

Book reviews

Barley: Genetics, Biochemistry, Molecular Biology and Biotechnology. P. R. Shewry (ed.). C. A. B. International, Oxford. 1992. Pp. 610. Price £75.00, hardback. ISBN 0 85198 725 7.

This book is a major review of the current knowledge of barley genetics, biochemistry and molecular biology. There are 27 chapters divided into six sections covering: origin, evolution and wild relatives; basic genetics; analysis of metabolism and development; seed development, composition, germination and utilization; pathogen resistance; and biotechnology. Somewhat surprisingly, considering the title, there is no specific section on molecular biology.

Clearly of importance when considering the purchase of such an expensive textbook is how much of the content is distinct from that available already from other sources. There is a large degree of overlap between this text and *Barley Genetics VI*, Volume 2 (1992), (L. Munck, ed.) with 14 of the 27 chapters having direct equivalents in the earlier work. Indeed many of the chapters are by the same authors and differ very little in content and the reader is advised to compare the two volumes.

This is a well constructed textbook on the whole and draws on contributions from authors widely regarded as experts in their respective fields. The content of several chapters, however, look rather dated with apparently little effort having been made to update previously presented work. This is particularly evident in the section on origin, evolution and wild relatives, where no attempt has been made by the authors to include material drawn from even their own more recent publications addressing the use of molecular marker techniques.

A further problem, for a text considering barley genetics, is the conspicuous absence of a chapter on quantitative genetics. This is surprising, as such traits are a major interest of geneticists and plant breeders, and significant progress has recently been reported by several authors in the use of molecular markers and novel statistical approaches for the identification and analysis of quantitative trait loci.

There are several well written and interesting chapters which are characterized by their forward-looking approach to the application of biotechnological and molecular biological techniques. Had more such chapters been present, this could have been an outstanding textbook. However, as a basic introduction to current progress in barley research, it is a competent text and catalogues much basic information. The main problem with attempting to address such wide-ranging and technical aspects of the genetics of any plant is the fact that advances are constantly being made at such a rate that they can quickly render the text outdated. As a consequence, this book will find a wide audience amongst

students as a basic text, but will be of limited use to those involved at the cutting edge of barley research.

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Rice Biotechnology. (Biotechnology in Agriculture No. 6.) G. S. Khush and G. H. Toenniessen (eds). C. A. B. International, Oxford. 1991. Pp. 300. Price £45.00, hardback. ISBN 0 85198 712 5.

Rice is the developing world's most important food crop and, as such, an entire volume devoted to the rapidly advancing field of rice biotechnology is particularly welcome. The book consists of 13 chapters from different expert contributors and covers subject areas relevant to the problem of increasing rice production to feed the expanding population of rice consumers. It is aimed at research workers and it is this group who will find it most useful; it would have limited use as a student text. The chapters fall principally into two types, those which aim to give enough technical detail for methods to be adopted in other laboratories, and discussion chapters which review subject areas such as the challenges which must be faced if rice production is to keep pace with demand.

Christina David sets the scene in the first chapter by emphasizing the diversity of ecosystems where rice is grown and the variety of problems faced. In doing so, she hammers home the enormous and complex challenge which biotechnology must face. With such a task, and with limited funds for research, it is appropriate to ask how research priorities should be decided. This question is addressed in chapter 2 by Robert Herdt, who guides us in a logical sequence through the complex issues involved in assessing the contributions made, through solving particular problems, to the overall goal of significantly increasing rice production.

The next nine chapters are all concerned in some way with the genetic engineering of rice. They cover the sources of genes, their potential, their isolation and their introduction to rice. The sources of genes include wild *Oryza* species (chapter 3) and the biotechnologist's role may be important in this context because attempts to introduce resistance genes from wild relatives by intervarietal crosses often result in reduced fertility in hybrids. In chapter 11 Gary Toenniessen presents an excellent and highly readable discussion of potentially useful genes for rice genetic engineering. He shows how there are opportunities for genetic engineering to play an important role in increasing yield,