

Book reviews

Selection Methods in Plant Breeding. Izak Bos and Peter Caligari. Chapman and Hall, London. 1995. Pp. 347. Price £59.00, hardback. ISBN 0 412 55330 9.

This book covers aspects of statistics, quantitative genetics and population genetics which are of importance to plant breeders. The subject matter is similar to that of *The Theory of Plant Breeding* by O. S. Mayo, but with a different style and with different priorities.

The book falls into three sections. The first seven chapters are on one and two locus theory, followed by six chapters on quantitative genetics. The final six chapters cover aspects of plant breeding not usually found in quantitative genetic textbooks with, for example, discussion of the size and shape of plots, optimum replicate number and allocompetition, grid and honeycomb selection and optimum plant density for selection. I found these later chapters the most interesting because the subject matter was the least familiar, and would have preferred these to be longer, and the earlier chapters to be more compact. The book also discusses other, more specific, plant breeding subjects such as genetic and cytoplasmic male sterility and autopolyploidy.

The text contains a large number of boxed notes and examples. These cover an extensive chronological, geographical and crop range, and were the best parts of the book for me. They are strongly focused on plant breeding problems, with most involving actual, rather than simulated, data taken from real crops. The main lesson I took away from these is how horribly messy anything associated with agriculture turns out to be. I particularly liked the reference to some 1973 Canadian work on the merits of visual selection, where the assistants were found to be more effective than the breeders. So much for the fabled 'breeders eye'. Of course this would never happen now, no-one can afford assistants any more!

There are some omissions. Although there is a chapter on optimum replicate number for yield trials, there is no discussion of optimum site or year numbers and the design of multi-stage selection procedures. However, it seems likely that this area will be covered in a forthcoming title in the same series. More surprisingly, there is little discussion of methodology for marker-assisted selection and the location of QTLs by the use of markers. Perhaps the authors are foresighted, and anticipate that such techniques will have as much bearing on plant breeding programmes constrained by a budget as quantum mechanics has on bridge building. This is not a view they put forward, I hasten to add.

The book would definitely benefit from a glossary of symbols. The use of symbols is consistent throughout the

book, and they are explained as they are introduced, but I found the book difficult to dip into, since one has to search back extensively to discover the meaning of many of the terms.

In addition to students learning the art, the practising plant breeder should also find this book worth reading.

IAN MACKAY
Lion Seeds,
Woodham Mortimer
Malden
Essex CM9 6SN
U.K.

Genetics of Wood Production. Bruce J. Zobel and Jackson B. Jett. Springer-Verlag, Berlin. 1995. Pp. 340. Price £134.00, hardback. ISBN 9 783540 588412.

The title, *Genetics of Wood Production*, embodies the two components of successful production forestry to which Bruce Zobel has devoted his lengthy and productive career — genetic improvement and wood quality. *Genetics of Wood Production* is the fourth of his substantive texts addressing these issues, following *Applied Forest Tree Improvement*, with J. T. Talbert (1984); *Growing Exotic Forests*, with G. van Wyk and P. Stahl (1987); and, its predecessor in the Springer Series in Wood Science, *Wood Variation: Its Causes and Control*, with J. P. van Buijtenen (1989). Zobel is one of the founding fathers, and now elder statesmen, of industrial tree breeding; some 40 years ago, he initiated the pioneering and influential North Carolina State University-Industry Cooperative Tree Improvement Programme, with which he remains associated and of which J. B. Jett has acted as Director.

Genetics of Wood Production is essentially a literature review on a grand scale. It comprises four introductory chapters, four chapters focusing on various wood properties, and five concluding chapters emphasizing the exploitation of genetic variation in these properties by tree breeding programmes. The text includes numerous figures and tables, many of which contain a wealth of information — for example, Table 5.1 reports 52 estimates of narrow-sense heritability in eleven *Pinus* species, and Appendix Table 3.1 comments synoptically on 47 papers describing methods to determine wood density. Around 900 sources are cited, and there are comprehensive indices.

With Bruce Zobel's and J. B. Jett's credentials and experience, *Genetics of Wood Production* has an impeccable pedigree, and the subject is one of real importance

to production forestry. Few have attempted a thorough review of the extensive and, as Zobel and Jett observe, often contradictory literature, and in this role they perform a real service. It is for undergraduate and graduate students, and those working in forest genetics and wood science, that the book will have most relevance. Sadly, its value to them and to any other interested parties will be more limited than I had hoped.

