara malayensis		++				++	+		•	
Amrasca devastans	+++	++	+		+++				+++	+++
Amritodus atkinsoni	++	+++								
Anomala spp.	+++				++					++
Anomala antiqua	+++	+				•			+	
Anomis flava	•	+		+	+++	++			•	++
Aphis craccivora	+	+	+	+	+++	+	+	++	++	++
Aphis gossypii	++	+++	+	++	++	++	+	+	++	+++
Apoderus notatus		++			++					
Aproaerema modicella	++	+	++	+++		+			+	+
Araecerus fasciculatus		+				+	+		+	++
Archips micaceanus	•	+	++		++	+	+			
Artona catoxantha		+	•		•	++	•		++	
Aspidiotus destructor	•	+		+	+	+	+		+	+
Atherigona soccata	•	++			++					
Attacus atlas		+			+	+	+		+	
Aulacophora similis		+	+		+++	+		+	++	
Bactrocera cucurbitae	+	+++	++	+++	+++	+++	+	+++	+++	+++
Bactrocera dorsalis	++	+++	++	++	+++	+++	++	+++	+++	+++
Bactrocera latifrons		+				++		++	+	
Bactrocera umbrosa		+				++	+	++	+	++
Bemisia tabaci	•	+++			+	+	+++		++	
Brevicoryne brassicae		+			+++					++
Bruchophagus mutabilis					+++					
Callosobruchus spp.	++				++					
Callosobruchus chinensis	+	+			++	++	+		+	

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Chilo infuscatellus	•	+	+	++	•				+	+++
Chilo polychrysus	•	+	+	++	+	+		•	+	
Chilo sacchariphagus		+	+	+	+++	++	+	•	+	
Chilo suppressalis	•	+	+	+	++	+		++	+++	++
Chlumetia transversa	•	++				++	+		++	+
Chromatomyia horticola						+++				
Chrysodeixis eriosoma	•	•		+	+	+		•	•	++
Citripestis sagittiferella		+				++	+	+	+	
Cnaphalocrocis medinalis	+	•	•	++	+++	++	•	+++	+++	++
Coccus viridis	•	+	•	+	++	•	+	•	++	
Conogethes punctiferalis	•	+	+	+++	+++	++		•	+	++
Conopomorpha cramerella		+				+++			+	++
Cosmopolites sordidus	?	+		•	+++	++	+	++	++	++
Crocidolomia pavonana	+	+		+		+		+++	++	
Cylas formicarius	•	+++	++	+++	++	++	+	+++	+++	+++
Deporaus marginatus	++	++				+	+			
Diaphania indica		+	•	+	++	+	+	+	•	
Diaphorina citri	•	•			++	+	+		++	++
Dysdercus cingulatus	+	+	+		++	+	+	•	++	++
Dysmicoccus brevipes				+	+++	++		•	++	++
Earias vittella	++	++	+	+	++	++	+	++	++	
Empoasca sp.		++		+++		+	+			
Empoasca flavescens	+	•			+++	+			++	
Eotetranychus cendanai		+++								
Epilachna vigintioctopunctata	++	++	•		++	+			+	
Erionota thrax	•	•	+	+	+	+	+	+	•	+
Etiella zinckenella	•	+			+++	+			++	+
Euchrysops cnejus	•				•	+	+			+++
Eutetranychus africanus		+++								
Glyphodes caesalis					+++	+	+	++	•	
Gryllotalpa africana		+			•	+		+	•	++
Hedylepta indicata	•	+	++		++				•	++
Helicoverpa armigera	+++	+++	++	+++	+++	+++	+	++	+++	+++
Helicoverpa assulta	•	+	+		++	+	•		++	
Hellula undalis	•	+	+	+	+	++	+++	++	+	
Helopeltis theivora					++	+++		+	++	++

Table 3 (continued)

Table 3 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Heteropsylla cubana	+	+++	+++	+++	+++	++	+	+++	++	++
Hyblaea puera	++	++	++		+					
Hydrellia philippina		•		+	+	+		++	•	++
Hypomeces squamosus	+	+	++	+	++	++	+	+++	+	
Hypothenemus hampei		+	+		++	++		+	++	+++
Idioscopus clypealis	+	+++		+		•	+		+	+++
Idioscopus nitidulus						++				+++
Idioscopus niveosparsus	+	+++	+++	+	+++	++		•	+	+++
Lampides boeticus		+			++	+	+	•	•	
Lepidosaphes beckii	•	•			+	•	+	++	+	
Leptocorisa acuta	•	+	•	+	++	++			+++	++
Leptocorisa oratorius	++	+	•			+		+++	+	•
Leptoglossus gonagra	•	+	•		•	+	•	++	•	++
Leucinodes orbonalis	++	+	+	++	+++	++	+	+++	•	
Leucopholis irrorata										+++
Lipaphis erysimi	+	+	+			+	+		•	
Lophobaris piperis		+			++	++			++	
Mahasena corbetti		++				++	+		•	
Maruca testulalis	+	+	+	+++	+++	++	+	+++	+	+
Melanagromyza sojae		+			+++				+	
Mythimna separata	++	+	++	++	•				+	•
Myzus persicae	•	+	+		+++	++	+		++	++
Neostauropus alternus					•				++	++
Nephotettix nigropictus	•	+	•	++	+	+	+	•	+++	•
Nephotettix virescens	+	+	•	•	+	+++		•	+++	++
Nezara viridula	++	+	+	+	++	+	+	•	+	•
Nilaparvata lugens	•	+++	++	+++	+++	+++	+	+	+++	++
Nomadacris succincta		++	++		++					
Odoiporus longicollis	•	+		+	++	+			•	
Oligonychus coffeae	•	++			+++				•	
Oligonychus mangiferus	•	+++					+			
Omphisa anastomosalis		+	+	++	+	+	+	•	•	
Ophiomyia phaseoli	+	+	++		++	++	+	•	+++	++
Orgyia postica		+	+		+	+		•	+	++
Orseolia oryzae	++	+	+	+++	++				+++	•
Oryctes rhinoceros	•	++	++	+	+++	++	+	+	+++	++

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Ostrinia furnacalis	•	+	+	++	+++	++		+++	++	+++
Ostrinia nubilalis		+							+++	
Othreis fullonia	•	+			++	+		++	•	
Oxyodes scrobiculata		+				•				
Papilio demoleus	+	+	+	•	+	+	+		*	
Papilio polytes		+	•		+	+	+	•	•	+
Paraponyx stagnalis	+			+	++			+++	+++	++
Parasa lepida	•	+			+	+		•	++	++
Pectinophora gossypiella	++	+	+	+	+				++	++
Pentalonia nigronervosa	•	+	+		+	•	+		•	++
Phthorimaea operculella	++	+			+++				+	
Phyllocnistis citrella	+	+++	++	++	++	+	+	+	+	++
Phyllocoptruta oleivora		+++				+				
Phyllotreta sp.			•	++				+++		
Phyllotreta striolata	+		•		+++		+			
Planococcus citri	•	+			+++	+		+	+	•
Plutella xylostella	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Polyphagotarsonemus latus	+	+				+	++		+	•
Rhopalosiphum maidis	•	+	+	+	++	+	+	•	•	++
Rhynchocoris poseidon	•	+		+	++	+			•	•
Rhynchophorus ferrugineus	•	++		++	+++		+		+	+
Rhynchophorus schach		++				++	•		•	
Rhytidodera simulans	+					+	+	+	+	
Saccharicoccus sacchari		+			+	+	+		•	+
Scirpophaga incertulas	++	+	•	++	+++	+		++	+++	++
Scirpophaga innotata					+				+++	•
Scirtothrips dorsalis	++	++				+				
Scotinophara cinerea		•				•			+++	
Scotinophara coarctata	•	+			++	++		+	•	++
Scrobipalpa heliopa	•	•		++	+	+	+		•	
Sesamia inferens	+	+	•	+	+	+		++	+++	++
Setora nitens	•	+	+		+	+	+	+	•	
Sexava spp.									+++	
Sogatella furcifera	++	+			++	++		+	+++	++
Spodoptera exigua	•	++			+++	•			•	
Spodoptera litura	+++	++	+	++	+++	+++	++	++	++	++

Table 3 (continued)

Table 3 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Spodoptera mauritia	+	+	•	+	++	++	+	•	+++	•
Sternochetus frigidus	•	+				+	+	+++	•	
Syllepte derogata	+	+	•	+	+	+	+	•	•	•
Taeniothrips sp.					+++	•				
Tarophagus proserpina										+++
Tetranychus spp.	+				++	+	+	+		++
Tetranychus urticae		+			++	++	+		+++	++
Thosea sinensis		+	+		+	•			•	++
Thrips palmi	+	++				+++	+	+	+	+++
Thrips parvispinus						+		+++		
Thrips tabaci	+	++			++		+		•	+++
Toxoptera aurantii	•	+	•	•	•	++	+		•	++
Toxoptera citricidus	+	+		+	+	+	+	•	•	•
Trichoplusia ni	++	++		++	+				•	
Xylotrechus quadripes		+	+		+++					
Xylotrupes gideon	++	•			++	•		•	•	
Zeuzera coffeae	•	++			++	++			•	++

Table 4

In this table the 160 most important arthropod pests listed in table 3 are arranged alphabetically in 5 groups according to the combined ratings they score for the region. The 47 species with the highest ratings (those with 10 and above) should be considered first for appropriateness as targets for classical biological control, followed next by the 89 species recording scores from 5 to 9. There are also 24 species listed from the lower end of the combined ratings scale. However, these have all been rated by one country as +++ or by two countries as ++. Whereas not of high regional importance, their local rating might well be justification for the particular countries concerned seeking support for a classical biological control approach for species from this group.

Species of Lepidoptera (39%) are the most common pests, followed by Hemiptera (28%) and Coleoptera (17%), with other orders (and Acarina) together contributing 17%. World wide, there has been a higher success rate with classical biological control of Hemiptera than other orders, followed by Lepidoptera.

Table 4 Aggregated ratings for the most important arthropod pests.

(a) Ratings 3 or 4 (but only if +++ in one country or ++ in two countries)

Alcidodes sp.	3	*Neostauropus alternus*	4
Alcidodes leuwenii	4	*Oligonychus mangiferus*	4
Amrasca sp.	4	*Ostrinia nubilalis*	4
Apoderus notatus	4	*Phyllocoptrupa oleivora*	4
Atherigona soccata	4	*Rhynchoporus schach*	4
Bruchophagus mutabilis	3	*Scirpophaga innotata*	4
Callosobruchus sp.	4	*Scotinophora cinerea*	3
Chromatomyia horticola	3	*Sexava* spp.	3
Eotetranychus cendanai	3	*Taeniothrips* sp.	3
Eutetranychus africanus	3	*Tarophagus colocasiae*	3
Heliothis sp.	3	*Thrips parvispinus*	4
Leucopholis irrorata	3	*Xylotrupes gideon*	4

(b) Ratings 5 to 9

Aceria tulipae	6	*Lepidosaphes beckii*	5
Achaea janata	8	*Leptocorisa oratorius*	9
Agrius convolvuli	7	*Leptoglossus gonagra*	6
Aleurodicus destructor	5	*Lipaphis erysimi*	5
Allocarsidara malayensis	5	*Lophobaris piperis*	7
Amritodus atkinsoni	5	*Mahasena corbetti*	5
Anomala spp.	7	*Melanagromyza sojae*	5
Anomala antiqua	6	*Mythimna separata*	8
Anomis flava	9	*Nephotettix nigropictus*	9
Araecerus fasciculatus	6	*Nomadacris succinata*	6
Archips micaceanus	7	*Odoiporus longicollis*	5
Artona catoxantha	5	*Oligonychus coffeae*	5
Aspidiotus destructor	7	*Omphisa anastomosalis*	7
Attacus atlas	5	*Orgyia postica*	7
Aulacophora similis	9	*Othreis fullonia*	6
Bactrocera latifrons	6	*Papilio demoleus*	6
Bactrocera umbrosa	9	*Papilio polytes*	5
Brevicoryne brassicae	6	*Paraponyx stagnalis*	8
Callosobruchus chinensis	8	*Parasa lepida*	7
Chilo infuscatellus	8	*Pentalonia nigronervosa*	6
Chilo polychrysus	7	*Phthorimaea operculella*	7
Chlumetia transversa	8	*Phyllotreta* sp.	5

(continued on next page)

Table 4 (continued)

Chrysodeixis eriosoma	5	*Phyllotreta striolata*	5
Citripestis sagittiferella	6	*Planococcus citri*	7
Coccus viridis	7	*Polyphagotarsonemus latus*	6
Conopomorpha cramerella	7	*Rhopalosiphum maidis*	9
Crocidolomia pavonana	9	*Rhynchocoris poseidon*	5
Deporaus marginatus	6	*Rhytidodera simulans*	5
Diaphania indica	7	*Saccharicoccus sacchari*	5
Diaphorina citri	8	*Scirtothrips dorsalis*	5
Empoasca sp.	7	*Scotinophara coarctata*	8
Empoasca flavescens	7	*Scrobipalpa heliopa*	5
Epilachna vigintioctopunctata	8	*Setora nitens*	6
Erionota thrax	7	*Spodoptera exigua*	5
Etiella zinckenella	8	*Sternochetus frigidus*	6
Euchrysops cnejus	5	*Syllepte derogata*	6
Glyphodes caesalis	7	*Tetranychus* spp.	8
Gryllotalpa africana	5	*Thosea sinensis*	5
Hedylepta indicata	7	*Thrips tabaci*	9
Helicoverpa assulta	7	*Toxoptera aurantii*	6
Helopeltis theivora	9	*Toxoptera citricidus*	6
Hyblaea puera	7	*Trichoplusia ni*	7
Hydrellia philippina	7	*Xylotrechus quadripes*	5
Idioscopus nitidulus	5	*Zeuzera coffeae*	8
Lampides boeticus	5		

(c) Ratings 10 to 14

Agrotis ipsilon	11	*Myzus persicae*	12
Aphis craccivora	15	*Nephotettix virescens*	11
Aproaerema modicella	11	*Nezara viridula*	10
Bemisia tabaci	10	*Ophiomyia phaseoli*	14
Chilo sacchariphagus	10	*Orseolia oryzae*	12
Chilo suppressalis	13	*Paraponyx stagnalis*	12
Conogethes punctiferalis	13	*Pectinophora gossypiella*	10
Cosmopolites sordidus	13	*Rhynchophorus ferrugineus*	10
Dysdercus cingulatus	12	*Sesamia inferens*	12
Dysmicoccus brevipes	10	*Sogatella furcifera*	13
Hypomeces squamosus	14	*Spodoptera mauritia*	11
Hypothenemus hampei	12	*Tetranychus urticae*	11
Idioscopus clypealis	10	*Thrips palmi*	12
Leptocorisa acuta	11		

(d) Ratings 15 to 19

Amrasca devastans	15	*Maruca testulalis*	17
Aphis gossypii	19	*Oryctes rhinoceros*	17
Cnaphalocrocis medinalis	16	*Ostrinia furnacalis*	17
Earias vittella	15	*Phyllocnistis citrella*	16
Idioscopus niveosparsus	17	*Scirpophaga incertulas*	16
Leucinodes orbonalis	15		

(e) Ratings 20 and above

Aleurodicus dispersus	22	*Heteropsylla cubana*	23
Bactrocera cucurbitae	25	*Nilaparvata lugens*	21
Bactrocera dorsalis	26	*Plutella xylostella*	30
Cylas formicarius	22	*Spodoptera litura*	22
Helicoverpa armigera	26		

(f) Summary of ratings

	Number of Pests					Total	% (rounded)
	Below 5	5 to 9	10 to 14	15 to 19	20 and above		
Lepidoptera	4	39	9	7	3	62	39
Hemiptera	3	25	10	3	3	44	28
Coleoptera	7	14	4	1	1	27	17
Diptera	2	3	2		2	9	6
Acarina	4	4	1			9	6
Thysanoptera	2	2	1			5	3
Orthoptera	1	2				3	2
Hymenoptera	1					1	1
Total species	24	89	27	11	9	160	

Table 5

In this table the origin, or presumed origin, of the most important pest species is listed where possible. If it is difficult to presume the origin, because the species has long been widespread, the present main distribution of the species is indicated within brackets. Because of the lack of adequate data, it is probable that somewhat fewer species than indicated originated in Southeast Asia. Conversely it follows that the number of pests that have originated outside the region has probably been underestimated.

Experience has shown that the largest number of specific (or reasonably specific) natural enemies usually occurs in the area of origin of a species and, indeed, this is a useful guide to where a species may have evolved. Other guides are (i) the region where the largest number of species closely related to the pest occur and (ii) (for a phytophagous pest) the region where the host plant originated, particularly if the pest is specific or reasonably specific to it. In general, those pests that evolved outside the Southeast Asian region are far more likely to be suitable targets for classical biological control than those native to the region or to countries adjoining it. It is highly probable, however, that the distribution of many natural enemies is not uniform throughout Southeast Asia, let alone Asia, particularly if there are, or have been, barriers to dispersal, such as zones that are host-free or where the climatic or other physical conditions are inhospitable. For example, important species might attack a pest in Pakistan or India, but not be present in some or all of Indonesia or the Philippines. It would thus be premature to exclude the possibility that valuable natural enemies might be usefully moved from one part to another of the Asian or even the Southeast Asian region. However, to evaluate this possibility, the natural enemies of each pest would have to be investigated in some detail and account taken also of any significantly lower pest abundance in some regions than in others.

Where only a genus is listed in table 4 (as on 10 occasions) it is not possible to assign an origin to the unidentified species and these pests are omitted from table 5.

Table 5 Origin of the arthropod pests scoring 5+(or more), or at least +++ in one country or ++ in two countries.

	Species	Order	Family	Origin
1	*Aceria tulipae*	Aca	Eriophyidae	(Cosmopolitan)
2	*Achaea janata*	Lep	Noctuidae	(Africa, India - Taiwan)
3	*Agrius convolvuli*	Lep	Sphingidae	(Europe - Africa - Asia)
4	*Agrotis ipsilon*	Lep	Noctuidae	(Cosmopolitan)
5	*Alcidodes leuwenii*	Col	Curculionidae	SE Asia
6	*Aleurodicus destructor*	Hem	Aleyrodidae	Tropical America
7	*Aleurodicus dispersus*	Hem	Aleyrodidae	Central America
8	*Allocarsidara malayensis*	Hem	Carsidaridae	SE Asia
9	*Amrasca devastans*	Hem	Cicadellidae	India - Myanmar
10	*Amritodus atkinsoni*	Hem	Cicadellidae	India - Myanmar
11	*Anomala antiqua*	Col	Scarabaeidae	India
12	*Anomis flava*	Lep	Noctuidae	(Africa - SE Asia)
13	*Aphis craccivora*	Hem	Aphididae	European warm temperate
14	*Aphis gossypii*	Hem	Aphididae	Cosmopolitan (?Americas)
15	*Apoderus notatus*	Col	Curculionidae	SE Asia
16	*Aproaerema modicella*	Lep	Gelechiidae	(India to Indonesia)
17	*Araecerus fasciculatus*	Col	Anthribidae	SE Asia
18	*Archips micaceanus*	Lep	Tortricidae	(India, China, SE Asia)
19	*Artona catoxantha*	Lep	Zygaenidae	SE Asia
20	*Aspidiotus destructor*	Hem	Diaspidae	(Tropicopolitan)
21	*Atherigona soccata*	Dip	Muscidae	(Africa - SE Asia)
22	*Attacus atlas*	Lep	Saturniidae	(India - SE Asia)
23	*Aulacophora similis*	Col	Chrysomelidae	SE Asia
24	*Bactrocera cucurbitae*	Dip	Tephritidae	SE Asia

(continued on next page)

Table 5 (continued)

	Species	Order	Family	Origin
25	*Bactrocera dorsalis*	Dip	Tephritidae	SE Asia
26	*Bactrocera latifrons*	Dip	Tephritidae	SE Asia
27	*Bactrocera umbrosa*	Dip	Tephritidae	SE Asia
28	*Bemisia tabaci*	Hem	Aleyrodidae	(possibly Pakistan; patchily present - tropical and warm temperate)
29	*Brevicoryne brassicae*	Hem	Aphididae	(Temperate regions and tropics, esp. N. hemisphere)
30	*Bruchophagus mutabilis*	Hym	Eurytomidae	(Eastern Europe - SE Asia)
31	*Callosobruchus chinensis*	Col	Bruchidae	SE Asia
32	*Chilo infuscatellus*	Lep	Pyralidae	(Afganistan - Taiwan)
33	*Chilo polychrysus*	Lep	Pyralidae	(India - China - Indonesia, Australia)
34	*Chilo sacchariphagus*	Lep	Pyralidae	SE Asia
35	*Chilo suppressalis*	Lep	Pyralidae	India - China, SE Asia
36	*Chlumetia transversa*	Lep	Noctuidae	Indo-Australian tropics
37	*Chromatomyia horticola*	Dip	Agromyzidae	(Europe - Africa - Asia: not Americas)
38	*Chrysodeixis eriosoma*	Lep	Noctuidae	Old World tropics
39	*Citripestis sagittiferella*	Lep	Pyralidae	SE Asia
40	*Cnaphalocrocis medinalis*	Lep	Pyralidae	India - SE Asia - Australia
41	*Coccus viridis*	Hem	Coccidae	(Tropicopolitan)
42	*Conogethes punctiferalis*	Lep	Pyralidae	(India - SE Asia - China - Australia)
43	*Conopomorpha cramerella*	Lep	Gracillariidae	Sri Lanka
44	*Cosmopolites sordidus*	Col	Curculionidae	Indo-Malaysian region
45	*Crocidolomia pavonana*	Lep	Pyralidae	(Africa, Asia)
46	*Cylas formicarius*	Col	Apionidae	Indo-Malaysian region
47	*Deporaus marginatus*	Col	Curculionidae	SE Asia
48	*Diaphania indica*	Lep	Pyralidae	Old World tropics
49	*Diaphorina citri*	Hem	Psyllidae	(Southern Asia, parts of tropical South America)
50	*Dysdercus cingulatus*	Hem	Pyrrhocoridae	(Mediterranean - Australia)
51	*Dysmicoccus brevipes*	Hem	Pseudococcidae	(Tropicopolitan)
52	*Earias vittella*	Lep	Noctuidae	(India - SE Asia - Australia)
53	*Empoasca flavescens*	Hem	Cicadellidae	(Europe - SE Asia)
54	*Eotetranychus cendanai*	Aca	Tetranychidae	SE Asia
55	*Epilachna vigintioctopunctata*	Col	Coccinellidae	(Widespread Oriental sp., India - Australia)
56	*Erionota thrax*	Lep	Hesperiidae	SE Asia
57	*Etiella zinckenella*	Lep	Pyralidae	(Cosmopolitan, genus is mainly Australian)
58	*Euchrysops cnejus*	Lep	Lycaenidae	(India - SE Asia - Australia)
59	*Eutetranychus africanus*	Aca	Tetranychidae	Southern Africa
60	*Glyphodes caesalis*	Lep	Pyralidae	(India - Sri Lanka - Myanmar)
61	*Gryllotalpa africana*	Ort	Gryllotalpidae	(Africa - tropical Asia)
62	*Hedylepta indicata*	Lep	Pyralidae	SE Asia
63	*Helicoverpa armigera*	Lep	Noctuidae	Old World tropics
64	*Helicoverpa assulta*	Lep	Noctuidae	Old World tropics
65	*Hellula undalis*	Lep	Pyralidae	(Europe - Africa - much of Asia)
66	*Helopeltis theivora*	Hem	Miridae	SE Asia
67	*Heteropsylla cubana*	Hem	Psyllidae	Tropical America
68	*Hyblaea puera*	Lep	Hyblaeidae	(Africa - India - Australia)

	Species	Order	Family	Origin
69	*Hydrellia philippina*	Dip	Ephydridae	SE Asia
70	*Hypomeces squamosus*	Col	Curculionidae	SE Asia
71	*Hypothenemus hampei*	Col	Scolytidae	Central Africa
72	*Idioscopus clypealis*	Hem	Cicadellidae	India - SE Asia
73	*Idioscopus nitidulus*	Hem	Cicadellidae	SE Asia
74	*Idioscopus niveosparsus*	Hem	Cicadellidae	India - SE Asia
75	*Lampides boeticus*	Lep	Lycaenidae	Old World tropics
76	*Lepidosaphes beckii*	Hem	Diaspididae	(Tropicopolitan)
77	*Leptocorisa acuta*	Hem	Alydidae	(Pakistan - SE Asia - Pacific)
78	*Leptocorisa oratorius*	Hem	Alydidae	(Pakistan - SE Asia)
79	*Leptoglossus gonagra*	Hem	Coreidae	SE Asia
80	*Leucinodes orbonalis*	Lep	Pyralidae	(Africa - SE Asia)
81	*Leucopholis irrorata*	Col	Scarabaeidae	(SE Asia)
82	*Lipaphis erysimi*	Hem	Aphididae	(Cosmopolitan)
83	*Lophobaris piperis*	Col	Curculionidae	SE Asia
84	*Mahasena corbetti*	Lep	Psychidae	SE Asia
85	*Maruca testulalis*	Lep	Pyralidae	possibly South America
86	*Melanagromyza sojae*	Dip	Agromyzidae	(Tropical Asia - Australia - Africa)
87	*Mythimna separata*	Lep	Noctuidae	(Tropical Asia - Australia)
88	*Myzus persicae*	Hem	Aphididae	probably Asia
89	*Neostaurops alternus*	Lep	Notodontidae	(India - SE Asia)
90	*Nephotettix nigropictus*	Hem	Cicadellidae	SE Asia
91	*Nephotettix virescens*	Hem	Cicadellidae	India - SE Asia
92	*Nezara viridula*	Hem	Pentatomidae	Mediterranean - North Africa
93	*Nilaparvata lugens*	Hem	Delphacidae	SE Asia
94	*Nomadacris succincta*	Ort	Acrididae	India - SE Asia
95	*Odoiporus longicollis*	Col	Curculionidae	SE Asia
96	*Oligonychus coffeae*	Aca	Tetranychidae	SE Asia
97	*Oligonychus mangiferus*	Aca	Tetranychidae	(Pantropical)
98	*Omphisa anastomosalis*	Lep	Pyralidae	(India - SE Asia - PNG)
99	*Ophiomyia phaseoli*	Dip	Agromyzidae	Mediterranean - SE Asia
100	*Orgyia postica*	Lep	Lymantriidae	(India - SE Asia)
101	*Orseolia oryzae*	Dip	Cecidomyiidae	SE Asia
102	*Oryctes rhinoceros*	Col	Scarabaeidae	SE Asia
103	*Othreis fullonia*	Lep	Noctuidae	Old World tropics
104	*Ostrinia furnacalis*	Lep	Pyralidae	(India - SE Asia - Australia - China - Japan)
105	*Ostrinia nubilalis*	Lep	Pyralidae	(Southern Europe, N. America)
106	*Papilio demoleus*	Lep	Papilionidae	Indo-Australian tropics
107	*Papilio polytes*	Lep	Papilionidae	Oriental region
108	*Paraponyx stagnalis*	Lep	Pyralidae	(India - SE Asia - Australia - S. Africa)
109	*Parasa lepida*	Lep	Limacodidae	(India - SE Asia - China)
110	*Pectinophora gossypiella*	Lep	Gelechiidae	(Australia - SE Asia - India - Egypt - USA)
111	*Pentalonia nigronervosa*	Hem	Aphididae	SE Asia
112	*Phthorimaea operculella*	Lep	Gelechiidae	South America
113	*Phyllocnistis citrella*	Lep	Phyllocnistidae	(Africa or Asia)
114	*Phyllocoptrupa oleivora*	Aca	Eriophyidae	Asia
115	*Phyllotreta striolala*	Col	Chrysomelidae	Europe
116	*Planococcus citri*	Hem	Pseudococcidae	(Cosmopolitan)
117	*Plutella xylostella*	Lep	Yponomeutidae	Southern Europe

Table 5 (continued)

	Species	Order	Family	Origin
118	*Polyphagotarsonemus latus*	Aca	Tarsonemidae	(Cosmopolitan)
119	*Rhopalosiphum maidis*	Hem	Aphididae	probably Asia
120	*Rhynchocoris poseidon*	Hem	Pentatomidae	SE Asia
121	*Rhynchophorus ferrugineus*	Col	Curculionidae	SE Asia
122	*Rhynchophorus schach*	Col	Curculionidae	SE Asia
123	*Rhytidodera simulans*	Col	Cerambycidae	SE Asia
124	*Saccharicoccus sacchari*	Hem	Pseudococcidae	Papua New Guinea
125	*Scirpophaga incertulas*	Lep	Pyralidae	(India - China - SE Asia)
126	*Scirpophaga innotata*	Lep	Pyralidae	(SE Asia - Australia)
127	*Scirtothrips dorsalis*	Thy	Thripidae	India - SE Asia
128	*Scotinophara cinerea*	Hem	Pentatomidae	SE Asia
129	*Scotinophara coarctata*	Hem	Pentatomidae	SE Asia
130	*Scrobipalpa heliopa*	Lep	Gelechiidae	Australia (Now widespread)
131	*Sesamia inferens*	Lep	Noctuidae	(India - SE Asia)
132	*Setora nitens*	Lep	Limacodidae	Peninsula Malaysia, Sumatra, Java
133	*Sogatella furcifera*	Hem	Delphacidae	SE Asia
134	*Spodoptera exigua*	Lep	Noctuidae	(N. America - Africa - Europe, India - Australia)
135	*Spodoptera litura*	Lep	Noctuidae	(India - Australia)
136	*Spodoptera mauritia*	Lep	Noctuidae	(India - Australia)
137	*Sternochetus frigidus*	Col	Curculionidae	SE Asia
138	*Syllepte derogata*	Lep	Pyralidae	(W. Africa - SE Asia - Australia - Pacific)
139	*Tarophagus colocasiae*	Hem	Delphacidae	SE Asia
140	*Tetranychus urticae*	Aca	Tetranychidae	(Cosmopolitan)
141	*Thosea sinensis*	Lep	Limacodidae	China
142	*Thrips palmi*	Thy	Thripidae	SE Asia
143	*Thrips parvispinus*	Thy	Thripidae	SE Asia
144	*Thrips tabaci*	Thy	Thripidae	Middle East
145	*Toxoptera aurantii*	Hem	Aphididae	Asia
146	*Toxoptera citricidus*	Hem	Aphididae	Asia
147	*Trichoplusia ni*	Lep	Noctuidae	(Europe - India - SE Asia - China)
148	*Xylotrechus quadripes*	Col	Cerambycidae	Oriental
149	*Xylotrupes gideon*	Col	Scarabaeidae	India - SE Asia
150	*Zeuzera coffeae*	Lep	Cossidae	(India - PNG)

Table 6

This table summarises the detailed information presented in table 5 and provides, for the major families of pests, a breakdown of data on the number of pests that are believed to have originated outside the region. Because of major uncertainties in the presumed origin of many pests, only very broad conclusions can be drawn. The results indicate that about two thirds of major arthropod pests are probably of Asian or Southeast Asian origin a very much higher proportion of endemism than for pests in Australia, New Zealand, the oceanic Pacific or California. At least 24 of the pests (15%) appear to be exotic to Southeast Asia and if information is assembled on this group and for the 29 pests that are now cosmopolitan, it will provide a valuable basis for the selection of appropriate biological control targets. At least 8 have already been targets elsewhere and some control successes have been reported.

Table 6 Overview of the relationship and origin of the 150 most important arthropod pests in Southeast Asia.

Family	Order	No species	Origin					
			Europe	Old World	Africa	Americas	Asia	Cosmopolitan (not determined)
Pyralidae	Lep	22	1	1		1	14	5
Noctuidae	Lep	15		4			6	5
Aphididae	Hem	9	2			1	5	1
Curculionidae	Col	9					9	
Cicadellidae	Hem	8					8	
	Aca	8	1		1		4	2
Scarabaeidae	Col	5					5	
Gelechiidae	Lep	4				2		2
Pentatomidae	Hem	4	1				3	
Tephritidae	Dip	4					4	
Thripidae	Thy	4		1			3	
Agromyzidae	Dip	3					3	
Aleyrodidae	Hem	3				2	1	
Delphacidae	Hem	3					3	
Limacodidae	Lep	3					3	
Pseudococcidae	Hem	3					1	2
7 families with 2 species		14	3	2	1	1	25	11
29 families with 1 species		29						
Totals	150	8	8	2	7	77	28	

Table 7 Major weeds in Southeast Asia.

