

Foreword

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The application of the omics in plant breeding offers outstanding opportunities to contribute to the well being of mankind. These opportunities come about when new varieties of food, feed, fiber, and fuel crops are developed that increase productivity and confidence in the product. Such varieties have become available through traditional breeding and the use of biotechnology and they are being grown on both large and small farms. Ultimately any improved performance benefits society as a whole. Furthermore, there are good prospects for the future through the increasing opportunities associated with plant breeding, especially from the new science of omics. Many traits in the major crops, such as resistance to disease and insects, deserve more attention, and in small acreage crops plant breeding programs merit greater consideration.

This book was written to provide a broad, integrated treatment of the subjects of, for example, genomics, proteomics, metabolomics, and it relies heavily on information gleaned by the authors throughout their research careers. The fundamental principles of genetics and the background information needed for plant breeding programs are emphasized.

The intention is that the book will be used by new and advanced students, as well as serving as a reference book for those interested in the independent study of omics. Instructors are encouraged to select specific chapters to meet classroom needs depending on the desired level of teaching and the time available. Readers will also benefit from the list of references that accompany each chapter.

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Editors

Many earlier predictions have now become reality (Table 1.1), leading to the consensus that each year the benefits of biotechnology will have a greater impact on breeding programs. Consequently, new companies