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This volume provides a
comprehensive description of the
basic tenets of molecular

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biology, from mechanisms to its elaborate role in gene regulation. The initial sections cover the history of genetics and molecular biology. The book then goes on to highlight the significance of molecular approaches for all

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biological processes in both simple and complex cells. The volume incorporates the most recent research from this ever-evolving field. The authors have described experimental approaches wherever necessary

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to present evidence that has led to the development of important concepts and significant advances in molecular biology. Gene Editing in Plants, Volume 149 aims to provide the reader with an up-to-date survey of

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cutting-edge research with gene editing tools and an overview of the implications of this research on the nutritional quality of fruits, vegetables and grains. New chapters in the updated volume include topics relating to

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Genome Engineering and Agriculture: Opportunities and Challenges, the Use of CRISPR/Cas9 for Crop Improvement in Maize and Soybean, the Use of Zinc-Finger Nucleases for Crop

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Improvement, Gene Editing in Polyploid Crops: Wheat, Camelina, Canola, Potato, Cotton, Peanut, Sugar Cane, and Citrus, and Gene Editing With TALEN and CRISPR/Cas in Rice. This ongoing serial contain

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contributions from leading scientists and researchers in the field of gene editing in plants who describe the results of their own research in this rapidly expanding area of science. Shows the importance of

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revolutionary gene editing technology on plant biology research and its application to agricultural production Provides insight into what may lie ahead in this rapidly expanding area of plant research and development

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Contains contributions from major leaders in the field of plant gene editing

Plant biotechnology has come of age. Products obtained by genetically engineered methods, once limited to science fiction,

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have become a reality. This book is an outstanding synthesis of the current status of technology transfer from the laboratory to the marketplace. It discusses the use of genetically engineered crops, with the focus on

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biotechnology becoming commercially marketable.

Technology Transfer of Plant Biotechnology addresses these important new products:
Plant cell structure and function;
Gene expression and its

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regulation in plant cells; The
manipulation of plant cells.

Molecular Biology

Methods for Plant Molecular
Biology

DNA Sequencing

Applied Molecular Biotechnology

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Practical Applications of Plant Molecular Biology

The last few years have seen an explosion of new information and resources in the areas of plant molecular genetics and genomics. As a result of developments such as

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high throughput sequencing, we now have huge amounts of information available on plant genes. But how does this help people charged with the task of improving crop species to create products with altered functions or

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improved characteristics? This volume considers ways in which the new information, resources and technology can be exploited by the plant breeder. Examples in current use will be quoted wherever possible.

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In calling this series Molecular Plant Virology, I had in mind aspects of plant virology of interest to biochemists, molecular geneticists, biophysicists, genetic engineers, or, collectively, molecular biologists. At the same time, the intention was to

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provide up-to-date reviews, by expert contributors, on current research topics in plant virology of interest and referential use to virologists and plant biologists. The selected topics are pitched mainly at a research level, but with

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sufficient introduction and cross-referencing to enable graduate students to enter this fascinating field and, hopefully, not get lost. This book provides up-to-date coverage at an advanced level of a range of topics in the biochemistry

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and molecular biology of plant hormones, with particular emphasis on biosynthesis, metabolism and mechanisms of action. Each contribution is written by acknowledged experts in the field, providing definitive coverage of the

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field. No other modern book covers this subject matter at such an advanced level so comprehensively. It will be invaluable to university libraries and scientists in the plant biotechnology industries.

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This book gives a comprehensive account of Plant Molecular Biotechnology intended for undergraduate students of biotechnology courses. The book contains twenty six chapters covered under three parts. Part A

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concentrates on an overview of plant molecular biology in areas like plant genome organization, plant promoters, plant gene expression, signal transduction and plant organellar genome organization as an indispensable basic tool to

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understand the concepts in plant biotechnology. Part B covers important aspects of plant tissue culture i.e. micropropagation, somaclonal variation, haploids and somatic hybrid production and strategies for plant secondary

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metabolite production. Part C, extensively covers topics on plant genetic engineering and biotechnological applications. The techniques of plant transformation have been elaborated. Comprehensive discussions have

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been made in the areas of plant engineering on trend setting topics like engineering plants for stress tolerance, male sterility, phytoremediation, transplastomic technology and metabolic engineering of plants. In view of fast

