Emerging Trends in Plant Science and Agricultural Research

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Preface

Plant science and agricultural research are undergoing a profound transformation driven by advances in biotechnology, genomics, bioinformatics, artificial intelligence, climate-smart agriculture, and sustainable production technologies. The book *Emerging Trends in Plant Science and Agricultural Research* brings together contemporary concepts and innovative approaches that are shaping the future of plant-based agriculture and research.

This book provides a comprehensive overview of emerging developments in plant biology, genetics, breeding, plant biotechnology, molecular biology, plant–microbe interactions, crop improvement, stress physiology, and modern agricultural practices. Particular emphasis is placed on technologies that enhance crop productivity, resource-use efficiency, resilience to climate change, and environmental sustainability. The integration of omics technologies, genome editing, precision agriculture, artificial intelligence, remote sensing, and digital tools is explored as a pathway toward more efficient and knowledge-driven agricultural systems.

The book is intended to serve as a valuable reference for students, researchers, teachers, agricultural professionals, and policymakers seeking to understand recent advances and future directions in plant science and agricultural research. By connecting fundamental scientific knowledge with practical agricultural applications, this volume aims to encourage innovation, interdisciplinary collaboration, and sustainable solutions to emerging challenges in global food production.

It is hoped that this book will contribute to scientific understanding and inspire further research toward productive, resilient, and sustainable agricultural systems for future generations.

Dr. Ompal Singh
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