

# Integrated pest management in ornamentals information kit

Reprint – information current in 2000



## REPRINT INFORMATION – PLEASE READ!

For updated information please call 13 25 23 or visit the website [www.deedi.qld.gov.au](http://www.deedi.qld.gov.au)

This publication has been reprinted as a digital book without any changes to the content published in 2000. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research:

- Chemical recommendations—check with an agronomist or Infopest [www.infopest.qld.gov.au](http://www.infopest.qld.gov.au)
- Financial information—costs and returns listed in this publication are out of date. Please contact an adviser or industry body to assist with identifying more current figures.
- Varieties—new varieties are likely to be available and some older varieties may no longer be recommended. Check with an agronomist, call the Business Information Centre on 13 25 23, visit our website [www.deedi.qld.gov.au](http://www.deedi.qld.gov.au) or contact the industry body.
- Contacts—many of the contact details may have changed and there could be several new contacts available. The industry organisation may be able to assist you to find the information or services you require.
- Organisation names—most government agencies referred to in this publication have had name changes. Contact the Business Information Centre on 13 25 23 or the industry organisation to find out the current name and contact details for these agencies.
- Additional information—many other sources of information are now available for each crop. Contact an agronomist, Business Information Centre on 13 25 23 or the industry organisation for other suggested reading.

Even with these limitations we believe this information kit provides important and valuable information for intending and existing growers.

**This publication was last revised in 2000. The information is not current and the accuracy of the information cannot be guaranteed by the State of Queensland.**

This information has been made available to assist users to identify issues involved in ornamental horticulture. This information is not to be used or relied upon by users for any purpose which may expose the user or any other person to loss or damage. Users should conduct their own inquiries and rely on their own independent professional advice.

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this publication.



Queensland Government



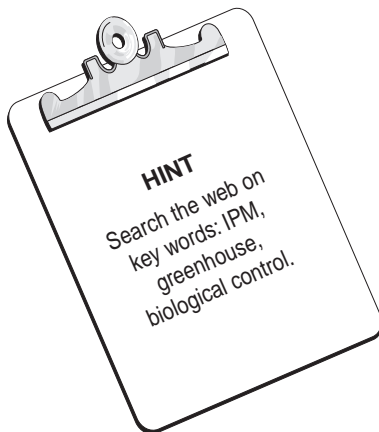
# Further Reading

## What can you expect to learn from this section?

Where you can get more information, either printed or electronic, that might be useful to you.

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**John Bunker, from Redlands Nursery in Queensland, has gathered information from workshops, cooperative research and trial programs with research agencies or the Department of Primary Industries in Queensland, magazines, overseas publications and the Internet.**

**He says:**

“On my Internet site at home I have a couple of favourite IPM programs from Europe and the United States, which have very interesting information that is regularly updated.”

## Web sites

This list of web sites is based on the book *Horticultural Sites on the World Wide Web* by V. Lane, Department of Primary Industries, Queensland. It is available from:

GrowSearch Australia  
PO Box 327  
CLEVELAND QLD 4163  
Ph. (07) 3821 3784

### **Australasian Biological Control—Goodbugs**

<http://www.goodbugs.org.au>

The home page of the Australasian Association of Beneficial Arthropod Producers, contains a fact sheet *What is IPM?* and a list of Australian commercial producers of biocontrol agents.

### **AgNet—a big list of Australian agricultural sites**

<http://agnet.com.au/biglist.html>

### **AgriWeb Australia**

<http://www.ruralnet.com.au/AgriWeb/>

On-line information for Australian farmers. Look here for market reports, classified advertisements and information on agricultural mailing lists.

### **Association of Natural Bio-control Producers**

<http://www.anbp.org>

A collection of biocontrol fact sheets and the on-line *Bio-control Matters* newsletter. The association is based in Western North America.

### **Biological Control Virtual Information Centre**

<http://ipmwww.ncsu.edu/biocontrol/biocontrol.html>

Look here for general information on biocontrol.