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emerging areas like biopharmaceuticals, topics on the utility of plants for molecular farming of pharmaceutically important biomolecules and also tailoring plants for nutritional quality are included. Improvement of crop

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through transgenic strategies such as disease resistance, antisense technology in post harvest preservation has been discussed. Chapters on plant genomics covers an overview of bioinformatics and the outcome of Arabidopsis and rice

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genome sequencing projects and also includes other omic technologies. One of the highlights of this book is that it gives the concepts of both plant molecular biology and plant biotechnology with up to date information. Contents:

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Part A: Plant molecular biology: an overview
Part B: Plant tissue culture
Part C: Plant genetic engineering and biotechnological applications.
10 Years Plant Molecular Biology
Plant Molecular Genetics
Plant Molecular Biology

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*Technology Transfer of Plant
Biotechnology
Molecular and Genomic
Perspectives*

**The treatise is dedicated to one of the
most important areas of modern biology
i.e. plant molecular genetics. The**

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science of genetics born to an Austrian monk Gregor Johann Mendel in the spring of 1865 was immediately consigned to the deep freeze for the next 35 years. It was rediscovered in 1900 by three scientists working independently. Since then the growth of the subject in terms of information generation has

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been phenomenal. The present book provides detailed information regarding the process of developing plants resistant to insect-pests, viruses, herbicides and cold stress using the modern techniques of genetics. It also discusses at length about heat-shock protein genes, defense response genes

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and photosynthetic genes of plants. The use of apomixis in crop genetic improvement has been thoroughly presented. The treatise has been prepared in simple language for easy understanding of the students, the complicated topics of plant molecular genetics. It would be of great interest to

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**a very large group of readers
undergraduate and postgraduate
students of genetics, plant
biotechnology, plant molecular biology,
professional plant breeders and
geneticists, research workers and
candidates taking competitive
examinations like NET, ARS and Civil**

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services Examinations. In writing this book the author has been led by the thought of the great ancient philosopher Aristotle The book is good when it says only what should be said.

Since its publication in 2000, Biochemistry & Molecular Biology of Plants, has been hailed as a major

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contribution to the plant sciences literature and critical acclaim has been matched by global sales success.

Maintaining the scope and focus of the first edition, the second will provide a major update, include much new material and reorganise some chapters to further improve the presentation.

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This book is meticulously organised and richly illustrated, having over 1,000 full-colour illustrations and 500 photographs. It is divided into five parts covering: Compartments: Cell Reproduction: Energy Flow; Metabolic and Developmental Integration; and Plant Environment and Agriculture.

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Specific changes to this edition include: Completely revised with over half of the chapters having a major rewrite. Includes two new chapters on signal transduction and responses to pathogens. Restructuring of section on cell reproduction for improved presentation. Dedicated website to

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include all illustrative material.

Biochemistry & Molecular Biology of Plants holds a unique place in the plant sciences literature as it provides the only comprehensive, authoritative, integrated single volume book in this essential field of study.

Methods for Plant Molecular Biology is

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a collection of articles that focuses on the techniques used in plant molecular biology and genetics. The book discusses the isolation and characterization of nuclear, chloroplast, and mitochondrial nucleic acids and the factors and systems involved in transcription and gene expression. Procedures for the

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isolation of cell walls, chloroplast membranes, membrane proteins; techniques to carry out plant cell culture and protoplast formation; and methods for gene and organelle transfer are covered as well. Biologists, molecular biologists, botanists, and students will find the book very useful.

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In the preface to the first edition of this book, we expressed a conviction that there was a need for a short book that highlighted important advances in the new discipline of plant molecular biology. The rapid development of this topic has been brought about by the recognition of the unique properties of

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plants in the study of growth and development together with the application of recombinant DNA techniques to tackle these problems. Plant cells contain DNA in nuclei, plastids and mitochondria, and so offer the unique challenge of studying the interaction of three separate genetic

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systems in a single organism. The molecular approach has provided, in recent years, a wealth of important information about how plants function, and how they interact with bacteria, fungi and viruses. Furthermore, plant development involves the regulation of gene expression in response to internal

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and external signals, and plant molecular biology has provided a fundamental insight into how this development is regulated. This is not only of considerable scientific interest, but also has important implications for the production of plants and plant products in agriculture, horticulture

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and the food industries.

