

Book reviews

Control of varroa: a guide for New Zealand beekeepers. By M. Goodwin & C. van Eaton. Published in 2001 by the Ministry of Agriculture and Forestry, New Zealand (<http://www.maf.govt.nz/varroa>). 120 p. ISBN: 0-478-07958-3. Price: NZ\$17 (New Zealand); US\$12/NZ\$28 (international).

“Control of varroa: a guide for New Zealand beekeepers” is a handbook by Mark Goodwin and Cliff van Eaton, both well-known scientists and advisors, also outside of New Zealand. This publication is a straight-forward presentation aimed at helping New Zealand beekeepers to avoid problems facing beekeepers virtually all over the world where varroa mites have become introduced; high colony losses because beekeepers do not adapt initially to the new situation imposed by the mite infestation. The book condenses in a commendable fashion the well of information from overseas on varroa and gives an updated review of what is most likely appropriate for New Zealand conditions. It is obvious that the authors have studied the literature on various aspects of the varroa problem thoroughly, but there are no references given in the text. For those wishing to study a certain aspect further, this is unfortunate since there are systems for entering references in the text that are hardly noticed, except for those interested.

The focus of the book is on production-related aspects of the varroa problem. Chapters dealing with mite biology and host-parasite interactions are brief with emphasis on the various aspects how to detect and control the mite. The structure of the presentation is logical, and to my judgement, the content seems to be based on the best available knowledge to date. It should be possible for New Zealand beekeepers to avoid most of the initial devastating effects of varroa demonstrated elsewhere if the advice on the main themes of the book are adapted: (1) determine mite infestation levels and be aware of the reinfestation problems; (2) use control methods appropriate for the season, infestation level,

and colony condition; (3) avoid producing acaricide-resistant mites; and (4) avoid contaminating bee products with acaricides.

Three critical comments can be given to specific items in the book. They do not diminish the overall positive impression of this publication which undoubtedly will be of great help to New Zealand beekeepers.

(1) For a more complete understanding of how colonies are damaged by varroa, the mite-virus association could have been given a bit more room. Increasing evidence suggests that what actually kills colonies are latent virus infections induced to replicate by the mite feeding behaviour and then vectored to both adults and brood as the mite changes host and feeding sites. Again, with production of honey in focus, controlling varroa will also control virus infections, but threshold levels for control may very well be dependent on the composition of virus infections, a field which needs more research.

(2) The authors emphasise the concept of low dose as a major risk to produce acaricide-resistant mites. This is not self evident. The extremely high efficacy of pyrethroids could be a problem in itself, producing acaricide resistance. With such extreme selection pressure as offered by the pyrethroids, only the most resistant mites that come into contact with the compounds survive the treatment, yielding a resistant population faster compared to compounds where part of the susceptible mite population remain after treatment. Nevertheless, the authors' conclusion that use of unlabelled products and misuse of acaricides have contributed to faster emergence of acaricide-resistant mite populations is probably true.

(3) The concept of monitoring mite populations is central for determining appropriate actions by the beekeepers. Several different techniques for this purpose are described in the book. However, most are cumbersome or partly unreliable. The most commonly used method, at least in Europe, is monitoring of natural mite mortality in screen bottom boards over a certain period to determine the number of mites per day in the debris. The method is simple, fast, and reliable enough, in particular in the middle

of the summer, to determine treatment thresholds. It may be misleading for the New Zealand practice that the authors primarily forward single British data for this purpose where 1 mite per day equals 30 mites in colonies in full brood production. Several independent estimates from other countries (Spain, Germany, Denmark) demonstrate that under these conditions, a rule of thumb can be used saying that 1 mite per day equals 120–130 mites in the colony. There is a factor of 4 between these estimates when only adult female mites are counted. This difference may be large enough to cause problems for New Zealand beekeepers if the lower estimate is used as a base for treatment decisions, potentially leading to damaged colonies before treatment is initiated.

In summary, Goodwin and van Eaton have composed a manual for beekeepers that contains an up-to-date review of knowledge for varroa mite control most relevant for the practice. The literature on this subject has become enormous over the past decades and the synthesis made by the authors is admirable and most certainly will serve the New Zealand beekeepers well when their battle against varroa is initiated.

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Compendium of cotton diseases. Second edition. Edited by T. L. Kirkpatrick and C. S. Rothrock. Published in 2001 by APS Press, 3340 Pilot Knob Road, St Paul, MN 551121-2097, United States (www.apsnet.org). 77 p., softcover. ISBN: 0-89054-279-1. Price: US\$ 49.00 (email: aps@scisoc.org).

The second edition of this book in the series of compendia produced by the American Phytopathological Society maintains the high standards set in the first edition published in 1981. The book is a welcome update and provides expanded up-to-date information on diseases affecting production of the cotton crop. It is designed as an aid to plant pathologists involved in extension and advisory work and serves practitioners with both extensive and limited experience of the crop, providing practical assistance in the recognition and diagnosis of diseases of cotton.