Scientific Name	Family	English Common Name	Principal Crops Attacked
Abutilon indicum (L.) Sweet	Malvaceae	Indian lantern flower	pea, cotton
Achyranthes aspera L.	Amaranthaceae		pigeon pea, rice
Aeschynomene aspera L.	Fabaceae		rice
Aeschynomene indica L.	Fabaceae	jointvetch, budda pea	rice, water
Ageratina adenophora (Sprengel) R.M. King & H. Robinson	Asteraceae		
Ageratum conyzoides L.	Asteraceae	tropic ageratum, goatweed, blue top	widespread
Alternanthera philoxeroides (Mart.) Griseb.	Amaranthaceae	alligatorweed	rice
Alternanthera sessilis (L.) R.Br. ex Roem. & Schult.	Amaranthaceae	sessile joyweed	rice
Alternanthera triandra	see *Alternanthera sessilis*		
Amaranthus spp.	Amaranthaceae		bean, vegetables
Amaranthus blitum	see *Amaranthus lividus*		
Amaranthus lividus L.	Amaranthaceae		orchards, banana
Amaranthus spinosus L.	Amaranthaceae	spiny amaranth, spiny pigweed, needle burr	widespread, vegetables
Amaranthus viridis L.	Amaranthaceae	slender amaranth, green amaranth	cabbage, vegetables
Aneilema nudiflorum	see *Murdannia nudiflora*		
Asystasia coromandeliana	see *Asystasia gangetica*		
Asystasia gangetica (L.) T. Anders.	Acanthaceae		cocoa, coconut, rubber, orchards, pineapple, oil palm
Asystasia intrusa Auct. non (Forsk.) Blume	Acanthaceae	common asystasia	orchards
Axonopus compressus (Sw.) P. Beauv.	Poaceae	broadleaf carpet grass	orchards, capsicum, rubber, oil palm, vegetables
Azolla pinnata R.Br.	Azollaceae	azolla, water fern	rice
Bacopa monnieri (L.) Pennell	Scrophulariaceae		rice
Bidens pilosa L.	Asteraceae	cobbler's pegs, spanish needle	cabbage, plantations
Blechnum orientale L.	Blechnaceae		pineapple, guava
Boerhavia diffusa L.	Nyctaginaceae	spiderling, tarvine	rice, maize
Borreria spp.	Rubiaceae		coconut
Borreria articularis (L.f) F.N. Williams	Rubiaceae		groundnut
Borreria laevis (Lam.) Griseb.	Rubiaceae		rice
Borreria latifolia (Aubl.) Schum.	Rubiaceae	broadleaf button weed	rice, orchards, vegetables, rubber, oil palm

Scientific Name	Family	English Common Name	Principal Crops Attacked
Bothriochloa pertusa (L) A. Camus	Poaceae		upland rice
Brachiaria distachya (L.) Stapf	Poaceae		orchards
Brachiaria mutica (Forssk.) Stapf	Poaceae	paragrass, panicum grass buffalo grass	rice, vegetables, oil palm
Brachiaria paspaloides (Presl) C.E. Hubb.	Poaceae	common brachiaria	orchards, coffee, tea, rice
Brachiaria reptans (L.) Gard. & C.E. Hubb	Poaceae	running grass	cabbage, maize
Bulbostylis barbata (Rottb.) C.B. Clarke	Cyperaceae		tobacco, rice, pineapple
Calopogonium mucunoides Desv.	Fabaceae		cocoa, coconut, oil palm, rubber
Cardiospermum halicacabum L.	Sapindaceae		sorghum, rice, oil palm
Cassia tora L.	Caesalpiniaceae	foetid cassia	pigeon pea, rubber
Celosia argentea L.	Amaranthaceae	quail grass	groundnut, rice
Cenchrus echinatus L.	Poaceae	southern sandburr hedgehog grass, burrgrass	rice, hemp
Centotheca lappacea (L.) Desv.	Poaceae	barbed grass	cocoa, coconut, rubber
Centrosema pubescens Benth.	Fabaceae		maize, plantations
Ceratophyllum demersum L.	Ceratophyllaceae	hornwort, coontail	rice
Ceratopteris pteridoides (Hook.) Hieron.	Parkeriaceae	floating stag's horn fern, pod fern, swamp fern	rice
Chara zeylanica Willd.	Characeae	stone wort	rice
Chloris barbata (L.) Sw.	see *Chloris inflata*		
Chloris inflata Link	Poaceae	swollen fingergrass, purpletop chloris, plush grass	soybean, maize, sugarcane, groundnut
Chromolaena odorata (L.) R.M. King & H. Robinson	Asteraceae	bitter bush, siam weed	oil palm, rubber, coffee, cashew, fruit, forestry
Cleome ciliata	see *Cleome rutidosperma*		
Cleome rutidosperma DC.	Capparidaceae	yellow cleome	orchards, rice, tobacco, immature plantations, vegetables
Cleome viscosa L.	Capparidaceae	wild caia, tickweed	rice, tobacco
Clidemia hirta (L.) D. Don	Melastomataceae	Koster's curse	orchards, rubber, oil palm
Commelina benghalensis L.	Commelinaceae	dayflower, hairy wandering jew	soybean, rice
Commelina diffusa Burm. f.	Commelinaceae	spreading dayflower	rice, brassicas
Commelina nudiflora	see *Murdannia nudiflora*		
Convolvulus arvensis L.	Convolvulaceae		wheat, rice
Corchorus olitorius L.	Tiliaceae	tossa jute	rice
Crotolaria pallida Aiton	Fabaceae	striped crotolaria, showy crotolaria	cassava
Crotolaria striata	see *Crotolaria pallida*		
Croton hirtus L'Her.	Euphorbiaceae		orchards, tobacco, vegetables
Cyclosorus aridus (Don) Ching	Thelypteridaceae		cocoa, coconut

Table 7 (continued)

Table 7 (continued)

Scientific Name	Family	English Common Name	Principal Crops Attacked
Cynodon dactylon (L.) Pers.	Poaceae	bermuda grass, couch	rice, soybean, groundnut etc
Cyperus aromaticus (Ridley) Mattf. & Kuek.	Cyperaceae		rice, pineapple, watermelon, vegetables
Cyperus babakan Steudel	Cyperaceae		rice
Cyperus babakensis	see *Cyperus babakan*		
Cyperus brevifolius (Rottb.) Hasskal	Cyperaceae	short kyllingia	rice, pineapple, watermelon
Cyperus compactus Retz.	Cyperaceae		rice
Cyperus compressus L.	Cyperaceae	hedgehog cyperus	cocoa, coconut, watermelon, pineapple
Cyperus difformis L.	Cyperaceae	small flowered umbrella plant	rice, vegetables, orchards
Cyperus diffusus Vahl	Cyperaceae		rice
Cyperus digitatus Roxb.	Cyperaceae	digitate cyperus	rice
Cyperus halpan	see *Cyperus haspan*		
Cyperus haspan L.	Cyperaceae		rice, pineapple
Cyperus imbricatus Retz.	Cyperaceae		
Cyperus iria L.	Cyperaceae	umbrella sedge, rice flatsedge, grasshoppers cyperus	rice, groundnut, capsicum, pineapple, vegetables
Cyperus kyllingia Endl.	Cyperaceae	white kyllingia	rice, vegetables, capsicum
Cyperus odoratus L.	Cyperaceae		rice, vegetables, orchards
Cyperus pilosus Vahl	Cyperaceae	hairy cyperus	rice
Cyperus platystylis R. Br.	Cyperaceae		rice, capsicum, vegetables, orchards
Cyperus polystachyos Rottb.	Cyperaceae	bunchy sedge	rice, pineapple
Cyperus pulcherrimus Willd. ex Kunth	Cyperaceae	elegant cyperus	rice
Cyperus rotundus L.	Cyperaceae	nutgrass, nutsedge, purple nutsedge	rice, vegetables, orchards
Cyperus zollingeri Steudel	Cyperaceae		orchards, vegetables
Cyrtococcum accrescens (Trin.) Stapf	Poaceae	diffuse panic grass	banana, durian, rubber, coconut
Cyrtococcum oxyphyllum (Hochst ex Steudel) Stapf	Poaceae	shining panic grass	cocoa, coconut, oil palm, rubber
Cyrtococcum trigonum (Retz.) A. Camus	Poaceae		cocoa, coconut, oil palm, rubber
Dactyloctenium aegyptium (L.) Richt.	Poaceae	crowfoot grass, coast buttongrass, beach wiregrass, Egyptian fingergrass	soybean, vegetables, rubber, tapioca
Desmodium triflorum (L.) DC.	Fabaceae		tobacco
Dicranopteris linearis	see *Gleichenia linearis*		
Digitaria adscendens	see *Digitaria ciliaris*		
Digitaria ciliaris (Retz.) Koel.	Poaceae	fingergrass, tropical crabgrass, summergrass	orchards, vegetables, cocoa, coconut, oil palm, rubber
Digitaria fuscescens (Presl) Henr.	Poaceae	common crabgrass	tobacco, vegetables, rubber

Scientific Name	Family	English Common Name	Principal Crops Attacked
Digitaria longiflora	see *Digitaria violescens*		
Digitaria longiflora (Retz.) Pers.	Poaceae		maize, rice
Digitaria sanguinalis (L.) Scop.	Poaceae	large crabgrass, hairy crabgrass, hairy fingergrass	rice, castor
Digitaria violascens Link	Poaceae		cocoa, coconut
Echinochloa sp.	Poaceae	jungle rice	radish
Echinochloa colona (L.) Link	Poaceae	jungle rice, birdspice, awnless barnyard grass	vegetables, rice
Echinochloa crus-galli (L.) P. Beauv.	Poaceae	barnyard grass, watergrass	rice
Echinochloa glabrescens Munro ex Hook.f.	Poaceae		rice
Echinochloa oryzoides (Ard.) Fritsch	Poaceae		rice
Eclipta alba	see *Eclipta prostrata*		
Eclipta prostrata (L.) L.	Asteraceae	white heads, false dairy	rice, groundnut, soybean, etc
Eichhornia crassipes (Mart.) Solms	Pontederiaceae	water hyacinth	rice, water
Eleocharis chaetaria	see *Eleocharis retroflexa*		
Eleocharis dulcis (Burm. f.) Henschel	Cyperaceae	ground chestnut, water chestnut	rice
Eleocharis retroflexa (Poir.) Urban	Cyperaceae		rice
Eleocharis variegata (Poir.) Presl	Cyperaceae		rice
Eleusine coracana (L.) Gaertner	Poaceae	Indian millet	rice
Eleusine indica (L.) Gaertner	Poaceae	crowsfoot grass, goosegrass, wiregrass	rice, vegetables, orchards, rubber, oil palm, cassava, coffee, tea
Emilia sonchifolia (L.) DC.	Asteraceae	emilia, red tassel flower, purple sowthistle	pineapple, vegetables, mulberry
Enydra fluctuans Lour.	Asteraceae		rice
Eragrostis japonica (Thunb.) Trin.	Poaceae	delicate lovegrass	rice
Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult.	Poaceae	feathery eragrostis	pineapple, banana, vegetables
Eragrostis unioloides (Retz.) Nees ex Steudel	Poaceae		rice, vegetables
Erechtites hieracifolia (L.) Rafin ex DC.	Asteraceae	American fireweed	orchards, mulberry
Erechtites valerianaefolia DC.	Asteraceae	Brazilian fireweed	orchards, vegetables, oil palm, rubber, cocoa
Erigeron sumatrensis Retz.	Asteraceae	fleabane	orchards, vegetables, plantations
Eriocaulon truncatum Buch.-Ham. ex Mart.	Eriocaulaceae		rice
Eupatorium adenophorum	see *Ageratina adenophora*		
Eupatorium odoratum	see *Chromolaena odorata*		
Euphorbia spp.	Euphorbiaceae	spurge	mango
Euphorbia geniculata	see *Euphorbia heterophylla*		
Euphorbia heterophylla L.	Euphorbiaceae	painted spurge	soybean, maize, orchards, upland rice

Table 7 (continued)

Table 7 (continued)

Scientific Name	Family	English Common Name	Principal Crops Attacked
Euphorbia hirta L.	Euphorbiaceae	garden spurge	sugarcane, orchards, vegetables
Euphorbia prunifolia	see *Euphorbia heterophylla*		
Fimbristylis dichotoma (L.) Vahl	Cyperaceae	tall-fringe rush	rice
Fimbristylis globulosa (Retz.) Kunth	Cyperaceae	globular fimbristylis	rice
Fimbristylis miliacea (L.) Vahl	Cyperaceae	lesser fimbristylis grass-like fimbristylis	rice, vegetables
Fuirena ciliaris (L.) Roxb.	Cyperaceae	umbrella grass	papaya, pineapple, banana
Fuirena umbellata Rottb.	Cyperaceae		rice
Galinsoga parviflora Cav.	Asteraceae	yellowweed	maize, rice, pastures
Gleichenia linearis (Burm. f.) C.B. Clarke	Gleicheniaceae	tropical bracken	orchards, rubber, oil palm
Gomphrena celosioides Mart.	Amaranthaceae	gomphrena	cowpea
Hedyotis biflora	see *Hedyotis racemosa*		
Hedyotis corymbosa	see *Oldenlandia corymbosa*		
Hedyotis racemosa Lam.	Rubiaceae		rice, pigeon pea
Heliotropium indicum L.	Boraginaceae	Indian heliotrope, turnsole	rice
Hemarthria compressa (L.f.) R.Br.	Poaceae		pineapple
Hydrilla verticillata (L.f.) Royle	Hydrocharitaceae	water thyme, hydrilla	rice
Hydrocera triflora (L.) Wight & Arn.	Geraniaceae	marsh henna	rice
Hydrolea glabra	see *Hydrolea zeylanica*		
Hydrolea zeylanica (L.) Vahl	Hydrophyllaceae		rice
Hymenachne acutigluma (Steud.) Gilliland	Poaceae		rice
Hymenachne pseudointerrupta	see *Hymenachne acutigluma*		
Hyptis brevipes Poit.	Lamiaceae	lesser roundweed	rice, orchards, vegetables, plantations
Hyptis capitata Jacq.	Lamiaceae	knobweed	cocoa, coconut, vegetables, orchards
Imperata cylindrica (L.) P. Beauv.	Poaceae	blady grass, kunai grass, cogongrass	rice, orchards, vegetables, plantations
Ipomoea triloba L.	Convolvulaceae		upland rice
Isachne globosa (Thunb.) O. Ktze.	Poaceae	swamp millet	rice
Ischaemum barbatum Retz.	Poaceae		
Ischaemum ciliare	see *Ischaemum indicum*		
Ischaemum indicum (Houtt.) Merr.	Poaceae	smutgrass	maize
Ischaemum muticum L.	Poaceae	seashore centipede grass, drought grass	cocoa, coconut, vegetables, orchards, rice, rubber, oil palm
Ischaemum rugosum Salisb.	Poaceae	wrinkle duck-beak, wrinkled grass	rice, pineapple, watermelon, rubber
Jussiaea linifolia	see *Ludwigia hyssopifolia*		
Jussiaea repens	see *Ludwigia adscendens*		
Lantana camara L.	Verbenaceae	lantana	durian, pineapple, banana, rubber

Scientific Name	Family	English Common Name	Principal Crops Attacked
Leersia hexandra Sw.	Poaceae	southern cutgrass, swamp ricegrass	rice, maize
Lemna minor	see *Lemna purpusilla*		
Lemna purpusilla Torr.	Lemnaceae	common duckweed	rice
Leptochloa chinensis (L.) Nees	Poaceae	red sprangletop, feathergrass	rice, cotton, soybean, maize, sugarcane
Leucas capitata	see *Leucas cephalotes*		
Leucas cephalotes (Roth) Sprengel	Lamiaceae		rice
Leucas zeylanica (L.) R.Br.	Lamiaceae		tobacco
Limnocharis flava (L.) Buch.	Butomaceae		rice
Lindernia crustacea (L.) F. Muell.	Scrophulariaceae		tobacco, vegetables
Ludwigia adscendens (L.) Hara	Onagraceae	creeping water primrose	rice
Ludwigia hyssopifolia (G. Don) Exell	Onagraceae	water primrose	rice, cotton, tobacco, vegetables
Ludwigia octovalvis (Jacq.) Raven	Onagraceae	willow primrose	rice
Lygodium circinnatum (Burm. f.) Sw.	Schizaceae		
Lygodium flexuosum (L.) Sw.	Schizaceae		cocoa, coconut, orchards, oil palm, rubber
Lygodium scandens (L.) Sw.	Schizaceae		pineapple
Macroptilium lathyroides (L.) Urb.	Fabaceae	phasey bean	rice
Marsilea crenata	see *Marsilea minuta*		
Marsilea minuta L.	Marsileaceae	water clover, clover fern	rice
Marsilea quadrifolia L.	Marsileaceae		rice
Melastoma malabathricum L.	Melastomataceae	straits rhododendron	orchards, pineapple, cocoa, coconut, oil palm, rubber, mulberry
Melochia concatenata	see *Melochia corchorifolia*		
Melochia corchorifolia L.	Sterculiaceae	wire bush, crabs eggs	rice, tobacco, upland rice
Mentha arvensis L.	Lamiaceae		groundnut, pineapple
Microcarpaea minima (Koen. ex Retz.) Merr.	Scrophulariaceae		rice
Mikania micrantha Kunth	Asteraceae	mile-a-minute weed	cocoa, coconut, orchards, rubber, oil palm, vegetables, rice
Mimosa invisa Mart. ex Colla	Fabaceae	giant sensitive plant	orchards, rice
Mimosa pigra L.	Fabaceae	giant mimosa, thorny sensitive plant	rice
Mimosa pudica L.	Fabaceae	sensitive plant	orchards, vegetables, maize, tea, rice
Mitracarpus villosus (Sw.) Cham. & Schldl. ex DC	Rubiaceae	groundnut, plantations	
Monochoria hastata (L.) Solms	Pontederiaceae	monochoria	rice
Monochoria vaginalis (Burm.f.) Presl	Pontederiaceae	pickerel weed, monochoria	rice

Table 7 (continued)

Table 7 (continued)

Scientific Name	Family	English Common Name	Principal Crops Attacked
Murdannia nudiflora (L.) Brenan	Commelinaceae	spreading dayflower	rice, vegetables, tobacco
Najas graminea Del.	Najadaceae	bushy pond weed	rice
Nelumbo nucifera Gaertn.	Nelumbonaceae	sacred lotus	rice
Nephrolepis biserrata (Sw.) Schott	Nephrolepidaceae	broad sword fern	orchards, rubber, oil palm
Nymphaea lotus L.	Nymphaceae		rice
Nymphoides indica (L.) O. Kuntze	Gentianaceae	water snowflake	rice
Oldenlandia corymbosa L.	Rubiaceae		orchards, vegetables
Oryza rufipogon Griff.	Poaceae	red rice, wild rice	rice
Ottelia alismoides (L.) Pers.	Hydrocharitaceae		rice
Ottochloa nodosa (Kunth) Dandy	Poaceae	slender panic grass	durian, cocoa, coconut, orchards, rubber, oil palm
Oxalis corymbosa DC.	Oxalidaceae	pink shamrock, lilac oxalis	vegetables
Panicum amplexicaule	see *Hymenachne aculigluma*		
Panicum bisulcatum Thunb.	Poaceae	blackseed panic	pineapple
Panicum brevifolium L.	Poaceae	short-leaved panic grass	pineapple, watermelon, plantations
Panicum cambogiense Balansa	Poaceae		rice
Panicum pillipes	see *Cyrtococcum oxyphyllum*		
Panicum repens L.	Poaceae	torpedo grass, creeping panic grass	soybean, groundnut, vegetables, plantations, tobacco
Panicum sarmentosum Roxb.	Poaceae	scrambling panic grass	starfruit, mangosteen, orchards, oil palm
Panicum trigonum	see *Cyrtococcum trigonum*		
Paspalum commersonii	see *Paspalum scrobiculatum*		
Paspalum conjugatum Berg.	Poaceae	sourgrass, T-grass	vegetables, orchards, cocoa, coconut, mulberry
Paspalum distichum L.	Poaceae	seashore paspalum	rice
Paspalum paspaloides	see *Paspalum distichum*		
Paspalum scrobiculatum L.	Poaceae	ditch millet, bull paspalum	rice, orchards, plantations
Paspalum vaginatum Sw.	Poaceae		rice
Passiflora foetida L.	Passifloraceae	stinking passionflower, wild passionfruit	banana, cocoa, coconut, vegetables, plantations
Pennisetum spp.	Poaceae		soybean, sorghum
Pennisetum polystachyon (L.) Schult.	Poaceae	feather pennisetum, mission grass	pineapple, banana, rubber, oil palm, orchards
Pennisetum purpureum K. Schum.	Poaceae	napier grass, elephant grass	rice, plantations
Pentapetes phoenicia L.	Sterculiaceae		rice
Phaseolus lathyroides	see *Macroptilium lathyroides*		
Phyllanthus fraternus Webster	Euphorbiaceae	niruri	rice, cocoa, coconut, tobacco etc

Scientific Name	Family	English Common Name	Principal Crops Attacked
Phyllanthus niruri	see *Phyllanthus fraternus*		
Physalis angulata L.	Solanaceae		sunflower
Physalis minima L.	Solanaceae	chinese lanternplant, wild gooseberry	orchards, vegetables
Pistia stratiotes L.	Araceae	water lettuce	rice, water
Polygonum pulchrum	see *Polygonum tomentosum*		
Polygonum tomentosum Willd.	Polygonaceae	knotweed	rice
Portulaca oleracea L.	Portulacaceae	common purslane, purslane, pigweed	radish, sorghum, rice, vegetables
Pteridium esculentum (Forst.f.) Cockayne	Dennstaedtiaceae	common bracken	banana, guava, pineapple, oil palm
Pteris vittata L.	Pteridaceae		pineapple
Pueraria phaseoloides (Roxb.) Benth.	Fabaceae	puero, tropical kudzu	bean
Richardia braziliensis (Moq.) Gomez	Rubiaceae	pursley, Brazil calla lily	cowpea
Rotala indica (Willd.) Koehne	Lythraceae		rice
Rottboellia cochinchinensis (Lour.) W.D. Clayton	Poaceae	itchgrass	rice, sugarcane
Rottboellia exaltata	see *Rottboellia cochinchinensis*		
Sacciolepis indica (L.) A. Chase	Poaceae	Indian cupscale grass	rice
Sagittaria guayanensis H.B.K.	Alismataceae		rice
Sagittaria trifolia L.	Alismataceae	old world arrowhead	rice
Salvinia cucullata Roxb. ex Bory	Salviniaceae		rice, water
Salvinia molesta D.S. Mitchell	Salviniaceae	salvinia	rice, water
Scirpus grossus L.f.	Cyperaceae	greater club rush	rice
Scirpus juncoides Roxb.	Cyperaceae		rice
Scirpus lateriflorus Gmelin	Cyperaceae		
Scirpus maritimus L.	Cyperaceae		rice
Scirpus supinus L.	Cyperaceae		rice
Scleria bancana Miq.	Cyperaceae		papaya, pineapple, banana, rice
Scleria ciliaris Nees	Cyperaceae		papaya, pineapple, banana
Scleria levis Retz.	Cyperaceae		papaya, banana
Scleria sumatrensis Retz.	Cyperaceae		banana, rice, plantations
Scoparia dulcis L.	Scrophulariaceae		sorghum
Setaria geniculata (Lam.) P. Beauv.	Poaceae	knotroot foxtail, slender pigeongrass, bristlegrass	rice
Senna obtusifolia (L.) Irwin & Barneby	Fabaceae		rice
Sida acuta Burm.f.	Malvaceae	broom weed, southern sida, spinyhead sida	plantations
Solanum nigrum L.	Solanaceae	blackberry nightshade	vegetables

Table 7 (continued)

Table 7 (continued)

Scientific Name	Family	English Common Name	Principal Crops Attacked
Spermacoce hispida	see *Borreria articularis*		
Sphaeranthus africanus L.	Asteraceae		rice
Sphenoclea zeylanica Gaertn.	Sphenocleaceae	gooseweed	rice
Spilanthes filicaulis (Schum. & Thonn.) C.D. Adams	Asteraceae		sorghum, pigeon pea
Spirodela polyrhiza (L.) Schleid.	Lenmaceae		rice
Sporobolus indica var. fertilis (Steudel) W. Clayton	Poaceae	rat's tail grass	cocoa, coconut, pepper, tea, nutmeg
Sporobolus indica var. *diander* (Retz.) P. Beauv.	Poaceae	tussocky sporobolus	pineapple, starfruit, plantations
Stachytarpheta indica (L.) Vahl	Verbenaceae	blue rat's tail, light blue snakeweed	pineapple, starfruit, banana
Stenochlaena palustris (Burm. f.) Bedd.	Blechnaceae	giant fern	cocoa, coconut, pineapple, oil palm
Striga asiatica (L.) O. Kuntze	Scrophulariaceae	witchweed	rice
Tetracera indica (Houtt. ex Christm. & Panz.) Merr.	Dilleniaceae	fire weed	cocoa, coconut, rubber, oil palm
Trianthema portulacastrum L.	Aizoaceae	giant pigweed, black pigweed	cotton
Tridax procumbens L.	Asteraceae	tridax	cotton, vegetables
Typha angustifolia L.	Typhaceae	narrow-leaf cat tail, bulrush	rice
Urena lobata L.	Malvaceae	pink burr	legumes, maize
Utricularia aurea Lour.	Lentiburiaceae	bladderwort	rice
Vernonia cinerea (L.) Less.	Asteraceae	little ironweed, vernonia	orchards, mulberry
Xanthium strumarium L.	Asteraceae	cockleburr	rice
Zoysia matrella (L.) Merr.	Poaceae	siglap grass, Korean grass	cocoa, coconut

Table 8 The distribution and importance of major weeds in Southeast Asia (231 species).

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Abutilon indicum	+	++	•	•	•				•	•
Achyranthes aspera	+	•		•	•	•			+	+
Aeschynomene aspera	•	+			•				•	+
Aeschynomene indica	•	+	•	++	•	•			•	++
Ageratina adenophora		+						+	++	•
Ageratum conyzoides	+++	+++	+	+	+	++	++	+	+	++
Alternanthera philoxeroides	•	+	•		+				•	
Alternanthera sessilis	+	+	•	•	+	+	++		•	++
Amaranthus spp.		++						•		
Amaranthus lividus		•				++			•	
Amaranthus spinosus	+++	+++	+	+	+	++	++		+	+++
Amaranthus viridis	+	+++	+	+	+	•	+		•	++
Asystasia gangetica						+++	++		•	•
Asystasia intrusa						+++	++			
Axonopus compressus	•	+			•	+	++	•	+	+
Azolla pinnata	•	+	+	+	+	++		•	•	+
Bacopa monnieri			•		•	+			•	•
Bidens pilosa	+	++	+	+	+	•			++	++
Blechnum orientale						+	+	++		
Boerhavia diffusa	+	++					++			++
Borreria spp.	•	+						•		
Borreria articularis	+				•				•	•
Borreria laevis	•	•				+	++		+	+
Borreria latifolia		•				+++	++		++	
Bothriochloa pertusa	+	•			•					
Brachiaria distachya	•				•	+			•	++
Brachiaria mutica		•	•	•	•	++	+		+	++
Brachiaria paspaloides		•				++	++		•	
Brachiaria reptans	•	++			+	•			•	•
Bulbostylis barbata					•	+	+		•	•
Calopogonium mucunoides						+	+		•	++
Cardiospermum halicacabum	+				•	•			•	•
Cassia tora	+	+		•	+	•			•	+
Celosia argentea	++	•	•	•	•	•			++	++

Table 8 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Cenchrus echinatus		+	+	+	+					+
Centotheca lappacea	•	•	•	•	•	++	++	•	•	•
Centrosema pubescens									•	+++
Ceratophyllum demersum		+	•		•	+			•	•
Ceratopteris pteridoides	•					+		+		•
Chara zeylanica		+	+	+	+				+	
Chloris inflata	+	++		•	+++	•	+		•	++
Chromolaena odorata	++	++	++	++	++	+++			++	+++
Cleome rutidosperma	•	+		•	•	++	+++		•	++
Cleome viscosa	+	•		•	•	+	++		•	++
Clidemia hirta						++	++	+	•	
Commelina benghalensis	++	+++			+	•			++	++
Commelina diffusa	•	++	•		•	•	++		++	++
Convolvulus arvensis	++									•
Corchorus olitorius	+	•							•	+
Crotolaria pallida	•	++	+	+	+		+			+
Croton hirtus					•	++	+		•	
Cyclosorus aridus						++	+			+
Cynodon dactylon	++	++	+	+	+++	++	++		+++	++
Cyperus aromaticus						+	+			
Cyperus babakan	•	•	•	•	•	+			•	•
Cyperus brevifolius	•	•	•	•	•	+	+	+	+	++
Cyperus compactus	•	•	•	•	•	+	+	+	•	++
Cyperus compressus	+	•	•	•	•	++	++	++	•	++
Cyperus difformis	+	+	+	++	+++	+++	++	+	+	+++
Cyperus diffusus			•		•	+	+			•
Cyperus digitatus	•	•	•	•	•	++	+	•	•	+
Cyperus haspan	•	•	•	•	•	+	+		•	•
Cyperus imbricatus	•	•	•	•	•	•	+	++	•	++
Cyperus iria	++	++	+++	++	+++	+++	+	+++	++	++
Cyperus kyllingia		•	•	•	++	++	+	•	•	++
Cyperus odoratus	•	•	•	•	++	•			•	•
Cyperus pilosus	•	•	•	•	•	++	+		•	•
Cyperus platystylis	•	•	•	•	•	+			•	
Cyperus polystachyos	•	•	•	•	•	+	+		•	•
Cyperus pulcherrimus		+		•	•	•			•	•

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Cyperus rotundus	+++	+++	++	++	+++	++	+++	+++	+++	+++
Cyperus zollingeri						++	+	+		•
Cyrtococcum accrescens	•	•				+	+		•	•
Cyrtococcum oxyphyllum						+				•
Cyrtococcum trigonum						+				
Dactyloctenium aegyptium	++	++	•		•	•	+		+	++
Desmodium triflorum		•				+	++	•	•	+
Digitaria ciliaris	++	++	+	+++	++	++	++		+++	++
Digitaria fuscescens						+	+		•	
Digitaria longiflora		•	•	•	•				•	+++
Digitaria sanguinalis	+	•			•	•	++	•	•	++
Digitaria violescens	•	•	•	•	•	++	++		•	•
Echinochloa sp.		+++								
Echinochloa colona	+++	+++	+++	++	+++	+++	++	+++	+++	+++
Echinochloa crusgalli	•	+++	+	++	+++	+++	++	+	+++	+++
Echinochloa glabrescens		•	•	++	•	•		+	•	++
Echinochloa oryzoides	•	•				•				+++
Eclipta prostrata	+	++	•	•	++	+++	++		+	++
Eichhornia crassipes	++	+++	++	++	+	+++	•	++	++	+++
Eleocharis dulcis	•	+	•	•	+	+			•	•
Eleocharis retroflexa	•	•	•	•	•	+			•	•
Eleocharis variegata				•		++			•	
Eleusine coracana	•	+			+					•
Eleusine indica	++	++	++	++	+++	+++	+++	+	+++	+++
Emilia sonchifolia	+	•		•	•	+	++	•	•	+
Enydra fluctuans	+	•			•	+			•	
Eragrostis japonica		•			+				•	•
Eragrostis tenella	+	+			•	+	++		•	•
Eragrostis unioloides	+	•			•	++	•		•	•
Erechtites hieracifolia						+	+		•	
Erechtites valerianaefolia		•				++	+		•	
Erigeron sumatrensis	•					++			•	•
Eriocaulon truncatum		•	•	•	•	+	+		•	•
Euphorbia spp.	+	++								
Euphorbia heterophylla	+	+++	+	+	+	++			•	+
Euphorbia hirta	•	++	+	+	+	+	++		•	++

Table 8 (continued)

Table 8 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Fimbristylis dichotoma	++	+	++		++	++	++		+++	++
Fimbristylis globulosa	•	•	•	•	•	++	++		•	•
Fimbristylis miliacea	+++	+	+	+++	++	+++	++	+++	+++	++
Fuirena ciliaris	•	•	•	•	•	+			•	•
Fuirena umbellata				•	•	++			•	•
Galinsoga parviflora		•							•	+++
Gleichenia linearis						++	+++	+++	•	
Gomphrena celosioides	+	++			+		•		•	+
Hedyotis racemosa	++	•							•	•
Heliotropium indicum	+	+	•	•	+	•	•	•	•	++
Hemarthria compressa	•				+					
Hydrilla verticillata	•	++	•	•	•	+	+	•	+	+
Hydrocera triflora	•	•				+				
Hydrolea zeylanica	+	•	•		•				•	•
Hymenachne acutigluma	•	•				++		++	•	+
Hyptis brevipes		+			•	+	++		•	++
Hyptis capitata		+			+	++	++		•	++
Imperata cylindrica	+++	+++	++	++	+++	+++	+++	+	+++	+++
Ipomoea triloba	+	•		•					•	+++
Isachne globosa	•	•	•		•	++	+		•	•
Ischaemum barbatum		•						+++		
Ischaemum indicum	•	•	•	•	+++	•	•		•	+
Ischaemum muticum						++	++			+
Ischaemum rugosum	+	•	•	•	•	+++	+	++	++	++
Lantana camara	+	+		•	•	+	•	•	•	++
Leersia hexandra	•	+	+	+	+	++	+	•	+	+
Lemna purpusilla		+	+	+	+	++		+	•	•
Leptochloa chinensis	+++	++	•	•	++	+++			++	++
Leucas cephalotes	+++									
Leucas zeylanica	++					+	++			+
Limnocharis flava	•	+	•	•	•	++	+	+	•	
Lindernia crustacea					•	++	++		•	•
Ludwigia adscendens	+	+	•	•	•	++			+	++
Ludwigia hyssopifolia	+++	++	•	•	•	++	•	•	•	+
Ludwigia octovalvis	+	•	•	•	•	•	+		+++	++
Lygodium circinnatum								+		

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Lygodium flexuosum					•	++	++		•	+
Lygodium scandens					•	+				
Macroptilium lathyroides		•	•	•	•	•			•	+
Marsilea minuta	+	+	+	+	+	+++			++	++
Marsilea quadrifolia	•	•	•	•	+++	•			•	+
Melastoma malabathricum		+	+	•	+	+++	++	+++	+	+
Melochia corchorifolia	+	•		•	•	++			•	+
Mentha arvensis	+				++				•	
Microcarpaea minima						+			•	
Mikania micrantha		•				+++	+++	++	++	+
Mimosa invisa	++	++	++	+	++	++	++		++	+++
Mimosa pigra	++	+++	++	+	+	++	++		++	
Mimosa pudica	+++	+	•	•	+	++	+++	++	+++	++
Mitracarpus villosus	+++	•				•			++	
Monochoria hastata	•	•	•	•	+	•(†)	+		+	•
Monochoria vaginalis	++	++	+++	+++	++	+++	++	+++	+++	+++
Murdannia nudiflora	+	•			•	+		•	+	++
Najas graminea	•	+	+	•	•	++			•	+
Nelumbo nucifera		+	+	•	+	+			•	•
Nephrolepis biserrata						++	+++	+++		++
Nymphaea lotus	•	+	+	•	+	++	+	+		
Nymphoides indica	•	+	•	•	•	+			•	•
Oldenlandia corymbosa	+	•		•	•	++	++	•	•	+
Oryza rufipogon	++	+	•	•	•	+			+	•
Ottelia alismoides	•	+	•	•	•	+			•	+
Ottochloa nodosa	++	•				++			•	•
Oxalis corymbosa		+				++	++		•	
Panicum bisulcatum					+++					
Panicum brevifolium						+			•	
Panicum cambogiense		+		•						•
Panicum repens	+	++	•	•	+++	++	++	+	+++	++
Panicum sarmentosum						+++	++		•	
Paspalum conjugatum	•	•	•	•	+++	+++	++	++	+++	++
Paspalum distichum	•	•			•	•		+	+++	++
Paspalum scrobiculatum	•	•	•	•	•	++	++	++	•	+
Paspalum vaginatum					+	++			•	•

Footnote (†) +++ in Sarawak.

Table 8 (continued)

Table 8 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Passiflora foetida	+	+	+		+	+++	+	++	•	+
Pennisetum spp.		++	++	++	++	++			+	
Pennisetum polystachyon		+	+	+	+	+++			++	++
Pennisetum purpureum		+	+	+	+	+	+		+	+
Pentapetes phoenicia		+		•	•	•			•	
Phyllanthus fraternus	+	+			•	++			•	•
Physalis angulata	+	+	•	•	•	•			•	•
Physalis minima	•	•	•			+	+	•	•	•
Pistia stratiotes	+	++	++	++	++	+	•	+	+	++
Polygonum tomentosum	+	•	•		•	+			•	+
Portulaca oleracea	+	++		•	+	+	+		+	+++
Pteridium esculentum	+					+	+	+++		
Pteris vittata						+	+	•	•	•
Pueraria phaseoloides	+	++					++		•	+
Richardia braziliensis	++	+++							•	
Rotala indica	•	•	•	•	++	++			•	+
Rottboellia cochinchinensis	+	++	+		+	+			+++	+++
Sacciolepis indica	•	•			•	+	+		•	•
Sagittaria guayanensis	•	•	•	•	•	+++	+		•	
Sagittaria trifolia	•	•	•	•	+	•			•	+
Salvinia cucullata		++	+	+	+	•			•	
Salvinia molesta						+++	+		+	++
Scirpus grossus	++	•	•	•	+	+++			•	+
Scirpus juncoides	++	•	•	•	•	++			+	•
Scirpus lateriflorus	•	•	•	•	•	•			•	++
Scirpus maritimus	•	•	•	•	•	•		++	•	+++
Scirpus supinus	•	•	•	•	•	++		++	•	+
Scleria bancana					•	+	+	++		
Scleria ciliaris						+				
Scleria levis	•	•	•	•	•	+			•	+
Scleria sumatrensis					•	++	+	++		
Scoparia dulcis	+	•	•	•	•	+			•	+
Senna obtusifolia	•	•			•				•	+++
Setaria geniculata	•	+		•		+	•		•	++
Sida acuta	+	+	+	+	+	•	+		+	++
Solanum nigrum	•	+		•		+	+		•	•

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Sphaeranthus africanus		•			•	+			•	+
Sphenoclea zeylanica	+	++	+	++	+	+++		+	+	++
Spilanthes filicaulis	+++									
Spirodela polyrhiza		+		•	•	+			•	•
Sporobolus indicus var. *fertilis*						+				+
Sporobolus indicus var. *diander*	•				•	+	++		•	•
Stachytarpheta indica		•				+	+	•	++	++
Stenochlaena palustris						++	++	+++	•	•
Striga asiatica	+	+				•	+		+++	•
Tetracera indica						+	+	•	•	•
Trianthema portulacastrum	+++	++		•	•				•	+++
Tridax procumbens	+	++		•	•	+	++		•	++
Typha angustifolia		++	+	+	+	+	+		+	+
Utricularia aurea	+	•	•	•	•	++			•	•
Urena lobata		•			•			•	•	+++
Vernonia cinerea	•	•	•	•	•	+	++		•	++
Zoysia matrella	++	•				+	++	•		•

Table 8 (continued)

Table 9 The distribution and importance of the most important weeds in Southeast Asia (140 species).

