Heterosis and Hybrid Seed Production in Agronomic Crops.

The development of commercial-scale hybridization techniques for our major agronomic crops has been hailed as one of the greatest breakthroughs in agricultural history. The exploitation of hybrid vigor has provided a platform upon which agronomists and plant breeders can develop higher yielding crop cultivars and, therefore, help farmers grow more food to meet the demands of an ever-increasing world population.

This book presents a basic summary of hybridization systems and methodologies that have been developed, refined, and employed for several important food and fiber crops from a global perspective. It is well organized, easy to read, and will make an excellent supplementary reference book for a beginning undergraduate plant breeding or general agronomy course. It will also be a good source of general agronomic information for individuals engaged in seed production research.

The initial chapter of the book provides an historical overview of research conducted on the genetic and physiological causes of the heterosis phenomenon. The chapter is greatly enhanced by its discussions of attempts to use new technologies, such as molecular markers and cellular biology, to unravel the mysteries that surround the underlying causes of heterosis. I found the chapter to be informative and enjoyable to read, and it helped set the stage for the remainder of the book.

The remaining seven chapters are dedicated to basic discussions of the breeding and development of improved parents for hybrid production as well as the operational procedures involved in producing commercial quantities of seed for the various crops. It is in the detailed descriptions of the more practical aspects of seed production that the book serves as an informative reference.

Having been away from the subject for some time, I was especially interested to learn about the advances in seed production methods and technologies from a global perspective. Other books and articles about these subjects have centered on experiences and developments in one or two countries or simply one or two growing regions and have not mentioned other countries such as India or China. The discussions of the research conducted on and the subsequent development of hybridization systems in these countries was very enlightening.

The book could be improved by including in the introductions to the respective chapters brief discussions of the levels of heterosis that have been observed for each of the crops. The aim of this book is to inform and educate, and I found the negative attempts to exploit heterosis in the world's major agronomic crop species.

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This volume represents the published proceedings from a conference on emerging technologies and integrated pest management (IPM) held in March 1999. The stated aim of the conference and of this book are to stimulate new ideas for implementing and integrating new technologies to share perspectives among disciplinary specialties of IPM, and to identify constraints associated with new technologies. Toward these objectives the book is divided into sections with a total of 38 chapters. Sections include ground on IPM and technology, new diagnostic approaches, genetic engineering, biological control, pesticides, and IPM, information processing, and progress and challenges (a summary section). Individual chapters focus on technologies, applications, examples, or broader issues surrounding technology and IPM.

While reading, I was reminded of the quote (though I have long forgotten the source) that there are no secrets as military secrets, and it seems to me there is a similar quality to information on “emerging technologies”. Certainly, some of the detailed information presented here will become dated. However, many chapters offer summaries to provide a short review of individual approaches and technologies that will be of more lasting value. As is common with edited volumes (not only conference proceedings), depth varies greatly among chapters. Although some chapters seem to offer little more than the transcription of a talk, most presented a reasonable summary of issues.

Regarding breadth, I suspect individual readers will judge Emerging Technologies for Integrated Pest Management from their own interests. Much emphasis in this volume is on entomology, which echoes a criticism of IPM that more than one author in this volume raise. However, more breadth on IPM, this volume may represent. Nevertheless, the book presents a general overview of emerging technologies and their applications within IPM.