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Book reviews

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Pest and Disease Management Handbook, ed. DAVID V. ALFORD. 624 pp. Oxford: Blackwell Science (2001). £99·50 (hardback).
ISBN 0 63205 503 0.

The older practitioners amongst us will have good memories of the predecessors of this volume: the *Insecticide and Fungicide Handbook for Crop Protection* and the *Pest and Disease Control Handbook*. The current volume updates the last edition of the latter and is a welcome addition to the BCPC publications list.

The book is very much targeted at the UK, with control recommendations reflecting practice, chemical availability and regulatory restrictions here. Despite this I can see the book being a very useful reference text elsewhere due to its immense coverage: cereals, brassicas, beans, potatoes, sugar beet, other field vegetables, fruit and hops, protected crops including ornamentals, outdoor bulbs and corms and outdoor ornamentals. I failed not to find a single crop I was interested in.

Each individual chapter is written by experts in management of pests and diseases for the crops concerned. Good elementary information is given for each pest or disease; not enough to replace a specialist textbook, but adequate for purpose. Most entries are a page or less, with more detail being provided in some cases e.g. the section on potato late blight gave 10 pages of excellent information. Each chapter contains a listing of the pests and diseases found on the particular crops which combined with the tabular presentation of control measures/chemicals, provides a superb reference. Control information, including chemical, biocontrol and cultural measures, is generally very up to date. Detailed product use recommendations are not given, the reader being advised to consult manufacturers' product labels. This is a very wise move, as products and recommendations can change, illustrated, for example, by the fact that strobilurin fungicides are not to be recommended for mildew control in cereals now.

To criticise the content is difficult and criticisms pale into insignificance compared with the value of the book. I wondered at the need for the Introductory chapter on Principles of Pest and Disease Management in Crop Protection because I doubt if many who buy the book will read it, preferring instead to go direct to their chosen crop and problem. The chapter is also a little too detailed in places: was it really necessary to introduce mathematics into disease management here? There is also a statement 'Fungicides alone will not control disease when conditions are most suitable for the pathogen'. I found this a very definitive statement and do not entirely agree with it. The cereal disease chapter introduces the concept of *conazole* fungicides, a term that could confuse those without prior knowledge, and it is interesting to see the new name (*Ramulispora* spp.) being used for eyespot but no use of *Blumeria* for powdery mildew. The new powdery mildew name is, however, used in the grasses chapter. There is some information on resistance management in specific chapters, but I would have appreciated the readers being advised to follow resistance management procedures in a more direct manner.

The book is well supported by a selected bibliography for each chapter, a comprehensive glossary, a pest index using common and Latin names, a Disease, Pathogen and Disorder index and a General index.

I wholeheartedly recommend this book to any office, laboratory or library where people may want to find out quickly and easily what problems are associated with crops, and how to manage such problems.

P. E. RUSSELL

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Broadening the Genetic Base of Crop Production, eds H. D. COOPER, C. SPILLANE & T. HODGKIN. xix+452 pp. CABI Publishing (2001). £75.00 (hardback).
ISBN 0 85199 411 3.

The title refers to the genetic variability of existing crops, rather than more species being grown as crops. It draws attention to a paradox of plant breeding. Greater genetic diversity within a breeding programme is more likely to lead to radically improved varieties. However, beyond the occasional backcrossing or transgenesis of resistance genes, breeders stringently limit the genetic variability of their material. They avoid the use of wild, distant, or even

near relatives of their crops, including much of the material maintained by gene banks. The reason is economic: breeders – from subsistence farmers who save their own seed, to multinational companies breeding F_1 or GM varieties for transnational markets – need to produce useful or marketable, reasonably uniform varieties, within a short length of time. The broader the genetic base, the lesser the chance of these criteria being met.

Consequently, crops have suffered accelerating genetic erosion, increasing the likelihood of widespread susceptibilities to biotic and abiotic stresses, and limiting the present and future uses of crop products. In 1997 FAO recommended (reproduced here as an appendix) a coordinated increase in the genetic diversity of crops, with progress crucially dependent on public funding. Four years later, one result has been the publication of this book. It contains 26 chapters from invited authors covering the science and practice of working from broad genetic bases, together with several case studies. The editors also give a comprehensive overview.

Inevitably, the book has a political subtext, with further pleas for public funding. However, since the 1997 report substantial changes have appeared. Although most of the authors are from FAO and national and international research institutes, several commercial breeders are also now involved. There is strong support for dynamic interactions between farmers and scientists, with healthy doses of realism about how these relationships work in practice. The relevance of conventional gene banking is questioned. Indeed, a common philosophy may be emerging across developed and less developed countries, over a wide diversity of nomenclatures ('genetic enhancement', 'broadening', 'incorporation', 'pre-breeding', 'evolutionary breeding'), and covering many crop species (including, here: cereals, pulses, potato, cassava, sugar cane, *Musa* and beet). There is a clear impression of an idea 'whose time has come'.