Plant Genetics and Molecular Breeding

Molecular Plant Immunity

Current Issues in Plant Molecular and

Cellular Biology

Plant Molecular Biology — A

Laboratory Manual

Plant Molecular Breeding

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Plant cell and tissue culture is a relevant area of experimental biology that has been developed for some decades to become an indispensable tool of plant biotechnology. Progress in this area,

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sometimes tumultuous, has been regularly recorded by the proceedings of the congresses of the International Association for Plant Tissue Culture which have been held every four

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years in several continents. This book reports plenary lectures, keynote lectures and invited oral presentations given at the last congress held in Florence. It is a useful reference guide both for

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established scientists and students on both traditional and emerging fields of plant biology. The following topics are covered: In vitro Culture and Plant Regeneration; Plant Propagation; Haploids;

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***Somatic Hybridisation;
Reproductive Systems;
Genetic Variability; Gene
Transfer; Organelles;
Biotechnology of Tropical and
Subtropical Species;
Agronomic Traits; Somatic***

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***Embryogenesis; Meristems;
Cell Surface; Growth
Regulators; Reception and
Transduction of Signals; Gene
Expression under Extreme
Conditions; Primary
Metabolism; Secondary***

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***Metabolism; Transport; Large
Scale Production.***

***In the Dictionary of Plant
Genetics and Molecular
Biology, more than 3,500
technical terms from the fields
of plant genetics and***

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molecular biology are defined for students, teachers, and researchers in universities, institutes, and agricultural research stations. An excellent educational tool that will save you time and effort, this

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dictionary brings together into a single source the meaning and origin of terms from the fields of classical genetics, molecular genetics, mutagenesis, population genetics, statistics, plant

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biotechnology, evolutionary genetics, plant breeding, and plant biotechnology. Finding and understanding the precise meaning of many terms in genetics is crucial to understanding the foundation

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of the subject matter. For reasons of space, the glossaries provided at the end of most textbooks are highly inadequate. There is, then, dire need for a dictionary of terms in a single volume. You?!!

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appreciate the helpful approaches and features of Dictionary of Plant Genetics and Molecular Biology, including: no terms that are of limited use, very general, or self-explanatory cross

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references for effective access to the materials and economy of space alternate names of terms, denoted with “Also referred to as . . .” or “Also known as . . .” multiple definitions for terms defined

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by different authors or for terms with different meanings in different contexts authors who coined, described, or contributed toward further understanding of a term are listed and respective

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publications are included in the Bibliography At last, there is compiled in a single volume the technical terms you need to know in order to understand plant genetics and molecular biology. As your knowledge

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grows, you?ll uncover even more terms that you need to understand. You?ll find yourself turning to this handy guide time and time again for help on all levels.

A single source of reference to

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key data and information required by the plant molecular biologist on an almost daily basis. A team of editors and contributors have compiled this manual to provide a guide to researchers

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in the most important basic and applied aspects of plant molecular biology.

Molecular Plant Immunity provides an integrated look at both well-established and emerging concepts in plant

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diseaseresistance providing the most current information on this importantvitaly important topic within plant biology. Understanding themolecular basis of the plant immune system has

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implications on the development of new varieties of sustainable crops, understanding the challenges plant life will face in changing environments, as well as providing a window into

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immune function that could have translational appeal to human medicine. Molecular Plant Immunity opens with chapters reviewing how the first line of plant immune response is activated

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followed by chapters looking at the molecular mechanisms that allow fungi, bacteria, and oomycetes to circumvent those defenses.

Plant resistance proteins, which provide the second line

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of plant immunodefense, are then covered followed by chapters on the role of hormones in immunity and the mechanisms that modulate specific interaction between plants and viruses. The final

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chapters look at model plant-pathogen systems to review interaction between plants and fungal, bacterial, and viral pathogens. Written by a leading team of international experts, Molecular Plant

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***Immunity will provide a
needed resource to diverse
research community
investigated plant immunity.
The Impact of Plant Molecular
Genetics
Gene Editing in Plants***

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***Biochemistry and Molecular
Biology of Plant Hormones
Molecular Systematics of
Plants II
2nd Edition***

It is very clear nowadays that
plants offer several opportunities

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for basic studies, e.g. on development and embryogenesis, and that the fundamental principles laid open contribute to the development of new tools for plant breeding.