### **Biological Control at the University of California**

<http://www.biocontrol.ucr.edu/>

An excellent resource on biocontrol from this university.

### **BioResources**

<http://www.bioresources.com.au>

The home page of BioResources, a biocontrol company based in Queensland.

### **Bugs for Bugs**

<http://www.bugsforbugs.com.au/>

The home page of a major Australian biocontrol agent producer and monitoring service based in Queensland.

### **Cornell University Biological Control Site**

<http://www.nysaes.cornell.edu/ent/biocontrol/>

Photographs and descriptions of biocontrol of major insect, disease and weed pests in North America. The site also contains a biocontrol/IPM tutorial.

### **Entomology on the Web**

[http://www.colostate.edu/Depts/Entomology/www\\_sites.html](http://www.colostate.edu/Depts/Entomology/www_sites.html)

A collection of entomology links.

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**Wayne Bacchi, from Wholesale Indoor Foliage in Queensland, has been practising IPM for 10 years. He has gathered IPM information from books, Australian and overseas workshops, and has asked suppliers of biocontrol agents or his local agricultural department. He says:**

“A lot of the training is on-site learning through experience, what works and what doesn’t.”

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#### **Entomology Resources at Iowa State**

<http://www.ent.iastate.edu/List/>

On-line directory and search engine of insect-related resources on the Internet. Look here for information on beekeeping, biocontrol, IPM and pesticides; chapters on palm genera; common names of palms; palm conservation.

#### **Entomology Virtual Library**

<http://www.colostate.edu/Depts/Entomology/WWWVL-Entomology.html>

Search here for entomology bulletin boards, list servers, and news groups.

#### **F@RMING OnLine**

<http://www.rpl.com.au/farming/>

Rural Press Ltd is Australia’s leading publisher of regional and rural newspapers and magazines. Farming OnLine, the company’s electronic publication, contains agricultural news, market reports, weather reports and classified advertising.

#### **Florida Entomologist**

<http://www.fcla.ufl.edu/FlaEnt/fehmpg.htm>

On-line journal features full-text papers on pest and pest control issues.

#### **Flowerbase**

<http://www.flowerweb.nl/>

A list of Dutch flower auctions. Information on Dutch companies involved in the floriculture industry can also be accessed.

#### **Greenem Biological Control**

<http://www.greenem.com.au>

Biocontrol product information and contact details from a company based in Victoria.

#### **Greenhouse Coverings**

<http://www.agric.gov.ab.ca/crops/hort/grnhouse/index.html>

This Alberta, Canada site contains a regular monthly newsletter on IPM in greenhouse crops and is full of practical advice.

#### **Greenhouse Pest Management**

<http://www.wvu.edu/~agexten/ipm/common/insect/Greenhs/index.html>

This US site links to a wealth of greenhouse pest management resources including on-line pest identification guides. Look here for information on biocontrol agents and pesticides.

#### **Horticultural Auctions (wholesale) Aalsmeer, the Netherlands**

<http://www.netland.nl/~hanns/Welcome.html>

The wholesale prices of flowers, pot plants and garden plants at the Dutch markets can be viewed at this site.

#### **Hortnet**

<http://www.hortnet.com/>

Hortnet links to sites with information on chemicals, equipment and greenhouses. The site also connects to the HortNet Bulletin Board—a place for growers to exchange ideas.

#### **Introduction to Insecticides**

<http://ipmworld.umn.edu/chapters/ware.htm>

Background to insecticide use and function.

**IOBC/SEAPRS Working Group on IPM in Greenhouse Crops**

<http://www.cpitt.uq.edu.au/iobc/Welcome.html>

A working group based in Australia and New Zealand and representing scientific and industry interests in south-east Asian and Pacific region countries. The aim of the Working Group on IPM in Greenhouse Crops is to promote the development and adoption of IPM in the greenhouse industry and to facilitate the frequent exchange of information and progress in research. This site contains the Monitor, the group's on-line newsletter. The proceedings of the 1999 grower workshop, The Latest Overseas Developments in IPM, can also be viewed on-line.

