Book reviews

Plant Genetic Conservation — The *In Situ* Approach. N. Maxted, B. V. Ford-Lloyd and J. G. Hawkes (eds). Chapman and Hall, London. 1997. Pp. 446. Price £27.50, paperback. ISBN 0 412 63730 8

This multi-author book includes 23 chapters arranged in four parts: (1) Introduction (two chapters); (2) Theory and Practice (12 chapters); (3) Case Studies (seven chapters), and (4) Discussion (two chapters). One of the chapters in Part 3, on *in situ* conservation for disease resistance, appears to be misplaced; it fits better with the concept-orientated accounts in Part 2. There are 36 contributors, representing 14 countries from all five continents; eight of the chapters are co-authored by one or more of the editors. Over 800 references are cited, including many from the 1990s. There is a detailed index.

The title of the book will appeal to two main audiences with overlapping interests: (i) those concerned with conserving plant genetic resources for human exploitation, mainly for agricultural and medicinal development, and (ii) those involved with conserving plant genetic diversity in its widest sense, irrespective of any tangible economic value. Several of the chapters in Part 2 of the book will appeal to both audiences. This section includes five chapters on genetic reserves (taxonomic prioritization, collation of ecogeographic data, reserve design, technical and political limitations, and management planning and monitoring), two on conservation applications of plant population biology (genetics and ecology), and five on other topics (molecular techniques, information management, forestry genetics, integrating plant and insect conservation, and local crop conservation). In contrast, the six case studies included in Part 3 are concerned solely with conserving genetic resources in crops and crop relatives, including wheat, rice and potatoes, in Israel, Turkey, south-east and central Asia, Ethiopia and Peru. Several important recent studies on genetic erosion in declining species of nature conservation importance receive no mention. The emphasis on economically important taxa could be guessed from the cover picture, which shows wheat harvesting in Algeria, but in my view should also have been signalled in the title.

The book's subtitle emphasizes its concern with developing protocols and methodologies for *in situ* conservation, including establishment of genetic reserves for conserving variation in wild relatives of cultivated species, as well as on-farm conservation of land races of the crops themselves. Advantages ascribed to *in situ* conservation include facilitation of continuing adaptive evolution in response to pests and diseases, and circumventing difficulties of cultivating recalcitrant and vegetatively propagated species. Few would disagree with these sentiments, and the book makes a convincing plea for increased emphasis on *in situ* conservation to complement

the attention given to *ex situ* conservation, mainly by seed banking, that developed during the 1960s and 1970s.

The content of the book is clearly presented. Each chapter has sufficient background information to be free-standing and intelligible without recourse to other texts. This does mean, however, that some well-trodden ground is included, especially in some of the chapters in Part 2. As with many multi-author texts, there are a few inconsistencies between chapters; for example on-farm conservation is referred to as *circa situ* in the forestry chapter but *in situ* elsewhere. Authorities for latin names are inconsistently given, both within and between chapters. I noticed less than a dozen typographical and other minor errors. Diagrams and tables are clear and concise.

For students and practitioners of plant breeding and crop conservation, this book provides a valuable supplement to broader texts such as *The Conservation of Plant Biodiversity* (Frankel *et al.*, 1995). Those more concerned with endangered plant species *per se* still await a replacement for the already somewhat dated *Genetics and Conservation of Rare Plants* (Falk & Holsinger, 1991).

References

- FALK, D. A. AND HOLSINGER, K. E. (eds). 1991. *Genetics and Conservation of Rare Plants*. Oxford University Press, Oxford.
- FRANKEL, O. H., BROWN, A. H. D. AND BURDON, J. J. 1995. *The Conservation of Plant Biodiversity*. Cambridge University Press, Cambridge.

DAVID STEVENS
Countryside Council for Wales
Plas Penrhos
Ffordd Penrhos
Bangor
Gwynedd LL57 2LQ
U.K.

Plant Molecular Biology — A Laboratory Manual. Melody S. Clark (ed.). Springer-Verlag, Berlin. 1997. Pp. 529. Price DM 120.00, spiralbound softback. ISBN 3 540 58405 6.

This spiralbound softback manual, a multi-authored collection of chapters, is designed to encompass a wide range of plant molecular biology techniques. It is split essentially into three main parts. These parts are basic molecular biology; characterization of plant DNA and finally, genetic engineering methodology and analysis. Each section is written in the same manner with a small

amount of historical background, a description of the technique and a troubleshooting section. Each chapter closes with reference lists which are pretty much up-to-date with several 1995 titles. This style was both easy to read and follow — exactly what one requires from a manual of this nature.

