BOOK REVIEWS

continues to exist and to evolve and remains a resource for all crop improvement efforts.

In considering the collection as a whole, the keynote papers vary considerably in their coverage of the theme subject matter. Keynotes on mixtures and global warming in addition to those mentioned above provide a broad overview of the topic addressing both the background of the theme and current issues. Others, although good papers, are much narrower in scope and as such, were somewhat disappointing. In most instances the cases studies are consistent with the section theme.

The publication quality of this book is inconsistent. The text and tables of the book have been prepared on a word processor and give it a consistent look. However, most readers will be struck by the lack of careful editing of the text of the papers. There are numerous typographical and grammatical errors. These often hinder the reading. In addition, the figures in many of the papers are of poor quality. Axes or legends have been reduced in size making them difficult to read and in some cases are obscured to the extent that the figure cannot be interpreted.

Overall, many of the papers in this collection provide a good resource for breeders. They outline current issues in plant adaptation and provide a good source of further references. This book would be particularly useful where the scientist does not have access to Euphytica. Although not intended for use as a text book, some of the articles would be suitable for use in graduate plant breeding courses.

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Pollen Biotechnology for Crop Production and Improvement.

The term biotechnology is widely used today in many contexts, and it has been applied to diverse techniques and processes that are providing significant and dramatic advances in a variety of areas of modern biology. In the field of plant breeding, the processes related to pollen formation, pollination, fertilization, and genetically engineered plants are fundamental to the production of crop plants that contain specific, desirable characteristics. The application of biotechnology to this field is of utmost importance to plant breeders.

This book brings together the gamut of topics specifically related to pollen biotechnology. In addition to an introductory chapter that provides an excellent overview of these topics, a variety of insects, the parameters that control anther and pollen development, various pollination control systems, and a genetically engineered pollen that rivals CMS.

Part III covers the two basic mechanisms of male sterility (CMS) and genic male sterility to produce functional female plants for the production of hybrids which, in turn, leads to heterosis. Both systems are covered in detail and identify areas of research that will have an impact on plant breeding programs. Part IV ends with recombinant DNA technology that is being applied to controlling pollen formation, seed production by using a variety of sophisticated methods. These include gene expressions that control anther and pollen development, various pollination control systems, and a genetically engineered pollen that rivals CMS.

Part IV is the longest of the four parts, and chapters present a variety of topics that include hybridization and the methods for overcoming crossing barriers, the storage of pollen, and the use of pollen to overcome interspecific and self-incompatibility systems. Additional topics deal with pollen-pistil interaction, growth and pollen assays for choosing plants with desirable traits, and how these technologies can be integrated into plant breeding programs. The isolation and manipulation of sperm cells, embryo sacs, and eggs from root tips also have provided powerful tools to study pollen fertilization and embryo formation with the genetic transformation during fertilization. These are covered in detail and identify areas of research that have an impact on plant breeding programs. The final chapter covers the array of methods for the transformation into embryos and the use of pollen as systems for gene transfer. The latest techniques are explained along with their use for application for crop improvement.

The two editors have brought together all the key topics on the subject of pollen biotechnology in this comprehensive book. Excellent specialists who have provided well documented information in their areas of specialty certainly could serve as both a reference source and a document for researchers and students at both the undergraduate and graduate levels.