**Koppert**

<http://www.koppert.nl/english/>

The homepage of Koppert Pty Ltd, the largest biocontrol agent producer in Europe. It provides excellent resources on the large range of beneficials produced by them.

**New York State Integrated Pest Management Program**

<http://www.nysaes.cornell.edu/ipmnet/ny/>

Information about New York State's IPM programs (fruits, vegetables, ornamentals and turf grass).

**Nursery Industry Association of Australia (NIAA)**

<http://www.niaa.org.au/>

The Nursery Industry Association of Australia is the peak industry body for the Australian nursery industry. This site details the NIAA's strategic plan and contains information on marketing and promotional research, industry development, exports and the nursery products levy. Full copies of *The Nursery Papers* can be viewed. A version of the Nursery Industry Accreditation Scheme, Australia (NIASA) Best Practice Guidelines can also be accessed through this web site. The site also contains a collection of useful links.

**National Science Foundation (NSF) Centre for IPM**

<http://ipmwww.ncsu.edu/cipm/>

Pest management and production information for commercial crops (fruits, vegetables and field crops); information on urban and municipal integrated pest management; and specific pesticide recommendations.

**Northeast Greenhouse IPM Notes**

<http://www.rce.rutgers.edu/pubs/greenhouseipmnotes/ghipmnotes>

Monthly note containing pest and disease report and IPM articles from experts. Strongly recommended.

**Ohio Florists Association**

<http://www.ofa.org/book/book.html>

Ohio Floriculture Online is a practical publication aimed at commercial growers of cut flowers. This site links to full-text back issues of the publication.

**Ohio IPM**

<http://www.ag.ohio-state.edu/~ipm/index.html>

A wealth of pest management information relevant to field crop producers.

**Plant Pathology Internet Guide Book (PPIGB)**

<http://www.scisoc.org/ppigb/>

The Plant Pathology Internet Guide Book contains links to plant pathology and applied entomology Internet resources. The site is maintained by Germany's University of Hanover.

#### **Queensland Nursery Industry Association (QNIA)**

<http://www.qnia.asn.au/>

The Queensland Nursery Industry Association is the State's peak industry body representing the nursery industry (wholesale and nursery industries, garden centres and other allied trades). This site contains a list of association contacts, activities, information and publications.

#### **Radcliffe's IPM World Textbook**

<http://ipmworld.umn.edu>

This on-line Integrated Pest Management textbook features chapters by internationally recognised experts.

#### **Texas A&M Greenhouse Management Handbook**

<http://extension-horticulture.tamu.edu/greenhouse/ghhdbk/handbook.html>

A great on-line handbook. Look here for information on greenhouse structures; greenhouse heating; growing media and pH; fertilising greenhouse crops; diagnosing nutritional deficiencies; irrigation; monitoring water quality; water treatments; and managing soluble salts.

#### **Western flower thrips in Australia**

<http://www.nre.vic.gov.au/farming/hort/wft/wft.htm>

Information on Australia's National Strategy for the management of Western Flower Thrips and Tomato Spotted Wilt Virus; on-line western flower thrips newsletters; and links to other sites of interest. It also lists host plants of tomato spotted wilt virus and western flower thrips.

#### **Whiteflies**

<http://www.ifas.ufl.edu/~ent2/wfly/>

Look here for information on banded-winged, greenhouse, silverleaf, and sweet potato whiteflies.

## **Publications**

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*Ball Field Guide to Diseases of Greenhouse Ornamentals*, Daughtrey, M. & Chase, A.R. (1992), Ball Publishing, Batavia, Ill., USA.

*Ball Identification Guide to Greenhouse Pests and Beneficials*, Gill, S. & Sanderson, J. (1998), Ball Publishing, Batavia, Ill., USA.

*Ball Pest and Disease Manual: Disease, Insect and Mite Control on Flower and Foliage Crops*, Powell, C.C. & Lindquist, R.K. (1997, 2nd edn), Ball Publishing, Batavia, Ill., USA.

