

Preface

The world population is predicted to reach about 9.7 billion by the end of the year 2050 and to feed this population the current food production levels have to be raised by nearly 60% with limited land resource. This challenge gets compounded by the threat of global climate change leading to erratic rainfall, drought, salinity, increased temperature, etc. These abiotic stress consequences will seriously threaten the sustainable agricultural production. Hence there is a need to address this issue by all available means in order to achieve the goal of enhanced food production. Certain agronomic strategies like change in sowing dates, alley cropping, zero tillage, etc. have been proposed to mitigate stress. Breeding strategies recommend mitigating abiotic stresses by choice of resistant cultivars, use of hyper-accumulator plants, etc. A lesser explored potential option for abiotic stress alleviation is in the utilization of stress tolerant microbial resources, which have the ability to promote and sustain crop growth during adverse environmental conditions. This approach has gained popularity in the recent years and seems to be a potential option for the future. Thus the present book brings out the role of different groups of microorganisms like plant growth promoting rhizomicroorganisms (PGPR), arbuscular mycorrhizal fungi (AMF), endophytes, etc. in alleviating abiotic stress in crop plants.

The book contains 14 chapters written by distinguished scientists of the country having expertise in dealing with microorganisms and exploiting them for the benefits of mankind. Chapters 1 and 2 deal with exploring microbes from extreme environments and rhizomicrobiome respectively, for use in sustainable agriculture. Chapter 3 describes the recent developments in utilizing microorganisms for abiotic stress management in crop plants. Chapter 4 helps to understand the innate stress management mechanisms in plants. Chapter 5 deals with nanoparticles synthesized by microorganisms for use in agricultural ecosystem. Chapter 6 covers the role of plant growth promoting rhizomicroorganisms in supporting the growth of plants under stressed environment. Chapters 7 and 8 discuss the role of endophytic microorganisms in alleviation of abiotic stress in crop plants. Chapters 9 to 12 cover the role of arbuscular mycorrhizal fungi in alleviating drought and salt tolerance in different crops important in agriculture and horticulture. Chapter 13 is devoted to

bioconversion of municipal solid wastes and its use in soil fertility. Chapter 14 provides an overview of microbial inoculants for quality seedling production in forestry. Thus the book is a comprehensive and detailed analysis of the subject.

We profusely thank all the authors for their keen interest, kind efforts and rich contributions in making this book highly informative and productive. Special thanks are due to Mr. R. Ashwin for his help in bringing out this book. We are also thankful to New India Publishing Agency, New Delhi for taking keen interest in bringing out this book in time.

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