The book may become a milestone in the development of plant breeding, particularly towards sustainable agricultural systems, and intriguingly, there are hints and questions about future progress. Will an industry become established which supplies breeders with broad genetic bases, like *Arabidopsis* stocks are now supplied to geneticists? Might this develop into a new role for gene banks? Could more systematic 'pump-priming' by governments help establish commercial farmer-based breeding?

Those with interests in the origin and current state of our crops will enjoy the broad and deep levels of information in this book. It should make informative reading for academic and applied breeders, and for many others involved in rural affairs – not least because it will allow some relief from the mantra that progress depends on transgenics. Public administrators of science and agriculture might read the editors' overview in order to understand genetic erosion, and then the chapter on how their legislation has exacerbated the problem.

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Genetic Improvement of Cotton. Emerging Technologies, eds J. N. Jenkins & S. Saha. ix + 344 pp. Enfield, UK: Science Publishers Inc. (2001). £62.00 (hardback).
ISBN 1 57808 145 9.

Development of new varieties of the most widely grown cotton species, *Gossypium hirsutum*, presents major challenges to the plant breeder. The main targets are yield of lint, pest and disease resistance and fibre quality. Beyond this, however, the same varieties are used for cottonseed oil and feed. That some success has been achieved, in tandem with developments in inputs, irrigation and mechanization, is shown by the large increase in lint yield that has been achieved worldwide in the past 20 years from a constant area of cultivation.

This book takes a broad view of cotton improvement with a focus on modern molecular approaches. Its 15 chapters feature contributions from five countries with the majority from two of the main cotton producers, USA and China.

The first four chapters deal with classical approaches to germplasm improvement: phenotypic selection, introgression from exotic germplasm and biometrical analysis. In these, the targets of breeding emerge clearly, emphasizing pest and pathogen resistance, fibre quality and yield. The bollworm and boll weevil feature strongly in the history of cotton production and this no doubt influenced the choice of early targets for transgenic approaches.

Chapters 5, 6 and 7 deal with the development of molecular marker approaches in characterizing germplasm, genome mapping and marker assisted selection. It is not clear from these to what extent the use of markers has been integrated within breeding programmes but the suspicion remains that there is some way to go in this regard.

By far the largest chapter is devoted to the development of transgenic 'Bt cotton' first grown commercially in 1996. A perspective from China on developments in the same area follows and these are supported by three other chapters outlining approaches to tissue culture and transformation (including pollen-mediated methods).

This book is of interest not only as a review of the current state of affairs in cotton improvement but in the way it indirectly sheds light on more generic issues. For instance, the integration of new approaches

with more traditional ones and the impact of modern technologies on the structure of breeding programmes are challenges seen to varying extents across all crops.

The reader new to cotton may well have appreciated a general introductory chapter where matters such as breeding system and genome constitution could have been dealt with alongside a guide to the plant itself, perhaps even with the aid of one or two photographs.

M. ABBERTON

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Biotechnological Applications for Integrated Pest Management, eds S. IGNACIMUTHU, A. SEN & S. JANARTHANAN. 149 pp. Enfield, USA: Science Publishers Inc. (2000). $59.50
ISBN 1 57808 137 8.

This book is a collation of 19 papers from a symposium. Although the date and venue of this event are not given, since 18 of the papers are from Indian universities and institutes one must assume that it was held in India.

Both the title and statement in the preface that 'This volume is an account of the progress in the field of biotechnology vis-à-vis insect control' are misleading. Only 4 of the 19 papers are about biotechnology. These are rather brief review articles covering the production of new neem cultivars, genetic manipulations in baculoviruses, transgenic cotton for insect resistance and insect-resistant transgenic crops. The latter is particularly disappointing in that the sub-title 'Their importance in IPM' was not discussed in the paper.

Of the remaining 15 papers, one is on biocontrol of the water hyacinth using weevils and fungi, and one is a review of chitin synthesis inhibitors as insect-pest control agents. The other contributions cover two main topics of biocontrol of insects and botanical pesticides, again for insect pest control. Most are reports of field trials conducted in India.

Although most of the papers are well referenced, the index is incomplete. For example 'neem' is frequently referred to in the text but does not appears in the index.

In summary, this book is not recommended as a review of biotechnological applications for IPM and the local nature of the crops and pests make it of little interest to readers outside of India.

R. T. HEWSON