The first chapter covers basic molecular biology. As an experienced molecular biologist I found it helpful to have all the basic material contained within this initial chapter to prevent repetition later. Indeed researchers new to this area may also find it helpful to have the majority of the basic material within one place. It certainly saves having to move from one section to another. The editor stated that the manual is targeted 'towards a wide range of people with different levels of experience', and this aim is, in the main, fulfilled. However, when the manual was shown to a colleague with little knowledge of this area he did comment that texts like this could never be basic enough for his liking.

At the beginning of the second chapter I became a little worried as the schematic diagram of a PCR reaction in no way aided the understanding of the text. However, this concern was short-lived as the 'use of PCRs in Plant Molecular Biology' section rapidly became a mine of information within this area. It was nice to see the authors suggest suitable computer software that could be used to design PCR primers. In addition various helpful hints and useful tables (e.g. the nucleotide sequences of PCR primers for the various plant marker genes on page 70) were liberally scattered throughout the text. This information can be easily obtained elsewhere but it is nice to see it brought together within one text.

On to Chapter 3 — if there was something that spoilt this manual then it was here. Once you start to spot typographical errors of the nature exemplified on pages 195–196 you begin to get that worrying feeling of just how many others are present that you might not be spotting. Spelling Whatman incorrectly at first (as Whatmann) on page 195 was corrected by the very next page. However, on the same page I was intrigued as to exactly how you are expected to use 1.5 microfuge tubes! These errors may seem amusing but they ought to have been spotted at the proof reading stage. These particular errors are unlikely seriously to affect an experiment but there remain nagging doubts that if these errors had crept through then how many others persisted, for example in the volumes or concentrations stated within the methods sections. However, these errors notwithstanding, many of the sections were excellent, both informative and up-to-date. This is best demonstrated by there being a section on the relatively new technique of cloning differentially expressed cDNAs by using Differential-Display Reverse Transcriptase Polymerase Chain Reaction (DDRT-PCR).

Overall, this manual deserves to be highly recommended due, in particular, to the clarity of the writing. It joins the market place (at a reasonable price of £42) where the only significant opposition comes from one other manual. I am sure that this manual will be

purchased and used by many in this rapidly expanding area of research.

TONY MOORE
Biochemistry Department
School of Biological Sciences
University of Sussex
Falmer
Brighton BN1 9QG
U.K.

Gene Cloning and Analysis — Current Innovations. Brian C. Schaefer (ed.). Horizon Scientific Press, Wymondham. 1997. Pp. 214. Price £34.99, paperback. ISBN 1 898486 06 9.

The major theme of this book is refinements to existing technologies and recently innovated technologies for the isolation and partial characterization of genes. The topics are particularly pertinent to the functional analysis phase of the human genome project given the identification of large numbers of cDNAs via Expressed Sequence Tag studies. A restriction endonuclease-based differential display approach for identifying cDNAs of interest is detailed in chapter 3, whilst the isolation of full length cDNAs is described by chapters 6 and 7. Elsewhere is considered the characterization of cDNA-encoded proteins on the basis of protein-protein/ligand interaction (chapters 1 and 2), codon mutagenesis to study the relationship between protein structure and function (chapter 8), and the alteration of protein function by gene replacement (chapter 10).

The remainder of the articles is loosely divided into techniques of perhaps particular relevance to diagnostics, and procedures that are applicable to molecular biologists working in a spectrum of fields. Peptide nucleic acid-based purification techniques (chapter 4) are suited to the sequence-specific purification of DNA templates from clinical material, whilst PCR-SSCP analysis (chapter 13) remains a valuable tool for the detection of sequence variation in DNA samples. Of universal interest, are TA cloning (chapter 11), a PCR-based method for isolating genomic DNA flanking a known sequence (chapter 5), and a method combining restriction digestion with 'long PCR' to effect selective amplification of one of a group of homologous sequences (chapter 12).

Volumes of this genre are normally a joy for the bench scientist because they elaborate on the nuances of experimental procedures and fill in the unwritten gaps so often present in scientific papers (indeed, there are few things more satisfying than being able properly to apply something that one has read to good effect in a short period of time). With few exceptions, this book fulfils the role of a good laboratory companion. Furthermore, the information is often usefully presented in combination with a review of variants of the procedure discussed. Chapter format is consistent throughout; a review of alternative approaches to a given technology is followed by a description of a specific procedure, preceding a section on trou-