Within the scope of the present

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publication, the editors have had to make a difficult choice from the many important subjects that have contributed to the remarkable progress of our molecular biological understanding of complex

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biological problems. This has resulted in review papers showing the present state of the art in genetic engineering, gene expression and its manipulation, microbe and insect interactions with plants, transposable

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elements and gene tagging, plant and organ development, the function and structure of the genome chloroplasts, and lipid biosynthesis. All papers have been written in such a way that they are also useful for non-

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experts interested in a particular field, as well as for students following courses in plant molecular biology. Besides presenting the state of the art, each paper gives some historical background to the developments

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in the field as well as perspectives for further basic research and applications. Because of the latter, scientists and students engaged in plant breeding will also profit from this publication.

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Salinity stress currently impacts more than 80 million hectares of land worldwide and more arable land is likely to be impacted in the future due to global climate changes. Managing Salt Tolerance in Plants: Molecular

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and Genomic Perspectives
presents detailed molecular and
genomic approaches for the
development of crop plants
tolerant to salinity
Describes some of the
developments in the field of Plant

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Genotyping, focusing on single nucleotide polymorphism (SNPs). This book covers the discovery, analysis and uses of SNPs, and examines other approaches to plant genotyping. Plant molecular biology has

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produced an ever-increasing flood of data about genes and genomes. Evolutionary biology and systematics provides the context for synthesizing this information. This book brings together contributions from

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evolutionary biologists, systematists, developmental geneticists, biochemists, and others working on diverse aspects of plant biology whose work touches to varying degrees on plant molecular evolution. The

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book is organized in three parts, the first of which introduces broad topics in evolutionary biology and summarizes advances in plant molecular phylogenetics, with emphasis on model plant systems. The

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second segment presents a series of case studies of gene family evolution, while the third gives overviews of the evolution of important plant processes such as disease resistance, nodulation, hybridization,

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transposable elements and genome evolution, and polyploidy.

Molecular Plant Virology
Proceedings of ISPMF 2018 -
Plant Molecular Farming
Managing Salt Tolerance in

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Plants

Volume II: Replication and Gene
Expression

Methods in Plant Molecular
Biology and Biotechnology

*The impact of molecular genetics on plant
breeding and, consequently, agri culture,*

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is potentially enormous. Understanding and directing this potential impact is crucial because of the urgent issues that we face concerning sustainable agriculture for a growing world population as well as conservation of the world's rapidly dwindling plant genetic resources. This book is largely devoted to

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the applications of genetic markers that have been developed by the application of molecular genetics to practical problems. These are known as DNA markers. They have gained a certain notoriety in forensics, but can be used in a variety of practical situations. We are going through a period of accelerated

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breakthroughs in molecular genetics. Therefore, the authors of each chapter were encouraged to speculate about both current bottlenecks and the future of their subfields of research. We can certainly apply molecular genetic tools and approaches to help resolve crucial genetic resource problems that face humanity.

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However, little has been discussed with respect to when or how we should use such tools, nor to who specifically should use them; therefore, social and economic analyses are important in the planning stages of projects that are aimed at practical results.

A stunning landmark co-publication

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between the American Society of Plant Biologists and Wiley-Blackwell. The Molecular Life of Plants presents students with an innovative, integrated approach to plant science. It looks at the processes and mechanisms that underlie each stage of plant life and describes the intricate network of cellular, molecular,

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biochemical and physiological events through which plants make life on land possible. Richly illustrated, this book follows the life of the plant, starting with the seed, progressing through germination to the seedling and mature plant, and ending with reproduction and senescence. This "seed-to-seed" approach will provide

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students with a logical framework for acquiring the knowledge needed to fully understand plant growth and development. Written by a highly respected and experienced author team The Molecular Life of Plants will prove invaluable to students needing a comprehensive, integrated introduction to

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the subject across a variety of disciplines including plant science, biological science, horticulture and agriculture.

