

Preface

As we know, several thousand years ago man was a hunter, struggling for his daily needs. Today, humankind has created every comfort for life. However, as we have progressed, our environment has been diminished and is still deteriorating at an alarming rate. Industrialization, urbanization and changing lifestyles have created more severe problems for the environment. Many disasters, including cyclones, floods, tornadoes, drought, etc. are due to changes in the environment and man is directly responsible for these disasters because of overexploitation of natural resources. Due to this degradation of the environment, crop production is decreasing and it will be very difficult to feed the growing population in the near future.

So our concern is to obtain maximum food production from limited resources. This book summarizes the pros and cons of these environmental effects on crop production. It will also discuss how to get maximum yield from limited resources.

The book is composed of 18 chapters. Chapter 1 deals with biotechnological applications to improve salinity stress in wheat. Molecular markers and defence responses of wheat plants against salinity are also discussed. Chapters 2 and 3 provide insights into genomic approaches in soybean and other food crops under abiotic stress. Proteomics under various abiotic stresses are very well explained in these two chapters. Chapter 4 discusses the transcriptome modulation in rice under abiotic stress. Chapter 5 explains the role of sulphur in mitigating different stresses in crop plants. Here the authors have described sulphur assimilation and its role under heavy metal stress, salinity, drought, etc. Chapter 6 throws light on the modulation of oxidative stress induced by cadmium through the use of proline and glycinebetaine. Chapter 7 deals with the role of brassinosteroids as potential enhancers of growth and yield of fruits and vegetables. The authors also highlight the impact of brassinosteroids on vegetables and fruits under environmental stresses. Chapter 8 is about

physiological mechanisms of salt stress tolerance in plants. Here the author explains the adverse impact of salinity on plants, mechanisms of salinity tolerance, seed priming for higher salinity tolerance and foliar application of salicylic acid. Chapter 9 deals with the effect of heat stress on performance of wheat plants. Mineral activity during heat stress and interdisciplinary approaches to improve heat tolerance in wheat are also discussed. Chapter 10 is about the effect of elevated CO₂ and temperature stress on cereal crops. Stress responses, tolerance and molecular approaches for high yield and gene expression are also explained. Chapter 11 discusses lipid metabolism and oxidation in plants under abiotic stress. Chapter 12 covers the role of mycorrhizal symbiosis in heavy metal phytoremediation. Chapter 13 deals with microbially derived phytohormones in plant adaptation against abiotic stress. Chapter 14 is about synergistic interactions among root-associated bacteria, rhizobia and chickpea under stress conditions. Chapter 15 deals with plant secondary metabolites, their effect on growth and development of plants, molecular genetics and impact on humans. Chapter 16 discusses the effect of abiotic stresses on different medicinal plants. Chapter 17 throws light on signalling roles of methylglyoxal and the involvement of the glyoxalase system in plant abiotic stress responses and tolerance. Chapter 18 deals with the role of sedges in wetlands, environmental cleaning and as food material.

This volume presents extensive information regarding crop plants, their growth and development, physiological and molecular responses, and adaptability to different environmental stresses. Chapters contributed in this book have been published keeping the author's justifications intact; however, suitable editorial changes were made where considered necessary. We have tried our best to gather information on different aspects of this extensive topic but there is a possibility that errors have still crept in, for which we seek the reader's indulgence and feedback. We are extremely thankful to