*Ball Red Book, Greenhouse Growing*, Ball, V. (1991), Ball Publishing, Geo. J. Ball Publishing, USA.

*Biological Control: Protected Crops*, Helyer, N. & Richardson, P.N. (1991), Grower Publications.

*Biological Pest Control: The Glasshouse Experience*, Hussey, N.W. & Scopes, N. (1985), Cornell University Press.

*Biological Pest Management for Interior Plantscapes*, Steiner, M.Y. & Elliott, D.P. (1987, 2nd edn), Alberta Environmental Centre, Vegreville, AB, T0B 4L0, Canada.

*Biological Technical Manual*, Applied Bio-Nomics Ltd, Sidney, B.C., Canada.

*Citrus Pests and their Natural Enemies: IPM in Australia*, Smith, D., Beattie, G.A.C. & Broadley, R.H. (eds) (1997), Department of Primary Industries, Brisbane & Horticultural Research & Development Corporation, Sydney.

*Citrus Pests—a Field Guide*. (A companion to *Citrus Pests and their Natural Enemies: IPM in Australia*), Smith, D., Broadley, R.H., Feutrill, C., Beattie, G.A.C. & Freebairn, C. (eds), (1997), Department of Primary Industries, Brisbane & Horticultural Research and Development Corporation, Sydney.

*Compendium of Flowering Potted Plant Diseases*, Daughtrey, M. L., Wick, R. L. & Peterson, J. L. (1995), American Phytopathological Society Press (APS). Cost: US\$37.

*Compendium of Ornamental Foliage Plant Diseases*, Chase, A. R. (1987), American Phytopathological Society Press (APS). Cost: US\$35.

*Diseases and Disorders of Ornamental Palms*, Chase, A.R. & Broschat, T.K. (1991), American Phytopathological Society Compendium Series, APS Press.

APS books are available from:  
 APS Press Headquarters  
 3340 Pilot Knob Road  
 ST. PAUL, MN 55121-2097 USA  
 Ph: +1 651 454 7250  
 Fax: +1 651 454 0766  
 E-mail: [aps@scisoc.org](mailto:aps@scisoc.org)  
 Web: <http://www.scisoc.org/apspress/>

*Diseases of Annuals and Perennials*, Chase, A.R., Daughtrey, M. & Simone, G.W. (1995) Ball Publishing, Batavia, Ill., USA.

*Greenhouse Coverings—Properties and Selection*, Connellan, G.J. (1998), Proceedings of the national protected cropping expo, 25 July 1998, Central Coast, NSW.

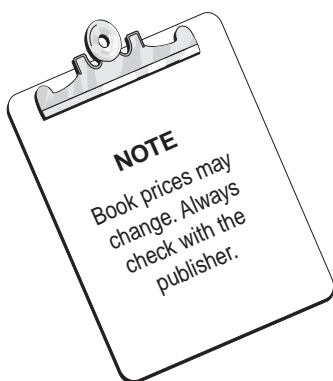
*Growing Media for Ornamental Plants and Turf*, Handreck, K. & Black, N. (1994) NSW University Press.

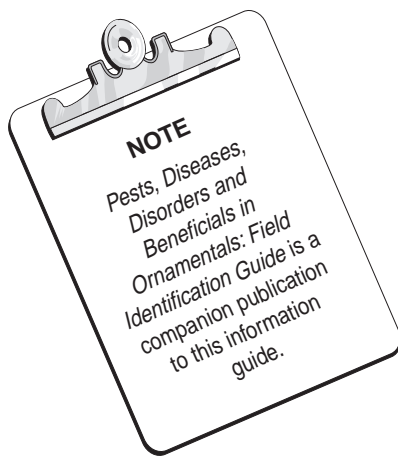
*Handbook of Integrated Pest Management for Turf and Ornamentals*, Leslie, A.R. (1994), Lewis Publishers, CRC Press Inc., USA.