Practical Applications of Plant

Molecular Biology is an important new title which covers the major techniques and how they are applied to a range of vitally important areas. Divided broadly

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into four sections, this book covers key subjects including the identification of plants and plant pathogens using molecular techniques, the estimation of genetic variation in plants, the use of molecular markers in plant improvement and the use of plant transformation techniques for the improvement of quality

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and the introduction of resistance. Also included is a comprehensive listing and description of the most frequently used techniques and a set of appendices covering useful topics of reference for the reader. All undergraduates studying plant sciences, molecular biology, biotechnology and agricultural sciences

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would benefit from having access to this title as would those studying for upper-level Masters courses concentrating on the disciplines covered. This book also provides an invaluable source of reference for professionals in agriculture, plant breeding, crop protection and improvement,

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biotechnology and molecular biology. Molecular Markers in Plants surveys an array of technologies used in the molecular analysis of plants. The role molecular markers play in plant improvement has grown significantly as DNA sequencing and high-throughput technologies have matured. This timely

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review of technologies and techniques will provide readers with a useful resource on the latest molecular technologies.

Molecular Markers in Plants not only reviews past achievements, but also catalogs recent advances and looks forward towards the future application of molecular technologies in plant

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improvement. Opening chapters look at the development of molecular technologies. Subsequent chapters look at a wide range of applications for the use of these advances in fields as diverse as plant breeding, production, biosecurity, and conservation. The final chapters look forward toward future developments in

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the field. Looking broadly at the field of molecular technologies, Molecular Markers in Plants will be an essential addition to the library of every researcher, institution, and company working in the field of plant improvement.

Different Facets

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*Proceedings of the VIIIth International
Congress on Plant Tissue and Cell
Culture, Florence, Italy, 12–17 June,
1994
1997
The Molecular Biology of Plant Cells*

Plants under abiotic stress are those

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suffering from drought, extreme temperatures, flood and other natural-but non-living-factors. Abiotic stress is responsible for reduced yields in several major crops, and climate change is focusing research in this area. To minimize cellular damage

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cause by such stresses, plants have evolved complex, well-coord
This book provides comprehensive information on the latest tools and techniques of molecular genetics and their applications in crop improvement. It thoroughly discusses advanced

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techniques used in molecular markers, QTL mapping, marker-assisted breeding, and molecular cytogenetics. Plant Molecular Breeding John Wiley & Sons

Applied Molecular Biotechnology: The Next Generation of Genetic

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Engineering explains state-of-the-art advances in the rapidly developing area of molecular biotechnology, the technology of the new millennium. Comprised of chapters authored by leading experts in their respective fields, this authoritative reference text:

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Highlights the latest omics-based tools and approaches used in modern biotechnology Explains how various molecular biology technologies can be used to develop transgenic plants and how those plants can meet growing food and plant-derived product

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demands Discusses chloroplast gene expression systems, mitochondrial omics, plant functional genomics, and whole-genome resequencing for crop improvement Explores plant-microbe and plant-insect interactions affecting plant protection and productivity

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Covers animal models, pharmacogenomics, human tissue banking, and the molecular diagnosis of diseases such as cervical cancer, obesity, and diabetes Examines the molecular aspects of viral diseases, production of industrial commodities

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using viral biotechnology, and biotechnological uses of magnetic nanoparticles Describes the use of biotechnology in the food, chemical, pharmaceutical, environmental conservation, and renewable energy sectors Applied Molecular

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Biotechnology: The Next Generation of Genetic Engineering serves as a springboard for new discoveries in molecular biology and its applications. Thus, this book is an invaluable resource for students and researchers of molecular biotechnology.

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Plant Molecular Biology Manual
Molecular Biology and Host Defense
Mechanisms, Second Edition
Plant Molecular Biology LabFax
Dictionary of Plant Genetics and
Molecular Biology
List of Journals Indexed for MEDLINE

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The development of new plant varieties is a long and tedious process involving the generation of large seedling populations for the selection of the best

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individuals. While the ability of breeders to generate large populations is almost unlimited, the selection of these seedlings is the main factor limiting

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the generation of new cultivars. Molecular studies for the development of marker-assisted selection (MAS) strategies are particularly useful when

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the evaluation of the character is expensive, time-consuming, or with long juvenile periods.

The papers published in the Special Issue "Plant Genetics and Molecular

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Breeding" report highly novel results and testable new models for the integrative analysis of genetic (phenotyping and transmission of agronomic characters),

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physiology (flowering, ripening, organ development), genomic (DNA regions responsible for the different agronomic characters), transcriptomic (gene

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expression analysis of the characters), proteomic (proteins and enzymes involved in the expression of the characters), metabolomic (secondary metabolites),

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and epigenetic (DNA methylation and histone modifications) approaches for the development of new MAS strategies. These molecular approaches

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together with an increasingly accurate phenotyping will facilitate the breeding of new climate-resilient varieties resistant to abiotic and biotic

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stress, with suitable productivity and quality, to extend the adaptation and viability of the current varieties.