This edition has been substantially revised and incorporates information from numerous scientists and practitioners, mainly from the United States and Australia, who are involved in cotton disease research, diagnosis, and advisory services. This, together with the excellent colour plates, increases its usefulness for accurate disease diagnosis. The compendium provides information on the origins of cotton and the evolution of its cultivation around the world. It includes details on growth and development of the plant which is so important in diagnosis of disease and the development of effective disease management strategies. For each disease there is a complete description of symptoms and the causal agent.

The contents of the compendium are organised according to the causal agents of diseases and disorders. Part I deals with infectious diseases and includes detailed information on diseases caused by fungal and bacterial pathogens, together with useful sections on nematodes, viruses, and phytoplasmas, and diseases of unknown etiology. The major section on fungal diseases is conveniently organised according to the infected part of the plant i.e., seedling, leaf, stem, root, and boll. Part II describes abiotic disorders as a result of nutritional deficiencies and toxicities, environmental disorders, and herbicide injury. Part III covers disease management including disease control in cotton production systems, resistance to nematodes, and resistance to fungal and bacterial pathogens.

In the second edition each individual section has been extensively revised and those sections describing nematode parasites and virus diseases of cotton have been substantially expanded to reflect their importance in production of the crop.

Descriptions of the diseases and disorders follow the format that has proved so successful in other compendia in the series. Background information on each disease includes notes on geographic distribution and economic importance. This is followed by descriptions of disease symptoms; details on the epidemiology and disease cycles; control strategies; and selected references. The sections on nematodes, viruses, and phytoplasma diseases, and diseases of unknown etiology are extremely useful. Part II on abiotic disorders, although less extensive than the pathogen section, is nevertheless most informative. Part III on disease management provides important information on the development of cotton disease control strategies that integrate disease management into production systems. The final sections on genetic resistance to fungal and bacterial diseases,

and nematodes, are particularly pertinent as breeding for resistance is probably the most cost-effective means of control available to growers.

The 16 pages of high quality colour plates provide 115 excellent photographs of symptoms and disorders, and causal agents. These photographs show many of the symptoms likely to be encountered in the field, thus enabling individuals with only limited experience in cotton production to make reasonably accurate diagnoses.

No glossary of terms used in the text is provided in this compendium as the reader is directed to the numerous general plant pathology texts containing this information and to an online glossary site. However, these may not necessarily be available to all readers and a glossary would have been an additional useful feature.

The accounts of each disease and disorder provide up-to-date information and are written with a conciseness which results in an excellent reference and diagnostic guide. The information on disease cycles and disease epidemiology provides the reader with a clear guide to the formulation of appropriate control strategies. This, together with the useful information provided in the disease management section, ensures that a comprehensive treatment of cotton diseases and their control in production systems is available to plant pathologists, growers, consultants, and others associated with the production of the cotton crop worldwide.

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Plant viruses as molecular pathogens.

Edited by Jawaid A. Khan and Jeanne Dijkstra. Published in 2001 by Food Products Press, 10 Alice Street, Binghamton, NY 13904-1508, United States (email: getinfo@haworthpressinc.com). 530 p. Hardback — ISBN: 1-56022-894-6; price: US\$129.95 (United Kingdom, £107.64). Softback — ISBN: 1-56022-895-4; price: US\$59.95 (United Kingdom, £49.68).

“Plant viruses as molecular pathogens” is comprised of 21 chapters from a range of authors, some with top international reputations and others who are less

well known. The book is organised into sections on taxonomy, virus transmission and transport, molecular biology of RNA viruses, molecular biology of DNA viruses, resistance to viral infection, and methods in molecular virology.

The first two chapters, on virus taxonomy and nomenclature, are by Mike Mayo and Marc Van Regenmortel, respectively. These provide an excellent introduction to plant viruses and will be particularly helpful to those who are new to the field. The following section looks at virus transmission by insects, nematodes, fungi, and seed, and a chapter on virus movement within plants. These chapters include general overviews of the modes and mechanisms of transmission as well as detailed information on the molecular determinants involved. Sections III (RNA viruses) and IV (molecular biology of DNA viruses) make up almost 50% of the book and cover topics such as viral replication, gene expression, and recombination. Individual chapters range from broad overviews (e.g., gene expression strategies of RNA viruses) to the detailed analysis of specific viruses (e.g., the evolution of *Potato virus Y*). The following section contains two chapters on resistance to viral infection. The first, by Jari Valkonen, on natural resistance, clearly explains the different types of plant virus interaction and the mechanisms involved, which effectively sets the scene for the following chapter on engineered resistance. This concise but very informative chapter starts with a brief summary of genome organisation and virus replication followed by an overview the various strategies used to produce pathogen-derived-resistance. The concluding section of the book is on methodology and includes chapters on antibody expression in plants, nucleic acid hybridisation, PCR, and virus detection in animal vectors. I found the chapter on PCR by Ralf Dietzen particularly good. In addition to explaining the various forms of PCR he also provides practical advice on dealing with problems, such as plant inhibitors and the use of degenerate primers.

This book is perhaps more a collection of reviews grouped into general themes, rather than a fully integrated text, but it contains many excellent and informative chapters that will be of interest to both experienced virologists and students.

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