*Handbook of the Major Pests and Diseases of Nursery Plants*, Mathias, P. (1997, 2nd edn), NSW Agriculture, Sydney, Horticultural Research & Development Corporation, Sydney & Nursery Industry Association of Australia.

*Horticultural Sites on the World Wide Web*, Lane, V. (1999, 3rd edn), Department of Primary Industries, Brisbane & GrowSearch Australia.

*Hydroponic Questions and Answers. The Best of Reader Inquiries from Practical Hydroponics and Greenhouses Magazine; 1999–2000*, Rick Donnan. Casper Publications Pty Ltd, ISSN 1442-3944.





*Integrated Pest and Disease Management in Greenhouse Crops*, Albajes, R., Lodovica Gullino, M., van Lenteren, J.C. and Elad, Y. (eds) (1999), Kluwer Academic Publishers, the Netherlands.

*Integrated Pest Management for Greenhouse Roses*, IPM Manual No. 8, Martin, N.A. August 1994, New Zealand Institute for Crop and Food Research.

*Multilayer Greenhouse Films*. Daponte, T. (1994), Proceedings of greenhouse systems—automation, control and environment international conference, Rutgers University, New Jersey, USA.

*Natural Enemies of Vegetable Insect Pests*, Hoffman, M. & Frodsham, A. (1993), Cornell University Press.

*Natural Pest Control: an Australian Guide for Commercial Growers, Orchardists and Farmers*, Chapman, B., Penman, D. & Hicks, P. (1986), Thomas Nelson publishers.

*New Interference Film for Climate Control*, Verloot, I. & Verschaeren, P. (1997), *Plasticulture*, No. 115, pp. 27–35.

*Ornamental Plants—Pests, Diseases and Disorders*, Bodman, K.G. et al. (1996), Department of Primary Industries, Brisbane, Information Series QI96001.

*Pest Control in Ornamental Crops*, Bodman, K.G, Hargreaves, J.R. & Parker, R.J. (1993), Queensland Nursery Industry Association.

*Pests, Diseases, Disorders and Beneficials in Ornamentals: Field Identification Guide* (2000), NSW Agriculture, Sydney.

*Plant Nutrient Disorders of Ornamental Plants*, Weir, R.G. & Cresswell, G.C. (1993), NSW Agriculture.

*The Biology of Glasshouse Pests and their Natural Enemies*, Malais, M. & Ravensberg, W.J. (1991), Koppert Biological Systems, the Netherlands.

*The Garden Pest Book: an Illustrated Australian Guide*, Chapman, B., Penman, D. & Hicks, P. (1991), Claremont Publishers.

*The Good Bug Book: Beneficial Insects and Mites Commercially Available in Australia for Biological Pest Control*, Australasian Biological Control Inc. (1995), Desert Oak Publishing. Cost: \$25 (includes postage). Available from:

The Secretary  
Australasian Biological Control Inc.  
PO Box 436  
Bourke Street  
RICHMOND NSW 2753  
Ph: (02) 4570 1331; Fax: (02) 4570 1314

*The Plant Disease Clinic and Field Diagnosis of Abiotic Diseases*, Shurtleff, M.C. & Averre, C.W. (1997), APS Press, St. Paul, Min., USA.

*The Use of Photosensitive Cladding Materials as Modifiers of Morphogenesis of Plants and Pathogens*, Raviv, M. (1989), *Acta Horticulturaria* 246, 1989, pp. 275–284.

*What Garden Pest or Disease is that? Companion Edition*, McMaugh, J. (1986), Lansdowne Press.