Covering the whole range

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of molecular biology techniques - genetic engineering as well as cytogenetics of plants -, each chapter begins with an introduction to the basic approach.

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followed by detailed methods with easy-to-follow protocols and comprehensive troubleshooting. The first part introduces basic molecular

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methodology such as DNA extraction, blotting, production of libraries and RNA cloning, while the second part describes analytical approaches, in

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particular RAPD and RFLP. The manual concludes with a variety of gene transfer techniques and both molecular and cytological analysis. As

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such, this will be of great use to both the first-timer and the experienced scientist. This text, concisely sets out the fundamentals required by

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students in this rapidly growing field. Plant Molecular Genetics is split into four parts: the first deals with the structure and inheritance of plant

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genomes; the second with the biology of *Agrobacterium tumefaciens* and its use in plant transformation; the third with key topics in plant

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molecular biology, including nitrogen fixation, the effect of light on plant development, flowering, breeding systems and disease resistance. The

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final section provides an overview of plant biotechnology, including a discussion of its future prospects.

Methods in Plant Molecular Biology and

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Biotechnology emphasizes a variety of well-tested methods in plant molecular biology and biotechnology. For each detailed and tested protocol presented, a

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brief overview of the methodology is provided. This overview considers why the protocol is used, what other comparable methods are available, and what

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limitations can be expected with the protocol. Other chapters in the book present overviews regarding how to approach particular problems and introduce

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unique methods - such as how to use computer methodology to study isolated genes. The book will be a practical reference for plant physiologists, plant

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molecular biologists,
phytopathologists, and
microbiologists.

Molecular Markers in
Plants

Fungal Pathogenesis in
Plants and Crops

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Proceedings of RBMP 2018

- Plant Molecular

Biology

Molecular Biology of the

Cell

Plant Molecular

Evolution

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Dramatic progress in molecular biology and genetic engineering has recently produced an unparalleled wealth of information on the mechanisms of plant and

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pathogen interactions at the cellular and molecular levels.

Completely revised and expanded, Fungal Pathogenesis in Plants and Crops: Molecular

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Biology and Host Defense Mechanisms, Second Edition offers fresh insight into the interplay of signaling systems in plant and pathogen interactions.

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The book delineates the battle between plant and fungal pathogen and the complex signaling systems involved. See what's new in the Second Edition: Chapter on the

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role of disease
resistance genes in
signal perception and
emission Chapter on cell
death signaling in
disease susceptibility
and resistance Revised

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material on
phytoalexins, toxins,
and signal perception
and transduction in
fungal pathogenesis 17
additional families of
pathogenesis-related

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proteins and antifungal proteins The book describes the weapons used by fungal pathogens to evade or suppress the host defense mechanisms. It covers each fungal

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infection process from initial contact and penetration to the subsequent invasion and symptom development. The author explains complex signaling systems in the

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plant-pathogen interface with flow charts and provides drawings elucidating the biosynthetic pathway of secondary metabolites. He includes figures that

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highlight cutting-edge breakthroughs in molecular science and tables documenting important findings in the field of molecular plant pathology. These

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features and more make this book not only the most up to date resource in the field, but also the most important.

In the five years since the publication of

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Molecular Systematics of Plants, the field of molecular systematics has advanced at an astonishing pace. This period has been marked by a volume of new

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empirical data and advances in theoretical and analytical issues related to DNA.

Comparative DNA sequencing, facilitated by the amplification of

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DNA via the polymerase chain reaction (PCR), has become the tool of choice for molecular systematics. As a result, large portions of the Molecular

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Systematics of Plants have become outdated. Molecular Systematics of Plants II summarizes these recent achievements in plant molecular systematics.

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Like its predecessor, this completely revised work illustrates the potential of DNA markers for addressing a wide variety of phylogenetic and evolutionary

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questions. The volume provides guidance in choosing appropriate techniques, as well as appropriate genes for sequencing, for given levels of systematic

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inquiry. More than a review of techniques and previous work, Molecular Systematics of Plants II provides a stimulus for developing future research in this rapidly

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Molecular Systematics of Plants II is not only written for systematists (faculty, graduate students, and researchers), but also

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