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Aeschynomene indica	•	+	•	++	•	•			•	++
Ageratum conyzoides	+++	+++	+	+	+	++	++	+	+	++
Alternanthera sessilis	+	+	•	•	+	+	++		•	++
Amaranthus spinosus	+++	+++	+	+	+	++	++		+	+++
Amaranthus viridis	+	+++	+	+	+	•	+		•	+++
Asystasia gangetica						+++	++		•	•
Asystasia intrusa						+++	++			
Axonopus compressus	•	+			•	+	++	•	+	+
Azolla pinnata	•	+	+	+	+	++		•	•	+
Bidens pilosa	+	++	+	+	+	•			++	++
Boerhavia diffusa	+	++					++			++
Borreria laevis	•	•				+	++		+	+
Borreria latifolia		•				+++	++		++	
Brachiaria mutica		•	•	•	•	++	+		+	++
Brachiaria paspaloides		•				++	++		•	
Celosia argentea	++	•	•	•	•	•			++	++
Cenchrus echinatus		+	+	+	+					+
Centotheca lappacea	•	•	•	•	•	++	++	•	•	•
Centrosema pubescens									•	+++
Chara zeylanica		+	+	+	+				+	
Chloris inflata	+	++		•	+++	•	+		•	++
Chromolaena odorata	++	++	++	++	++	+++			++	+++
Cleome rutidosperma	•	+		•	•	++	+++		•	++
Cleome viscosa	+	•		•	•	+	++		•	++
Clidemia hirta						++	++	+	•	
Commelina benghalensis	++	+++			+	•			++	++
Commelina diffusa	•	++	•		•	•	++		++	++
Crotolaria pallida	•	++	+	+	+		+			+
Cynodon dactylon	++	++	+	+	+++	++	++		+++	++
Cyperus brevifolius	•	•	•	•	•	+	+		+	++
Cyperus compactus						+	+	+		++
Cyperus compressus	+	•	•	•	•	++	++		•	++
Cyperus difformis	+	+	+	++	+++	+++	++		+	+++
Cyperus imbricatus							+	++		++

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Cyperus iria	++	++	+++	++	+++	+++	+		++	++
Cyperus kyllingia		•	•	•	++	++	+	•	•	++
Cyperus rotundus	+++	+++	++	++	+++	++	+++		+++	+++
Dactyloctenium aegyptium	++	++	•		•	•	+		+	++
Digitaria ciliaris	++	++	+	+++	++	++	++		+++	++
Digitaria longiflora		•	•	•	•				•	+++
Digitaria sanguinalis								++		++
Digitaria violescens	•	•	•	•	•	++	++		•	•
Echinochloa sp.		+++								
Echinochloa colona	++	+++	+++	++	+++	+++	++		+++	+++
Echinochloa crusgalli	•	+++	+	++	+++	+++	++	+	+++	+++
Echinochloa glabrescens		•	•	++	•	•			•	++
Echinochloa oryzoides	•	•				•				+++
Eclipta prostrata	+	++	•	•	++	+++	++		+	++
Eichhornia crassipes	++	+++	++	++	+	+++	•	++	++	+++
Eleusine indica	++	++	++	++	+++	+++	+++		+++	+++
Emilia sonchifolia	+	•		•	•	+	++	•	•	+
Eragrostis tenella	+	+			•	+	++		•	•
Euphorbia heterophylla	+	+++	+	+	+	++			•	+
Euphorbia hirta	•	++	+	+	+	+	++		•	++
Fimbristylis dichotoma	++	+	++		++	++	++		+++	++
Fimbristylis globulosa	•	•	•	•	•	++	++		•	•
Fimbristylis miliacea	+++	+	+	+++	++	+++	++		+++	++
Galinsoga parviflora		•							•	+++
Gleichenia linearis						++	+++	+++	•	
Gomphrena celosioides	+	++			+				•	+
Heliotropium indicum	+	+	•	•	+	•	•	•	•	++
Hydrilla verticillata	•	++	•	•	•	+	+		+	+
Hymenachne actigluma						++	++			+
Hyptis brevipes		+			•	+	++		•	++
Hyptis capitata		+			+	++	++		•	++
Imperata cylindrica	+++	+++	++	++	+++	+++	+++	+	+++	+++
Ipomoea triloba	+	•		•					•	+++
Ischaemum barbatum		•						+++		
Ischaemum indicum	•	•	•	•	+++	•	•		•	+
Ischaemum muticum						++	++			+

Table 9 (continued)

Table 9 (continued)

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Ischaemum rugosum	+	•	•	•	•	+++	+		++	++
Lantana camara	+	+		•	•	+	•	•	•	++
Leersia hexandra	•	+	+	+	+	++	+	•	+	+
Lemna purpusilla		+	+	+	+	++		+	•	•
Leptochloa chinensis	+++	++	•	•	++	+++			++	++
Leucas cephalotes	+++									
Leucas zeylanica	++					+	++			+
Limnocharis flava	•	+	•	•	•	++	+	+	•	
Lindernia crustacea					•	++	++		•	•
Ludwigia adscendens	+	+	•	•	•	++			•	++
Ludwigia hyssopifolia	+++	++	•	•	•	++	•	•	•	+
Ludwigia octovalvis	+	•	•	•	•	•	+		+	++
Lygodium flexuosum					•	++	++		•	+
Marsilea minuta	+	+	+	+	+	+++			++	++
Marsilea quadrifolia	•	•	•	•	+++				•	+
Melastoma malabathricum		+	+	•	+	+++	++	+++	+	+
Melochia corchorifolia	+	•		•	•	+++			•	+
Mikania micrantha		•				+++	+++	++	++	+
Mimosa invisa	++	++	++	+	++	++	++		++	+++
Mimosa pigra	++	+++	++	+	+	++	++		++	
Mimosa pudica	+++	+	•	•	+	++	+++	++	+++	++
Mitracarpus villosus	+++	•							++	
Monochoria hastata					+	•(†)	+		+	
Monochoria vaginalis	++	++	+++	+++	++	+++	++	+++	+++	+++
Murdannia nudiflora	+	•			•	+		•	+	++
Najas graminea	•	+	+	•	•	++			•	+
Nephrolepis biserrata						++	+++	+++		++
Nymphaea lotus	•	+	+	•	+	++	+	+		
Oldenlandia corymbosa	+	•		•	•	++	++	•	•	+
Oryza rufipogon	++	+	•	•	•	+			+	•
Ottochloa nodosa	++	•				++			•	•
Oxalis corymbosa		+				++	++		•	
Panicum bisulcatum					+++					
Panicum repens	+	++	•	•	+++	++	++	+	+++	++
Panicum sarmentosum						+++	++		•	
Paspalum conjugatum	•	•	•	•	+++	+++	++	+	+++	++

(†) +++ in Sarawak

Scientific Name	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Paspalum distichum	•	•			•	•			+++	++
Paspalum scrobiculatum	•	•	•	•	•	++	++		•	+
Passiflora foetida	+	+	+		+	+++	+	++	•	+
Pennisetum spp.		++	++	++	++	++			+	
Pennisetum polystachyon		+	+	+	+	+++			++	++
Pennisetum purpureum		+	+	+	+	+	+		+	+
Pistia stratiotes	+	++	++	++	++	+	•	+	+	++
Portulaca oleracea	+	++		•	+	+	+		+	+++
Pteridium esculentum	+					+	+	+++		
Pueraria phaseoloides	+	++				•	++		•	+
Richardia braziliensis	++	+++							•	
Rotala indica	•	•	•	•	++	++			•	+
Rottboellia cochinchinensis	+	++	+		+	+			+++	+++
Sagittaria guayanensis	•	•	•	•	•	+++	+		•	
Salvinia cucullata		++	+	+	+	•			•	
Salvinia molesta						+++	+		+	++
Scirpus grossus	++	•	•	•	+	+++			•	+
Scirpus juncoides	++	•	•	•	•	++			+	•
Scirpus maritimus	•	•	•	•	•	•			•	+++
Scirpus supinus						++		++		+
Scleria sumatrensis					•	++	+	++		
Senna obtusifolia	•	•			•				•	+++
Sida acuta	+	+	+	+	+	•	+		+	++
Sphenoclea zeylanica	+	++	+	++	+	+++			+	++
Spilanthes filicaulis	+++									
Stachytarpheta indica		•				+	+		++	++
Stenochlaena palustris						++	++	+++	•	•
Striga asiatica	+	+				•	+		+++	•
Trianthema portulacastrum	+++	++		•	•				•	+++
Tridax procumbens	+	++		•	•	+	++		•	++
Typha angustifolia		++	+	+	+	+	+		+	+
Urena lobata		•			•				•	+++
Vernonia cinerea	•	•	•	•	•	+	++		•	++
Zoysia matrella	++	•				+	++	•		•

Table 9 (continued)

Table 10

In this table the 140 most important weeds listed in table 9 are arranged alphabetically in 5 groups according to the combined ratings they score for the region. The 40 species with the highest ratings (those with 10 and above) should be considered first for appropriateness as targets for classical biological control, followed next by the 78 species recording scores from 5 to 9. There are also 22 species listed from the lower end of the combined ratings scale. However these have all been rated by one country as +++ or by two countries as ++. Whereas not of high regional inportance, their local rating might well be justification for the particular countries concerned seeking support for a classical biological control approach for species from this group.

Table 10 Aggregated ratings for the most important weeds.

(a) Ratings 3 or 4 (but only if +++ in one country or ++ in two countries)

Brachiaria paspaloides	4	*Ischaemum indicum*	4
Centotheca lappacea	4	*Leucas cephalotes*	3
Centrosema pubescens	3	*Lindernia crustacea*	4
Digitaria longiflora	3	*Marsilea quadrifolia*	4
Digitaria violescens	4	*Melochia corchorifolia*	4
Echinochloa sp.	3	*Ottochloa nodosa*	4
Echinochloa oryzoides	3	*Panicum bisulcatum*	3
Fimbristylis globulosa	4	*Sagittaria guayanensis*	4
Galinsoga parviflora	3	*Senna obtusifolia*	3
Ipomoea triloba	4	*Spilanthes filicaulis*	3
Ischaemum barbatum	3	*Urena lobata*	3

(b) Ratings 5 to 9

Aeschynomene indica	5	*Lemna purpusilla*	7
Alternanthera sessilis	8	*Leucas zeylanica*	6
Asystasia gangetica	5	*Limnocharis flava*	5
Asystasia intrusa	5	*Ludwigia adscendens*	7
Axonopus compressus	6	*Ludwigia hyssopifolia*	8
Azolla pinnata	7	*Ludwigia octovalvis*	7
Boerhavia diffusa	7	*Lygodium flexuosum*	5
Borreria laevis	5	*Mitracarpus villosus*	5
Borreria latifolia	7	*Monochoria hastata*	6
Brachiaria mutica	6	*Murdannia nudiflora*	5
Celosia argentea	6	*Najas graminea*	5
Cenchrus echinatus	5	*Nymphaea lotus*	7
Chara zeylanica	5	*Oldenlandia corymbosa*	6
Chloris inflata	9	*Oryza rufipogon*	5
Cleome rutidosperma	8	*Oxalis corymbosa*	5
Cleome viscosa	6	*Panicum sarmentosum*	5
Clidemia hirta	5	*Paspalum distichum*	6
Commelina diffusa	8	*Paspalum scrobiculatum*	7
Crotolaria pallida	7	*Pennisetum purpureum*	8
Cyperus brevifolius	6	*Pteridium esculentum*	6
Cyperus compactus	5	*Pueraria phaseoloides*	6
Cyperus compressus	9	*Richardia braziliensis*	5
Cyperus imbricatus	5	*Rotala indica*	5
Cyperus kyllingia	7	*Salvinia cucullata*	5
Dactyloctenium aegyptium	8	*Salvinia molesta*	7
Digitaria sanguinalis	5	*Scirpus grossus*	7
Echinochloa glabrescens	5	*Scirpus juncoides*	5
Emilia sonchifolia	5	*Scirpus maritimus*	5
Eragrostis tenella	5	*Scirpus supinus*	5

Gleichenia linearis	8	*Scleria sumatrensis*	5
Gomphrena celosioides	5	*Sida acuta*	9
Heliotropium indicum	5	*Stachytarpheta indica*	6
Hydrilla verticillata	6	*Stenochlaena palustris*	7
Hymenachne actigluma	5	*Striga asiatica*	6
Hyptis brevipes	6	*Trianthema portulacastrum*	8
Hyptis capitata	8	*Tridax procumbens*	8
Ischaemum muticum	5	*Typha angustifolia*	9
Lantana camara	5	*Vernonia cinerea*	5
Leersia hexandra	9	*Zoysia matrella*	5

(c) Ratings 10 to 14

Amaranthus viridis	10	*Mikania micrantha*	11
Bidens pilosa	10	*Nephrolepis biserrata*	10
Commelina benghalensis	10	*Passiflora foetida*	11
Eclipta prostrata	13	*Pennisetum* spp.	11
Euphorbia heterophylla	10	*Pennisetum polystachyon*	11
Euphorbia hirta	10	*Pistia stratiotes*	14
Ischaemum rugosum	11	*Portulaca oleracea*	10
Leptochloa chinensis	14	*Rottboellia cochinchinensis*	12
Marsilea minuta	12	*Sphenoclea zeylanica*	14
Melastoma malabathricum	13		

(d) Ratings 15 to 19

Ageratum conyzoides	17	*Fimbristylis dichotoma*	16
Amaranthus spinosus	17	*Mimosa invisa*	18
Chromolaena odorata	18	*Mimosa pigra*	15
Cynodon dactylon	18	*Mimosa pudica*	17
Cyperus difformis	18	*Panicum repens*	16
Digitaria ciliaris	19	*Paspalum conjugatum*	15

(e) Ratings 20 and above

Cyperus iria	23	*Eleusine indica*	24
Cyperus rotundus	27	*Fimbristylis miliacea*	23
Echinochloa colona	28	*Imperata cylindrica*	26
Echinochloa crusgalli	21	*Monochoria vaginalis*	26
Eichhornia crassipes	20		

(f) Summary of ratings

	Number of species						
Family	Below 5	5 to 9	10 to 14	15 to 19	20 and above	Total	%(rounded)
Poaceae	10	17	5	4	4	40	29
Cyperaceae	1	10		2	3	16	12
Asteraceae	2	3	3	2		10	7
Fabaceae	2	3		3		8	6
Amaranthaceae		3	1	1		5	4
Rubiaceae		5				5	4
Lamiaceae	1	3				4	3
Onagraceae		3				3	2
Pontederiaceae		1			2	3	2
Species in Families with 1 or 2 spp.	6	30	10			46	33
Total species	22	78	19	12	9	140	

Table 11

In this table the origin, or presumed origin, of the most important weed species is listed, although the origin of many of the weeds is obscure, especially when they have been widespread for many hundreds of years. The information in at least two relevant, standard, botanical works is used as the basis for the entry for each species. This is often followed (in brackets) by a "best guess" in an attempt to localise, somewhat, the probable centre of origin. I am greatly indebted to L. Adams of the Australian National Herbarium for assisting in the search for relevant data. Where information is available on the occurence of host-specific natural enemies in one region — but not apparently elsewhere — this is taken as a strong indication of the region of origin of the weed and has been given precedence over standard botanical texts.

In the entries, Tropical America is taken as the zone between the tropics of Cancer and Capricorn. Central America is taken as (approximately) the central half of this zone. West Indies is used when attention is centered on the Caribbean. Old World tropics is taken as extending from tropical Africa eastwards as far as Papua New Guinea and Northern Australia. Pantropical is taken for the tropical belt of the world. Where entries occur such as (Africa?, India?) and (Europe?, India?) no information has been found to narrow the choice.

Where only a genus is listed in table 10 (as on 2 occasions) it is not possible to assign an origin to the unidentified weed and these weeds are omitted from table 11.

For additional comments see those introducing table 5.

Table 11 Origin of the Southeast Asian weeds scoring 5+ (or more) or at least +++ in one country or ++ in two countries.

	Species	Family	Origin
1.	*Aeschynomene indica*	Fabaceae	Asia, Old World tropics (Africa?)
2.	*Ageratum conyzoides*	Asteraceae	Tropical America
3.	*Alternanthera sessilis*	Amaranthaceae	Pantropical (Africa?)
4.	*Amaranthus spinosus*	Amaranthaceae	Tropical America (C. America?)
5.	*Amaranthus viridis*	Amaranthaceae	Eastern Asia
6.	*Asystasia gangetica*	Acanthaceae	Tropical Asia (India, Ceylon?)
7.	*Asystasia intrusa*	Acanthaceae	Tropical Asia
8.	*Axonopus compressus*	Poaceae	Tropical America (C. America?)
9.	*Azolla pinnata*	Azollaceae	Old World tropics (Australia?)
10.	*Bidens pilosa*	Asteraceae	Tropical America (C. America?)
11.	*Boerhavia diffusa*	Nyctaginaceae	Pantropical (SE Asia?)
12.	*Borreria laevis*	Rubiaceae	Tropical S. America (Venezuela?)
13.	*Borreria latifolia*	Rubiaceae	Tropical S. America (Brazil?)
14.	*Brachiaria mutica*	Poaceae	Africa (Tropical Africa?)
15.	*Brachiaria paspaloides*	Poaceae	Tropical Asia (India?)
16.	*Celosia argentea*	Amaranthaceae	Pantropical (Africa?)
17.	*Cenchrus echinatus*	Poaceae	Tropical and subtropical America (Brazil?)
18.	*Centotheca lappacea*	Poaceae	Tropical Asia (India?)
19.	*Centrosema pubescens*	Fabaceae	Tropical America (C. America?)
20.	*Chara zeylanica*	Characeae	Tropical Asia (Indonesia?)
21.	*Chloris inflata*	Poaceae	Tropical Asia (India?)
22.	*Chromolaena odorata*	Asteraceae	Tropical and South America
23.	*Cleome rutidosperma*	Capparidaceae	Africa (tropical West Africa?)
24.	*Cleome viscosa*	Capparidaceae	Old World tropics (Africa?)
25.	*Clidemia hirta*	Melastomataceae	Tropical America (C. America?)
26.	*Commelina benghalensis*	Commelinaceae	Old World tropics (Africa?)
27.	*Commelina diffusa*	Commelinaceae	Pantropical (India?)

(continued on next page)

	Species	Family	Origin
28.	*Crotolaria pallida*	Fabaceae	Old World tropics (Africa?)
29.	*Cynodon dactylon*	Poaceae	Africa
30.	*Cyperus brevifolius*	Cyperaceae	SE Asia (Indonesia?)
31.	*Cyperus compactus*	Cyperaceae	Tropical Asia (Indonesia?)
32.	*Cyperus compressus*	Cyperaceae	Pantropical (SE Asia?)
33.	*Cyperus difformis*	Cyperaceae	Old World tropics tropical Asia
34.	*Cyperus imbricatus*	Cyperaceae	Pantropical (India?)
35.	*Cyperus iria*	Cyperaceae	Asia
36.	*Cyperus kyllingia*	Cyperaceae	Tropical Asia (India?)
37.	*Cyperus rotundus*	Cyperaceae	India
38.	*Dactyloctenium aegyptium*	Poaceae	Old World tropics (Africa?)
39.	*Digitaria ciliaris*	Poaceae	Old World tropics (India?)
40.	*Digitaria longiflora*	Poaceae	Old World tropics (Africa?)
41.	*Digitaria sanguinalis*	Poaceae	Pantropical andtemperate (Europe?)
42.	*Digitaria violescens*	Poaceae	Pantropical (Brazil?)
43.	*Echinochloa colona*	Poaceae	India
44.	*Echinochloa crus-galli*	Poaceae	Europe, India
45.	*Echinochloa glabrescens*	Poaceae	Old World tropics (India?)
46.	*Echinochloa oryzoides*	Poaceae	S. Europe & W. Asia (Mediterranean?)
47.	*Eclipta prostrata*	Asteraceae	Asia
48.	*Eichhornia crassipes*	Pontederiaceae	South America
49.	*Eleusine indica*	Poaceae	India
50.	*Emilia sonchifolia*	Asteraceae	Old World tropics (India?)
51.	*Eragrostis tenella*	Poaceae	Old World tropics (India?)
52.	*Euphorbia heterophylla*	Euphorbiaceae	Tropical America (W. Indies?)
53.	*Euphorbia hirta*	Euphorbiaceae	Tropical America (C. America?)
54.	*Fimbristylis dichotoma*	Cyperaceae	Southeast Asia
55.	*Fimbristylis globulosa*	Cyperaceae	Tropical Asia (SE Asia?)
56.	*Fimbristylis miliacea*	Cyperaceae	Tropical America
57.	*Galinsoga parviflora*	Asteraceae	Tropical S. America (Peru?)
58.	*Gleichenia linearis*	Gleicheniaceae	Old World tropics (Australia?)
59.	*Gomphrena celosioides*	Amaranthaceae	Subtropical S. America (Paraguay, Uruguay?)
60.	*Hedyotis corymbosa*	Rubiaceae	Africa, India (Africa?)
61.	*Heliotropium indicum*	Boraginaceae	Tropical America (C. America?)
62.	*Hydrilla verticillata*	Hydrocharitaceae	Old World tropics (Australia?)
63.	*Hymenachne actigluma*	Poaceae	Tropical Asia (India?)
64.	*Hyptis brevipes*	Lamiaceae	Tropical America (Brazil?)
65.	*Hyptis capitata*	Lamiaceae	Tropical America (Brazil?)
66.	*Imperata cylindrica*	Poaceae	Tropical Asia
67.	*Ipomoea triloba*	Convolvulaceae	Tropical America (Brazil?)
68.	*Ischaemum barbatum*	Poaceae	Old World tropics (Indonesia?)
69.	*Ischaemum indicum*	Poaceae	Tropical Asia (Sri Lanka?)
70.	*Ischaemum muticum*	Poaceae	Tropical Asia (SE Asia?)
71.	*Ischaemum rugosum*	Poaceae	Southeast Asia
72.	*Lantana camara*	Verbenaceae	Tropical America (Brazil?)
73.	*Leersia hexandra*	Poaceae	Africa (N. Africa?)
74.	*Lemna purpusilla*	Lemnaceae	Pantropical and subtropical (SE Asia?)
75.	*Leptochloa chinensis*	Poaceae	Southeast Asia
76.	*Leucas capitata*	Lamiaceae	Tropical Asia (Pakistan?)
77.	*Leucas zeylanica*	Lamiaceae	Tropical Asia (SE Asia?)

Table 11 (continued)

	Species	Family	Origin
78.	*Limnocharis flava*	Butomaceae	Tropical America (C. America?)
79.	*Lindernia crustacea*	Scrophulariaceae	Old World tropics (SE Asia?)
80.	*Ludwigia adscendens*	Onagraceae	Tropical Asia (SE Asia?)
81.	*Ludwigia hyssopifolia*	Onagraceae	Old World tropics (India?)
82.	*Ludwigia octovalvis*	Onagraceae	Pantropical (SE Asia?)
83.	*Lygodium flexuosum*	Schizaceae	Old World tropics (Australia?)
84.	*Marsilea minuta*	Marsileaceae	Africa, Tropical Asia
85.	*Marsilea quadrifolia*	Marsileaceae	Europe, Asia (Mediterranean?)
86.	*Melastoma malabathricum*	Melastomataceae	Asia, PNG, N. Australia
87.	*Melochia concatenata*	Sterculiaceae	Tropical Asia (India, Ceylon?)
88.	*Mikania micrantha*	Asteraceae	Tropical America (C. America?)
89.	*Mimosa invisa*	Fabaceae	Tropical America (C. America?)
90.	*Mimosa pigra*	Fabaceae	Tropical America (C. America?)
91.	*Mimosa pudica*	Fabaceae	Tropical America (C. America?)
92.	*Mitracarpus villosus*	Rubiaceae	Tropical America (C. America?)
93.	*Monochoria hastata*	Pontederiaceae	Tropical Asia (SE Asia?)
94.	*Monochoria vaginalis*	Pontederiaceae	Asia, Africa
95.	*Murdannia nudiflora*	Commelinaceae	Old World tropics (India?)
96.	*Najas graminea*	Najadaceae	Old World tropics (India?)
97.	*Nephrolepis biserrata*	Nephrolepidaceae	Pantropical (Tropical Africa?)
98.	*Nymphaea lotus*	Nymphaceae	Africa (Tropical Africa?)
99.	*Oryza rufipogon*	Poaceae	Tropical Asia (India?)
100.	*Ottochloa nodosa*	Poaceae	Tropical Asia (India?)
101.	*Oxalis corymbosa*	Oxalidaceae	Tropical America (Brazil?)
102.	*Panicum bisulcatum*	Poaceae	E. and SE Asia (China, Japan?)
103.	*Panicum repens*	Poaceae	Tropical & North Africa S. Europe
104.	*Panicum sarmentosum*	Poaceae	SE Asia (Thailand)
105.	*Paspalum conjugatum*	Poaceae	Tropical America
106.	*Paspalum distichum*	Poaceae	Tropical America (C. America?)
107.	*Paspalum scrobiculatum*	Poaceae	Old World tropics (SE Asia?)
108.	*Passiflora foetida*	Passifloraceae	Tropical America
109.	*Pennisetum polystachyon*	Poaceae	Old World tropics
110.	*Pennisetum purpureum*	Poaceae	Old World tropics (Africa?)
111.	*Pistia stratiotes*	Araceae	Tropical America
112.	*Portulaca oleracea*	Portulacaceae	Asia, N. Africa (Mediterranean?)
113.	*Pteridium esculentum*	Dennstaedtiaceae	Australasia (Australia?)
114.	*Pueraria phaseoloides*	Fabaceae	Tropical Asia (SE Asia?)
115.	*Richardia braziliensis*	Rubiaceae	S. America (Brazil?)
116.	*Rotala indica*	Lythraceae	Tropical Asia (SE Asia)
117.	*Rottboellia cochinchinensis*	Poaceae	SE Asia, Africa
118.	*Sagittaria guayanensis*	Alismataceae	Old World tropics (SE Asia?)
119.	*Salvinia cucullata*	Salviniaceae	SE Asia (India?)
120.	*Salvinia molesta*	Salviniaceae	Southeast Brazil
121.	*Scirpus grossus*	Cyperaceae	Tropical Asia (SE Asia?)
122.	*Scirpus juncoides*	Cyperaceae	Old World tropics (SE Asia?)
123.	*Scirpus maritimus*	Cyperaceae	Pantropical (Africa?)
124.	*Scirpus supinus*	Cyperaceae	Pantropical (Africa?)
125.	*Scleria sumatrensis*	Cyperaceae	E. and SE Asia (Indonesia?)
126.	*Senna obtusifolia*	Fabaceae	Tropical America (C. America?)
127.	*Sida acuta*	Malvaceae	Tropical Asia (SE Asia?)
128.	*Sphenoclea zeylanica*	Sphenocleaceae	Tropical Africa
129.	*Spilanthes filicaulis*	Asteraceae	Tropical Africa (W. Africa)

	Species	Family	Origin
130.	*Stachytarpeta indica*	Verbenaceae	Tropical America (S. America, NW Africa?)
131.	*Stenochlaena palustris*	Blechnaceae	Old World tropics (Australia?)
132.	*Striga asiatica*	Scrophulariaceae	Tropical Asia (SE Asia?)
133.	*Trianthema portulacastrum*	Aizoaceae	Pantropical (SE Asia?)
134.	*Tridax procumbens*	Asteraceae	Tropical America (Mexico?)
135.	*Typha angustifolia*	Typhaceae	Tropical Asia (Indonesia?)
136.	*Urena lobata*	Malvaceae	Tropical Asia (SE Asia)
137.	*Vernonia cinerea*	Asteraceae	Old World tropics (India?)
138.	*Zoysia matrella*	Poaceae	Tropical Asia (SE Asia?)

Table 12

A summary is attempted in table 12 of the regions of the world where the most important weeds in Southeast Asia are generally held to have originated. However, there are many uncertainties and some of the weeds assigned to Africa may have originated further eastwards in the Old World tropics and some of those assigned to Asia may have originated well away from Southeast Asia. Nevertheless, the overall conclusion is probably valid, namely that some 44% (61 species) are exotic to the Southeast Asian region and might reasonably be assumed to be potential targets for classical biological control.

Of the 232 weeds nominated by correspondents, 138 (60%) are regarded as 'most important'. Of the latter 38 species (28%) are grasses, 23 of them probably native to Southeast Asia. Nine of the 138 most important weeds have been targets in biological control projects, with several successes; and 33 are listed amongst the 76 worst weeds in the world by Holm et al. (1977).

Table 12 Overview of the relationship and possible origin of the 138 most important weeds in Southeast Asia.

Family	Number of Species	Possible Origin			
		Americas	Africa	Asia	European
Poaceae	38	5	8	23	2
Cyperaceae	16	1	2	13	
Asteraceae	10	6	1	3	
Fabaceae	8	5	1	2	
Amaranthaceae	5	2	1	2	
Rubiaceae	5	4	1		
Lamiaceae	4	2		2	
Commelinaceae	3		1	2	
Onagraceae	3			3	
Pontederiaceae	3	1		2	
Acanthaceae	2			2	
Capparidaceae	2		2		
Euphorbiaceae	2	2			
Malvaceae	2			2	
Marsiliaceae	2		1		1
Melastomataceae	2	1		1	
Salviniaceae	2	1		1	
Scrophulariaceae	2			2	
Verbenaceae	2	2			
25 Families each with one weed	25	5	5	15	
Totals	138	37	23	75	3

Table 13

The major arthropod pests and weeds of individual crops in Southeast Asia

1. This table has been compiled from records of pests rated +, ++ and +++ provided by contributors from the region. It probably does not include some pest species that are important and may list some that might well be omitted. I would be most grateful if errors or ommisions could be brought to my attention.

2. Arthropod pests are listed (according to Order) alphabetically under the main part of the plant damaged. Sometimes more then one plant part is damaged, but the pest is only listed once under the most important part. Unfamiliarity with many of the pests may have led me to wrong allocations and I trust these will be pointed out.

3. The notations following each species relate to:

   (i) for insects: host range PP = very wide, P = wide, R = restricted (often to a single plant family), O = restricted to a few related species, blank = host range unknown.
   for plants: A = alga, B = broad leaf, F = fern, G = grass, S = sedge.

   (ii) the numeral before the square bracket is the sum of the ratings for that pest for the entire region. For polyphagous pests, the crop under which this rating appears may, in some instances, not be the one most affected by the pest.

   (iii) the numbers within the square brackets, but not within the curved brackets designate the countries from left to right in the tables — 1. Myanmar, 2. Thailand, 3. Laos, 4. Cambodia, 5. Vietnam, 6. Malaysia, 7. Singapore, 8. Brunei, 9. Indonesia, 10. Philippines.

   (iv) the numbers within the curved brackets designate the ratings (from tables 2 and 7) for the countries whose numbers precede the curved brackets. These ratings indicate the highest level assigned to <u>any</u> crop in that country; this may be higher than that for the particular crop under which the record appears, eg P20[1(1)2,3,4,5,6(2)7,9,10(3)] is a polyphagous pest with a regional score of 20 + 's. In Myanmar it scores +, in Thailand, Laos, Cambodia, Vietnam and Malaysia, it scores ++, in Singapore, Indonesia and Philippines +++ and there is no record for Brunei.

4. Where only arthropod pests are listed, no lists have been provided of weeds for that crop. I trust that relevant information will be provided for the next revision.

Table 13 (continued)

ACACIA
Acacia spp. (including *A. mangia*) MIMOSACEAE
Origin: Australia, Africa, Tropical America

Major arthropod pests			Regional ratings		
leaf eating	Lep	*Archips machlopis*	**R**	**1**	[6(1)]
		Crematopsyche pendula	**O**	**2**	[6,7(1)]
		Darna trima	**PP**	**4**	[2(2),6,9(1)]
		Neostaurops alternus	**P**	**4**	[9,10(2)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Setora nitens	**PP**	**6**	[2,3,5,6,7,8(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
stem boring	Col	*Araecerus fasciculatus*	**P**	**6**	[2,6,7,9(1)10(2)]
root and stem boring	Iso	*Coptotermes curvignathus*	**P**	**4**	[2(1)6(2)9(1)]
sucking	Hem	*Rastrococcus iceryioides*	**P**	**2**	[6(2)]

AVOCADO
Persea americana LAURACEAE
Origin: Central America

Major arthropod pests

leaf eating	Lep	*Attacus atlas*	**P**	**5**	[2,5,6,7,9(1)]
		Cricula trifenestrata	**P**	**4**	[2,4(1) 9(2)]
fruit damaging	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
stem boring	Col	*Niphonclea albata*		**2**	[10(2)]
		N. capito		**2**	[10(2)]
sucking	Hem	*Ferrisia virgata*	**P**	**4**	[2,4(1),10(2)]
	Thy	*Heliothrips haemorrhoidalis*	**P**	**2**	[2,4(1)]

BAMBOO
Bambusa spp. POACEAE
Origin: India, Asia

Major arthropod pests

leaf eating	Lep	*Hidari irrava*	**R**	**3**	[6(1)9(2)]
stem boring	Col	*Bostrychopsis parallella*	**R**	**2**	[10(2)]
		Chlorophorus annularis	**R**	**2**	[10(2)]
stem eating	Iso	*Macrotermes* spp.	**P**	**4**	[1,5,6,7(1)]
		M. gilvus	**P**	**2**	[10(2)]

BANANA
Musa spp. MUSACEAE
Origin: Southeast Asia

Major arthropod pests

leaf eating	Lep	*Amathusia phidippus*	**R**	**3**	[2,5,6(1)]
		Artona catoxantha	**R**	**5**	[2(1)6,9(2)]
		Attacus atlas	**P**	**5**	[2,5,6,7,9(1)]
		Calliteara horsfieldii	**P**	**1**	[6(1)]
		Erionota thrax	**O**	**7**	[3,4,5,6,7,8,10(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]

		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Scopelodes anthela		**2**	[5(2)]
		S. testacea		**2**	[5(2)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Col	*Adoretus compressus*	**PP**	**4**	[5,6,7,9(1)]
		Basilepta subcostatum	**P**	**2**	[5(2)]
		B. viridipenne	**P**	**1**	[2(1)]
	Ort	*Nomadacris succinata*	**P**	**6**	[2,3,5(2)]
		Valanga nigricornis	**P**	**4**	[6(1)7(2)10(1)]
tip boring	Lep	*Tiracola plagiata*	**P**	**2**	[2,6(1)]
stem,	Col	*Cosmopolites sordidus*	**R**	**13**	[2(1)5(3)6(2)7(1)8,9,10(2)]
root boring		*Odoiporus longicollis*	**O**	**5**	[2,4(1)5(2)6(1)]
fruit damaging	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		Aspidiotus destructor	**P**	**7**	[2,4,5,6,7,9,10(1)]
sucking	Hem	*Pentalonia nigronervosa*	**O**	**6**	[2,3,5,7(1)10(2)]
		Stephanitis typica	**P**	**3**	[2,5,7(1)]
Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Amaranthus lividus	**B**	**2**	[6(2)]
		A. spinosus	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)9(1)10(3)]
		Asystasia intrusa	**B**	**5**	[6(3)7(2)]
		Axonopus compressus	**G**	**6**	[2,6(1)7(2)9,10(1)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Cleome rutidosperma	**B**	**8**	[2(1)6(2)7(3)10(2)]
		Cyperus zollingeri	**S**	**4**	[6(2)7,8(1)
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5(2)6(3)7(2)9(3) 10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Erechtites hieracifolia	**B**	**3**	[6(2)7(1)]
		E. valerianaefolia	**B**	**3**	[6(2)7(1)]
		Erigeron sumatrensis	**B**	**2**	[6(2)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Ischaemum muticum	**G**	**5**	[6,7(2)10(1)]
		Melastoma malabathricum	**B**	**13**	[2,3,5(1)6(3)7(2)8(3)9,10(1)]
		Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]
		Mimosa invisa	**B**	**18**	[1,2,3(2)4(1)5,6,7,9(2)10(3)]
		M. pudica	**B**	**17**	[1(3),2,5(1)6(2)7(3)8(2)9(3)10(2)]
		Ottochloa nodosa	**G**	**4**	[1,6(2)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
		P. scrobiculatum	**G**	**7**	[6,7,8(2)10(1)]
		Passiflora foetida	**B**	**11**	[1,2,3,5(1)6(3)7(1)8(2)10(1)]
		Scleria sumatrensis	**S**	**5**	[6(2)7(1)8(2)]

BEAN
Phaseolus vulgaris FABACEAE
Origin: Mexico

Major arthropod pests

leaf eating	Lep	*Chrysodeixis eriosoma*	**P**	**5**	[4,5,6(1)10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Lamprosema diemenalis	**R**	**4**	[2,3,6,7(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Tiracola plagiata	**P**	**2**	[2,6(1)]
	Col	*Epilachna indica*	**R**	**1**	[7(1)]
leaf mining	Dip	*Chromatomyia horticola*	**P**	**3**	[6(3)]
		Ophiomyia phaseoli	**R**	**14**	[1,2(1)3,5,6(2)7(1)9(3)10(2)]

Table 13 (continued)

stem boring	Dip	*Melanagromyza sojae*	**R**	**5**	[2(1)5(3)9(1)]
		Anomis flava	**R**	**9**	[2,4(1)5(3),6,10(2)]
pod boring	Lep	*Maruca testulalis*	**R**	**17**	[1,2,3(1)4,5(3)6(2)7(1)8(3)9,10(1)
	Col	*Callosobruchus chinensis*	**R**	**8**	[1,2(1)5,6(2)7,9(1)]
Major weeds		*Amaranthus* spp.	**B**	**2**	[2(2)]
		Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Pueraria phaseoloides	**B**	**6**	(1(1)2,7(2)10(1)]

BREADFRUIT
Artocarpus altilis MORACEAE
Origin: Polynesia

Major arthropod pests

fruit damaging	Lep	*Glyphodes caesalis*	**R**	**7**	[5(3)6,7(1)8(2)]
	Col	*Araecerus fasciculatus*	**P**	**6**	[2,6,7,9(1)10(2)]
	Dip	*Bactrocera umbrosa*	**P**	**9**	[2(1)6(2)7(1)8(2)9(1)10(2)]
stem boring	Col	*Batocera rubus*	**P**	**4**	[2,5(1)10(2)]
root eating	Col	*Leucopholis irrorata*	**P**	**3**	[10(3)]
sucking	Hem	*Ferrisia virgata*	**P**	**4**	[2,4(1)10(2)]

CABBAGE (and other brassicas)
(a) *Brassica oleracea var capitata* (b) *Brassica chinensis* BRASSICACEAE
Origin: (a) head cabbage, Mediterranean; (b) chinese cabbage, eastern Asia.

