

Preface

Ever since the discovery about four decades ago of the first molecular tools to investigate DNA structure and function, the science of genomics has contributed tremendously to investigate the genetic and functional basis of plant phenotypes and how this variability affects crop productivity. More recently, further advances in high-throughput genotyping technologies and genome sequencing have accelerated gene discovery and allele mining and the application of this knowledge to crop improvement. This aspect of translational genomics has also been referred to as genomics-assisted breeding (GAB). Due to the continuous and coordinated efforts of the global scientific community involved in crop improvement, in a number of cases GAB has become an integral part of crop-breeding programs.

Although substantial efforts have been made in the past century to mitigate the negative effects of abiotic stresses on crop productivity and improve the nutritional quality of crops, the progress achieved through conventional breeding approaches has been limited and will be insufficient to meet the ever-growing needs of humankind in the next decades. Within this daunting scenario, the advances in genomics during the past decades provide new avenues for enhancing our understanding of the genetic basis of complex traits while accelerating crop improvement. While a good number of success stories have been completed or are in progress for resistance to biotic stresses, GAB has limited examples of success stories for the improvement of resistance to abiotic stresses, quality, and

yield *per se*. In view of the fast-growing need for developing new cultivars with enhanced tolerance to abiotic stresses, better quality and/or higher yield, this volume compiles reviews from leading authorities in their own fields of expertise while describing the progress and presenting ideas for future applications.

The editors thank all the authors of the different chapters (Appendix I) for the skillful summaries of the research work in their area of expertise and in some cases for sharing unpublished results in order to make the articles as up to date as possible. We also appreciate their cooperation in meeting the deadlines and in revising their manuscripts. While editing this book, the editors also received strong support from several colleagues (Appendix II), who willingly reviewed the manuscripts. Their constructive and critical suggestions have been very useful for improving the quality of manuscripts.

We are also grateful to colleagues and staff from our respective laboratories, who have helped us complete the editing of this volume in parallel with their demanding responsibilities. In particular, Manish Roorkiwal, B. Manjula, Pawan Khera, and Mahendar Thudi helped RKV with the editorial work. RKV is thankful to his wife Monika for her constant encouragement and support, and to Prakhar (son) and Preksha (daughter) for their love and cooperation. Similarly, RT is thankful to his wife Kay for her patience and editorial contributions. RKV would also like to extend his sincerest thanks to Dr. William D. Dar, Director General, ICRIAT,

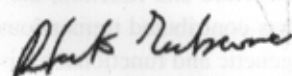
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We hope that this book will be helpful and useful as a ready guide to students, young researchers, crop specialists, breeders, and pol-

icy makers for contributing to the development of new cultivars more resilient to abiotic stresses and with a better nutritional quality. Lastly, we would appreciate if the readers can point out any errors and give comments/suggestions, as this would be useful for the future, revised and updated editions.



Hyderabad, India (Rajeev K. Varshney)
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Bologna, Italy (Roberto Tuberosa)
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