Genetic Frontiers in Modern Plant Breeding

Genetic Frontiers in Modern Plant Breeding

Dr. L.S. Dhayal
Professor & Head Department of Genetics and Plant Breeding, Suresh Gyan Vihar University, Jaipur

Dr. Hansa Mathur
Assistant Professor
Suresh Gyan Vihar University, Jaipur

Dr. Hemant Sharma
Assistant Professor
Department of Botany, Dayanand College, Hisar

Dr. Suresh Singh Rajpurohit
Faculty, Department of Botany
Neet UG Coaching, Kota

VITAL BIOTECH PUBLICATION
Kota, Rajasthan, India
http://www.vitalbiotech.org/bookpublication/

An International Publishers

VITAL BIOTECH get Accredited by following International organization

https://www.portico.org/publishers/vital/
101 Greenwich Street, 18th Floor
New York, NY 10006

Published by Vital Biotech Publication
First Edition: 2026

Product Form:
Digital download, online and hard bound

Edition:
ISBN: 978-93-48793-39-3

Head, Production (Higher Education and Professional) & Publishing Director
Dr. Jitendra Mehta

Product Manager
Aman Saxena

General Manager
Jaya Mehta

Graphic Designer
Avneet Kaur

Office Address:

VITAL BIOTECH PUBLICATION
772, Basant Vihar, Kota,
Rajasthan-324009 India
Visit us at: http://www.vitalbiotech.org
Contact No. +91-9784677044
Printed at: Vital Biotech Publication, Kota

Preface

Plant breeding has entered a transformative era driven by remarkable advances in genetics, genomics, biotechnology, and computational sciences. The book *Genetic Frontiers in Modern Plant Breeding* is designed to present a comprehensive understanding of these emerging innovations and their applications in crop improvement for global food and nutritional security. Modern agriculture faces unprecedented challenges including climate change, shrinking natural resources, evolving pests and diseases, and the increasing demand for sustainable agricultural production. In such a scenario, genetic advancement has become one of the most powerful tools for developing resilient, high-yielding, and quality crop varieties.

This book highlights the integration of classical breeding approaches with cutting-edge molecular techniques such as marker-assisted selection, genomic selection, genome editing, bioinformatics, and omics technologies. It also explores recent developments in stress tolerance, hybrid breeding, conservation of genetic resources, and precision breeding strategies. Each chapter has been carefully prepared to provide both fundamental concepts and practical insights for students, researchers, academicians, and professionals in agricultural sciences.

The editors sincerely hope that this volume will serve as a valuable academic and research resource, encouraging innovative thinking and scientific exploration in the field of plant breeding and genetics. We express our heartfelt gratitude to all contributors, reviewers, and scholars whose dedication and expertise made this publication possible. It is our belief that this book will contribute meaningfully toward sustainable agricultural development and future genetic innovations in crop science.

Dr. L.S. Dhayal **Dated - 01 May, 2026**
Dr. Hansa Mathur
Dr. Hemant Sharma
Dr. Suresh Singh Rajpurohit

CONTENTS