Major arthropod pests

leaf eating	Lep	*Agrotis ipsilon*	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		A. segetum	**P**	**1**	[1(1)]
		Amsacta lactinea	**P**	**1**	[5(1)]
		Argyrogramma signata	**R**	**2**	[2,3(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Crocidolomia pavonana	**R**	**9**	[1,2,4,6(1)8(3)9(2)]
		Hellula undalis	**P**	**12**	[2,3,4,5(1)6(2)7(3)8(2)9(l)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Lyonetia sp.		**1**	[3(1)]
		Pieris canidia	**R**	**4**	[1(2),2,7(1)]
		Pieris rapae	**R**	**4**	[1(2)5,6(1)]
		Plutella xylostella	**R**	**30**	[1,2,3,4,5,6,7,8,9,10(3)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Spodoptera exigua	**PP**	**5**	[2(2)5(3)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3),7,8,9,10(2)]
		Tiracola plagiata	**P**	**2**	[2,6(1)]
		Trichoplusia ni	**R**	**7**	[1,2,4(2)5(1)]
	Col	*Phyllotreta cruciferae*	**P**	**2**	[6,7(1)]
		P. flexuosa	**R**	**3**	[2,3,6(1)]
		P. striolata	**R**	**5**	[1(1)5(3)7(1)]
		P. vittata	**R**	**1**	[9(1)]
leaf mining	Dip	*Chromatomyia horticola*	**P**	**3**	[6(3)]
		Liriomyza brassicae	**R**	**4**	[2(1)4(2)7(1)]
sucking	Hem	*Brevicoryne brassicae*	**R**	**6**	[2(1)5(3)10(2)]
		Eurydema pulchra	**R**	**2**	[2,3(1)]
		Lipaphis erysimi	**R**	**5**	[1,2,3,6,7(1)]
		Myzus persicae	**P**	**12**	[2,3(1)5(3)6(2)7(1)9,10(2)]

Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Amaranthus viridis	**B**	**10**	[1(1)2(3)3,4,5,7(1)10(2)]
		Bidens pilosa	**B**	**10**	[1(1)2(2)3,4,5(1)9,10(2)]
		Brachiaria reptans	**G**	**3**	[2(2)5(1)]
		Commelina diffusa	**B**	**8**	[2,7,9,10(2)]
		Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
		Cyperus rotundus	**S**	**28**	[1,2(3)3,4(2)5,6,7,8,9,10(3)]
		Echinochloa spp.	**G**	**3**	[2(3)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Panicum repens	**G**	**16**	[1(1)2(2)5(3)6,7(2)8(1)9(3)10(2)]
		Portulaca oleracea	**B**	**10**	[1(1)2(2)5,6,7,9(1)10(3)]

CAPSICUM
Capsicum annuum SOLANACEAE
Origin: South America

Major arthropod pests

fruit boring	Lep	*Agrotis ipsilon*	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6,(3)7(1)8(2)9,10(3)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
		B. dorsalis	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		B. latifrons	**R**	**6**	[2(1)6,8(2)9(1)]
root damaging	Col	*Anomala pallida*		**2**	[6,7(1)]
	Ort	*Gryllotalpa africana*	**P**	**5**	[2,6,8(1)10(2)]
sucking	Hem	*Aphis gossypii*	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Helopeltis theivora	**R**	**9**	[5(2)6(3)9,10(2)]
	Thy	*Scirtothrips dorsalis*	**P**	**5**	[1,2(2)6(1)]
		Thrips palmi	**P**	**12**	[1(1)2(2)6(3)7,8,9(1)10(3)]
		T. tabaci	**PP**	**9**	[1(1)2,5(2)7(1)10(3)]
	Aca	*Polyphagotarsonemus latus*	**P**	**6**	[1,2,6(1)7(2)9(1)]
		Tetranychus urticae	**PP**	**11**	[2(1)5,6(2)7(1)9(3)10(2)]

CARAMBOLA
Averrhoa carambola OXALIDACEAE
Origin: Indonesia

Major arthropod pests

leaf eating	Lep	*Lymantria lunata*	**P**	**2**	[10(2)]
		Diachrotricha fasciola	**O**	**1**	[6(1)]
		Porthesia scintillans	**P**	**3**	[2,5,7(1)]
fruit damaging	Lep	*Cryptophlebia* sp.	**P**	**2**	[6(2)]
		Conogethes punctiferalis	**P**	**13**	[2,3(1),4,5(3)6(2)9(1)10(2)]
	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		B. latifrons	**R**	**6**	[2(1)6,8(2)9(1)]
stem boring	Col	*Pterolophia bigibbera*		**1**	[10(1)]
sucking	Hem	*Ferrisia virgata*	**P**	**4**	[2,4(1)10(2)]
Major weeds		*Borreria latifolia*	**B**	**7**	[6(3)7,9(2)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5(2)6,7(2)9(3)10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]

Table 13 (continued)

		Panicum sarmentosum	**G**	**5** [6(3)7(2)]
		Paspalum conjugatum	**G**	**15** [5,6(3)7,8(2)9(3)10(2)]

CASHEW
Anacardium occidentale ANCARDIACEAE
Origin: Tropical America

Major arthropod pests

leaf eating	Lep	*Attacus atlas*	**P**	**5** [2,5,6,7,9(1)]
		Cricula trifenestrata	**P**	**4** [2,4(1)9(2)]
		Euproctis spp.		**1** [10(1)]
		Euthalia aconthea	**O**	**2** [5,6(1)]
		Hyperaeschrella insulicola	**R**	**1** [2(1)]
		Metanastria hyrtaca	**R**	**1** [2(1)]
		Parasa lepida	**PP**	**7** [2,5,6(1)9,10(2)]
	Col	*Lepidiota stigma*	**P**	**3** [2(1)9(2)]
leaf mining	Lep	*Acrocercops syngramma*	**O**	**1** [2(1)]
	Col	*Xylotrupes gideon*	**PP**	**4** [1,5(2)]
fruit damaging	Lep	*Nephopterix piratis*		**1** [1(9)]
	Dip	*Bactrocera dorsalis*	**PP**	**26** [1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
stem boring	Col	*Batocera rufomaculata*	**PP**	**2** [1,2(1)]
		Plocaderus ferrugineus	**R**	**1** [2(1)]
		Rhytidodera simulans	**R**	**5** [1,6,7,8,9(1)]
root damaging	Col	*Leucopholis rorida*	**P**	**1** [9(1)]
sucking	Hem	*Ferrisia virgata*	**P**	**4** [2,4(1)10(2)]
	Thy	*Rhipiphorothrips cruentatus*	**PP**	**1** [2(1)]

CASSAVA
Manihot esculenta EUPHORBIACEAE
Origin: Central America

Major arthropod pests

leaf eating	Lep	*Achaea janata*	**P**	**8** [1(1)2(2)3(1)4(2)5,6(1)]
		Calliteara horsfieldii	**P**	**2** [2,6(1)]
		Tiracola plagiata	**P**	**2** [2,6(1)]
	Ort	*Valanga nigricornis*	**P**	**4** [6(1)7(2)10(1)]
stem borer	Col	*Dorysthenes buqueti*	**P**	**1** [2(1)]
seedling	Iso	*Macrotermes* sp.	**P**	**4** [1,5,6,7(1)]
damaging	Col	*Lepidiota stigma*	**P**	**3** [2(1)9(2)]
sucking	Hem	*Aonidomytilus albus*	**R**	**1** [2(1)]
		Jacobiasca formosana	**P**	**3** [2,6,7(1]
		Ferrisia virgata	**P**	**4** [2,4(1)10(2)]
		Megymenum brevicornis	**P**	**2** [5,6(1)]
		Parasaissetia nigra	**P**	**1** [6(1)]
	Aca	*Oligonychyus coffeae*	**P**	**5** [2(2)5(3)]
		Tetranychus truncatus	**P**	**2** [2(2)]
		T. urticae	**PP**	**11** [2(1)5,6(2)7(1)9(3)10(2)]
Major weeds		*Ageratum conyzoides*	**B**	**17** [1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Amaranthus spinosus	**B**	**17** [1,2(3)3,4,5(1)6,7,(2)9(1)10(3)]
		Bidens pilosa	**B**	**10** [1(1)2(2)3,4,5(1)9,10(2)]
		Crotolaria pallida	**B**	**7** [2(2)3,4,5,7,10(1)]
		Cyperus rotundus	**S**	**27** [1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Digitaria ciliaris	**G**	**19** [1,2(2)3(1)4(3)5(2)6,7(2)9(3)10(2)]

		Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Euphorbia heterophylla	**B**	**10**	[1(1)2(3)3,4,5(1)6(2)10(1)]
		E. hirta	**B**	**10**	[2(2)3,4,5,6(1)7,10(2)]
		Imperata cylindrica	**G**	**26**	[1,2(3),3,4(2)5,6,7(3)8(1)9,10(3)]
		Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
		Tridax procumbens	**B**	**10**	[1(1)2(2)6(1)7,10(2)]

CASTOR
Ricinus communis EUPHORBIACEAE
Origin: Africa

Major arthropod pests

leaf eating	Lep	*Achaea janata*	**P**	**8**	[1(1)2(2)3(1)4(2)5,6(1)]
		A. serva	**R**	**1**	[1(3)]
		Ariadne ariadne	**O**	**2**	[5(2)]
		Darna trima	**PP**	**4**	[2(2)6,9(1)]
		Hyposidra talaca	**P**	**2**	[6,9(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Orgyia postica	**P**	**7**	[2,3,5,6,9(1)10(2)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Setora nitens	**P**	**6**	[2,3,5,6,7,8(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Tiracola plagiata	**P**	**2**	[2,6(1)]
	Col	*Anomala antiqua*	**P**	**6**	[1(3)2,5,9(1)]
		Anomala cupripes	**P**	**4**	[2,5,6,7(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
		Empoasca flavescens	**P**	**7**	[1(1)5(3)6(1)9(2)]
	Ort	*Valanga nigricornis*	**P**	**4**	[6(1)7(2)10(1)]
pod boring	Lep	*Conogethes punctiferalis*	**P**	**13**	[2,3(1)4,5(3)6(2)9(1)10(2)]
sucking	Hem	*Bemisia* spp.		**1**	[5(1)]
		Jacobiasca formosana	**R**	**3**	[2,6,7(1)]
		Trialeurodes rara	**R**	**1**	[4(1)]
		T. ricini	**R**	**2**	[2,4(1)]
	Aca	*Aceria tulipae*	**P**	6	[2(1)5(3)10(2)]
		Tetranychus truncatus	**P**	**2**	[2(2)]
Major weeds		*Digitaria sanguinalis*	**G**	**4**	[1,7(1)10(2)]
		Portulaca oleracea	**B**	**10**	[1(1)2(2)5,6,7,9(1)10(3)]

CEMPEDAK
Artocarpus champeden MORACEAE
Origin: Malaysia

Major arthropod pests

fruit damaging	Dip	*Bactrocera umbrosa*	**P**	**9**	[2(1)6(2)7(1)8(2)9(1)10(2)]
Major weeds		*Chromolaena odorata*	**B**	**18**	[1,2,3,4,5(2)6(3)9,10(2)]
		Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1),9,10(3)]
		Gleichenia linearis	**F**	**8**	[6(2)7,8(3)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Ischaemum muticum	**G**	**5**	[6,7(2)10(1)]
		I. rugosum	**G**	**11**	[1(1)6(3)7(1)8,9,10(2)]
		Melochia concatenata	**B**	**4**	[1(1)6(2)10(1)]
		Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]

Table 13 (continued)

Mimosa invisa	**B**	**18**	[1,2,3(2)4(1)5,6,7,9(2)10(3)]
Nephrolepis biserrata	**F**	**10**	[6(2)7,8(3)10(2)]
Ottochloa nodosa	**G**	**4**	[1,6(2)]
Panicum repens	**G**	**16**	[1(1)2(2)5(3)6,7(2)8(1)9(3)10(2)]
Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
P. scrobiculatum	**G**	**7**	[6,7,8(2)10(1)]

CHICK PEA, see Pigeon Pea for same pests

CHRYSANTHEMUM
Chrysanthemum indicum ASTERACEAE
Origin: China

Major arthropod pests

sucking	Hem	*Aphis gossypii*	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2)10(3)]
		Frankliniella occidentalis	**PP**	**1**	[6(1)]
		Myzus persicae	**P**	**12**	[2,3(1)5(3)6(2)7(1)9,10(2)]
	Aca	*Tetranychus* spp.	**P**	**8**	[1(1)5(2)6,7,8(1)10(2)]

CIKU
Achras sapota SAPOTACEAE
Origin: Southeast Asia

Major arthropod pest

leaf eating	Lep	*Achaea serva*	**R**	**1**	[3(1)]
	Col	*Anomala pallida*	**P**	**2**	[6,7(1)]
		Apogonia cribricollis	**R**	**1**	[7(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
shoot,	Lep	*Nephopterix piratis*		**1**	[9(1)]
fruit boring	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]

Major weeds	*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
	Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
	Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
	Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
	Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
	Ischaemum muticum	**G**	**5**	[6,7(2)10(1)]
	Melastoma malabathricum	**B**	**13**	[2,3,5(1)6(3)7(2)8(3)9,10(1)]
	Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]
	Mimosa pudica	**B**	**17**	[1(3)2,5(1),6(2)7(3)8(2)9(3)10(2)]
	Ottochloa nodosa	**G**	**4**	[1,6(2)]
	Panicum sarmentosum	**G**	**5**	[6(3)7(2)]
	Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
	P. scrobiculatum	**G**	**7**	[6,7,8(2)10(1)]

CINNAMON
Cinnamomum zeylanicum LAURACEAE
Origin: Sri Lanka, south west India

Major arthropod pests

leaf eating	Lep	*Adoxophyes privatana*	**P**	**1**	[7(1)]
		Archips tabescens	**P**	**1**	[6(1)]

		Attacus atlas	**P**	**5**	[2,5,6,7,9(1)]
		Calliteara horsfieldii	**P**	**1**	[6(1)]
		Cricula trifenestrata	**P**	**4**	[2,4(1)9(2)]
		Homona coffearia	**P**	**3**	[6,7,9(1)]
		Hyposidra talaca	**P**	**2**	[6,9(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Orgyia postica	**P**	**7**	[2,3,5,6,9(1)10(2)]
		Orgyia turbata	**P**	**2**	[2,6(1)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
sucking	Aca	*Eriophyes doctersi*	**O**	**1**	[9(1)]

CITRUS
Citrus spp. RUTACEAE
Origin: Southeast Asia, China, West Indies

Major arthropod pests

leaf eating	Lep	*Archips machlopis*	**R**	**1**	[6(1)]
		Archips micaceanus	**P**	**6**	[2(1)3(2)5,6,7(1)]
		Attacus atlas	**P**	**5**	[2,5,6,7,9(1)]
		Darna trima	**PP**	**4**	[2(2)6,7(1)]
		Mahasena corbetti	**R**	**5**	[2,6(2)7(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Papilio demoleus	**R**	**6**	[1,2,3,5,6,7(l)]
		P. polytes	**R**	**5**	[2,5,6,7,10(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,89,10(2)]
		Thosea sinensis	**P**	**5**	[2,3,5(1)10(2)]
		Tiracola plagiata	**P**	**2**	[2,6(1)]
	Col	*Apogonia cribricollis*	**R**	**1**	[7(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
	Ort	*Chondacris rosea*	**P**	**1**	[5(1)]
		Valanga nigricornis	**P**	**4**	[6(1)7(2)10(1)]
leaf mining	Lep	*Phyllocnistis citrella*	**R**	**16**	[1(1)2(3)3,4,5(2)6,7,8,9(1)10(2)]
fruit damaging	Lep	*Citripestis sagittiferella*	**R**	**6**	[2(1)6(2)7,8,9(1)]
		Ephestia cautella	**P**	**2**	[6,7(1)]
		Eudocima salaminia	**P**	**2**	[5(2)]
		Ophiusa coronata	**P**	**3**	[2(1)5(2)]
		Ophiusa tirhaca	**P**	**2**	[6(2)]
		Othreis fullonia	**P**	**6**	[2(1)5(2)6(1)8(2)]
		Prays endocarpa	**O**	**3**	[6(2)7(1)]
	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		Bactrocera latifrons	**R**	**6**	[2(1)6,8(2)9(1)]
stem boring	Lep	*Zeuzera coffeae*	**R**	**8**	[2,5,6,10(2)]
	Col	*Anoplophora chinensis*	**R**	**2**	[5(2)]
		Chelidonium sp.	**R**	**1**	[2(1)]
		C. argentatum	**R**	**2**	[5(2)]
	Iso	*Coptotermes havilandi*	**P**	**1**	[9(1)]
sucking	Hem	*Cataenococcus hispidus*	**P**	**2**	[2,6(1)]
		Ceroplastes rubens	**R**	**3**	[2,5,6(1)]
		Chrysomphalus aonidum	**P**	**3**	[1,2,5(1)]
		Coccus viridis	**P**	**7**	[2,4(1)5(2)7(1)9(2)]
		Diaphorina citri	**R**	**8**	[5(2)6,7(1)9,10(2)]
		Eysarcoris guttiger		**1**	[1(1)]
		Ferrisia virgata	**P**	**4**	[2,4(1)10(2)]
		Icerya pulchra		**1**	[6(1)]
		Icerya purchasi	**P**	**4**	[2,5,6,7(1)]

Table 13 (continued)

		I. seychellarum	**P**	**1**	[2(1)]
		Lepidosaphes beckii	**R**	**5**	[5,7(1)8(2)9(1)]
		Leptoglossus gonagra	**P**	**6**	[2,6(1)8,10(2)]
		Mictis longicornis	**P**	**3**	[6,7,8(1)]
		Parlatoria ziziphi	**R**	**2**	[4,5(1)]
		Planococcus citri	**P**	**7**	[2(1)5(3)6,8,9(l)]
		Rhynchocoris poseidon	**R**	**5**	[2,4(1)5(2)6(l)]
		Saissetia coffeae	**P**	**2**	[2,6(1)]
		Toxoptera aurantii	**P**	**6**	[2(1)6(2)7(1)10(2)]
		T. citricidus	**R**	**6**	[1,2,4,5,6,7(l)]
	Thy	*Scirtothrips dorsalis*	**P**	**5**	[1,2(2)6(1)]
	Aca	*Eotetranychus cendanai*	**R**	**3**	[2(3)]
		Eutetranychus africanus	**P**	**3**	[2(3)]
		Phyllocoptrupa oleivora	**R**	**4**	[2(3)6(1)]
		Tetranychus spp.	**P**	**8**	[1(1)5(2)6,7,8(1)10(2)]
Major weeds		*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Cyperus rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5(2)6,7(2)9(3)10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]
		Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]

CLOVE
Eugenia caryonhyllus MYRTACEAE
Origin: Moluccas

Major arthropod pests

leaf eating	Lep	*Cryptothelea variegata*	**PP**	**1**	[5(1)]
	Col	*Anomala cupripes*	**P**	**4**	[2,5,6,7(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
		Leucopholis rorida	**P**	**1**	[9(1)]
stem boring	Col	*Apoderus notatus*	**R**	**4**	[2,5(2)]
		Hexamitodera semivelutina	**O**	**2**	[9(2)]
		Nothopeus fasciatipennis	**O**	**2**	[9(2)]
sucking	Hem	*Icerya purchasi*	**P**	**4**	[2,5,6,7(1)]
		Lawana imitata	**R**	**1**	[5(1)]
		Saissetia coffeae	**P**	**2**	[2,6(1)]
Major weeds		*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
		Axonopus compressus	**G**	**6**	[2,6(1)7(2)9,10(1)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5(2)6,7(2)9(3)10(2)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]

COCOA
Theobroma cacao STERCULIACEAE
Origin: Central America

Major arthropod pests

leaf eating	Lep	*Achaea janata*	**P**	**8**	[1(1)2(2)3(1)4(2)5,6(1)]
		Adoxophyes privatana	**P**	**1**	[7(1)]

		Amsacta lactinea	**P**	**1**	[5(1)]
		Archips machlopis	**R**	**1**	[6(1)]
		Calliteara horsfieldii	**P**	**1**	[6(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Crematopsyche pendula	**O**	**2**	[6,7(1)]
		Cryptothelia variegata	**PP**	**1**	[5(1)]
		Darna diducta	**P**	**2**	[2,6(1)]
		Darna trima	**PP**	**4**	[2(2)6,9(1)]
		Hyposidra talaca	**P**	**2**	[6,9(1)]
		Mahasena corbetti	**R**	**5**	[2,6(2)7(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Orgyia postica	**P**	**7**	[2,3,5,6,9(1)10(2)]
		O. turbata	**P**	**2**	[2,6(1)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Setora nitens	**PP**	**6**	[2,3,5,6,7,8(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Col	*Anomala cupripes*	**P**	**4**	[2,5,6,7(1)]
		A. pallida	**P**	**2**	[6,7(1)]
		Apogonia cribricollis	**R**	**1**	[7(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
	Ort	*Valanga nigricornis*	**P**	**4**	[6(1)7(2)10(1)]
pod boring	Lep	*Archips machlopis*	**R**	**1**	[6(1)]
		Conogesthes punctiferalis	**P**	**13**	[2,3(1)4,5(3)6(2)9(1)10(2)]
		Conopomorpha cramerella	**R**	**7**	[2(1)6(3)9(1)10(2)]
husk boring	Lep	*Cryptophlebia encarpa*		**1**	[6(1)]
		Niphonclea albata		**2**	[10(2)]
stem boring	Lep	*Zeuzera coffeae*	**R**	**8**	[2,5,6,10(2)]
	Col	*Xyleborus* sp.		**1**	[5(1)]
		Xyleborus fornicatus		**1**	[6(1)]
		Xylosandrus compactus	**P**	**2**	[5(2)]
sucking	Hem	*Bemisia tabaci*	**PP**	**10**	[2(3)5,6(1)7(3)9(2)]
		Ferrisia virgata	**P**	**4**	[2,4(1)10(2)]
		Helopeltis bradyi	**R**	**1**	[9(1)]
		Helopeltis theivora	**R**	**9**	[5(2)6(3)9,10(2)]
		Icerya pulcher	**P**	**1**	[6(1)]
		Planococcus citri	**P**	**7**	[2(1)5(3)6,8,9(l)]
		Rastrococcus iceryioides	**P**	**2**	[6(2)]
		Toxoptera aurantii	**P**	**6**	[2(1)6(2)7(1)10(2)]
	Thy	*Heliothrips haemorrhoidalis*	**P**	**2**	[2,4(1)]
		Thrips hawaiiensis	**P**	**1**	[6(1)]
		Xylaplothrips sp.		**1**	[6(1)]
	Aca	*Aceria tulipae*	**P**	**6**	[2(1)5(3)10(2)]
		Tetranychus piercei	**P**	**2**	[4(2)]
Major weeds		*Achryanthes aspera*	**B**	**3**	[1,9,10(1)]
		Ageratum conyzoides	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Amaranthus spinosus	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)9(1)10(3)]
		A. viridis	**B**	**10**	[1(1)2(3)3,4,5,7(1)10(2)]
		Asystasia gangetica	**B**	**5**	[6(3)7(2)]
		Bidens pilosa	**B**	**10**	[1(1)2(2)3,4,5(1)9,10(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Brachiaria mutica	**G**	**6**	[6(2)7,9(1)10(2)]
		Centrotheca lappacea	**G**	**4**	[6,7(2)]
		Chromolaena odorata	**B**	**18**	[1,2,3,4,5(2)6(3)9(2)10(3)]
		Cleome rutidosperma	**B**	**8**	[2(1)6(2)7(3)10(2)]
		Clidemia hirta	**B**	**5**	[6,7(2)8(1)]
		Commelina benghalensis	**B**	**10**	[1(2)2(3)5(1)9,10(2)]
		C. diffusa	**B**	**8**	[2,7,9,10(2)]

Table 13 (continued)

Cyclosorus aridus	**F**	**4**	[6(2)7,10(1)]
Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
Cyperus compressus	**S**	**9**	[1(1)6,7,8,10(2)]
C. rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
Cyrtococcum oxyphyllum	**G**	**1**	[6(1)]
C. trigonum	**G**	**1**	[6(1)]
Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
D. sanguinalis	**G**	**3**	[7(1)10(2)]
D. violescens	**G**	**4**	[6,7(2)]
Echinocloa colonum	**G**	**24**	[1(2)2,3(3)4(2)5,6(3)7(2)9,10(3)]
Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
Hyptis capitata	**B**	**8**	[2,5(1)6,7,10(2)]
Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
Ipomoea triloba	**G**	**4**	[1(1)10(3)]
Ischaemum muticum	**G**	**5**	[6,7(2)10(1)]
Lantana camara	**B**	**5**	[1,2,6(1)10(2)]
Lygodium flexuosum	**B**	**5**	[6,7(2)10(1)]
Melastoma malabathricum	**B**	**13**	[2,3,5(1)6,7,8(3)9(1)]
Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]
Mimosa invisa	**B**	**18**	[1,2,3(2)4(1)5,6,7,9(2)10(3)]
M. pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
Nephrolepis biserrata	**F**	**10**	[6(2)7,8(3)10(2)]
Ottochloa nodosa	**G**	**4**	[1,6(2)]
Panicum repens	**G**	**16**	[1(1)2(2)5(3)6,7(2)8(1)9(3)10(2)]
Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
P. scrobiculatum	**G**	**7**	[6,7,8(2)10(1)]
Pennisetum purpureum	**G**	**8**	[2,3,4,5,6,7,9,10(1)]
Phyllanthus fraternus	**B**	**4**	[1,2(1)6(2)]
Portulaca oleracea	**B**	**10**	[1(1)2(2)5,6,7,9(1)10(3)]
Stenochlaena palustris	**F**	**7**	[6,7(2)8(3)]
Vernonia cinerea	**B**	**5**	[6(1)7(2)10(2)]

COCONUT
Cocos nucifera PALMAE
Origin: Southeast Asia, Pacific

Major arthropod pests

leaf eating	Lep	*Amathusia phidippus*	**R**	**3**	[2,5,6(1)]
		Archips machlopis	**R**	**1**	[6(1)]
		Artona catoxantha	**R**	**5**	[2(1),6,9(2)]
		Calliteara horsfieldii	**P**	**1**	[6(1)]
		Darna diducta	**P**	**2**	[2,6(1)]
		Darna trima	**PP**	**4**	[2(2)6,9(1)]
		Elymnias hypermestra	**R**	**1**	[5(1)]
		Hidari irava	**R**	**3**	[6(1),9(2)]
		Mahasena corbetti	**R**	**5**	[2(2)7(1)]
		Orgyia turbata	**P**	**2**	[2,6(1)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Setora nitens	**PP**	**6**	[2,3,5,6,7,8(1)]
		Thosea spp.	**P**	**3**	[7(1)10(2)]
		T. sinensis	**P**	**5**	[2,3,5(1)10(2)]
		T. vetusta	**P**	**1**	[6(1)]
	Col	*Anomala cupripes*	**P**	**4**	[2,5,6,7(1)]
		Anomala pallida	**P**	**2**	[6,7(1)]
		Apogonia cribricollis	**R**	**1**	[7(1)]
	Ort	*Sexava* spp.	**P**	**3**	[9(3)]

		Valanga nigricornis	**P**	**4**	[6(1)7(2)10(1)]
leaf mining	Col	*Plesispa reichei*	**O**	**3**	[2,6,7(1)]
		Promecotheca cumingii	**R**	**3**	[2,6,9(1)]
flower eating	Lep	*Tirathaba* sp.	**R**	**1**	[9(1)]
		T. rufivena	**R**	**2**	[2,6(1)]
shoot boring	Col	*Oryctes rhinoceros*	**O**	**17**	[2,3(2)4(1)5(3)6(2)7,8(1)9(3)10(2)]
		Rhynchophorus ferrugineus	**R**	**10**	[2,4(2)5(3)7,9,10(1)]
		R. schach	**R**	**4**	[2,6(2)]
		R. vulneratus	**R**	**1**	[2(1)]
		Xylotrupes gideon	**PP**	**4**	[1,5(2)]
stem boring	Iso	*Coptotermes curvignathus*	**P**	**4**	[2(1)6(2)9(1)]
root damaging	Col	*Adoretus compressus*	**PP**	**4**	[5,6,7,9(1)]
		Leucopholis rorida	**P**	**1**	[9(1)]
sucking	Hem	*Aleurodicus destructor*	**P**	**5**	[2,5,6,7,9(1)]
		Aspidiotus destructor	**P**	**7**	[2,4,5,6,7,9,10(l)]
		Chrysomphalus aonidum	**P**	**3**	[1,2,5(1)]
		Nipaecoccus nipae	**P**	**3**	[2(1)5(2)]
		Stephanitis typica	**P**	**3**	[2,5,7(1)]
Major weeds		*Achryanthes aspera*	**B**	**3**	[1,9,10(1)]
		Ageratum conyzoides	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Amaranthus spinosus	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)9(1)10(3)]
		A. viridis	**B**	**11**	[1(1)2(3)3,4,5,7(1)10(3)]
		Asystasia gangetica	**B**	**6**	[6,7(3)]
		Bidens pilosa	**B**	**10**	[1(1)2(2)3,4,5(1)9,10(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Brachiaria mutica	**G**	**6**	[6(2)7,9(1)10(2)]
		Centrotheca lappacea	**G**	**4**	[6,7(2)]
		Chromolaena odorata	**B**	**18**	[1,2,3,4,5(2)6(3)9(2)10(3)]
		Cleome rutidosperma	**B**	**8**	[2(1)6(2)7(3)10(2)]
		Clidemia hirta	**B**	**5**	[6,7(2)8(1)]
		Commelina benghalensis	**B**	**10**	[1(2)2(3)5(1)9,10(2)]
		C. diffusa	**B**	**8**	[2,7,9,10(2)]
		Cyclosorus aridus	**F**	**4**	[6(2)7,10(1)]
		Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
		Cyperus compressus	**S**	**7**	[1(1)6,7,10(2)]
		C. rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Cyrtococcum oxyphyllum	**G**	**1**	[6(1)]
		C. trigonum	**G**	**1**	[6(1)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
		D. sanguinalis	**G**	**5**	[1(1)7,10(2)]
		D. violescens	**G**	**4**	[6,7(2)]
		Echinocloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Hyptis capitata	**B**	**8**	[2,5(1)6,7(2)10(2)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Ipomoea triloba	**B**	**4**	[1(1)10(3)]
		Ischaemum muticum	**G**	**5**	[6,7(2)10(1)]
		Lantana camara	**B**	**5**	[1,2,6(1)10(2)]
		Lygodium flexuosum	**B**	**5**	[6,7(2)10(1)]
		Melastoma malabathricum	**B**	**13**	[2,3,5(1)6(3)7(2)8(3)9,10(1)]
		Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]
		Mimosa invisa	**B**	**18**	[1,2,3(2)4(1)5,6,7,9(2)10(3)]
		M. pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
		Nephrolepis biserrata	**F**	**10**	[6(2)7,8(3)10(2)]
		Ottochloa nodosa	**G**	**4**	[1,6(2)]
		Panicum repens	**G**	**16**	[1(1)2(2)5(3)6,7(2)8(1)9(3)10(2)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]

Table 13 (continued)

P. scrobiculatum	**G**	**7**	[6,7,8(2)10(1)]
Pennisetum purpureum	**G**	**8**	[2,3,4,5,6,7,9,10(1)]
Phyllanthus fraternus	**F**	**4**	[1,2(1)6(2)]
Portulaca oleracea	**B**	**10**	[1(1)2(2)5,6,7,9(1)10(3)]
Stenochlaena palustris	**F**	**7**	[6,7(2)8(3)]
Vernonia cinerea	**B**	**5**	[6(1)7(2)10(2)]

COFFEE

(a) *Coffea arabica* (b) *Coffea canephora* RUBIACEAE

Origin: (a) Ethiopia, (b) West Africa & Uganda

Major arthropod pests

leaf eating	Lep	*Cephonodes hylas*	**R**	**2**	[6,7(1)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
bean boring	Lep	*Ephestia cautella*	**P**	**2**	[6,7(1)]
	Col	*Araecerus fasciculatus*	**P**	**6**	[2,6,7,9(1)10(2)]
		Hypothenemus hampei	**R**	**12**	[2,3(1)5,6(2)8(1)9(2)10(3)]
stem boring	Lep	*Zeuzera coffeae*	**R**	**8**	[2,5,6,10(2)]
	Col	*Xylosandrus compactus*	**P**	**2**	[5(2)]
		Xylotreuchus quadripes	**R**	**5**	[2,3(1)5(3)]
sucking	Hem	*Coccus viridis*	**P**	**7**	[2,4(1)5(2)7(1)9(2)]
		Ferrisia virgata	**P**	**4**	[2,4(1)10(2)]
		Pseudococcus sp.	**P**	**3**	[2(1)5(2)]
		Saissetia coffeae	**P**	**2**	[2,6(1)]
		Toxoptera aurantii	**P**	**6**	[2(1)6(2)7(1)10(2)]

