

Preface

The improvement of crop species has been a basic pursuit since cultivation began thousands of years ago. To feed an ever increasing world population will require a great increase in food production. Wheat, corn, rice, potato and few others are expected to lead as the most important crops in the world. Enormous efforts are made all over the world to document as well as use these resources. Everybody knows that the introgression of genes in wheat provided the foundation for the “Green Revolution”. Later also demonstrated the great impact that genetic resources have on production. Several factors are contributing to high plant performance under different environmental conditions, therefore an effective and complementary use of all available technological tools and resources is needed to meet the challenge.

The developments in biotechnology, genomic research, and molecular marker applications has brought to the forefront an interdisciplinary science that is revolutionizing 21st century crop improvement. Many new genomics technologies like next generation sequencing, omics technologies have emerged as powerful tools for understanding genome variation in crop species at different molecular levels.

The era of genomics seems to be upon us and new techniques will probably enable us to access the genetic basis of metabolomics associated traits much more rapidly. The information and developments related to the metabolomics, transcriptomics analysis and extensive phenotyping of genetically diverse populations together with bioinformatics is going to prove of great help in the field of crop biotechnology. These technologies will unveil the metabolic pathways for under-resourced crop species.

In this book attempt has been made to bring together chapters from different authors and highlight the current status of crop productivity in the light of developments in crop biotechnology, and at the same time provide information on some recent genomic tools and novel genetic and breeding approaches with a final aim of crop improvement. Emphasis has been laid on the topics related to advances in crop biotechnology, the key principles influencing the current practice in crop improvement programs and elucidate the nature of new approaches as well as modern techniques in crop improvement and how molecular plant breeding opens new avenues for research and is contributing to discoveries in this field.

We hope that a new generation of researchers will benefit much from this book and share the respect for the crop plants we all live by and concern for the maintenance of diversity.

The final objective of this book is to refresh and emphasize the fact that we are compelled to save our biodiversity, otherwise plant breeding possibilities will decrease to the extent that it will cost us much.

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Crop Improvement

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