One limitation is that, despite its laudable intent of — and considerable success in — compiling the widely scattered literature in one volume, there seem to be important omissions from the greyer literature. Unfortunately, any coverage of relevant biotechnologies is missing, despite wood properties being a major focus of biotechnological research in trees, and notwithstanding the world's leading group being based at North Carolina State University. Wood production for non-industrial uses rates only a figure and passing mention in the concluding paragraphs, despite representing half the world total. Although this is not an unreasonable reflection of the literature, mention of that preliminary work which has been reported would have promoted awareness of it and its importance. There is some inattention to citation detail, perhaps of the publisher's rather than the authors' making. Similarly, expression and grammar seem haphazard through much of the text (for example, on p. 146: 'Fiber diameter and wall thickness are reasonably strongly inherited, but since they are closely allied to specific gravity, separate genetic breeding is rarely applied for them.'). The style of writing often seems disjointed, and sometimes appears to be directed at first-year undergraduates rather than at a more mature audience (for example, on p. 47, where we are hectored in capitalized and italicized type, 'as a WARNING to anyone contemplating improving wood genetically, how complex the situation is and how much care is needed in selecting the wood properties.'). It is in the latter respect, offering synthesis, that I found the book most disappointing. Admittedly, the authors' introductory caveats, of the inconsistent quality of information, of its often contradictory implications, and of the controversy and difficulty associated with its interpretation, are fair comment — but both students and others coming to *Genetics of Wood Production* will hope to emerge with a more coherent understanding of the subject area than I fear they will gain from reading this book.

Notwithstanding, *Genetics of Wood Production* remains an invaluable source of information about variation in the properties of wood that affect its industrial use. I shall refer my students to it for that, and as an example of the standard of writing their literature reviews should surpass after the first revision.

PETER J. KANOWSKI
 Department of Forestry
 The Australian National University
 Canberra
 ACT 0200
 Australia

Essentials of Genetics (2nd edition). William S. Klug and Michael R. Cummings. Prentice Hall, New Jersey. 1996. Pp. 560. Price £22.95, paperback. ISBN 0 13 371147 1.

It had to happen! Within days of handing over the reins of the *Heredity* book reviews, the new Review Editor has asked me to provide a review of the above book. 'Serves you right', I can hear all of my former victims whisper, and probably with a degree of justification.

Although *Essentials of Genetics* now appears as a second edition, it is not a textbook with which I am familiar. Nevertheless, I was intrigued by the book because a related title by the same authors (*Concepts of Genetics*, 4th Edn, Prentice Hall, 1994) is one of my favoured texts for first and second year Genetics undergraduates. For this reason alone, any review of *Essentials of Genetics* is bound to be comparative — so what do we find?

The Contents pages of both books are more or less identical, and it is quite hard at first to spot any differences. In *Essentials of Genetics*, Chapter 1 provides an 'Introduction to Genetics' and Chapters 2–8 cover 'Heredity and Phenotype'. In *Concepts of Genetics*, Chapter 1 provides an 'Introduction to Genetics', whereas 'Heredity and Phenotype' is covered in Chapters 2–7. Moreover, the detailed contents and sub-headings are virtually identical. The same comparison could be applied to all of the other topics covered in the two books, although I shall spare readers the detail. Suffice it to say that *Essentials of Genetics* manages to cover the ground in 22 chapters, whereas *Concepts of Genetics* requires 25. The authors claim, quite correctly, that *Essentials of Genetics* is shorter than *Concepts of Genetics* by almost 300 pages. However, when they say that this is achieved by focusing on the CONCEPTS of Genetics, you begin to realise my difficulty in defining separate roles for these two books. Apart from leaving out some detail, which they must have done to decrease the overall length, the content of the two books is remarkably similar.

Are there any advantages to *Essentials of Genetics*? The answer here is yes, although not for the reasons outlined by the authors. They claim that *Essentials* has a revised chapter organisation to provide a smoother flow to the text. However, the only real changes seem to be the earlier introduction of 'Quantitative Genetics' and the delayed consideration of 'Cloning' and 'Recombinant DNA Technology'. This minor reorganization, in my view, makes a trivial difference. The aspects of *Essentials of Genetics* which are more useful are threefold. First, and by far the most important, the book is necessarily more up-to-date. In such a fast moving subject, this makes more difference than anything else. The fourth edition of *Concepts of Genetics* was published in 1994 and parts of it are becoming a little dated. Thus, we find that *Essentials of Genetics* has more recent information on gene regulation, human genetics, gene therapy, cancer, immunology, development, behaviour and the application of recombinant DNA technology. Secondly, *Essentials of Genetics* includes ten short essays on scientific and social aspects of