Major weeds	*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
	Axonopus compressus	**G**	**8**	[2(1)6,7(3)9(1)]
	Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
	Chromolaena odorata	**B**	**18**	[1,2,3,4,5(2)6(3)9(2)10(3)]
	Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
	Cyperus rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
	Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
	D.sanguinalis	**G**	**5**	[1(1)7,10(2)]
	Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
	Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
	Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]

CORKWOOD TREE

Sesbania cannabina FABACEAE

Origin: Asia

Major arthropod pests

leaf eating	Lep	*Eurema hecabe*	**R**	**2**	[5,7(1)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Spodoptera litura	**P**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
seed borer	Hym	*Bruchophagus mutabilis*		**3**	[5(3)]
sucking	Hem	*Aphis craccivora*	**P**	**15**	[1,2,3,4(1)5(3)6,7(1)8,9,10(2)]
		Coptosoma japonicum	**R**	**1**	[5(1)]
		Empoasca flavescens	**P**	**7**	[1(1)5(3)6(1)9(2)]
		Nezara viridula	**PP**	**10**	[1(2)2,3,4(1)5(2)6,7,9(1)]
		Piezodorus hybneri	**R**	**4**	[2,4,5,10(1)]

COTTON
Gossypium spp. MALVACEAE
Origin: Africa, Asia, Australia, America

Major insect pests

leaf eating	Lep	*Anomis flava*	**R**	**9**	[2,4(1)5(3)6,10(2)]
		Archips machlopis	**R**	**1**	[6(1)]
		Omphisa anastomosalis	**O**	**7**	[2,3(1)4(2)5,6,7(1)]
		Spodoptera exempta		**2**	[10(2)]
		S. exigua	**PP**	**5**	[2(2)5(3)]
		S. litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)
		Syllepte derogata	**R**	**6**	[1,2,4,5,6,7(1)]
	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
boll attacking	Lep	*Earias vittella*	**R**	**15**	[1,2(2)3,4(1)5,6(2)7(1)8,9(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Pectinophora gossypiella	**O**	**10**	[1(2)2,3,4,5(1)9,10(2)]
	Col	*Amorphoidea lata*	**O**	**1**	[10(1)]
		Araecerus fasciculatus	**P**	**6**	[2,5,6,9(1)10(2)]
stem boring	Lep	*Zeuzera coffeae*	**R**	**8**	[2,5,6,10(2)]
sucking	Hem	*Amrasca devastans*	**O**	**15**	[1(3)2(2)3(1)5,9,10(3)]
		Aphis gossypii	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Dysdercus cingulatus	**R**	**12**	[1,2,3(1)4(1)5(2)6,7(1)9,10(2)]
		Empoasca sp.	**P**	**7**	[2(2)4(3)6,7(1)]
		Nezara viridula	**PP**	**10**	[1(2)2,3,4(1)5(2)6,7,9(1)]
	Thy	*Scirtothrips dorsalis*	**P**	**5**	[1,2(2)6(1)]
		Thrips flavus		**1**	[2(1)]
Major weeds		*Cynodon dactylon*	**G**	**18**	[1,2(2)3,4(1)5(2)6(3)7(2)9(3)10(1)]
		Cyperus rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Dactyloctenium aegyptium	**G**	**8**	[1,2(2)7,9(1)10(2)]
		Digitaria sanguinalis	**G**	**5**	[1(1)7,10(2)]
		Echinochloa crusgalli	**G**	**21**	[2(3)3(1)4(2)5,6(3)7(2)9,10(3)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Leptochloa chinensis	**G**	**14**	[1(3)2,5(2)6(3)9,10(2)]
		Ludwigia hyssopifolia	**B**	**8**	[1(3)2,6(2)10(1)]
		Portulaca oleracea	**B**	**10**	[1(1)2(2)5,6,7,9(1)10(3)]
		Trianthema portulacastrum	**B**	**8**	[1(3)2(2)10(3)]
		Tridax procumbens	**B**	**8**	[1(1)2(2)6(1)7(2)10(2)]

COWPEA
Vigna unguiculata FABACEAE
Origin: North Africa

Major arthropod pests

leaf eating	Lep	*Adoxophyes privatana*	**P**	**1**	[7(1)]
		Agrius convolvuli	**P**	**7**	[2,4(1)5(2)6(1)9(2)]
		Aproaerema modicella	**R**	**11**	[1(2)2(1)3(2)4(3)6,9,10(1)]
		Archips machlopis	**R**	**1**	[6(1)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Homona coffearia	**P**	**3**	]6,7,9(1)]
		Hyposidra talaca	**P**	**2**	[6,9(1)]
		Lamprosema diemenalis	**R**	**4**	[2,3,6,7(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Orgyia turbata	**P**	**2**	[2,6(1)]

Table 13 (continued)

		Parasa lepida	**PP**	**7**	2,5,6(1)9,10(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Syllepte derogata	**R**	**6**	[1,2,4,5,6,7(1)]
		Tiracola plagiata	**P**	**2**	[2,6(1)]
	Col	*Anomala pallida*	**P**	**2**	[6,7(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
		Phyllotreta vittata	**R**	**1**	[9(1)]
	Ort	*Nomadacris succinata*	**P**	**5**	[2,3(2I)5(1)]
		Valanga nigricornis	**P**	**4**	[6(1)7(2)10(1)]
leaf mining	Dip	*Ophiomyia phaseoli*	**R**	**14**	[1,2(1)3,5,6(2)7(1)9(3)10(2)]
pod boring	Lep	*Euchrysops cnejus*	**R**	**5**	[6,7(1)10(3)]
		Lampides boeticus	**R**	**5**	[2(1)5(2)6,7(1)]
		Maruca testulalis	**R**	**17**	[1,2,3(1)4,5(3)6(2)7(1)8(3)9,10(1)]
	Col	*Callosobruchus chinensis*	**R**	**8**	[1,2(1)5,6(2)7,9(1)]
sucking	Hem	*Aphis craccivora*	**P**	**15**	[1,2,3,4(1)5(3)6,7(1)8,9,10(2)]
		Eysarcoris guttiger		**1**	[1(1)]
		Jacobiasca formosana	**P**	**3**	[2,6,7(1)]
		Leptocorisa acuta	**R**	**11**	[2,4(1)5,6(2)9(3)10(2)]
		Nezara viridula	**PP**	**10**	[1(2)2,3,4(1)5(2)6,7,9(1)]
Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Gomphrena celosioides	**B**	**5**	[1(1)2(2)5,10(1)]
		Richardia braziliensis	**B**	**5**	[1(2)2(3)]

CUCUMBER
Cucumis sativus CUCURBITACEAE
Origin: India

Major insect pests

leaf eating	Lep	*Amsacta lactinea*	**P**	**1**	[5(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
	Col	*Aulacophora foveicollis*	**R**	**4**	[1,2(1)6(2)]
		A. similis	**P**	**9**	[2,3(1)5(3)6,8(1)9(2)]
		Epilachna indica	**R**	**1**	[7(1)]
fruit damaging	Lep	*Diaphania indica*	**R**	**7**	[2,4(1)5(2)6,7,8(1)]
	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
sucking	Hem	*Aphis gossypii*	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9,10(2)]
		Megymenum brevicornis	**P**	**2**	[5,6(1)]
	Thy	*Haplothrips floricola*	**R**	**2**	[2(2)]
		Thrips palmi	**P**	**12**	[1(1)2(2)6(3)7,8,9(1)10(3)]

CUCURBITS
Cucumber: *Cucumis sativus*, India; melons: *Cucumis melo*, Africa; watermelon: *Citrullus lanatus*, Tropical & Subtropical Africa; pumpkin: *Cucurbita maxima*, South America; squash, marrow: *Cucurbita pepo*, Mexico; luffa: Asia. CUCURBITACEAE

Major arthropod pests

leaf eating	Lep	*Spoladea recurvalis*		**1**	[4(1)]
	Col	*Aulacophora femoralis*	**R**	**3**	[2(1)5(2)]
		A. flavomarginata	**O**	**3**	[6(2)8(1)]
		A. foveicollis	**R**	**4**	[1,2(1)6(2)]
		A. frontalis	**R**	**4**	[2,3,5,7(1)]

		A. lewisii		**1**	[6(1)]
		A. similis	**P**	**9**	[2,3(1)5(3)6,8(1)9(2)]
		Epilachna indica	**R**	**1**	[7(1)]
		E. 28-punctata	**R**	**8**	[1,2,5(2)6,9(1)]
		Rhaphidopalpa sp.		**1**	[4(1)]
fruit damaging	Lep	*Diaphania indica*	**R**	**7**	[2,4(1)5(2)6,7,8(1)]
	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
		B. tau		**3**	[2,5,8(1)]
sucking	Hem	*Aphis gossypii*	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Coridius fuscus	**R**	**2**	[5(2)]
		Leptoglossus gonagra	**P**	**6**	[2,6(1)8,10(2)]
		Megymenum brevicornis	**P**	**2**	[5,6(1)]
		Parabemisia myricae	**R**	**1**	[5(1)]
	Thy	*Haplothrips floricola*	**R**	**2**	[2(2)]
		Taeniothrips sp.	**R**	**3**	[5(3)]
		Thrips palmi	**P**	**12**	[1(1)2(2)6(3)7,8,9(1)10(3)]
		T. parvispinus	**P**	**4**	[6(1)9(3)]
	Aca	*Tetranychus* spp.	**P**	**8**	[1(1)5(2)6,7,8(1)10(2)]

CUSTARD APPLE
Annona squamosa ANNONACEAE
Origin: Central America

Major arthropod pests

leaf eating	Lep	*Archips micaceanus*	**P**	**6**	[2(1)3(2)5,6,7(1)]
		Attacus atlas	**P**	**5**	[2,5,6,7,9(1)]
sucking	Hem	*Aleurodicus destructor*	**P**	**5**	[2,5,6,7,9(1)]
		Cataenococcus hispidus	**P**	**2**	[2,6(1)]
		Planococcus citri	**P**	**7**	[2(1)5(3)6,8,9(1)]

DURIAN
Durio zibethinus BOMBACACEAE
Origin: Malaysia

Major arthropod pests

leaf eating	Lep	*Archips machlopis*	**R**	**1**	[6(1)]
		Archips micaceanus	**P**	**6**	[2(1)3(2)5,6,7(1)]
		Cremastopsyche pendula	**O**	**2**	[6,7(1)]
		Homona coffearia	**P**	**3**	[5,6,9(1)]
		Mahasena corbetti	**R**	**5**	[2,6(2)7(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Orgyia postica	**P**	**7**	[2,3,5,6,9(1)10(2)]
		Orgyia turbata	**P**	**2**	[2,6(1)]
		Oxyodes scrobiculata	**O**	**1**	[2(1)]
		Syllepte derogata	**R**	**6**	[1,2,4,5,6,7(1)]
	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
fruit damaging	Lep	*Conogethes punctiferalis*	**P**	**13**	[2,3(1)4,5(3)6(2)9(1)10(2)]
		Mudaria magniplaga		**2**	[6(2)]
stem boring	Lep	*Zeuzera coffeae*	**P**	**8**	[2,5,6,10(2)]
	Col	*Xyleborus apertus*	**R**	**2**	[8(2)]
sucking	Hem	*Allocarsidaria malayensis*	**O**	**5**	[2,6(2)7(1)]
		Aspidiotus destructor	**P**	**7**	[2,4,5,6,7,9,10(1)]
		Asterolecanium ungulatum		**2**	[8(2)]

Table 13 (continued)

		Icerya pulcher	**P**	**1**	[6(1)]
	Aca	*Eutetranychus africanus*	**P**	**3**	[2(3)]
Major weeds		*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Chromolaena odorata	**B**	**18**	[1,2,3,4,5(2)6(3)9(2)10(3)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Euphorbia heterophylla	**B**	**10**	[1(1)2(3)3,4,5(1)6(2)10(1)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]
		Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
		Ottochloa nodosa	**G**	**4**	[1,6(2)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
		P. scrobiculatum	**G**	**7**	[6,7,8(2)10(1)]

EGG PLANT
Solanum melongena SOLANACEAE
Origin: India

Major arthropod pests

leaf eating	Lep	*Acherontia lachesis*	**P**	**4**	[2,3,4,5(1)]
		Acherontia styx	**R**	**3**	[2,3,4(1)]
		Amsacta lactinea	**P**	**1**	[5(1)]
		Archips tabescens	**P**	**1**	[6(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Glyphodes pulverulentalis	**R**	**3**	[5(2)6(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Xanthodes transversa	**R**	**1**	[6(1)]
	Col	*Aulacophora similis*	**P**	**9**	[2,3(1)5(3)6,8(1)9(2)]
		Epilachna indica	**R**	**1**	[7(1)]
		Epilachna vigintioctopunctata	**R**	**8**	[1,2,5(2)6,9(1)]
fruit & stem boring	Lep	*Araecerus fasciculatus*	**P**	**6**	[2,5,6,9(1)10(2)]
		Leucinodes orbonalis	**R**	**15**	[1(2)2,3(1)4(2)5(3)6(2)7(1)8(3)]
fruit damaging	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
root eating	Col	*Anomala pallida*	**P**	**2**	[6,7(1)]
sucking	Hem	*Amrasca* sp.		**4**	[1(2)9(3)]
		Aphis gossypii	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Myzus persicae	**P**	**12**	[2,3(1)5(3)6(2)7(1)9,10(2)
		Planococcus citri	**P**	**7**	[2(1)5(3)6,8,9(1)]
		Urentius hystricellus	**O**	**2**	[4(2)]
	Thy	*Thrips flavus*		**1**	[2(1)]
		T. palmi	**P**	**12**	[1(1)2(2)6(3)7,8,9(1)10(3)]

FIG
Ficus spp. MORACEAE
Origin: Indo-Malaysia

Major Arthropod pests

leaf eating	Lep	*Asota* spp.	**O**	**1**	[9(1)]
		Euproctis spp.		**1**	[10(1)]
		Glyphodes caesalis	**R**	**7**	[5(3)6,7(1)8(2)]

		Tiracola plagiata	**P**	**2**	[2,6(1)]
	Col	*Apriona germari*	**R**	**2**	[3,5(1)]
		Batocera rubus	**P**	**4**	[2,5(1)10(2)]
sucking	Thy	*Gynaikothrips ficorum*	**O**	**1**	[2(1)]

GAMBIR
Uncaria gambir RUBIACEAE
Origin: Malaysia

Major arthropod pests

leaf eating	Lep	*Attacus atlas*	**P**	**5**	[2,5,6,7,9(1)]
		Dichocrocis megillalis	**O**	**1**	[9(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
sucking	Hem	*Pinnaspis aspidistrae*	**P**	**3**	[6(1)10(2)]

GARLIC
Allium sativum ALLIACEAE
Origin: Central Asia
see onion for pests.

GINGER
Zingiber officinale ZINGIBERACEAE
Origin: Southeast Asia

Major arthropod pests

leaf eating	Lep	*Spodoptera exempta*		**2**	[10(2)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Ort	*Nomadacris succinata*	**P**	**6**	[2,3,5(2)]
shoot & root boring	Lep	*Conogethes punctiferalis*	**P**	**13**	[2,3(1)4,5(3)6(2)9(1)10(2)]
sucking	Hem	*Dysmicoccus brevipes*	**P**	**10**	[4(1)5(3)6,9,10(2)]

GROUNDNUT (PEANUT)
Arachis hypogaea FABACEAE
Origin: South America

Major arthropod pests

leaf eating	Lep	*Adoxophyes privatana*	**P**	**1**	[7(1)]
		Agrotis ipsilon	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Amsacta lactinea	**P**	**1**	[5(1)]
		Archips tabescens	**P**	**1**	[6(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Hedylepta indicata	**R**	**7**	[2(1)3,5,10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Homona coffearia	**P**	**3**	[6,7,9(1)]
		Lamprosema diemenalis	**R**	**4**	[2,3,6,7(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Orgyia turbata	**P**	**2**	[2,6(1)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Spoladea recurvalis		**1**	[4(1)]

Table 13 (continued)

	Col	*Anomala* spp.		**7**	[1(3)5,10(2)]
		A. antiqua	**P**	**6**	[1(3)2,5,9(1)]
		A. varians		**2**	[1(2)]
		Epicauta maklini	**R**	**1**	[2(1)]
		Monolepta signata		**1**	[4(1)]
		Mylabris phalerata	**P**	**2**	[2,5(1)]
		Phyllotreta cruciferae	**P**	**2**	[6,7(1)]
		P. flexuosa	**R**	**3**	[2,3,6(1)]
		Platymycterus sieversi		**2**	[5(2)]
	Hym	*Dorylus orientalis*	**P**	**1**	[2(1)]
	Ort	*Valanga nigricornis*	**P**	**4**	[6(1)7(2)10(1)]
leaf mining	Lep	*Aproaerema modicella*	**R**	**11**	[1(2)2(1)3(2)4(3)6,9,10(1)]
	Dip	*Ophiomyia phaseoli*	**R**	**14**	[1,2(1)3,5,6(2)7(1)9(3)10(2)]
bean boring	Lep	*Etiella zinckenella*	**R**	**8**	[2(1)5(3)6(1)9(2)10(1)]
		Euchrysops cnejus	**R**	**5**	[6,7(1)10(3)]
		Maruca testulalis	**R**	**17**	[1,2,3(1)4,5(3)6(2)7(1)8(3)9,10(1)]
root feeding	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
	Iso	*Odontotermes* sp.	**P**	**1**	[2(1)]
sucking	Hem	*Aphis craccivora*	**P**	**15**	[1,2,3,4(1)5(3)6,7(1)8,9,10(2)]
		Nezara viridula	**PP**	**10**	[1(2)2,3,4(1)5(2)6,7,9(1)]
	Thy	*Caliothrips indicus*		**1**	[2(1)]
		Scirtothrips dorsalis	**P**	**5**	[1,2(2)6(1)]
	Aca	*Tetranychus kanzawai*	**P**	**1**	[6(1)]
		T. pierci	**P**	**2**	[4(2)]
Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Amaranthus spinosus	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)9(1)10(3)]
		Borreria articularis	**B**	**1**	[1(1)]
		Celosia argentea	**B**	**6**	[1,9,10(2)]
		Chloris inflata	**G**	**9**	[1(1)2(2)5(3)7(1)10(2)]
		Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
		Cyperus iria	**S**	**23**	[1,2(2)3(3)4(2)5,6(3)7(1)8(3)9, 10(2)]
		C. rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Dactyloctenium aegyptium	**G**	**8**	[1,2(2)7,9(1)10(2)]
		Digitaria sanguinalis	**G**	**5**	[1(1)7,10(2)]
		Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		Eclipta prostrata	**B**	**13**	[1(1)2,5(2)6(3)7(2)9(1)10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Mentha arvensis	**B**	**3**	[1(1)5(2)]
		Mitracarpus villosus	**B**	**5**	[1(3)9(2)]
		Panicum repens	**G**	**16**	[1(1)2(2)5(3)6,7(2)8(1)9(3)10(1)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
		Portulaca oleracea	**B**	**10**	[1(1)2(2)5,6,7,9(1)10(3)]
		Rottboellia cochinchinensis	**G**	**12**	[1(1)2(2)3,5,6(1)9,10(3)]
		Tridax procumbens	**B**	**8**	[1(1)2(2)6(1)7,10(2)]

GUAVA
Psidium guajava MYRTACEAE
Origin: West Indies, Central America

Major arthropod pests

leaf eating	Lep	*Amsacta lactinea*	**P**	**1**	[5(1)]
		Attacus atlas	**P**	**5**	[2,5,6,7,9(1)]
		Calliteara horsfieldii	**P**	**1**	[6(1)]

		Crematopsyche pendula	**O**	**2**	[6,7(1)]
		Lymantria monacha	**P**	**2**	[5(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
fruit damaging	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
		Bactrocera dorsalis	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		Bactrocera latifrons	**R**	**6**	[2(1)6,8(2)9(1)]
	Col	*Hypothenemus psidii*	**R**	**1**	[10(1)]
sucking	Hem	*Aleurodicus dispersus*	**P**	**22**	[1(2)2(3)3(2)5,6(3)7(1)8(3)9(2) 10(3)]
		Aphis gossypii	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2)10(3)
		Ferrisia virgata	**P**	**4**	[2,4(1)10(2)]
		Helopeltis theivora	**R**	**9**	[5(2)6(3)9,10(2)]
		Icerya seychellarum	**P**	**1**	[2(1)]
		Planococcus citri	**P**	**7**	[2(1)5(3)6,8,9(1)]
Major weeds		*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Lygodium flexuosum	**B**	**5**	[6,7(2)10(1)]
		Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]

IPOMOEA
Ipomoea aquatica CONVOLVULACEAE
Origin: Tropical Asia

Major arthropod pests

leaf eating	Lep	*Acherontia lachesis*	**P**	**4**	[2,3,4,5(1)]
		Agrius convolvuli	**P**	**7**	[2,4(1)5(2)6(1)9(2)]
		Agrotis ipsilon	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Col	*Aspidomorpha miliaris*	**R**	**4**	[2(1)5(2)9(1)]
stem boring	Lep	*Omphisa anastomosalis*	**O**	**7**	[2,3(1)4(2)5,6,7(1)]
sucking	Hem	*Acanthocoris scaber*	**P**	**2**	[5(2)]
		Aphis gossypii	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]

JACKFRUIT (NANGKA)
Artocarpus heterophyllus MORACEAE
Origin: India

Major arthropod pests

leaf eating	Lep	*Archips tabescens*	**P**	**1**	[6(1)]
		Darna diducta	**P**	**2**	[2,6(1)]
		Homona coffearia	**P**	**3**	[5,6,9(1)]
		Olene mendosa	**P**	**4**	[3,6(1)10(2)]
	Col	*Anomala* spp.		**7**	[1(3)5,10(2)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
		Lepidiota bimaculata	**R**	**1**	[5(1)]
bark boring	Lep	*Arbela dea*	**R**	**1**	[5(1)]
stem boring	Col	*Apriona germari*	**R**	**2**	[3,5(1)]
		Batocera rubus	**P**	**4**	[2,5(1)10(2)]

Table 13 (continued)

fruit damaging	Lep	*Glyphodes caesalis*	**R**	**7**	[5(3)6,7(1)8(2)]
	Col	*Araecerus fasciculatus*	**P**	**6**	[2,6,7,9(1)10(2)]
	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		B. umbrosa	**P**	**9**	[2(1)6(2)7(1)8(2)9(1)10(2)]
sucking	Hem	*Ferrisia virgata*	**P**	**4**	[2,4(1)10(2)]
		Toxoptera aurantii	**P**	**6**	[2(1)6(2)7(1)10(2)]
Major weeds		*Asytasia intrusa*	**B**	**5**	[6(3)7(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)
		Mimosa invisa	**B**	**18**	[1,2,3(2)4(1)5,6,7,9(2)10(3)]
		Ottochloa nodosa	**G**	**4**	[1,6(2)]

JUJUBA
Zizyphus mauritiana RHAMNACEAE
Origin: Africa, Asia

Major arthropod pests

leaf eating	Lep	*Achaea janata*	**P**	**8**	[1(1)2(2)3(1)4(2)5,6(1)]
		Archips micaceanus	**P**	**6**	[2(1)3(2)5,6,7(1)]
		Mythimna separata	**R**	**8**	[1(2)2(1)3,4(2)9(1)]
fruit boring		*Meridarchis scyrodes*	**O**	**1**	[2(1)]

JUTE
Corchorus capsularis TILIACEAE
Origin: China

Major arthropod pests

leaf eating	Lep	*Spodoptera litura*	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
stem boring	Col	*Apion collare*	**R**	**1**	[5(1)]
		A. corchori	**R**	**2**	[1(2)]
root eating	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
sucking	Hem	*Amrasca devastans*	**O**	**15**	[1(3)2(2)3(1)5,9,10(3)]
		Dysdercus cingulatus	**R**	**12**	[1,2,3,4(1)5(2)6,7(1)9,10(2)]
		Empoasca sp.	**P**	**7**	[2(2)4(3)6,7(1)]
	Aca	*Tetranychus urticae*	**PP**	**11**	[2(1)5,6(2)7(1)9(3)10(2)]

KAPOK
Ceiba pentandra BOMBACACEAE
Origin: Tropical America, West Africa to Southeast Asia

Major arthropod pests

leaf eating	Lep	*Mahasena corbetti*	**R**	**5**	[2,6(2)7(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
	Col	*Adoretus compressus*	**PP**	**4**	[5,6,7,9(1)]
		Hypomeces squamosos	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
fruit boring	Col	*Araecerus fasciculatus*	**P**	**6**	[1,6,7,9(1)10(2)]
stem boring	Lep	*Zeuzera coffeae*	**R**	**8**	[2,5,6,10(2)]
shoot boring	Col	*Alcidodes leeuweni*	**O**	**4**	[8,9(2)]
pod boring	Lep	*Mudaria variabilis*	**O**	**3**	[3(2)9(1)]
sucking	Hem	*Dysdercus cingulatus*	**R**	**12**	[1,2,3,4(1)5(2)6,7(1)9,10(2)]

KENAF (HEMP or JUTE)
Hibiscus cannabinus MALVACEAE
Origin: Africa

Major arthropod pests

leaf eating	Lep	*Agrotis ipsilon*	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Anomis flava	**R**	**9**	[2,4(1)5(3)6,10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Syllepte derogata	**R**	**6**	[1,2,4,5,6,7(1)]
	Col	*Platymycterus sieversi*		**2**	[5(2)]
root eating	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)
sucking	Hem	*Amrasca devastans*	**O**	**15**	[1(3)2(2)3(1)5,9,10(3)]
		Aphis gossypii	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Dysdercus cingulatus	**R**	**12**	[1,2,3,4(1)5(2)6,7(1)9,10(2)]
		Empoasca sp.	**P**	**7**	[2(2)4(3)6,7(1)]
Major weed		*Cenchrus echinatus*	**G**	**5**	[2,3,4,5,10(1)]

LETTUCE
Lactuca sativa COMPOSITAE
Origin: Middle East

Major arthropod pests

leaf eating	Lep	*Agrotis ipsilon*	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
leaf eating	Dip	*Chromatomyia horticola*	**P**	**3**	[6(3)]
sucking	Hem	*Aphis gossypii*	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]

LEUCAENA
Leucaena leucocephala MIMOSACEAE
Origin: South America

Major arthropod pest

sucking	Hem	*Heteropsylla cubana*	**O**	**23**	[1(1)2,3,4,5(3)6(2)7(1)8(3)9,10(2)]

LITCHI
Litchi chinensis SAPINDACEAE
Origin: China

Major arthropod pests

fruit borer	Lep	*Conopomorpha sinensis*	**R**	**1**	[2(1)]
stem borer	Lep	*Cossus* sp.	**R**	**1**	[2(1)]
sucking	Hem	*Leptoglossus gonagra*	**P**	**6**	[2,6(1)8(3)10(2)]
		Tessaratoma papillosa	**R**	**2**	[2(2)]
	Aca	*Aceria litchi*	**O**	**1**	[2(1)]

Table 13 (continued)

LONGAN
Euphoria longana
Origin: India

Major arthropod pests

leaf eating	Lep	*Oxyodes scrobiculata*	**O**	**1**	[2(1)]
		Statherotis discana	**O**	**1**	[3(1)]
	Col	*Anomala pallida*	**R**	**2**	[6,7(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
flower eating	Lep	*Conogethes punctiferalis*	**P**	**13**	[2,3(1)4,5(3)6(2)9(1)10(2)]
		Eublemma abrupta	**O**	**2**	[2,6(1)]
		Eublemma brachygonia	**O**	**2**	[2,6(1)]
		Eublemma versicolor	**O**	**2**	[2,6(1)]
fruit borer	Lep	*Conopomorpha sinensis*	**R**	**1**	[2(1)]
		Othreis fullonia	**P**	**6**	[2(1)5(2)6(1)8(2)]
stem borer	Lep	*Cossus* sp.	**R**	**1**	[2(1)]
sucking	Hem	*Lohita grandi*		**1**	[2(1)]
		Tessaratoma javanica	**R**	**1**	[2(1)]

LUFFA (Smooth)
Luffa cylindrica
Origin: Asia

Major arthropod pests

leaf eating	Col	*Aulacophora foveicollis*	**R**	**4**	[1,2(1)6(2)]
		A. lewisi		**1**	[6(1)]
		A. similis	**P**	**9**	[2,3(1)5(3)6,8(1)9(2)]
fruit damaging	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]

MAIZE (corn)
Zea mays POACEAE
Origin: South America

Major arthropod pests

leaf eating	Lep	*Agrotis ipsilon*	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Agrotis segetum	**P**	**1**	[1(1)]
		Amsacta lactinea	**P**	**1**	[5(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Cnaphalocrocis medinalis	**R**	**16**	[1(1)4(2)5(3)6(2)8,9(3)10(2)]
		Mythimna sp.		**2**	[1,5(1)]
		M. separata	**R**	**8**	[1(2)2(1)3,4(2)9(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Orgyia postica	**P**	**7**	[2,3,5,6,9(1)10(2)
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Spodoptera spp.		**1**	[10(1)]
		S. litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)
ear boring	Lep	*Helicoverpa armigera*	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
	Col	*Adoretus compressus*	**PP**	**4**	[5,6,7,9(1)]
		Adoretus sinicus	**PP**	**4**	[2(1)5(2)6(1)]
	Ort	*Cyrtacanthacris tartarica*	**P**	**1**	[5(1)]
		Hieroglyphus banian	**R**	**4**	[2,3,4,5(1)]

		Nomadacris succinata	**P**	**6**	[2,3,5(2)
		Valanga nigricornis	**P**	**4**	[6(1)7(2)10(1)]
stem boring	Lep	*Chilo polychrysus*	**R**	**7**	[2,3(1)4(2)5,6,9(1)]
		Chilo suppressalis	**R**	**13**	[2,3,4(1)5(2)6(1)8(2)9(3)10(2)]
		Ostrinia furnacalis	**P**	**17**	[2(1)4(2)5,6,8(3)9(2)10(3)]
		O. nubilalis	**O**	**4**	[2(1)9(3)]
		Sesamia inferens	**R**	**12**	[1,2,4,5,6(1)8(2)9(3)10(2)]
seedling attacking	Dip	*Atherigona oryzae*	**O**	**4**	[5(1)9(2)10(1)]
seed attacking	Col	*Carpophilus hemipterus*	**P**	**3**	[2(1)5(2)]
root attacking	Col	*Anomala cupripes*	**P**	**4**	[2,5,6,7(1)]
		Leucopholis irrorata	**P**	**3**	[10(3)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
sucking	Hem	*Melanaphis sacchari*	**R**	**3**	[2,6,7(1)]
		Rhopalosiphum maidis	**R**	**9**	[2,3,4(1)5(2)6,7(1)10(2)]
		R. padi	**R**	**1**	[3(1)]
		Scotinophara coarctata	**R**	**8**	[2(1)5,6(2)8(1)10(2)]
	Thy	*Frankliniella williamsi*	**R**	**1**	[2(1)]
		Thrips hawaiiensis	**P**	**1**	[6(1)]
Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Alternantherus sessilis	**B**	**8**	[1,2,5,6(1)7,10(2)]
		Amaranthus spinosus	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)9(1)10(2)]
		A. viridus	**B**	**11**	[1(1)2(3)3,4,5,7(1)10(3)]
		Bidens pilosa	**B**	**10**	[1(1)2(2)3,4,5(1)9,10(2)]
		Boerhavia diffusa	**B**	**7**	[1(1)2,7,10(2)]
		Borreria laevis	**B**	**5**	[6(1)7(2)9,10(1)]
		Brachiaria distachya	**G**	**3**	[6(1)10(2)]
		B. reptans	**G**	**3**	[2(2)5(1)]
		Calpogonium mucunoides	**B**	**4**	[6,7(1)10(2)]
		Celosia argentea	**B**	**6**	[1,9,10(2)]
		Cenchrus echinatus	**G**	**5**	[2,3,4,5,10(1)]
		Chloris inflata	**G**	**9**	[1(1)2(2)5(3)7(1)10(2)]
		Chromolaena odorata	**B**	**18**	[1,2,3,4,5(2)6(3)9(2)10(3)]
		Cleome rutidosperma	**B**	**8**	[2(1)6(2)7(3)10(2)]
		C. viscosa	**B**	**6**	[1,6(1)7,10(2)]
		Commelina benghalensis	**B**	**10**	[1(2)2(3)7,9,10(2)]
		C. diffusa	**B**	**8**	[2,7,9,10(2)]
		Convolvulus arvensis	**B**	**2**	[1(2)]
		Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
		Cyperus difformis	**S**	**18**	[1,2,3(1)4(2)5,6(3)7(2)8,9(1)10(3)]
		C. iria	**S**	**23**	[1,2(2)3(3)4(2)5,6(3)7(1)8(3)9, 10(2)]
		C. kyllingia	**S**	**7**	[5,6(2)7(1)10(2)]
		C. rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Dactyloctenium aegyptium	**G**	**8**	[1,2(2)7,9(1)10(2)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
		D. sanguinalis	**G**	**5**	[1(1)7,10(2)]
		Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		E. crusgalli	**G**	**21**	[2(3)3(1)4(2)5,6(3)7(2)8(1)9,10(3)]
		E. glabrescens	**G**	**5**	[4(2)8(1)10(2)]
		Eclipta prostrata	**B**	**13**	[1(1)2,5(2)6(3)7(2)9(1)10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Euphorbia heterophylla	**B**	**10**	[1(1)2(3)3,4,5(1)6(2)10(1)]
		E. hirta	**B**	**10**	[2(2)3,4,5,6(1)9,10(2)]
		Heliotropium indicum	**B**	**5**	[1,2,5(1)10(2)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Ipomoea triloba	**G**	**4**	[1(1)10(3)]

Table 13 (continued)

Ischaemum indicum	G	4	[5(3)10(1)]
I. rugosum	G	11	[1(1)6(3)7(1)8,9,10(2)]
Leptochloa chinensis	G	14	[1(3)2,5(2)6(3)9,10(2)]
Ludwigia octovalvis	B	7	[1,7(1)9(3)10(2)]
Mimosa invisa	B	18	[1,2,3(2)4(1)5,6,7,9(2)10(3)]
M. pudica	B	17	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
Panicum repens	G	16	[1(1)2(2)5(3)6,7(2)8(1)9(3)10(2)]
Paspalum conjugatum	G	15	[5,6(3)7,8(2)9(3)10(2)]
P. distichum	G	6	[8(1)9(3)10(2)]
Pennisetum polystachyon	G	11	[2,3,4,5(1)6(3)9(2)10(2)]
Phyllanthus fraternus	B	4	[1,2(1)6(2)]
Physalis angulata	B	2	[1,2(1)]
Portulaca oleracea	B	10	[1(1)2(2)5,6,7,9(1)10(3)]
Rottboellia cochinchinensis	G	12	[1(1)2(2)3,5,6(1)9,10(3)]
Striga asiatica	B	6	[1,2,7(1)9(3)]
Trianthemum portulacastrum	B	8	[1(3)2(2)10(3)]