*Wye College Biological Control Handbook*. Cost: £(Sterling)5.95. Available from:

Defenders Ltd  
PO Box 131  
Wye  
Ashford  
KENT TN25 5TQ UK

### The Nursery Papers

'TNP' is The Nursery Paper number reference. The following nursery papers can be found on the Nursery Industry Association Australia web site: <http://www.niaa.org.au/np/index.html>

- |              |  |
|--------------|--|
| TNP 2000#05  | Hygiene in the nursery—disinfecting production surfaces; cement, gravel, capillary mats and sand beds. |
| TNP 2000#02  | Hygiene and sanitation of working surfaces in the nursery.   |
| TNP 2000#01  | Western flower thrips insecticide management.  |
| TNP 1999#02  | Beware of <i>Chalara elegans</i> —black root rot.  |
| TNP 1999#11  | Windbreaks, an investment in quality and profitability.  |
| TNP 1999#10  | The southern red mite, another new pest.   |
| TNP 1999#09  | Warning! Industry chemicals under review.  |
| TNP 1999#07  | Ash whitefly—a new pest.   |
| TNP 1999#03  | Slow sand filtration (SSF) for water treatment in nurseries and greenhouses.                           |
| TNP 1999#01  | Greenhouse insect screens—making the right selection.  |
| TNP 1998#002 | Getting control of weevil borers and leaf beetles in palms.  |
| TNP 1998#006 | Measure and improve your environmental performance.  |
| TNP 1998#007 | Biological control of insect pests: now and tomorrow.  |
| TNP 1997#003 | Chasing consistent disease suppression in potting media.   |
| TNP 1997#005 | A step-wise programme for practising IPM.  |
| TNP 1997#006 | Controlling <i>Botrytis</i> (grey mould) in nurseries.   |
| TNP 1997#007 | Keeping pests out with screening.  |
| TNP 1997#008 | Water disinfestation? Chloro-bromination and ozone systems get the thumbs up.                          |
| TNP 1997#009 | Silverleaf whitefly: management of a new nursery pest.   |
| TNP 1997#010 | New hygiene protocols will reduce disease and save on control costs!                                   |
| TNP 1997#011 | Grubs in your post? Are they weevils and what can you do about it?                                     |
| TNP 1997#012 | Managing western flower thrips.  |
| TNP 1996#004 | Monitoring and managing recycled water quality in nurseries.   |



- TNP 1996#005 Using ultraviolet radiation and chlorine dioxide to control fungal plant pathogens in water.
- TNP 1996#008 Biological control of thrips, mites and other insects.
- TNP 1996#012 Controlling downy mildew in nursery seedlings.
- TNP 1996#013 Rid seeds of disease—give them a sauna.

## Magazines

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### Australian

*Australian Horticulture*—IPM Notebook and other articles on pest and disease management, \$75 a year. Ph: 1800 035 351

*Australian Nursery Manager* (6 issues a year). Inserted in *Australian Horticulture* and free to subscribers

### Overseas

*GMPPro* (formerly *Greenhouse Manager*) (monthly, USA). \$US120 a year. Ph: (817) 882 4120

*Greenhouse Grower* (12 issues a year, supplements in autumn and spring, US). \$US80 a year airmail. Ph: (800) 572 7740

*Grower* (weekly, UK) £(Sterling)123 a year. Ph: 01 322 660 070

*Grower Talks* (monthly, USA). \$US75 a year. Ph: (630) 208 9080

*Practical Hydroponics and Greenhouses* (every second month). \$45 a year. Ph: (02) 9905 9933

*The IPM Practitioner* (10 issues a year, US). \$US35 a year plus \$US25 postage for 2001–02. Ph: 510 524 2567

Available from:

Bio-Integral Resource Centre (BIRC)

P O Box 7414

Berkley

CALIFORNIA CA 94707 USA

E-mail: [birc@igc.apc.org](mailto:birc@igc.apc.org)

## CD-ROM

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*Infopest*—pest management information system, Department of Primary Industries, Brisbane. Cost: \$95 for the Infopest CD and \$180 for an annual subscription (three CDs, one every four months). Available from:

Infopest Marketing Manager

Animal & Plant Health Service

Department of Primary Industries

GPO Box 46

BRISBANE QLD 4001

Ph: (07) 3239 3967; Fax: (07) 3211 3293

E-mail: [infopest@dpi.qld.gov.au](mailto:infopest@dpi.qld.gov.au)

Web: <http://www.dpi.qld.gov.au/aphs/infopest>