MANGO
Mangifera indica ANACARDIACEAE
Origin: Indo-Myanmar

Major arthropod pests

leaf eating	Lep	*Archips micaceanus*	P	7	[2(1)3(2)5,6(1)7(2)]
		Crematopsyche pendula	O	2	[6,7(1)]
		Euthalia aconthea	O	2	[5,6(1)]
		Orgyia postica	P	7	[2,3,5,6,9(1)10(2)]
		Parasa lepida	PP	7	[2,5,6(1)9,10(2)
		Porthesia scintillans	P	3	[2,5,6(1)]
		Setora nitens	PP	6	[2,3,5,6,7,8(1)]
		Thosea spp.	P	3	[7(1)10(2)]
		Thosea sinensis	P	5	[2,3,5(1)10(2)]
	Col	*Anomala cupripes*	P	4	[2,5,6,7(1)]
		Apoderus crenatus	R	2	[2(2)]
		A. notatus	R	4	[2,5(2)]
		Deporaus marginatus	O	6	[1,2(2)6,7(1)]
		Hypomeces squamosus	P	14	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
		Lepidiota stigma	P	3	[2(1)9(2)]
		Leucopholis rorida	P	1	[9(1)]
	Ort	*Valanga nigricornis*	P	4	[1(6)7(2)10(1)]
leaf mining	Dip	*Erosomyia mangiferae*	O	1	[2(1)]
		Raodiplosis orientalis		2	[1,3(1)]
fruit damaging	Lep	*Eudocima salaminia*	P	2	[2(6)]
		Noorda albizonalis	O	3	[2(1)10(2)]
		Othreis fullonia	P	6	[2(1)5(2)6(1)8(2)]
	Dip	*Bactrocera dorsalis*	PP	26	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		Bactrocera latifrons	R	6	[2(1)6,8(2)9(1)]
seed damaging	Col	*Sternochetus frigidus*	O	6	[2,6,7(1)8(3)]
		S. goniocnemis	O	1	[4(1)]
		S. mangiferae	O	2	[2,6(1)]
shoot and stem boring	Lep	*Chlumetia transversa*	R	8	[2,6(2)7(1)9(2)10(1)]
	Col	*Niphonclea albata*		2	[10(2)]
		N. capito		2	[10(2)]
		Olenecamptus bilobus		1	[5(1)]
		Plocaderus fulvicornis	R	1	[5(1)]
		P. pedestris	R	1	[1(1)]

		Rhytidodera simulans	**R**	**5**	[1,6,7,8,9(1)]
	Iso	*Coptotermes curvignathus*	**P**	**4**	[2(1)6(2)9(1)]
sucking	Hem	*Amritodus atkinsoni*	**O**	**5**	[1(2)2(3)]
		Aulacaspis tuberculatus	**O**	**2**	[5(2)]
		Ceroplastes rubens	**R**	**3**	[2,5,6(1)]
		Idioscopus clypealis	**P**	**10**	[1(1)2(3)4,7,9(1)10(3)]
		I. nitidulus	**P**	**5**	[6(2)10(3)]
		I. niveosparsus	**P**	**17**	[1(1)2,3(3)4(1)5(3)6(2)9(1)10(3)]
		Mictis longicornis	**P**	**3**	[6,7,8(1)]
		Rastrococcus spinosus	**P**	**2**	[2,6(1)]
	Thy	*Scirtothrips dorsalis*	**P**	**5**	[1,2(2)6(1)]
	Aca	*Aceria mangiferae*	**O**	**2**	[2(2)]
		Oligonychus mangiferus	**R**	**4**	[2(3)7(1)]
Major weeds		*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Mimosa invisa	**B**	**18**	[1,2,3(2)4(1)5,6,7,9(2)10(3)]
		M. pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]

MANGOSTEEN
Garcinia mangostana GUTTIFERAE
Origin: Malaysia

Major arthropod pests

leaf feeding	Lep	*Hyposidra talaca*	**P**	**2**	[6,9(1)]
leaf mining	Lep	*Phyllocnistis citrella*	**R**	**16**	[1(1)2(3)3,4,5(2)6,7,8,9(1)10(2)]
sucking	Hem	*Toxoptera aurantii*	**P**	**6**	[2(1)6(2)7(1)10(2)]
Major weeds		*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Mimosa invisa	**B**	**18**	[1,2,3(2)4(1)5,6,7,9(2)10(3)]
		M. pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]

MARROW
Cucurbita pepo CUCURBITACEAE
Origin: Asia

see Pumpkin for pests

MULBERRY
Morus spp. MORACEAE
Origin: China, Asia

Major arthropod pests

leaf eating	Lep	*Archips micaceanus*	**P**	**7**	[2(1)3(2)5,6(1)7(2)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Glyphodes pulverulentalis	**R**	**3**	[5(2)6(1)]
		Orgyia postica	**P**	**7**	[1,2,5,6,9(1)10(2)]
		Orgyia turbata	**P**	**2**	[2,6(1)]

Table 13 (continued)

		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Phthorardria atrilineata		**2**	[5(2)]
	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
stem boring	Col	*Apriona germari*	**R**	**2**	[3,5(1)]
		Ceresium sinicum	**R**	**1**	[5(1)]
		Epepeotes uncinatus	**O**	**1**	[1(1)]
		Platymycterus sieversi		**2**	[5(2)]
sucking	Hem	*Bemisia* sp.		**1**	[5(1)]
		Parasaissetia nigra	**P**	**1**	[6(1)]
		Pseudaulacaspis pentagona	**P**	**1**	[7(1)]

NOSEBERRY
Achras zapota SAPOTACEAE

Major arthropod pests

leaf eating	Lep	*Achaea serva*	**R**	**1**	[3(1)]
	Col	*Anomala pallida*	**P**	**2**	[6,7(1)]
		Apogonia cribricollis	**R**	**1**	[7(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
leaf mining	Lep	*Acrocercops symbolopis*	**O**	**1**	[2(1)]
fruit boring	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
sucking	Hem	*Coccus viridis*	**P**	**7**	[2,4(1)5(2)7(1)9(2)]

NUTMEG
Myristica fragrans MYRISTICACEAE
Origin: Moluccas

Major arthropod pests

fruit damaging	Col	*Araecerus fasciculatus*	**P**	**6**	[2,6,7,9(1)10(2)]
		Oryzaephilus surinamensis	**P**	**2**	[7,9(1)]
stem boring	Col	*Batocera hercules*		**1**	[9(1)]
		Xyleborus fornicatus		**1**	[6(1)]

Major weeds	*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
	Axonopus compressus	**G**	**8**	[2(1)6,7(3)9(1)]
	Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
	Ischaemum muticum	**G**	**5**	[6,7(2)10(1)]
	Ottochloa nodosa	**G**	**4**	[1,6(2)]
	Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]

OIL PALM
Elaeis guineensis PALMAE
Origin: West Africa

Major arthropod pests

leaf eating	Lep	*Amathusia phidippus*	**R**	**3**	[2,5,6(1)]
		Artona catoxantha	**R**	**5**	[2(1)6,7(2)]
		Calliteara horsfieldii	**P**	**1**	[6(1)]
		Crematopsyche pendula	**O**	**2**	[6,7(1)]
		Darna diducta	**P**	**2**	[1,6(1)]
		Darna furva	**P**	**1**	[2(1)]
		D. trima	**PP**	**4**	[2(2)6,9(1)]

		Elymnias hypermestra	**R**	**1**	[5(1)]
		Hidari irrava	**R**	**3**	[6(1)9(2)]
		Mahasena corbetti	**R**	**5**	[2,6(2)7(1)]
		Metisa plana	**O**	**4**	[6(2)7,9(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Orgyia turbata	**P**	**2**	[2,6(1)]
		Setora nitens	**PP**	**6**	[2,3,5,6,7,8(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Thosea sinensis	**P**	**5**	[2,3,5(1)10(2)]
	Col	*Anomala pallida*	**P**	**2**	[6,7(1)]
		Apogonia cribricollis	**R**	**1**	[7(1)]
		Leucopholis rorida	**P**	**1**	[9(1)]
		Promecotheca cumingii	**R**	**3**	[2,6,7(1)]
		Xylotrupes gideon	**PP**	**4**	[1,5(2)]
	Ort	*Valanga nigricornis*	**P**	**4**	[6(1)7(2)10(1)]
flower eating	Lep	*Tirathaba mundella*	**R**	**1**	[6(1)]
	Col	*Anomala pallida*	**P**	**2**	[6,7(1)]
shoot eating	Col	*Oryctes rhinoceros*	**O**	**17**	[2,3(2)4(1)5(3)6(2)7,8(1)9(3)10(2)]
		Rhynchophorus schach	**R**	**4**	[2,6(2)]
stem boring	Iso	*Coptotermes curvignathus*	**P**	**4**	[2(1)6(2)9(1)]
root damaging	Ort	*Gryllotalpa africana*	**P**	**5**	[2,6,8(1)10(2)]
sucking	Hem	*Aspidiotus destructor*	**P**	**7**	[2,4,5,6,7,9,10(1)]
		Dysmicoccus brevipes	**P**	**10**	[4(1)5(3)6,9,10(2)]
		Ferrisia virgata	**P**	**4**	[2,4(1)10(2)]
		Hysteroneura setariae	**R**	**1**	[7(1)]
		Pinnaspis aspidistrae	**P**	**3**	[6(1)10(2)]

OKRA
Hibiscus esculentus MALVACEAE
Origin: Tropical Africa

Major arthropod pests

leaf eating	Lep	*Anomis flava*	**R**	**9**	[2,4(1)5(3)6,10(2)]
		Archips micaceanus	**P**	**6**	[2(1)3(2)5,6,7(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Syllepte derogata	**R**	**6**	[1,2,4,5,6,7(1)]
		Xanthodes transversa	**R**	**1**	[6(1)]
pod boring	Lep	*Earias vittella*	**R**	**15**	[1,2(2)3,4(1)5,6(2)7(1)8,9(2)]
	Col	*Epilachna vigintioctopunctata*	**R**	**8**	[1,2,5(2)6,9(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
root eating	Col	*Leucopholis irrorata*	**P**	**3**	[10(3)]
sucking	Hem	*Amrasca devastans*	**O**	**15**	[1(3)2(2)3(1)5,9,10(3)]
		Aphis gossypii	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Dysdercus cingulatus	**R**	**12**	[1,2,3,4(1)5(2)6,7(1)9,10(2)]
		Ferrisia virgata	**P**	**4**	[2,4(1)10(2)]
	Thy	*Megalurothrips usistatus*		**2**	[2,6(1)]
		Thrips hawaiiensis	**P**	**1**	[6(1)]

ONION
Allium cepa ALLIACEAE
Origin: West Africa

Major arthropod pests

leaf eating	Lep	*Spodoptera exigua*	**PP**	**5**	[2(2)5(3)]

Table 13 (continued)

		S. litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
bulb damaging	Dip	*Delia antiqua*	**R**	**2**	[10(2)]
sucking	Thy	*Thrips tabaci*	**P**	**9**	[1(1)2,5(2)7(1)10(3)]
	Aca	*Aceria tulipae*		**3**	[2(1)10(2)]

PASSIONFRUIT
Passiflora edulis PASSIFLORACEAE
Origin: South America

Major arthropod pests

fruit damaging	Dip	*Batrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
stem boring	Lep	*Zeuzera coffeae*	**P**	**8**	[2,5,6,10(2)]

PAPAYA
Carica papaya CARICACEAE
Origin: Mexico, Costa Rica

Major arthropod pests

leaf eating	Lep	*Asota* spp.		**1**	[9(1)]
fruit damaging	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)2,3(2)5,6(3)7(2)8,9,10(3)]
		Othreis fullonia	**P**	**6**	[2(1)5(2)6(1)8(2)]
stem boring	Col	*Araecerus fasciculatus*	**P**	**6**	[2,6,7,9(1)10(2)]
sucking	Hem	*Aleurodicus dispersus*	**P**	**22**	[1(2)2(3)3(2)5,6(3)7(1)8(2)9(2) 10(3)]
		Aphis gossypii	**P**	**19**	[1(1)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Chrysomphalus aonidum	**P**	**3**	[1,2,5(1)]
		Phenacaspis papayae		**3**	[2(2)9(1)]
	Thy	*Thrips parvispinus*	**P**	**4**	[6(1)9(3)]
	Aca	*Eutetranychus orientalis*	**P**	**3**	[2(3)]
		Tetranychus cinnabarinus	**PP**	**2**	[6,7(1)]
Major weeds		*Abutilon indicum*	**B**	**3**	[1(1)2(2)]
		Ageratum conyzoides	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Asystasia intrusa	**B**	**5**	[6(3)7(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Croton hirtus	**B**	**3**	[6(2)7(1)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Erechtites valerianifolia	**B**	**2**	[6,7(1)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]
		Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
		Panicum sarmentosum	**G**	**5**	[6(3)7(2)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
		Passiflora foetida	**B**	**11**	[1,2,3,5(1)6(3)7(1)8(2)10(1)]
		Pennisetum polystachyon	**G**	**11**	[2,3,4,5(1)6(3)9,10(2)]

PEA
Pisum sativum FABACEAE
Origin: USSR, Mediterranean

Major arthropod pests

leaf eating	Lep	*Chrysodeixis eriosoma*	**P**	**5**	[4,5,6(1)10(2)]

		Euchrysops cnejus	**R**	**5**	[6,7(1)10(3)]
		Hedylepta indicata	**R**	**7**	[2(1)3,5,10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Helicoverpa assulta	**R**	**7**	[2,3(1)5(2)6(1)9(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Tiracola plagiata	**P**	**2**	[2,6(1)]
leaf mining	Lep	*Aproarema modicella*	**R**	**11**	[1(2)2(1)3(2)4(3)6,9,10(1)]
	Dip	*Ophiomyia phaseoli*	**R**	**14**	[1,2(1)3,5,6(2)7(1)9(3)10(2)]
pod boring	Lep	*Etiella zinckenella*	**R**	**8**	[2(1)5(3)6(1)9(2)10(1)]
		Lampides boeticus	**R**	**5**	[2(1)5(2)6,7(1)]
seed boring	Col	*Callosobruchus* spp.		**4**	[1,5(2)]
sucking	Hem	*Aphis craccivora*	**P**	**15**	[1,2,3,4(1)5(3)6,7(1)8,9,10(2)]
Major weeds		*Abutilon indicum*	**B**	**3**	[1(1)2(2)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]

PEANUT, see GROUNDNUT

PEPPER
(a) *Piper betle*, (b) *P. nigrum* PIPERACEAE
Origin: (a) Malaysia (b) India

Major arthropod pests

stem boring	Col	*Lophobaris piperis*	**O**	**7**	[2(1)5,6,9(2)]
sucking	Hem	*Aleurodicus destructor*	**P**	**5**	[2,5,6,7,9(1)]
		Dasyneurus piperis	**O**	**3**	[6(1)9(2)]
		Diconocoris hewitti	**O**	**2**	[9(2)]
		D. nepalensis	**O**	**3**	[1(1)5(2)]
		Ferrisia virgata	**P**	**4**	[2,5(1)10(2)]
		Pinnaspis aspidistrae	**P**	**3**	[6(1)10(2)]
		Planococcus citri	**P**	**7**	[2(1)5(3)6,8,9(1)]
Major weeds		*Asystasia intrusa*	**B**	**5**	[6(3)7(2)]
		Axonopus compressus	**G**	**8**	[2(1)6,7(3)9(1)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Digitaria ciliaris	**G**	**20**	[1,2(2)3(1)4(3)5(2)6(3)7(2)9(3) 10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Erigeron sumatrensis	**B**	**2**	[6(2)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
		Sporobolus indicus	**G**	**4**	[6(3)10(1)]

PIGEON PEA
Cajanus cajan FABACEAE
Origin: Africa

Major insect pests

leaf eating	Lep	*Euchrysops cnejus*	**R**	**5**	[6,7(1)10(3)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
		Lamprosema diemenalis	**R**	**4**	[2,3,4,5(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]

Table 13 (continued)

leaf mining	Dip	*Ophiomyia phaseoli*	**R**	**14**	[1,2(1)3,5,6(2)7(1)9(3)10(2)]
pod boring	Lep	*Brachyacma palpigera*		**1**	[6(1)]
stem boring	Lep	*Zeuzera coffeae*	**R**	**8**	[2,5,6,10(2)]
sucking	Hem	*Aphis craccivora*	**P**	**15**	[1,2,3,4(1)5(3)6,7(1)8,9,10(2)]
Major weeds		*Achyranthes aspera*	**B**	**2**	[1,10(1)]
		Ageratum conyzoides	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Cassia tora	**B**	**3**	[1,2,10(1)]
		Hedyotis corymbosa	**B**	**6**	[1(1)6,7(2)10(1)]
		H. racemosa	**B**	**2**	[1(2)]
		Spilanthes filicaulis	**B**	**3**	[1(3)]

PINEAPPLE
Ananas comosus BROMELIACEAE
Origin: South America

Major arthropod pests

sucking	Hem	*Aspidiotus destructor*	**P**	**7**	[2,4,5,6,7,9,10(1)]
		Dysmicoccus brevipes	**P**	**10**	[4(1)5(3)6,9,10(2)]
leaf eating	Ort	*Valanga nigricornis*	**P**	**4**	[6(1)7(2)10(1)]
Major weeds		*Asystasia gangetica*	**B**		[6,7(3)]
		Asystasia intrusa	**B**	**5**	[6(3)7(2)]
		Bidens pilosa	**B**	**10**	[1(1)2(2)3,4,5(1)9,10(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Cleome rutidosperma	**B**	**8**	[2(1)6(2)7(3)10(2)]
		Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
		Cyperus haspan	**S**	**2**	[6,7(1)]
		Cyperus rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Hemarthria compressa	**B**	**1**	[5(1)]
		Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
		Leptochloa chinensis	**G**	**14**	[1(3)2,5(2)6(3)9,10(2)]
		Melastoma malabathricum	**B**	**13**	[2,3,5(1)6(3)7(2)8(3)9,10(1)]
		Mentha arvensis	**B**	**3**	[1(2)5(2)6(3)9(1)]
		Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
		Nephrolepis biserrata	**F**	**10**	[6(2)7,8(3)10(2)]
		Panicum bisulcatum	**G**	**3**	[5(3)]
		Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
		Stenochlaena palustris	**F**	**7**	[6,7(2)8(3)]

POTATO (see also SOLANACEAE)
Solanum tuberosum SOLANACEAE
Origin: South America

Major arthropod pests

leaf eating	Lep	*Agrotis ipsilon*	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Spodoptera litura	**P**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
tuber boring	Lep	*Phthorimaea operculella*	**R**	**7**	[1(2)2(1)5(3)9(1)]
	Col	*Anomala cupripes*	**P**	**4**	[2,5,6,7(1)]
root eating	Ort	*Gryllotalpa africana*	**P**	**5**	[2,6,8(1)10(2)]
sucking	Hem	*Aphis gossypii*	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]

		Myzus persicae	**P**	**12**	[2,3(1)5(3)6(2)7(1)9,10(2)]
	Thy	*Thrips palmi*	**P**	**12**	[1(1)2(2)6(3)7,8,9(1)10(3)]
		T. tabaci	**PP**	**9**	[1(1)2,5(2)7(1)10(3)]

PUMPKIN
Cucurbita maxima CUCURBITACEAE
Origin: South America

Major arthropod pests

leaf eating	Lep	*Adoxophyes privatana*	**P**	**1**	[7(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Diaphania indica	**R**	**7**	[2,4(1)5(2)6,7,8(1)]
	Col	*Aulacophora flavomarginata*		**O 3**	[6(2)8(1)]
		A. foveicollis	**R**	**4**	[1,2(1)6(2)]
		A. lewisi		**1**	[6(1)]
		A. similis	**P**	**9**	[2,3(1)5(3)6,8(1)9(2)]
fruit damaging	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
sucking	Hem	*Leptoglossus gonagra*	**P**	**6**	[2,6(1)8,10(2)]

QUININE
Cinchona spp. RUBIACEAE
Origin: Peru

Major arthropod pests

leaf eating	Lep	*Attacus atlas*	**P**	**5**	[2,5,6,7,9(1)]
		Hyposidra talaca	**P**	**2**	[6,9(1)]
		Metanastria hyrtaca	**R**	**1**	[2(1)]
		Setora nitens	**PP**	**6**	[2,3,5,6,7,8(1)]
		Thosea sinensis	**P**	**5**	[2,3,5(1)10(2)]
stem boring	Lep	*Zeuzera coffeae*	**R**	**8**	[2,5,6,10(2)]
sucking	Hem	*Coccus viridis*	**P**	**7**	[2,4(1)5(2)7(1)9(2)]

RAMBUTAN
Nephelium lappaceum SAPINDACEAE
Origin: Malaysia

Major arthropod pests

leaf eating	Lep	*Adoxophyes privatana*	**P**	**1**	[7(1)]
		Archips machlopis	**R**	**1**	[6(1)]
		Archips micaceanus	**P**	**6**	[2(1)3(2)5,6,7(1)]
		Attacus atlas	**P**	**5**	[2,5,6,7,9(1)]
		Homona coffearia	**P**	**3**	[5,6,9(1)]
		Hyperaeschrella insulicola	**R**	**1**	[2(1)]
		Hyposidra talaca	**P**	**2**	[6,9(1)]
		Oxyodes scrobiculata		**1**	[2(1)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Setora nitens	**PP**	**6**	[2,3,5,6,7,8(1)]
	Col	*Anomala antiqua*	**P**	**5**	[1(3)2,9(1)]
		Anomala cupripes	**P**	**4**	[2,5,6,7(1)]
		Anomala pallida	**P**	**2**	[6,7(1)]
		Hypomeces squamosos	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]

Table 13 (continued)

flower feeding	Lep	*Eublemma abrupta*	**O**	**2**	[2,6(1)]
		E. brachygonia	**O**	**2**	[2,6(1)]
		E. versicolor	**O**	**2**	[2,6(1)]
		Rapala phretima	**P**	**1**	[6(1)]
		Tirathaba rufivena	**R**	**2**	[2,6(1)]
fruit boring	Lep	*Conogethes punctiferalis*	**P**	**13**	[2,3(1)4,5(3)6(2)9(1)10(2)]
		Conopomorpha cramerella	**R**	**7**	[2(1)6(3)9(1)10(2)]
		Othreis fullonia	**P**	**6**	[2(1)5(2)6(1)8(2)]
		Tirathaba mundella	**R**	**1**	[6(1)]
	Dip	*Bactrocera dorsalis*	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
sucking	Hem	*Cataenococcus hispidus*	**P**	**2**	[2,6(1)]
		Planococcus citri	**P**	**7**	[2(1)5(3)6,8,9(1)]
	Aca	*Eutetranychus orientalis*	**P**	**1**	[2(1)]

RAMIE
Boehmeria nivea URTICACEAE
Origin: eastern Asia

Major arthropod pests

leaf eating	Lep	*Acraea issoria*	**R**	**1**	[5(1)]
		Lamprosema diemenalis	**R**	**4**	[2,3,6,7(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Vanessa indica	**R**	**1**	[5(1)]
	Ort	*Valanga nigricornis*	**P**	**4**	[6(1)7(2)10(1)]
sucking	Hem	*Icerya seychellarum*	**P**	**1**	[2(1)]

RICE
Oryza sativa POACEAE
Origin: Asia, Africa

Major arthropod pests

leaf eating	Lep	*Cnaphalocrocis medinalis*	**R**	**16**	[1(1)4(2)5(3)6(2)8,9(3)10(2)]
		Mythimna separata	**R**	**8**	[1(2)2(1)3,4(2)9(1)]
		Naranga aenescens	**R**	**3**	[5(1)10(2)]
		Paraponyx stagnalis	**O**	**12**	[1,4(1)5(2)8,9(3)10(2)]
		Parnara guttatus	**R**	**3**	[1(2)5(1)]
		Spodoptera exempta		**2**	[10(2)]
		Spodoptera exigua	**PP**	**5**	[2(2)5(3)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		S. mauritia		**11**	[1,2,4(1)5,6(2)7(1)9(3)]
	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
	Ort	*Nomadacris succinata*	**P**	**5**	[2,3(2)5(1)]
		Oxya sp.			
leaf mining	Col	*Dicladispa armigera*	**R**	**2**	[1,5(1)]
	Dip	*Hydrellia* sp.		**2**	[5(2)]
		H. philippina		**7**	[4,5,6(1)8,10(2)]
stem boring	Lep	*Chilo auricilius*	**O**	**3**	[5(2)7(1)]
		C. polychrysus	**R**	**7**	[2,3(1)4(2)5,6,9(1)]
		C. suppressalis	**R**	**13**	[2,3,4(1)5(2)6(1)8(2)9(3)10(2)]
		Scirpophaga incertulas	**O**	**16**	[1(2)2(1)4(2)5(3)6(1)8(2)9(3)10(2)]
		S. innotata	**O**	**4**	[5(1)9(3)]
		S. nivella	**O**	**4**	[2,5(1)10(2)]
		Sesamia inferens	**R**	**12**	[1,2,4,5,6(1)8(2)9(3)10(2)]
gall midge	Dip	*Orseolia oryzae*	**R**	**12**	[1(2)2,3(1)4(3)5(2)9(3)]

root eating	Ort	*Gryllotalpa africana*	**P**	**5**	[2,6,8(1)10(2)]
		Gryllotalpa orientalis	**P**	**2**	[1,5(1)]
sucking	Hem	*Hysteroneura setariae*	**R**	**1**	[7(1)]
		Leptocorisa acuta	**P**	**11**	[2,4(1)5,6(2)9(3)10(2)]
		L. oratorius	**P**	**9**	[1(2)2,5,6(1)9(3)9(1)]
		Nephotettix spp.		**1**	[2(1)]
		N. nigropictus	**R**	**9**	[2(1)4(2)5,6,7(1)9(3)]
		N. virescens	**R**	**11**	[1,2,5(1)6,9(3)10(2)]
		Nezara viridula	**PP**	**10**	[1(2)2,3,4(1)5(2)6,7,9(1)]
		Nilaparvata lugens	**R**	**21**	[2(3)3(2)4,5,6(3)7,8(1)9(3)10(2)]
		Recilia dorsalis	**R**	**3**	[2,5,9(1)]
		Scotinophara sp.		**1**	[5(1)]
		S. cinerea	**R**	**3**	[9(3)]
		S. coarctata	**R**	**8**	[2(1)5,6(2)8(1)10(2)]
		Sogatella furcifera	**O**	**13**	[1(2)2(1)5,6(2)8(1)9(3)10(2)]
	Thy	*Stenchaetothrips biformis*	**O**	**3**	[1(1)5(2)]
	Aca	*Tetranychus urticae*	**PP**	**11**	[2(1)5,6(2)7(1)9(3)10(2)]

Major weeds [Where nominated D=direct seeding, T=transplanted, U=upland or dryland]

		Alternanthera philoxeroides	**B**	**2**	[2,5(1)]
	D.T.	*Azolla pinnata*	**F**	**7**	[2,3,4,5(1)6(2)10(1)]
	U.	*Borreria laevis*	**B**	**5**	[6(1)7(2)9,10(1)]
	U.	*B. latifolia*	**B**	**7**	[6(3)7,9(2)]
	U.	*Botriochloa pertusa*	**G**	**1**	[1(1)]
	T.	*Brachiaria mutica*	**G**	**6**	[6(2)7,9(1)10(2)]
		Chara zeylanica	**A**	**5**	[2,3,4,5,9(1)]
		Commelina diffusa	**B**	**8**	[2,7,9,10(2)]
	D.T.	*Cyperus difformis*	**S**	**18**	[1,2,3(1)4(2)5,6(3)7(2)8,9(1)10(3)]
	U.	*C. digitatus*	**S**	**4**	[6(2)7,10(1)]
	D.T.	*C. iria*	**S**	**23**	[1,2(2)3(3)4(2)5,6(3)7(1)8(3)9, 10(2)]
		C. haspan	S	2	[6,7(1)]
		C. kyllingia	**S**	**7**	[5,6(2)7(1)10(2)]
		C. odoratus	**S**	**2**	[6(2)]
	T.	*C. pilosus*	**S**	**3**	[6(2)7(1)]
		C. rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
	U.	*Digitaria ciliaris*	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
	D.	*Echinochloa colonum*	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
	D.	*E. crusgalli*	**G**	**21**	[2(3)3(1)4(2)5,6(3)7(2)8(1)9,10(3)]
	T.U.	*Eclipta prostrata*	**B**	**13**	[1(1)2,5(2)6(3)7(2)9(1)10(2)]
		Eleocharis dulcis	**S**	**3**	[2,5,6(1)]
	T.	*E. variegata*	**S**	**2**	[6(2)]
		Eleusine coracana	**G**	**2**	[2,5(1)]
	U.	*E. indica*	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Eragrostis japonica	**G**	**1**	[5(1)]
	U.	*E. uniloides*	**G**	**3**	[1(1)6(2)]
	U.	*Fimbristylis globulosa*	**S**	**4**	[6,7(2)]
	D.T.	*F. miliacea*	**S**	**23**	[1(3)2,3(1)4(3)5(2)6(3)7(2)8,9(3) 10(2)]
	U.	*Fuerina umbellata*	**S**	**2**	[6(2)]
	U.	*Hedyotis racemosa*	**B**	**2**	[1(2)]
	U.	*Hydrolea zeylanica*	**B**	**1**	[1(1)]
	T.	*Hymenachne actigluma*	**G**	**5**	[6,8(2)10(1)]
	T.	*Ischaene globosa*	**G**	**3**	[6(2)7(1)]
	D.U.	*Ischaemum rugosum*	**G**	**11**	[1(1)6(3)7(1)8,9,10(2)]
	D.T.	*Leersia hexandra*	**G**	**9**	[2,3,4,5(1)6(2)7,9,10(1)]
	D.T.	*Lemna purpusilla*	**B**	**7**	[2,3,4,5(1)6(2)8(1)]
	D.	*Leptochloa chinensis*	**G**	**14**	[1(3)2,5(2)6(3)9,10(2)]

Table 13 (continued)

U.	*Leucas cephalotes*	**B**	**3**	[1(3)]
D.T.	*Limnocharis flava*	**B**	**5**	[2(1)6(2)7,8(1)]
D.T.	*Ludwigia adscendens*	**B**	**7**	[1,2(1)6(2)9(1)10(2)]
D.T.	*L. hyssopifolia*	**B**	**8**	[1(3)2,6(2)10(1)]
D.T.	*Marsilea minuta*	**B**	**12**	[1,2,3,4,5(1)6(3)9,10(2)]
	M. quadrifolia	**B**	**4**	[5(3)10(1)]
T.U.	*Melochia corchorifolia*	**B**	**4**	[1(1)6(2)10(1)]
D.T.	*Monochoria vaginalis*	**B**	**26**	[1,2(2)3,4(3)5(2)6(3)7(2)8,9,10(3)]
T.	*Murdannia nudiflora*	**B**	**5**	[1,6,9(1)10(2)]
T.	*Najas graminea*	**B**	**5**	[2,3(1)6(2)10(1)]
T.	*Nymphaea lotus*	**B**	**7**	[2,3,5(1)6(2)7,8(1)]
	Panicum cambogiense	**G**	**1**	[2(1)]
U.	*Paspalum scrobiculatum*	**G**	**7**	[6,7,8(2)10(1)]
T.	*P. vaginatum*	**G**	**3**	[5(1)6(2)]
	Pentapes phoenicia	**B**	**1**	[2(1)]
T.	*Phyllanthus fraternus*	**B**	**4**	[1,2(1)6(2)]
T.	*Rotala indica*	**B**	**5**	[5,6(2)10(1)]
D.T.	*Sagittaria guayanensis*	**B**	**4**	[6(3)7(1)]
	S. trifolia	**B**	**2**	[5,10(1)]
T.	*Salvinia molesta*	**F**	**7**	[6(3)7,9(1)10(2)]
D.T.	*Scirpus grossus*	**S**	**7**	[1(2)5(1)6(3)10(1)]
D.T.	*S. juncoides*	**S**	**5**	[1,6(2)9(1)]
T.	*S. supinus*	**S**	**5**	[6,8(2)10(1)]
D.T.	*Sphenoclea zeylanica*	**B**	**14**	[1(1)2(2)3(1)4(2)5(1)6(3)8,9(1)10(2)]
T.	*Utricularia aurea*	**B**	**3**	[1(1)6(2)]

ROSE
Rosa spp. ROSACEAE
Origin: Europe

Major arthropod pests

leaf eating	Lep	*Achaea janata*	**P**	**8**	[1(1)2(2)3(1)4(2)5,6(1)]
		Calliteara horsfieldii	**P**	**1**	[6(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Setora nitens	**PP**	**6**	[2,3,5,6,7,8(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Col	*Adoretus compressus*	**PP**	**4**	[5,6,7,9(1)]
		Apogonia cribricollis	**R**	**1**	[7(1)]
		Aulacophora similis	**P**	**9**	[2,3(1)5(3)6,8(1)9(2)]
stem boring	Lep	*Zeuzera coffeae*	**R**	**8**	[2,5,6,10(2)]
sucking	Hem	*Frankliniella occidentalis*	**P**	**1**	[6(1)]
		Icerya purchasi	**P**	**4**	[2,5,6,7(1)]
		Mictis longicornis	**P**	**3**	[6,7,9(1)]

ROSELLE
Hibiscus sabdariffa MALVACEAE
Origin: West Africa

Major arthropod pests

leaf eating	Lep	*Helicoverpa armigera*	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
	Col	*Anomala cupripes*	**P**	**4**	[2,5,6,7(1)]
		Anomis flava	**R**	**9**	[2,4(1)5(3)6,10(2)]
fruit boring	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]

sucking	Hem	*Dysdercus cingulatus*	**R**	**12**	[1,2,3,4(1)5(2)6,7(1)9,10(2)]
		Empoasca sp.	**P**	**7**	[2(2)4(3)6,7(1)]

RUBBER
Hevea braziliensis EUPHORBIACEAE
Origin: Brazil

Major arthropod pests

leaf eating	Lep	*Apogonia cribricollis*	**R**	**1**	[7(1)]
		Attacus atlas	**P**	**5**	[2,5,6,7,9(1)]
		Orgyia turbata	**P**	**2**	[2,6(1)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Tiracola plagiata	**P**	**2**	[2,6(1)]
	Col	*Anomala cupripes*	**P**	**4**	[2,5,6,7(1)]
		A. pallida	**P**	**2**	[6,7(1)]
		Epilachna indica	**R**	**1**	[7(1)]
		Holotrichia bidentata		**1**	[6(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)6,7(1)8(3)9(1)]
		Leucopholis rorida	**P**	**1**	[9(1)]
		Lepidiota stigma	**P**	**3**	[2(1)9(2)]
stem boring	Iso	*Coptotermes curvignathus*	**P**	**4**	[1(1)6(2)9(1)]
	Col	*Batocera rubus*	**P**	**2**	[2,5(1)10(2)]
		Xyleborus fornicatus		**1**	[6(1)]
	Ort	*Gryllotalpa africana*	**P**	**5**	[2,6,8(1)10(2)]
		Nomadacris succinata	**P**	**6**	[2,3,5(2)]
		Valanga nigricornis	**P**	**4**	[6(1)7(2)10(1)]
sucking	Hem	*Aspidiotus destructor*	**P**	**7**	[2,4,5,6,7,9,10(1)]
		Ferrisia virgata	**P**	**4**	[2,4(1)10(2)]
		Parasaissetia nigra	**P**	**1**	[6(1)]
		Pinnaspis aspidistrae	**P**	**3**	[6(1)10(2)]
	Thy	*Heliothrips haemorrhoidalis*	**P**	**2**	[2,4(1)]
	Aca	*Polyphagotarsonemus latus*	**P**	**6**	[1,2,6(1)7(2)9(1)]

Major weeds	*Asystasia gangetica*	**B**	**6**	[6(3)7(2)]
	Axonopus compressus	**B**	**8**	[2(1)6,7(3)9(1)]
	Chromolaena odorata	**B**	**18**	[1,2,3,4,5(2)6(3)9(2)10(3)]
	Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
	Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
	Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
	Melastoma malabathricum	**B**	**13**	[2,3,5(1)6(3)7(2)8(3)9,10(1)]
	Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
	Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]

SESAME
Sesamum indicum PEDALIACEAE
Origin: Africa

Major arthropod pests

leaf eating	Lep	*Acherontia lachesis*	**P**	**4**	[2,3,4,5(1)]
		A. styx	**R**	**3**	[2,3,4(1)]
		Antigastra catalaunalis	**O**	**3**	[2(1)9(2)]
		Aproaerema modicella	**R**	**11**	[1(2)2(1)3(2)4(3)6,9,10(1)]

Table 13 (continued)

	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
sucking	Hem	*Eysacoris guttiger*	**O**	**1**	[1(1)]
		Nezara viridula	**PP**	**10**	[1(2)2,3,4(1)5(2)6,7,9(1)]
		Nysius sp.		**1**	[2(1)]
		Orosius orientalis	**P**	**2**	[1(2)]

SNAKE GOURD
Trichosanthes cucumerina CUCURBITACEAE
Origin: Asia

Major arthropod pests

leaf eating	Lep	*Diaphania indica*	**R**	**7**	[2,4(1)5(2)6,7,8(1)]
	Col	*Aulacophora similis*	**P**	**9**	[2,3(1)5(3)6,8(1)9(2)]
fruit damaging	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
sucking	Hem	*Leptoglossus gonagra*	**P**	**6**	[2,6(1)8,10(2)]
		Megymenum brevicornis	**P**	**2**	[5,6(1)]

SOLANACEAE
Major arthropod pests

leaf eating	Lep	*Acherontia lachesis*	**P**	**4**	[2,3,4,5(1)]
		A. styx	**R**	**3**	[2,3,4(1)]
		Agrotis ipsilon	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Heliothis sp.		**3**	[5(3)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Leucinodes orbonalis	**R**	**15**	[1(2)2,3(1)4(2)5(3)6(2)7,8(3)]
		Spodoptera litura	**P**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Tiracola plagiata	**P**	**2**	[2,6(1)]
	Col	*Anomala cupripes*	**P**	**4**	[2,5,6,7(1)]
		Epicauta waterhousei	**R**	**1**	[2(1)]
		Epilachna indica	**R**	**1**	[7(1)]
		E. vigintioctopunctata	**R**	**8**	[1,2,5(2)6,9(1)]
fruit attacking	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
		B. dorsalis	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		B. latifrons	**R**	**6**	[2(1)6,8(2)9(1)]
tuber attacking	Lep	*Phthorimaea operculella*	**R**	**7**	[1(2)2(1)5(3)9(1)]
	Ort	*Gryllotalpa africana*	**P**	**5**	[2,6,8(1)10(2)]
sucking	Hem	*Acanthocoris scaber*		**2**	[5(2)]
		Aphis gossypii	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2)]
		Bemisia tabaci	**P**	**10**	[2(3)5,6(1)7(3)9(2)]
		Empoasca flavescens	**P**	**7**	[1(1)5(3)6(1)9(2)]
		Megymenum brevicornis	**P**	**2**	[5,6(1)]
		Myzus persicae	**P**	**12**	[2,3(1)5(3)6(2)7(1)9,10(2)]
		Nezara viridula	**P**	**10**	[1,2,3,4(1)5(2)6,7,9(1)]
		Parabemisia myricae	**R**	**1**	[5(1)]
		Pseudococcus sp.		**3**	[2(1)5(2)]
		Stibaropus molginus		**1**	[2(1)]
		Urentius hystricellus		**2**	[4(2)]
	Thy	*Scirtothrips dorsalis*	**P**	**5**	[1,2(2)6(1)]
		Thrips flavus		**1**	[2(1)]
		T. palmi	**P**	**12**	[1(1)2(2)6(3)7,8,9(1)10(3)]
		T. tabaci	**PP**	**9**	[1(1)2,5(2)7(1)10(3)]
	Aca	*Polyphagotarsonemus latus*		**P**	**6** [1,2,6(1)7(2)9(1)]
		Tetranychus urticae	**PP**	**11**	[2(1)5,6(2)7(1)9(3)10(2)]

SORGHUM
Sorghum bicolor POACEAE
Origin: Africa

Major arthropod pests

leaf eating	Lep	*Mythimna separata*	**R**	**8**	[1(2)2(1)3,4(2)9(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
		Stenachroia elongella		**2**	[5(2)]
	Ort	*Nomadacris succinata*	**P**	**6**	[2,3,5(2)]
stem boring	Lep	*Chilo auricilius*	**O**	**3**	[5(1)9(2)]
		C. sacchariphagus	**R**	**10**	[2,3,4(1)5(3)6(2)7,9(1)]
		Conogethes punctiferalis	**P**	**10**	[2,3(1)4(3)6(2)9(1)10(2)]
		Ostrinia furnacalis	**P**	**17**	[2(1)4(2)5,6,8(3)9(2)10(3)]
		Sesamia inferens	**R**	**12**	[1,2,4,5,6(1)8(2)9(3)10(2)]
leaf mining	Dip	*Atherigona soccata*	**O**	**4**	[2,5(2)]
seed boring	Col	*Carpophilus hemipterus*	**P**	**3**	[2(1)5(2)]
sucking	Hem	*Leptocorisa acuta*	**R**	**11**	[2,4(1)5,6(2)9(3)10(2)]
		Melanaphis sacchari	**R**	**3**	[2,6,7(1)]
		Nezara viridula	**P**	**10**	[1(2)2,3,4(1)5(2)6,7,9(1)]
		Rhopalosiphum maidis	**R**	**9**	[2,3,4(1)5(2)6,7(1)10(2)]
Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Cardiospermum halicacabum	**B**	**1**	[1(1)]
		Cyperus rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Digitaria sanguinalis	**G**	**5**	[1(1),7,10(2)]]
		Echinochloa colonum	**G**	**25**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		E. crusgalli	**G**	**21**	[2(3)3(1)4(2)5,6(3)7(2)8(1)9,10(3)]
		Eclipta prostrata	**B**	**13**	[1(1)2,5(2)6(3)7(2)9(1)10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Pennisetum spp.	**G**	**11**	[2,3,4,5,6(2)9(1)]
		Portulaca oleracea	**B**	**10**	[1(1)2(2)5,6,7,9(1)10(3)]
		Scoparia dulcis	**B**	**3**	[1,6,10(1)]
		Spilanthes filicaulis	**B**	**3**	[1(3)]

SOYBEAN
Glycine max FABACEAE
Origin: southern China

Major arthropod pests

leaf eating	Lep	*Agrotis ipsilon*	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Aproaerema modicella	**R**	**11**	[1(2)2(1)3(2)4(3)6,9,10(1)]
		Archips micacaenus	**P**	**7**	[2(1)3,5(2)6,7(1)]
		Brachyacma palpigera		**1**	[6(1)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
		Hedylepta indicata	**R**	**7**	[2(1)3,5,10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Hyposidra talaca	**P**	**2**	[6,9(1)]
		Lamprosema diemenalis	**R**	**4**	[2,3,6,7(1)]
		Porthesia scintillans	**P**	**3**	[2,5,6(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Col	*Epicauta gorhami*	**P**	**1**	[5(1)]
		Epicauta maklini	**R**	**1**	[2(1)]
		Epilachna vigintioctopunctata	**R**	**8**	[1,2,5(2)7,9(1)]
		Hypomeces squamosus	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
	Ort	*Chondacris rosea*	**P**	**1**	[5(1)]

Table 13 (continued)

leaf mining	Dip	*Japanagromyza tristella*	**R**	**2**	[5(2)]
		Melanagromyza sojae	**R**	**5**	[2(1)5(3)9(1)]
		Ophiomyia phaseoli	**R**	**14**	[1,2(1)3,5,6(2)7(1)9(3)10(2)]
pod boring	Lep	*Ephestia cautella*	**P**	**2**	[6,7(1)]
		Etiella zinckenella	**R**	**8**	[2(1)5(3)6(1)9(2)10(1)]
		Maruca testulalis	**R**	**17**	[1,2,3(1)4,5(3)6(2)7(1)8(3)9,10(1)]
	Col	*Aracerus fasciculatus*	**P**	**6**	[2,6,7,9(1)10(2)]
stem boring	Col	*Platymycterus sieversi*		**2**	[5(2)]
sucking	Hem	*Amrasca* sp.		**4**	[2(1)9(3)]
		Aphis craccivora	**P**	**15**	[1,2,3,4(1)5(3)6,7(1)8,9,10(2)]
		A. glycines	**R**	**3**	[2(1)5(2)]
		Empoasca flavescens	**P**	**7**	[1(1)5(3)6(1)9(2)]
		Nezara viridula	**P**	**10**	[1(2)2,3,4(1)5(2)6,7,9(1)]
		Parabemisia myricae	**R**	**1**	[5(1)]
		Piezodorus hybneri	**R**	**4**	[2,4,5,10(1)]
		Caliothrips indicus		**1**	[2(1)]
	Thy	*Frankliniella* sp.		**2**	[2,5(1)]
	Aca	*Tetranychus kanzawai*	**P**	**1**	[6(1)]
Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)4,5(1)6,7(2)8,9(1)10(2)]
		Amaranthus spinosus	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)9(1)10(2)]
		Chloris inflata	**G**	**9**	[1(1)2(2)5(3)7,10(2)]
		Commelina benghalensis	**B**	**10**	[1(2)2(3)7,9,10(2)]
		Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
		Cyperus rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Dactyloctenium aegyptium	**G**	**8**	[1,2(2)7,9(1)10(2)]
		Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
		Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		E. crusgalli	**G**	**21**	[2(3)3(1)4(2)5,6(3)7(2)8(1)9,10(3)]
		Eclipta prostrata	**B**	**13**	[1(1)2,5(2)6(3)7(2)9(1)10(2)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
		Euphorbia heterophylla	**B**	**10**	[10(1)2(3)3,4,5(1)6(2)10(1)]
		Leptochloa chinensis	**G**	**14**	[1(3)2,5(2)6(3)9,10(2)]
		Mimosa pudica	**B**	**17**	[1(3)2,5(1)6(2)7(3)8(2)9(3)10(2)]
		Panicum repens	**G**	**16**	[1(1)2(2)5(3)6,7(2)8(1)9(3)10(2)]
		Pennisetum spp.	**G**	**11**	[2,3,4,5,6(2)9(1)]
		Physalis angulata	**B**	**2**	[1,2(1)]
		Rottboellia cochinchinensis	**G**	**12**	[1(1)2(2)3,5,6(1)9,10(3)]

SQUASH, see PUMPKIN for pests

STARFRUIT, see CARAMBOLA

STAR GOOSEBERRY
Cicca acida EUPHORBIACEAE

Major arthropod pest

sucking	Hem	*Aleurodicus destructor*	**P**	**5**	[2,5,6,7,9(1)]

SUGARCANE
Saccharum officinarum POACEAE
Origin: Papua New Guinea

Major arthropod pests

leaf eating	Lep	*Euchrysops cnejus*	**R**	**6**	[6(2)7(1)10(3)]

		Mahasena corbetti	**R**	**5**	[2,6(2)7(1)]
	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
	Ort	*Hieroglyphus banian*	**P**	**4**	[2,3,4,5(1)]
		Nomadacris succinata	**P**	**6**	[2,3,5(2)]
shoot boring	Lep	*Tetramoera schistaceana*	**O**	**3**	[5(2)7(1)]
stem boring	Lep	*Chilo infuscatellus*	**O**	**8**	[2,3(1)4(2)9(1)10(3)]
		C. sacchariphagus	**R**	**10**	[2,3,4(1)5(3)6(2)8,9(1)]
		Phragmatacea castaneae		**1**	[6(1)]
		Scirpophaga excerptalis	**O**	**3**	[2(1)5(2)]
		S. nivella	**O**	**4**	[2(1)5(1)10(2)]
		Sesamia inferens	**R**	**12**	[1,2,4,5,6(1)8(2)9(3)10(2)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Col	*Alissonotum impressicolle*	**O**	**3**	[2(1)5(2)]
		Dorysthenes buqueti		**1**	[2(1)]
		Holotrichia sinensis		**3**	[2(1)5(2)]
		Lepidiota discendens	**R**	**1**	[2(1)]
		L. stigma	**P**	**3**	[2(1)9(2)]
		Sepiomus sp.		**1**	[2(1)]
root eating	Col	*Leucopholis irrorata*	**P**	**3**	[10(3)]
		Xylotrupes gideon		**4**	[1,5(2)]
	Iso	*Coptotermes havilandi*	**P**	**1**	[7(1)]
		Macrotermes spp.	**P**	**4**	[1,5,6,7(1)]
sucking	Hem	*Aleurolobus barodensis*	**O**	**1**	[2(1)]
		Aulacaspis tegalensis	**R**	**2**	[2,9(1)]
		Callitettix versicolor		**1**	[2(1)]
		Ceratovacuna lanigera	**R**	**4**	[2(1)5(2)6(1)]
		Phaenacantha saccharicida		**2**	[2,6(1)]
		Saccharicoccus sacchari	**R**	**5**	[2,5,6,7,10(1)]
	Thy	*Frankliniella williamsi*	**R**	**1**	[2(1)]
Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
		Amaranthus spinosus	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)9(1)10(2)]
		Bidens pilosa	**B**	**10**	[1(1)2(2)3,4,5(1)9,10(2)]
		Chloris inflata	**G**	**9**	[1(1)2(2)5(3)7,10(2)]
		Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
		C. rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
		Echinochloa colonum	**G**	**28**	[1(2)2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		Euphorbia hirta	**B**	**10**	[2(2)3,4,5,6(1)9,10(2)]
		Portulaca oleracea	**B**	**9**	[1(1)2(2)5,6,7,9(1)10(2)]
		Rottboellia cochinchinensis	**G**	**12**	[1(1)2(2)3,5,6(1)9,10(3)]

SUNFLOWER
Helianthus anuus COMPOSITAE
Origin: Western USA

Major arthropod pest

leaf eating	Lep	*Archips micaceanus*	**P**	**6**	[2(1)3(2)5,6,7(1)]

Major weed *Physalis angulata* **B** **2** [1,2(1)]

SUN HEMP
Crotolaria juncea FABACEAE
Origin: India

Major arthropod pests

leaf eating	Lep	*Utetheisa pulchella*	**R**	**2**	[5(2)]

Table 13 (continued)

	Col	*Epicauta gorhami*	**P**	**1**	[5(1)]
		Mylabris phalerata	**P**	**2**	[2,5(1)]
pod boring	Lep	*Etiella zinckenella*	**R**	**8**	[2(1)5(3)6(1)9(2)10(1)]
		Lampides boeticus	**R**	**5**	[2(1)5(2)6,7(1)]

SWEET POTATO
Ipomoea batatas CONVOLVULACEAE
Origin: tropical America

Major arthropod pests

leaf eating	Lep	*Agrius convolvuli*	**P**	**7**	[2,4(1)5(2)6(1)9(2)]
		Archips machlopis	**R**	**1**	[6(1)]
		Brachmia trianuella		**1**	[5(1)]
		Orgyia turbata	**P**	**2**	[2,6(1)]
		Spodoptera litura	**P**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Col	*Apogonia cribricollis*	**R**	**1**	[7(1)]
		Aspidomorpha furcata	**R**	**2**	[5,7(1)]
		A. miliaris	**R**	**4**	[2(1)5(2)9(1)]
		Colasposoma dauricum	**R**	**1**	[5(1)]
		Epilachna indica	**R**	**1**	[7(1)]
		Taiwania circumdata		**1**	[5(1)]
stem boring	Lep	*Omphisa anastomosalis*	**O**	**7**	[2,3(1)4(2)5,6,7(1)]
root damaging	Col	*Leucopholis irrorata*	**P**	**3**	[10(3)]
tuber	Col	*Cylas formicarius*	**R**	**22**	[2(3)3(2)4(3)5,6(2)7(1)8,9,10(3)]
damaging		*Xylotrupes gideon*		**4**	[1,5(2)]
sucking	Aca	*Bedellia somulentella*		**1**	[2(1)]
		Tetranchus hydrangeae		**1**	[2(1)]
Major weeds		*Echinochloa colonum*	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]

TAMARIND
Tamarindus indica CAESALPINACEAE
Origin: tropical Africa

Major arthropod pest

leaf eating	Lep	*Calliteara horsfieldii*	**P**	**1**	[6(1)]

TARO
Colocasia spp. ARACEAE
Origin: Southeast Asia

Major arthropod pests

leaf eating	Lep	*Hippotion celerio*	**R**	**3**	[2(1)10(2)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
sucking	Hem	*Aphis gossypii*	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Tarophagus colocasiae	**O**	**3**	[10(3)]

TEA
Camellia sinensis THEACEAE
Origin: China

Major arthropod pests

leaf eating	Lep	*Adoxophyes privatana*	**P**	**1**	[7(1)]
		Amsacta lactinea	**P**	**1**	[5(1)]
		Archips machlopis	**R**	**1**	[6(1)]
		Euproctis pseudoconspersa		**R**	**1** [5(1)]
		Homona coffearia	**P**	**3**	[5,6,9(1)]
		Hyposidra talaca	**P**	**2**	[6,9(1)]
		Olene mendosa	**P**	**4**	[4,6(1)10(2)]
		Parasa lepida	**PP**	**7**	[2,5,6(1)9,10(2)]
		Setora nitens	**PP**	**6**	[2,3,5,6,7,8(1)]
	Col	*Apogonia* sp.		**2**	[5(2)]
		Apogonia cribricollis	**R**	**1**	[7(1)]
stem boring	Lep	*Xyleutes ceramicus*		**1**	[2(1)]
		Zeuzera coffeae	**R**	**8**	[2,5,6,10(2)]
	Col	*Xyleborus fornicatus*		**1**	[6(1)]
		Xylosandrus compactus	**P**	**2**	[5(2)]
root eating	Col	*Anomala pallida*		**2**	[6,7(1)]
	Iso	*Macrotermes* spp.	**P**	**4**	[1,5,6,7(1)]
		Microtermes pakistanicus	**P**	**2**	[6,7(1)]
sucking	Hem	*Empoasca flavescens*	**P**	**7**	[1(1)5(3)6(1)9(2)]
		Helopeltis bradyi	**R**	**1**	[9(1)]
		H. theivora	**R**	**9**	[5(2)6(3)9,10(2)]
		Lohita grandis		**1**	[2(1)]
		Poecilocoris latus	**R**	**1**	[5(1)]
		Pinnaspis aspidistrae	**P**	**3**	[6(1)10(2)]
		Toxoptera aurantii	**P**	**6**	[1(1)6(2)7(1)10(2)]
	Thy	*Mycterothrips setiventris*		**2**	[5(2)]
		Scirtothrips dorsalis	**P**	**5**	[1,2(2)6(1)]
	Aca	*Oligonychus coffeae*	**P**	**5**	[2(2)5(3)]

Major weeds	*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
	Asystasia intrusa	**B**	**5**	[6(3)7(2)]
	Axonopus compressus	**G**	**6**	[2,6(1)7(3)9(1)]
	Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
	Clidemia hirta	**B**	**5**	[6,7(2)7(1)]
	Cynodon dactylon	**G**	**18**	[1,2(2)3,4(1)5(3)6,7(2)9(3)10(2)]
	Cyperus rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
	Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
	Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
	Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
	Sporobolus indicus	**S**	**3**	[6(3)]

TEAK
Tectona grandis VERBENACEAE
Origin: Myanmar

Major arthropod pests

stem boring	Lep	*Dichocrocis megillalis*	**O**	**1**	[9(1)]
		Hyblaea puera	**R**	**7**	[1,2,3(2)5(1)]
		Zeuzera coffeae	**R**	**8**	[2,5,6,10(2)]
	Col	*Xyleutes ceramicus*		**1**	[2(1)]

Table 13 (continued)

TOBACCO
Nicotiana tabacum SOLANACEAE
Origin: Central and South America

Major arthropod pests

leaf eating	Lep	*Agrotis ipsilon*	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Cnaphalocrocis medinalis	**R**	**16**	[1(1)4(2)5(3)6(2)8,9(3)10(2)]
		Helicoverpa armigera	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
		H. assulta	**R**	**7**	[2,3(1)5(2)6(1)9(2)]
		Lamprosema diemenalis	**R**	**4**	[2,3,6,7(1)]
		Orgyia turbata	**P**	**2**	[2,6(1)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
leaf mining	Lep	*Scrobipalpa heliopa*		**5**	[4(2)5,6,7(1)]
fruit boring	Lep	*Leucinodes orbonalis*	**R**	**15**	[1(2)2,3(1)4(2)5(3)6(2)7(1)8(3)]
root damaging	Col	*Hypomeces squamosus*	**PP**	**14**	[1,2(1)3(2)4(1)5,6(2)7(1)8(3)9(1)]
sucking	Hem	*Aphis gossypii*	**P**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2) 10(3)]
		Bemisia tabaci	**PP**	**10**	[2(3)5,6(1)7(3)9(2)]
		Cyrtopeltis tenuis	**O**	**1**	[5(1)]
		Myzus persicae	**P**	**12**	[2,3(1)5(3)6(2)7(1)9,10(2)]
		Stibaropus molginus		**1**	[2(1)]
	Thy	*Thrips tabaci*	**PP**	**9**	[1(1)2,5(2)7(1)10(3)]
Major weeds		*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9)1)10(2)]
		Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
		Cleome rutidosperma	**B**	**8**	[2(1)6(2)7(3)10(2)]
		Croton hirtus	**B**	**3**	[6(2)7(1)]
		Echinochloa colonum	**G**	**28**	[1,2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
		Eclipta prostrata	**B**	**13**	[1(1)2,5(2)6(3)7(2)9(1)10(2)]
		Hedyotis corymbosa	**B**	**7**	[1(1)6(3)7(2)10(1)]
		Lindernia crustacea	**B**	**4**	[6,7(2)]
		Ludwigia hyssopifolia	**B**	**8**	[1(3)2,6(2)10(1)]
		Melochia corchorifolia	**B**	**4**	[1(1)6(2)10(1)]
		Murdannia nudiflora	**B**	**5**	[1,6,9(1)10(2)]
		Phyllanthus fraternus	**B**	**4**	[1,2(1)6(2)]

TOMATO (see also SOLANACEAE)
Lycopersicon esculentum SOLANACEAE
Origin: South America

Major arthropod pests

leaf eating	Lep	*Acherontia lachesis*	**P**	**4**	[2,3,4,5(1)]
		Acherontia styx	**R**	**3**	[2,3,4(1)]
		Agrotis ipsilon	**P**	**11**	[1,2,4,5(1)6(2)7(1)9,10(2)]
		Chrysodeixis eriosoma	**P**	**5**	[4,5,6(1)10(2)]
fruit boring	Lep	*Helicoverpa armigera*	**PP**	**26**	[1,2(3)3(2)4,5,6(3)7(1)8(2)9,10(3)]
		Spodoptera litura	**PP**	**22**	[1(3)2(2)3(1)4(2)5,6(3)7,8,9,10(2)]
	Dip	*Bactrocera cucurbitae*	**P**	**25**	[1(1)2(3)3(2)4,5,6(3)7(1)8,9,10(3)]
		B. dorsalis	**PP**	**26**	[1(2)2(3)3,4(2)5,6(3)7(2)8,9,10(3)]
		B. latifrons	**R**	**6**	[2(1)6,8(2)9(1)]
root damaging	Ort	*Gryllotalpa africana*	**P**	**5**	[2,6,8(1)10(2)]
sucking	Hem	*Aphis gossypii*	**PP**	**19**	[1(2)2(3)3(1)4,5,6(2)7,8(1)9(2)10(3)]
		Bemisia tabaci	**P**	**10**	[2(3)5,6(1)7(3)9(2)]
		Cyrtopeltis tenuis	**O**	**1**	[5(1)]
		Myzus persicae	**P**	**12**	[2,3(1)5(3)6(2)7(1)9,10(2)]
		Urentius hystricellus	**O**	**2**	[4(2)]
	Thy	*Thrips palmi*	**P**	**12**	[1(1)2(2)6(3)7,8,9(1)10(3)]
		T. tabaci	**PP**	**9**	[1(1)2,5(2)7(1)10(3)]

VEGETABLES (Malaysia)

Major weeds	*Ageratum conyzoides*	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)8,9(1)10(2)]
	Amaranthus lividus	**B**	**3**	[6(3)]
	A. spinosus	**B**	**17**	[1,2(3)3,4,5(1)6,7(2)9(1)10(2)]
	Asystasia intrusa	**B**	**5**	[6(3)7(2)]
	Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
	Cleome rutidosperma	**B**	**8**	[2(1)6(2)7(3)10(2)]
	Croton hirtus	**B**	**3**	[6(2)7(1)]
	Cyperus iria	**S**	**23**	[1,2(2)3(3)4(2)5,6(3)7(1)8(3)9, 10(2)]
	C. kyllingia	**S**	**7**	[5,6(2)7(1)10(2)]
	C. rotundus	**S**	**27**	[1,2(3)3,4(2)5(3)6(2)7,8,9,10(3)]
	C. zollingeri	**S**	**4**	[6(2)7,8(1)]
	Digitaria ciliaris	**G**	**19**	[1,2(2)3(1)4(3)5,6,7(2)9(3)10(2)]
	Echinochloa colonum	**G**	**28**	[1(2)2,3(3)4(2)5,6(3)7(2)8,9,10(3)]
	Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
	Fimbristylis miliacea	**S**	**23**	[1(3)2,3(1)4(3)5(2)6(3)7(2)9(3) 10(2)]
	Imperata cylindrica	**G**	**26**	[1,2(3)3,4(2)5,6,7(3)8(1)9,10(3)]
	Ischaemum muticum	**G**	**5**	[6,7(2)10(1)]
	Mikania micrantha	**B**	**11**	[6,7(3)8,9(2)10(1)]
	Murdannia nudiflora	**B**	**5**	[1,6,9(1)10(2)]
	Oldenlandia corymbosa	**B**	**6**	[1(1)6,7(2)10(1)
	Oxalis corymbosa	**B**	**5**	[2(1)6,7(2)]
	Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
	Passiflora foetida	**B**	**11**	[1,2,3,5(1)6(3)7(1)8(2)10(1)]

WATERMELON
Citrullus lanatus CUCURBITACEAE
Origin: tropical and subtropical Africa

Major arthropod pests

leaf eating	Lep	*Diaphania indica*	**R**	**7**	[2,4(1)5(2)6,7,8(1)]
	Col	*Aulacophora foveicollis*	**R**	**4**	[1,2(1)6(2)]
		A. frontalis	**R**	**4**	[2,3,5,7(1)]
		A. similis	**P**	**9**	[[2,3(1)5(3)6,8(1)9(2)]
		Epilachna indica	**R**	**1**	[7(1)]
fruit damaging	Dip	*Bactrocera cucurbitae*	**R**	**25**	[1(1)2(3)392)4,5,6(3)7(1)8,9,10(3)]
		B. tau		**3**	[2,6,8(1)]
sucking	Thy	*Haplothrips floricola*	**R**	**2**	[2(2)]
		Thrips palmi	**P**	**12**	[1(1)2(2)6(3)7,8,9(1)10(3)]
		T. parvispinus	**P**	**4**	[1(6)9(3)]
	Aca	*Tetranychus* sp.	**P**	**8**	[1(1)5(2)6,7,8(1)10(2)]

Major weeds	*Axonopus compressus*	**B**	**6**	[2,6(1)7(3)9(1)]
	Borreria latifolia	**B**	**7**	[6(3)7,9(2)]
	Cleome rutidosperma	**B**	**8**	[2(1)6(2)7(3)10(2)]
	Eleusine indica	**G**	**24**	[1,2,3,4(2)5,6,7(3)8(1)9,10(3)]
	Erigeron sumatrensis	**B**	**2**	[6(2)]
	Paspalum conjugatum	**G**	**15**	[5,6(3)7,8(2)9(3)10(2)]
	P. scrobiculatum	**G**	**7**	[6,7,8(2)10(1)]

WHEAT
Triticum aestivum POACEAE
Origin: southeast Asia

Major weed	*Convolvulus arvensis*	**B**	**2**	[1(2)]

Table 14

Southeast Asian Crop Statistics

Two parameters that influence the importance of a pest to a crop in a particular country are the area under that crop and, particularly, the yield produced. The latest statistics available (as of April 1991) for Southeast Asia as a whole for a number of the more important crops affected by the major pests reported, are shown in table 14. The figures are drawn from the 1990 FAO Production Yearbook (FAO 1991). They refer to produce that moves through the market place and do not take into account the quite large amounts of some crops (eg. vegetables) that are produced for home consumption.

Gaps indicate that the crop is not grown commercially in a country or that the area grown is less than 1,000 hectares and/or the production is less than 1,000 metric tonnes. The figures uncover a weakness in simply adding up the pluses assigned to each pest. Thus, for soybeans in 1990, Indonesia produced 1,427,000, Thailand 578,000 and all remaining countries only 141,000 metric tonnes. It is evident that a soybean pest rated +++ in Indonesia must be accorded a far higher priority than a different pest with the same rating in the Philippines with a soybean production in 1990 of only 10,000 tonnes. However, this argument would be partly eroded if a massive increase in production was planned in the Philippines and, especially so, if its high rating pest was currently a major factor in discouraging farmers from increasing the areas planted to soybeans.

Additional information is available for some countries. For example, in 1990 about 5 million ha were cultivated in Malaysia of a total of about 11.6 million ha suitable for agriculture (Yusof 1990). The agricultural sector accounted for 22% of the GDP, 32% of the employment and 31% of export earnings. It is characterised by the predominance of a few export-oriented tree crops, such as rubber, oil palm, coconut, cocoa and fruits. There is an efficient and well organised estate segment engaged in export-oriented production of tree crops and a relatively less efficient and unorganised smallholder segment.

Figures for some major commodities in 1990 are shown below (Yusof 1990). The discrepancies between these figures and those published by FAO have not been investigated, but are presumably due, in part, to different bases on which the information has been assembled. It is assumed that the FAO figures have been collected from all countries in a uniform fashion and that they are thus valuable in establishing broad relativity.

	ha 4 1000	production (metric T 4 1000)
rubber	1,865	1,530
oil palm	1,815	6,860
cocoa	400	270
coconut	328	1,557
rice	666	1,590
fruits	148	
vegetables and spices	7	
other field crops	50	
pepper		28
pineapple		173
tobacco		12

In recent years the production of rice, pepper and pineapple has declined due to a drastic reduction in area, whereas the production of oil palm (now 68% of world production), cocoa and tobacco has increased markedly.

In Brunei, tropical rain forest covers some 70% of the total land area of about 6,000 sq km. Agriculture accounts for about 1% of GDP and some 80% of food is imported. Agriculture is now steadily gaining in importance after decades of low priority and current policy is to diminish dependence on imported foods. The aim is to produce some 30% of the nation's rice requirements (now >95% imported) and about 1,300 ha is under rice cultivation. There is also emphasis on increasing vegetable production, based on introduced varieties including cabbage, tomato, capsicum, beans, egg plant, maize, but also relying on traditional crops such as sweet potato. Current emphasis in fruit is on durian, cempedak and jackfruit, but also on mango and banana.

Reports from Myanmar suggest that losses in major crops due to pests may be lower than in neighbouring countries. There are several possible underlying reasons. Very low pesticide usage avoids the creation of pest population upsurges; there is no year round crop production, except in limited areas; and restrictions on population movement in and out of the country doubtless slows the entry of some new pests. A four year rice surveillance network concluded that the total loss from insects, weeds and diseases was less than 4%. Second in area after rice is sesame (edible oil is in short supply) and a leafhopper (*Orosius orientalis*) which transmits phyllody disease is thus a major pest in Myanmar, but unlisted elsewhere in Southeast Asia. The production of sesame in Myanmar (207,000 tonnes) is four times that of the rest of Southeast Asia (50,000 tonnes).

In Singapore weeds are seldom a problem in Agriculture, so the few records refer mainly to amenity horticulture and re-export of commodities.

Thailand has about 23.3 m ha of agricultural land of which 1.3 m h (or 5.4%) is used for growing fruits. About 25 types are produced for sale in local markets. Of these only 10, namely longan, pineapple, durian, mango, pomelo, rambutan, litchi, sugar apple (*Anona squamosa*), papaya and banana are exported.

Table 14 Southeast Asian Crop Statistics for 1990 [Ha 000's (Metric T 000's)]

	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Population x 1000	41,675	55,702	4,139	8,246	66,693	17,891	2,723	266	184,263	62,413
Agricultural population x 1000	19,535	33,675	2,961	5,771	40,387	5,417	27		81,845	29,024
Cereals: TOTAL	5,253(14,427)	11,615(22,921)	675(1,558)	1,825(2,455)	6,414(19,255)	648(1,685)		1(1)	13,476(51,234)	7,138(14,173)
Wheat	130(124)									
Rice paddy	4,797(13,965)	9,700(19,000)	638(1,491)	1,800(2,400)	5,900(18,400)	628(1,650)		1(1)	10,301(44,490)	3,319(9,319)
Maize	123(186)	1,713(3,675)	37(67)	25(55)	510(850)	20(35)			3,169(6,741)	3,820(4,854)
Millet	177(138)									
Sorghum		186(230)			4(5)				4(2)	
Roots and Tubers: TOTAL	24(211)	1,508(20,921)	41(376)	26(219)	657(5330)	55(523)		1(1)	1,722(19,944)	398(2,722)
Potatoes	14(130)	1(12)	6(58)		37(330)				39(480)	4(50)
Sweet Potato	5(28)	10(102)	28(218)	8(90)	340(2,000)	3(36)			241(2,180)	140(670)
Cassava	5(53)	1,488(20,701)	7(100)	17(115)	280(3,000)	38(410)		(1)	1,398(17,064)	213(1,850)
Taro		5(56)								31(103)
Yams										7(27)
Fruit (excluding melons)	(958)	(5,662)	(1,195)	(239)	(3,861)	(1,229)	(1)	(5)	(6,448)	(5,846)
All citrus		(314)	(77)	(46)	(113)	(19)			(433)	(130)
Avocado									(72)	(22)
Banana		(1,613)	(23)	(115)		(505)		(1)	(2,360)	(3,803)
Plantain	(238)									
Mango		(572)	(3)	(23)		(32)			(441)	(348)
Papaya		(536)			(1200)	(28)			(354)	(99)
Pineapple		(1865)	(52)	(12)		(211)		(1)	(283)	(1,170)
Cashew		(8,500)				(14,400)			(30,000)	(6,800)
Nuts (trees)			(9)	(1)	(3)	(14)			(31)	(10)
Coffee (green)	3(1)	53(61)	17(5)		45(260)	12(4)			750(391)	143(105)
Cocoa						295(250)			90(150)	19(9)
Tea		17(5)	(2)		45(31)	3(4)			108(165)	
Vegetables & melons: TOTAL	(2,149)	(2,486)	(268)	(475)	(3,738)	(533)	(8)	(9)	(4,095)	(887)
Watermelons		27(380)			16(155)	2(52)				4(110)
Other melons			2(42)							2(10)
Cabbage		18(194)			4(95)	1(14)			45(800)	7(75)
Cauliflower		4(27)			1(23)					
Capsicum		1(10)							213(403)	2(4)
Carrot									11(135)	
Egg plant		11(59)							73(165)	16(113)
Tomato		8(76)	3(22)			(7)			65(214)	20(180)

	MYAN	THAI	LAOS	CAMB	VIET	MSIA	SING	BRUN	INDO	PHIL
Cucumber, gerkins		27(206)				2(37)	(2)		68(278)	1(6)
Pumpkin, squash, gourds		16(204)				(11)			27(210)	4(50)
Onions	23(161)	14(180)	27(54)		55(165)				75(400)	6(60)
Garlic	11(39)	34(120)							15(65)	6(16)
Pulses: TOTAL	637(465)	625(459)	15(34)	45(43)	293(195)				375(464)	38(30)
Beans (dry)	400(301)	470(301)		45(43)	163(105)				350(460)	36(25)
Beans (green)		21(82)				(17)			22(85)	3(2)
Chick peas	134(101)									
Lentils	1									
Peas (dry)	20(13)									
Peas (green)		2(5)								8(24)
Soybean	32(26)	489(578)	5(4)	8(15)	120(86)				1,268(1,427)	10(10)
Groundnut in shell	524(458)	124(162)	7(6)	5(3)	220(210)	1(5)			626(919)	50(35)
Castor bean		50(29)		1(2)	5(4)				5(3)	(7)
Sunflower	134(89)									
Sesame	925(207)	54(32)		16(6)	23(8)				9(3)	(1)
Sugarcane	46(2,205)	686(33,561)	4(96)	5(230)	135(5,700)	20(1,370)			369(25,503)	315(24,800)
Cotton lint	(21)	(132)	(5)		(5)				(3)	(4)
Other fibres		(1)		(2)	(95)				(1)	(1)
Seed cotton	141(63)	71(97)	7(15)	1(1)	14(15)				18(10)	4(11)
Cotton seed	(42)	(64)	(10)	(1)	(10)				(6)	(7)
Coconut	(183)	(1,483)		(46)	(940)	(1,140)	(5)*		(12,550)	(10,185)
Copra		(67)		(8)	(170)	(93)	(8)*		(1,250)	(2,072)
Palm kernels		(50,000)				(1,845,000)			(425,680)	(18,000)
Palm oil		(226,000)				(6,094,700)			(1,936,899)	(54,000)
Tobacco	31(40)	62(70)	12(5)	16(13)	30(30)	12(11)			246(158)	60(71)
Jute	32(34)	136(181)		3(9)	16(35)				35(30)	
Jute + jute like fibres	32(34)	136(181)		3(9)	16(35)				35(30)	
Rubber	(15)	(1,100)		(29)	(65)	(1,420)			(1,300)	(188)

* probably re-exported

Table 14 (continued)

Table 15

Checklist of preferred names for arthropod pests in Southeast Asia

1. The only names included here come from the lists submitted and are those where alternatives are (or have recently been) in use in the region. Other names, where there is no current confusion, also appear in table 1.

2. The preferred name x is indicated by 'see x', or by 'x use for y', the name y being non-preferred.

3. The names are arranged alphabetically. The author and family of each preferred name appears in table 1.

4. It is evident from the number of entries that there is much to be done to stabilise the scientific names of even the major pest arthropods in the region. Accurate and consistent names are essential if information is to be effectively recorded, retrieved and communicated.

5. The checklist has been prepared with the assistance of taxonomic colleagues and is compatible with Wood (1989) 'Insects of Economic Importance: A Checklist of Preferred Names', which however, does not include many of the species listed in the table. In a few instances (e.g. use *Achaea serva* instead of *Achaea pentasema*, use *Chrysodeixis eriosoma* instead of *Chrysodeixis chalcites*, use *Papilio demoleus* instead of *Papilio demodocus* and use *Tarophagus colocasiae* instead of *Tarophagus prosepina*) all eight names are valid, but the second species of each pair does not occur in Southeast Asia. There are two instances where the names preferred in this table differ from those of Wood (1989). These are *Crocidolomia pavonana* preferred to *C. binotalis*, and *Spoladea recurvalis* preferred to *Hymenia recurvalis*. These preferred names follow the advice of taxonomists in the British Museum (Natural History).

Acanthoscelides obtectus	use for	*Bruchus obsoletus*
Aceria mangiferae	use for	*Eriophyes mangiferae*
Achaea janata	use for	*Achaea melicerta*
	use for	*Ophiusa janata*
Achaea melicerta	see	*Achaea janata*
Achaea pentasema	see	*Acheaa serva*
Achaea serva	use for	*Achaea pentasema*
Acontia transversa	see	*Xanthodes transversa*
Acraea issoria	use for	*Pareba vesta*
Acrocercops cramerella	see	*Conopomorpha cramerella*
Acryptorhynchus frigidus	see	*Sternochetus frigidus*
Agrius convolvuli	use for	*Herse convolvuli*
Agromyza phaseoli	see	*Ophiomyia phaseoli*
Agromyza sojae	see	*Melanagromyza sojae*
Allocarsidara malayensis	use for	*Tenaphalara malayensis*
Amrasca biguttula	see	*Amrasca devastans*
Amrasca devastans	use for	*Amrasca biguttula*
	use for	*Empoasca biguttula*
	use for	*Empoasca devastans*
Anomala antiqua	use for	*Aprosterna antiqua*
Anomala cupripes	use for	*Euchlora cupripes*
Anomis flava	use for	*Cosmophila flava*
Anua coronata	see	*Ophiusa coronata*
Anua tirhaca	see	*Ophiusa tirhaca*
Aonidiella orientalis	use for	*Aspidiotus orientalis*

Aproaerema modicella	use for	*Aproaerema nerteria*
	use for	*Biloba subsecivella*
	use for	*Stomopteryx subsecivella*
Aproaerema neteria	see	*Aproaerema modicella*
Aprosterna antiqua	see	*Anomala antiqua*
Archips machlopis	use for	*Cacoecia machlopis*
Archips micaceana	use for	*Cacoecia micaceana*
Archips tabescens	use for	*Cacoecia tabescens*
Argyrogramma signata	use for	*Phytometra signata*
	use for	*Plusia signata*
Artogeia canidia	see	*Pieris canidia*
Artona catoxantha	use for	*Zeuxippa catoxantha*
Aspidiotus orientalis	see	*Aonidiella orientalis*
Aspongopus fuscus	see	*Coridius fuscus*
Aulacaspis mangiferae	see	*Aulacaspis tuberculatus*
Aulacaspis tubercularis	use for	*Aulacaspis mangiferae*
Aulacophora frontalis	use for	*Ceratia frontalis*
Aulacophora similis	use for	*Rhaphidopalpa similis*
Bactrocera spp.	use for	*Dacus* spp.
Bactrocera hageni	see	*Bactrocera tau*
Bactrocera tau	use for	*Bactrocera hageni*
Basilepta viridipenne	use for	*Nodostoma viridipenne*
Batocera albofasciata	see	*Batocera rubus*
Batocera rubus	use for	*Batocera albofasciatus*
Bemisia myricae	see	*Parabemisia myricae*
Biloba subsecivella	see	*Aproaerema modicella*
Bombotelia jocosatrix	see	*Penicillaria jocosatrix*
Bruchus analis	see	*Callosobruchus analis*
Bruchus chinensis	see	*Callosobruchus chinensis*
Bruchus obsoletus	see	*Acanthoscelides obtectus*
Cacoecia machlopis	see	*Archips machlopis*
Cacoecia micaceana	see	*Archips micaceana*
Cacoecia tabescens	see	*Archips tabescens*
Cadamustus typicus	see	*Stephanitis typicus*
Calliteara horsfieldii	use for	*Dasychira horsfieldii*
Callosobruchus analis	use for	*Bruchus analis*
Callosobruchus chinensis	use for	*Bruchus chinensis*
Cataenococcus hispidus	use for	*Planococcus hispidus*
Catochrysops cnejus	see	*Euchrysops cnejus*
Ceratia frontalis	see	*Aulacophora frontalis*
Ceratovacuna lanigera	use for	*Oregma lanigera*
Chilo infuscatellus	use for	*Chilotraea infuscatellus*
		Proceras infuscatellus
Chilo polychrysus	use for	*Chilotraea polychrysa*
Chilo sacchariphagus	use for	*Proceras venosatus*
Chilotraea infuscatellus	see	*Chilo infuscatellus*
Chilotraea polychrysa	see	*Chilo polychrysus*
Chionaspis minor	use for	*Pinnaspis minor*
Chionaspis papayae	see	*Phenacaspis papayae*
Chromatomyia horticola	use for	*Phytomyza atricornis*
Chrysodeixis chalcites	see	*Chrysodeixis eriosoma*
Chrysodeixis eriosoma	use for	*Chrysodeixis chalcites*
		Plusia chalcites
		Plusia eriosoma
Chrysomphalus aonidum	use for	*Chrysomphalus ficus*
Chrysomphalus ficus	see	*Chrysomphalus aonidum*
Chunra niveosparsa	see	*Idioscopus niveosparsus*

Table 15 (continued)

Clania variegata	see	*Cryptothelia variegata*
Conogethes punctiferalis	use for	*Dichocrocis punctiferalis*
Conopomorpha cramerella	use for	*Acrocercops cramerella*
Coptotermes havilandi	use for	*Coptotermes javanicus*
Coptotermes javanicus	see	*Coptotermes havilandi*
Coridius fuscus	use for	*Aspongopus fuscus*
Cosmophila flava	see	*Anomis flava*
Crocidolomia binotalis	see	*Crocidolomia pavonana*
Crocidolomia pavonana	use for	*Crocidolomia binotalis*
Cryptorhynchus goniocnemis	see	*Sternochetus goniocnemis*
Cryptorhynchus gravis	see	*Sternochetus gravis*
Cryptorhynchus mangiferae	see	*Sternochetus mangiferae*
Cryptothelia variegata	use for	*Clania variegata*
Dacus spp.	see	*Bactrocera* spp.
Dacus hageni	see	*Bactrocera tau*
Darna diducta	use for	*Ploneta diducta*
Darna trima	use for	*Orthocraspeda trima*
Dasineura mangiferae	see	*Erosomyia mangiferae*
Dasychira horsfieldii	see	*Calliteara horsfieldii*
Dasychira mendosa	see	*Olene mendosa*
Diaphania caesalis	see	*Glyphodes caesalis*
Diaphania indica	use for	*Palpita indica*
Diaphania pulverulentis	see	*Glyphodes pulverulentis*
Dichocrocis punctiferalis	see	*Conogethes punctiferalis*
Dicladispa armigera	use for	*Hispa armigera*
Dinocoris nepalensis	use for	*Elasmognathus nepalensis*
Earias fabia	see	*Earias vittella*
Earias vittella	use for	*Earias fabia*
Elasmognathus nepalensis	see	*Dinocoris nepalensis*
Empoasca biguttula	see	*Amrasca devastans*
Empoasca devastans	see	*Amrasca devastans*
Empoasaa formosana	see	*Jacobiasca formosana*
Eotetranychus cendanai	use for	*Eutetranychus cendanae*
Ephestia cautella	use for	*Etiella cautella*
Epilachna vigintioctopunctata	use for	*Henosepilachna vigintioctopunctata*
Eriophyes boisi	see	*Eriophyes doctersi*
Eriophyes doctersi	use for	*Eriophyes boisi*
Eriophyes mangiferae	see	*Aceria mangiferae*
Erosomyia mangiferae	use for	*Dasineura mangiferae*
Etiella cautella	see	*Ephestia cautella*
Euchlora cupripes	see	*Anomala cupripes*
Euchrysops cnejus	use for	*Catachrysops cnejus*
Eutetranychus cendanae	see	*Eutetranychus cendanai*
Ferrisia virgata	use for	*Ferrisiana virgata*
Ferrisiana virgata	see	*Ferrisia virgata*
Glyphodes bivatralis	use for	*Margaronia bivatralis*
Glyphodes caesalis	use for	*Diaphania caesalis*
Glyphodes pulverulentalis	use for	*Diaphania pulverulentalis*
		Margaronia pulverulentalis
Hedylepta dimenalis	see	*Lamprosema diemenalis*
Hedylepta indicata	use for	*Lamprosema indicata*
Hedythia suturalis	see	*Medythia suturalis*
Helicoverpa armigera	use for	*Heliothis armigera*
Helicoverpa assulta	use for	*Heliothis assulta*
Heliothis armigera	see	*Helicoverpa armigera*
Heliothis assulta	see	*Helicoverpa assulta*
Hellula undalis	use for	*Oebia undalis*

Helopeltis theivora	use for	*Helopeltis theobromae*
Helopeltis theobromae	see	*Helopeltis theivora*
Hemerophila atrilineata	see	*Phthorardria atrilineata*
Henosepilachna vigintioctopunctata	see	*Epilachna vigintioctopunctata*
Herse convolvuli	see	*Agrius convolvuli*
Hispa armigera	see	*Dicladispa armigera*
Hymenia recurvalis	see	*Spoladea recurvalis*
Hyperaeschrella dentata	see	*Hyperaeschrella insulicola*
Hyperaeschrella insulicola	use for	*Hyperaeschrella dentata*
Hypothenemus hampei	use for	*Stephanoderes hampei*
Hypothenemus psidii	use for	*Stephanoderes psidii*
Icerya pulcher	see	*Icerya pulchra*
Icerya pulchra	use for	*Icerya pulcher*
Idiocerus clypealis	see	*Idioscopus clypealis*
Idiocerus niveosparsus	see	*Idioscopus niveosparsus*
Idioscopus clypealis	use for	*Idiocerus clypealis*
	use for	*Idioscopus nigroclypealis*
Idioscopus nigroclypealis	see	*Idioscopus clypealis*
Idioscopus niveosparsus	use for	*Chunra niveosparsa*
		Idiocerus niveosparsus
Jacobiasca formosana	use for	*Empoasca formosana*
Kerria javana	use for	*Laccifer javanus*
Laccifer javanus	see	*Kerria javana*
Lamprosema diemenalis	use for	*Hedylepta diemenalis*
Lamprosema indicata	see	*Hedylepta indicata*
Latoia lepida	see	*Parasa lepida*
Leptocorisa acuta	use for	*Leptocorisa varicornis*
Leptocorisa varicornis	see	*Leptocorisa acuta*
Leptoglossus australis	see	*Leptoglossus gonagra*
Leptoglossus gonagra	use for	*Leptoglossus australis*
		Leptoglossus membranaceus
Leucania unipuncta	see	*Mythimna separata*
Leptoglossus membranaceus	see	*Leptoglossus gonagra*
Lohita grandis	use for	*Macroceroea grandis*
Longiunguis sacchari	see	*Melanaphis sacchari*
Macroceroea grandis	see	*Lohita grandis*
Margaronia bivatralis	see	*Glyphodes bivatralis*
Margaronia indica	see	*Diaphania indica*
Margaronia pulveruntalis	see	*Glyphodes pulverulentalis*
Medythia suturalis	use for	*Hedythia suturalis*
Melanagromyza phaseoli	see	*Ophiomyia phaseoli*
Melanagromyza sojae	use for	*Agromyza sojae*
Melanaphis sacchari	use for	*Longiunguis sacchari*
Menophra atrilineata	see	*Phthorardria atrilineata*
Metatetranychus bioculatus	see	*Oligonychus coffeae*
Microtermes pakistanicus	use for	*Microtermes pallidus*
Microtermes pallidus	see	*Microtermes pakistanicus*
Mudaria sp.	use for	*Plagideicta* sp.
Mycterothrips setiventris	use for	*Physothrips setiventris*
Mythimna separata	use for	*Leucania unipuncta*
	use for	*Pseudaletia separata*
Neostauropus alternus	use for	*Stauropus alternus*
Nephotettix apicalis	see	*Nephotettix nigropictus*
Nephotettix bipunctata	see	*Nephotettix virescens*
Nephotettix impicticeps	see	*Nephotettix virescens*
Nephotettix nigropictus	use for	*Nephotettix apicalis*

Table 15 (continued)

Nephotettix virescens	use for	*Nephotettis bipunctatus* *Nephotettix impicticeps*
Nipaecoccus nipae	use for	*Pseudococcus nipae*
Nodostoma viridipenne	see	*Basilepta viridipenne*
Nomadacris succincta	use for	*Patanga succincta*
Nymphula depunctalis	see	*Papaponyx stagnalis*
Oebia undalis	see	*Hellula undalis*
Olene mendosa	use for	*Dasychira mendosa*
Olethreutes discana	see	*Statherotis discana*
Oligonychus coffeae	use for	*Metatetranychus bioculatus*
Ophiomyia phaseoli	use for	*Agromyza phaseoli* *Melanagromyza phaseoli*
Ophiusa coronata	use for	*Anua coronata*
Ophiusa janata	see	*Achaea janata*
Ophiusa tirhaca	use for	*Anua tirhaca*
Oregma lanigera	see	*Ceratovacuna lanigera*
Orosius albicinctus	see	*Orosius orientalis*
Orosius orientalis	use for	*Orosius albicinctus*
Orseolia oryzae	use for	*Pachydiplosis oryzae*
Orthocraspeda trima	see	*Darna trima*
Ostrinia nubilalis	use for	*Pyrausta nubilalis*
Pachydiplosis oryzae	see	*Orseolia oryzae*
Palpita indica	see	*Diaphania indica*
Papilio demodocus	see	*Papilio demoleus*
Papilio demoleus	use for	*Papilio demodocus*
Parabemisia myricae	use for	*Bemisia myricae*
Paraponyx stagnalis	use for	*Nymphula depunctalis*
Parasa lepida	use for	*Latoia lepida*
Parasaissetia nigra	use for	*Saissetia nigra*
Pareba vesta	see	*Acraea issoria*
Patanga succincta	see	*Nomadacris succincta*
Penicillaria jocosatrix	use for	*Bombotelia jocosatrix*
Phenacaspis papayae	use for	*Chionaspis papayae*
Phenacoccus iceryioides	see	*Rastrococcus iceryioides*
Philosamia cynthia	see	*Samia cynthia*
Phthorardria atrilineata	use for	*Hemerophila atrilineata* *Menophra atrilineata*
Phthorimaea heliopa	see	*Scrobipalpa heliopa*
Phyllotreta flexuosa	use for	*Phyllotreta sinuata* (Stephens)
Phyllotreta sinuata Redtenbacker	see	*Phyllotreta vittata*
Phyllotreta sinuata Stephens	see	*Phyllotreta flexuosa*
Phyllotreta vittata	use for	*Phyllotreta sinuata* Redtenbacker
Physothrips setiventris	see	*Mycterothrips setiventris*
Phytometra signata	see	*Argyrogramma signata*
Phytomyza atricornis	see	*Chromatomyia horticola* or *Chromatomyia syngenesiae*
Pieris canidia	use for	*Artogeia canidia*
Piezodorus hybneri	use for	*Piezodorus rubrofasciatus*
Piezodorus rubrofasciatus	see	*Piezodorus hybneri*
Plagideicta sp.	see	*Mudaria* sp.
Planococcus citri	use for	*Pseudococcus citri*
Planococcus hispidus	see	*Cataenococcus hispidus*
Ploneta diducta	see	*Darna diducta*
Plusia chalcites	see	*Chrysodeixis eriosoma*
Plusia eriosoma	see	*Chrysodeixis eriosoma*
Plusia signata	see	*Argyrogramma signata*

Proceras infuscatellus	see	*Chilo infuscatellus*
Proceras venosatus	see	*Chilo sacchariphagus*
Pseudaletia separata	see	*Mythimna separata*
Pseudococcus citri	see	*Planococcus citri*
Pseudococcus nipae	see	*Nipaecoccus nipae*
Pyrameis indica	see	*Vanessa indica*
Pyrausta nubilalis	see	*Ostrinia nubilalis*
Rastrococcus iceryioides	use for	*Phenacoccus iceryioides*
Rhaphidopalpa similis	see	*Aulacophora similis*
Rhynchocoris poseidon	use for	*Rhynchochorus serratus*
Rhynchocoris serratus	see	*Rhynchochorus poseidon*
Saccharicoccus sacchari	use for	*Tryonymus sacchari*
Samia cynthia	use for	*Philosamia cynthia*
Saissetia nigra	see	*Parasaissetia nigra*
Schoenobius bipunctifer	see	*Scirpophaga incertulas*
Scirpophaga excerptalis	use for	*Scirpophaga monostigma*
Scirpophaga incertulas	use for	*Schoenobius bipunctifer*
	use for	*Tryporyza incertulas*
Scirpophaga innotata	use for	*Tryporyza innotata*
Scirpophaga monostigma	see	*Scirpophaga excerptalis*
Scirpophaga nivella	use for	*Tryporyza nivella*
Scotinophara cinerea	use for	*Scotinophara vermiculata*
Scotinophara vermiculata	see	*Scotinophara cinerea*
Scrobipalpa heliopa	use for	*Phthorimaea heliopa*
Spodoptera exigua	use for	*Susunai exigua*
Spoladea recurvalis	use for	*Hymenia recurvalis*
Statherotis discana	use for	*Olethreutes discana*
Stauropus alternus	see	*Neostauropus alternus*
Stephanitis typica	use for	*Cadamustus typicus*
Stephanoderes hampei	see	*Hypothenemus hampei*
Stephanoderes psidii	see	*Hypothenemus psidii*
Sternochetus frigidus	use for	*Acryptorhynchus frigidus*
Sternochetus goniocnemis	use for	*Cryptorhynchus goniocnemis*
Sternochetus gravis	use for	*Cryptorhynchus gravis*
Sternochetus mangiferae	use for	*Cryptorhynchus mangiferae*
Stomopteryx subsecivella	see	*Aproaerema modicella*
Susunai exigua	see	*Spodoptera exigua*
Tarophagus colocasiae	use for	*Tarophagus prosepina*
Tarophagus prosepina	see	*Tarophagus colocasiae*
Tenaphalara malayensis	see	*Allocarsidara malayensis*
Tetranychus telarius	see	*Tetranychus urticae*
Tetranychus urticae	use for	*Tetranychus telarius*
Thosea biguttata	see	*Thosea vetusta*
Thosea vetusta	use for	*Thosea biguttata*
Toxoptera aurantii	use for	*Toxoptera bradyi*
Toxoptera bradyi	see	*Toxoptera aurantii*
Trialeurodes rara	see	*Trialeurodes ricini*
Trialeurodes ricini	use for	*Trialeurodes rara*
Tryonymus sacchari	see	*Saccharicoccus sacchari*
Tryporyza incertulas	see	*Scirpophaga incertulas*
Tryporyza innotata	see	*Scirpophaga innotata*
Tryporyza nivella	see	*Scirpophaga nivella*
Vanessa indica	use for	*Pyrameis indica*
Xanthodes transversa	use for	*Acontia transversa*
Xyleborus morstatti	see	*Xylosandrus compactus*
Xylosandrus compactus	use for	*Xyleborus morstatti*
Zeuxippa catoxantha	see	*Artona catoxantha*

Table 16

Checklist of preferred names for weeds in Southeast Asia

Ageratina adenophora	use for	*Eupatorium adenophorum*
Alternanthera sessilis	use for	*Alternanthera triandra*
Alternanthera triandra	see	*Alternanthera sessilis*
Amaranthus blitum	see	*Amaranthus lividus*
Amaranthus lividus	use for	*Amaranthus blitum*
Aneilema nudiflorum	see	*Murdannia nudiflora*
Asystasia coromandeliana	see	*Asystasia gangetica*
Asystasia gangetica	use for	*Asystasia coromandeliana*
Borreria articularis	use for	*Spermacoe hispida*
Chloris barbata	see	*Chloris inflata*
Chloris inflata	use for	*Chloris barbata*
Chromolaena odorata	use for	*Eupatorium odoratum*
Cleome ciliata	see	*Cleome rutidosperma*
Cleome rutidosperma	use for	*Cleome ciliata*
Commelina nudiflora	see	*Murdannia nudiflora*
Crotolaria pallida	use for	*Crotolaria striata*
Crotolaria striata	see	*Crotolaria pallida*
Cyperus babakan	use for	*Cyperus babakensis*
Cyperus babakensis	see	*Cyperus babakan*
Cyperus halpan	see	*Cyperus haspan*
Cyperus haspan	use for	*Cyperus halpan*
Cyrtococcum oxyphyllum	use for	*Panicum pillipes*
Cyrtococcum trigonum	use for	*Panicum trigonum*
Dicranopteris linearis	see	*Gleichenia linearis*
Digitaria adscendens	see	*Digitaria ciliaris*
Digitaria ciliaris	use for	*Digitaria adscendens*
Digitaria longiflora	see	*Digitaria violescens*
Digitaria violescens	use for	*Digitaria longiflora*
Eclipta alba	see	*Eclipta prostrata*
Eclipta prostrata	use for	*Eclipta alba*
Eleocharis chaetaria	see	*Eleocharis retroflexa*
Eleocharis retroflexa	use for	*Eleocharis chaetaria*
Eupatorium adenophorum	see	*Ageratina adenophora*
Eupatorium odoratum	see	*Chromolaena odorata*
Euphorbia geniculata	see	*Euphorbia heterophylla*
Euphorbia heterophylla	use for	*Euphorbia geniculata* *Euphorbia prunifolia*
Euphorbia prunifolia	see	*Euphorbia heterophylla*
Gleichenia linearis	use for	*Dicranopteris linearis*
Hedyotis corymbosa	see	*Oldenlandia corymbosa*
Hedyotis biflora	see	*Hedyotis racemosa*
Hedyotis racemosa	use for	*Hedyotis biflora*
Hydrolea glabra	see	*Hydrolea zeylanica*
Hydrolea zeylanica	use for	*Hydrolea glabra*
Hymenachne actigluma	use for	*Hymenachne psuedointerrupta* *Panicum amplexicaule*
Hymenachne pseudointerrupta	see	*Hymenachne actigluma*
Ischaemum ciliare	see	*Ischaemum indicum*
Ischaemum indicum	use for	*Ischaemum ciliare*
Jussiaea linifolia	see	*Ludwigia hyssopifolea*
Jussiaea repens	see	*Ludwigia adscendens*
Lemna minor	see	*Lemna purpusilla*

Lemna purpusilla	use for	*Lemna minor*
Leucas capitata	see	*Leucas cephalotes*
Leucas cephalotes	use for	*Leucas capitata*
Ludwigia adscendens	use for	*Jussiaea repens*
Ludwigia hyssopifolia	use for	*Jussiaea linifolia*
Macroptilium lathyroides	use for	*Phaseolus lathroides*
Marsilea crenata	see	*Marsilea minuta*
Marsilea minuta	use for	*Marsilea crenata*
Melochia concatenata	see	*Melochia corchorifolia*
Melochia corchorifolia	use for	*Melochia concatenata*
Murdannia nudiflora	use for	*Aneilema nudiflorum* *Commelina nudiflora*
Oldenlandia corymbosa	see	*Hedyotis racemosa*
Panicum amplexicaule	see	*Hymenachne actigluma*
Panicum pillipes	see	*Cyrtococcum oxyphyllum*
Panicum trigonum	see	*Cyrtococcum trigonum*
Paspalum commersonii	see	*Paspalum scrobiculatum*
Paspalum distichum	use for	*Paspalum paspaloides*
Paspalum paspaloides	see	*Paspalum distichum*
Paspalum scrobiculatum	use for	*Paspalum commersonii*
Phaseolus lathroides	see	*Macroptilium lathyroides*
Phyllanthus fraternus	use for	*Phyllanthus niruri*
Phyllanthus niruri	see	*Phyllanthus fraternus*
Polygonum pulchrum	see	*Polygonum tomentosum*
Polygonum tomentosum	use for	*Polygonum pulchrum*
Rottboellia cochinchinensis	use for	*Rottboellia exalata*
Rottboellia exalata	see	*Rottboellia cochinchinensis*
Spermacoe hispida	see	*Borreria articularis*

5. Useful Literature

This is a partial list of the literature consulted in preparing the tables. It consists mainly of general sources and omits many of the individual papers dealing with selected pests.

Ahmed, A.I. (Ed) 1992. List of weed species in selected crops of Peninsular Malaysia MARDI, Kuala Lumpur, Malaysia. In press.

Anon. 1976. Results of insect investigations 1967-1968. Agricultural Committee, Plant Protection Institute, Rural Publication, Hanoi, Vietnam.

Anon. 1988a. Brunei Darussalam agricultural research in perspective. Department of Agriculture, Bandar Seri Begawan, Brunei, 130pp.

Anon. 1988b. Use of pesticides 1988. Division of Entomology, Thailand Department of Agriculture, Agricultural Technical Bulletin.

Anon. 1990. The use of natural enemies to control agricultural pests. Food and Fertiliser Technology Center for the Asian and Pacific Region, Taipei, Taiwan. 254pp.

Barnes, D.E. & Chan, L.G. 1990. Common Weeds of Malaysia and their Control. Ancom Berhad, Selangor, Malaysia, 349pp.

Biotrop. 1989. Biological Control of Pests in Tropical Agricultural Ecosystems. Biotrop Special Publication 36: 1-349. SEAMEO-BIOTROP, Bogor, Indonesia.

Cock, M.J.W., Godfray, H.C.J. and Holloway, J.D. 1987. Slug and nettle caterpillars. The biology, taxonomy and control of the Limacodidae of economic importance on palms in South-east Asia. C.A.B. International, UK. 270pp.

Crowe, T.J. 1985. Field crop pests in Burma: An annotated list. Office of the FAO Representative, Rangoon, Burma. 1-66.

Dean, G.J. 1978. Insects found on economic plants other than rice in Laos. PANS 24: 129-142.

FAO. 1987. Insect pests of economic significance affecting major crops of the countries in Asia and the Pacific region. Technical Document 135/1987, 56pp. FAO Regional Office for Asia and the Far East, Bangkok, Thailand.

FAO. 1991. FAO 1990 Yearbook Vol 44. FAO Rome 283pp.

Geddes, A.M.W. 1992. The relative importance of pre-harvest crop pests in Indonesia. Natural Resources Institute Bulletin 47, 70pp.

Ghosh, C.C. 1940. Insect Pests of Burma. Government Printing and Stationary, Burma, 216pp.

Grist, D.H. and Lever, R.J.A.W. 1969. Pests of Rice. Tropical Science Series, Longmans, London, 520pp.

Harada, J., Paisooksantivatana, Y. and Zungsontiporn, S. 1987. Weeds in the Highlands of Northern Thailand. National Weed Science Research Institute Project, Thailand. Project Manual No. 3, 126pp.

Ho Tong Lip. 1966. Liste des plantes courantes du Cambodge. Division des Recherches Agronomiques. Phon-Penh. 9pp.

Hill, D.S. 1975. Agricultural Insect Pests of the Tropics and their Control. Cambridge University Press. 516pp.

Hill, D.S. 1978. Handbook of Agricultural Insect Pests of S.E. Asia. Department of Zoology, University of Hong Kong, 87pp.

Holm, L., Pancho, J.V., Herberger, J.P. and Plucknett, D.L. 1979. A Geographical Atlas of World Weeds. John Wiley & Sons, New York, 391pp.

Holm, L.G., Plucknett, D.L., Pancho, J.V. and Herberger, J.P. 1977. The World's Worst Weeds. Distribution and Biology. University Press of Hawaii, Honolulu, Hawaii, 609pp.

Jangi, M.S., Ibrahim, A.G., Liau, S.S., Lim, G.S., Lim, G.T., Mohamed, M.S. and Ooi, P.A.C. 1991. Biological Control in Malaysia: Insect and Other Pests. MARDI, Kuala Lumpur, Malaysia, 110pp.

Julien, M.H. 1987. Biological Control of Weeds. A World Catalogue of Agents and their Target Weeds: Second Edition. CAB International Institute of Biological Control, Wallingford, U.K. 144pp.

Kalshoven, L.G.E. 1981. The Pests of Crops in Indonesia. Revised and translated by P.A. Van Der Laan and G.H.L. Rothschild. P.T. Ichtiar Baru-Van Hoese, Jakarta, Indonesia, 701pp.

Kranz, J. 1977. Diseases, Pests and Weeds in Tropical Crops.
Le Pelley, R.H. 1968. Pests of Coffee. Tropical Science Series. Longmans 590pp.
Manser, P.D., Plumb G.H. and Liengphilavanh, M. 1968. A preliminary list of insects found on economic crops in Laos. Technical Document 63, 4pp. FAO Regional Office for Asia and the Far East, Bangkok, Thailand.
Manser, P.D., Plumb, G.H. and Liengphilavanh, M. 1969. Supplement 1 to the preliminary list of insects found on economic crops in Laos. Technical document 68, 3pp. FAO Regional Office for Asia and the Far East, Bangkok, Thailand.
McCrae, D.J. 1981. Insects of agricultural importance in Brunei. Department of Agriculture, Brunei, 110pp.
Mochida, O. 1988. Nonseedborne rice pests of quarantine importance, pp. 117-129 in Rice Seed Health, 362pp. IRRI Los Banos Philippines.
Moody, K. 1989. Weeds Reported in Rice in South and Southeast Asia. 442pp. IRRI, Los Banos, Philippines.
Napompeth, B. 1965. Entomology in Thailand up to 1964. Department of Entomology, College of Agriculture, Kasetsart University, Bangkok, Thailand, 1-46.
Napompeth, B. 1980. Report on insect pests and their incidence in Burma. Division of Agriculture, Bangkok, 1-16.
Napompeth, B. 1983. Final report on the consultancy in rice entomology and biological control in Vietnam. UNDP/FAO Project VIE/79/001 Hanoi. 25pp.
Napompeth, B. 1986. Final report on FAO Consultancy on biological control in Vietnam. UNDP/FAO Project VIE/82/009 Hanoi. 68pp.
Napompeth, B. 1989. Report on FAO Consultancy on biological control in Vietnam. UNDP/FAO Project VIE/88/031 Hanoi. 46pp.
Nguyen, Vuong. 1979. Weed flora in rice field in south Vietnam. Biotrop Bulletin. 11: 155-161.
Nickel, J.L. 1979. Annotated list of insects and mites associated with crops in Cambodia. Southeast Asian Regional Centre for Graduate Study and Research in Agriculture, College, Laguna, Philippines. 1-75.
Noda, K., Teerawatsakul, M., Prakongvongs, C. and Chaiwiratnukul, L. 1985. Major Weeds in Thailand. 142pp. National Weed Science Research Institute Project. Thailand.
Ooi, P.A.C. Insects in Malaysian Agriculture. Tropical Press, Kuala Lumpur Malaysia. 106pp.
Ooi, A.C.P. and Greathead, D.J. 1986. Biological Control in Southeast Asia and the role of CIBC. Proceedings of the Regional Conference on Plant Quarantine Support for Agricultural Development, December 1985. pp. 301-307.
Ooi, P.A.C., Neo, C.E. and Lim, G.S. 1981. A compendium of economic entomology in peninsula Malaysia (1887-1975) Bulletin No. 158: 1-233. Ministry of Agriculture, Malaysia.
Pholboon, L. 1965. A host list of the insects of Thailand. Department of Agriculture, Royal Thai Government and the United States Operations Mission to Thailand. 149pp.
Purseglove, J.W. 1968. Tropical Crops. Dicotyledons 1 and 2(1-719). Longman, London.
Purseglove, J.W. 1972. Tropical Crops. Monocotyledons 1(1-334) and 2(335-607). Longman, London.
Sathal, H. 1979. Weed problems on lowland rice fields in Khmer. Biotrop Bulletin, 11: 163-165.
Sisounthone, C. and Sisombat, L. 1979. Information on weeds in rice fields in Laos. Biotrop Bulletin, 11:151-153.
Soerjani, M., Kostermans, R.J.G.H. and Titrosoepomo. 1987. Weeds of Rice in Indonesia. 732pp. Balai Pustaka, Jakarta.
Tan, C.L., 1981. Natural enemies of the major insect pests of rice in peninsula Malaysia. Crop Protection Branch Information Leaflet 1:1-29. MARDI, Serdang, Selangor, Malaysia.
Vien Bao Ve Thucvat (Plant Protection Research Institute) KET QUA DIEU TRA CON TRUNG (List of Insects and Diseases in Northern Vietnam) 1967-1968. NHA XUAT BAN NONG THON, Vietnam, 560pp.
Vreden, G. van and Ahmadzabidi, A.L. 1986. Pests of Rice and their Natural Enemies in Peninsular Malaysia. Pudor, Wageningen. 230pp.

Waterhouse, D.F. 1992. Prospects for biological control of paddy weeds in Southeast Asia and some recent successes in the biological control of aquatic weeds. pp 21-42 *In* Proceedings of International Symposium on Biological Control and Integrated Management of Paddy and Aquatic Weeds in Asia. National Agricultural Research Centre, Kannondai 3-1-1, Tsukuba, Ibaroki 305, Japan. October 1992.

Waterhouse, D.F. 1993. Biological Control: Pacific Prospects. Supplement 2. ACIAR, Canberra, 138pp.

Waterhouse, D.F. and Norris, K.R. 1987. Biological Control: Pacific Prospects. Inkata Press, Melbourne, 454pp.

Waterhouse, D.F. and Norris, K.R. 1989. Biological Control: Pacific Prospects. Supplement 1. ACIAR, Canberra, 123pp.

Wood, A.M. 1989. Insects of Economic Importance: A Checklist of Preferred Names. CAB International, Wallingford, UK. 150pp.

Yunus, A. and Balasubramaniam, A. 1981. Major Crop Pests in Peninsular Malaysia. Ministry of Agriculture Malaysia, Kuala Lumpur, Bulletin 138:1-190.

Yunus, A. and Ho, T.H. 1980. List of Economic Pests, Host Plants, Parasites and Predators in West Malaysia (1920-1978). Ministry of Agriculture, Malaysia, Kuala Lumpur, Bulletin 153:1-538.