

Introduction To Plant Tissue Culture By Mk Razdan

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Encyclopedia of Plant and Crop Science (Print) RobertM. Goodman 2004-02-27 Encyclopedia of Plant and Crop Science is the first-ever single-source reference work to inclusively cover classic and modern studies in plant biology in conjunction with research, applications, and innovations in crop science and agriculture. From the fundamentals of plant growth and reproduction to developments in agronomy and agricultural science, the encyclopedia's authoritative content nurtures communication between these academically distinct yet intrinsically related fields-offering a spread of clear, descriptive, and concise entries to optimally serve scientists, agriculturalists, policy makers, students, and the general public. ALSO AVAILABLE ONLINE This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for both researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options For more information, visit Taylor and Francis Online or contact us to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367 / (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062 / (E-mail) online.sales@tandf.co.uk **Plant Tissue Culture** Sant Saran Bhojwani 1983

Plant Cell Culture Michael R. Davey 2010-05-20 The ability to culture cells is fundamental for mass propagation and as a baseline for the genetic manipulation of plant nuclei and organelles. The introduction to Plant Cell Culture: Essential Methods provides a general background to plant cell culture, including basic principles, technologies and laboratory practices that underpin the more detailed techniques described in subsequent chapters. Whilst each chapter provides a background to the topic area and methodology, a crucial aspect is the provision of detailed protocols with emphasis on trouble shooting, describing common problems and detailed advice for their avoidance. Plant Cell Culture: Essential Methods provides the reader with a concise overview of these techniques, including micropropagation, mutagenesis, cryopreservation, genetic and plastid transformation and somatic cell technologies. This book will be an essential addition to any plant science laboratory's bookshelf. Highlights the best and most up-to-date techniques for working on plant cell culture Explains clearly and precisely how to carry out selected techniques in addition to background information on the various approaches Chapters are written by leading international authorities in the field and cover both well-known and new, tried and tested, methods for working in plant cell culture An essential laboratory manual for students and early-career researchers.

Applied and Fundamental Aspects of Plant Cell, Tissue, and Organ Culture Jakob Reinert 2013-04-17 Progress in the field of plant cell and tissue culture has made this area of research one of the most dynamic and promising not only in plant physiology, cell biology and genetics but also in agriculture, forestry, horticulture and industry. Studies with plant cell cultures clearly have bearing upon a variety of problems as yet unsolved in basic and applied research. This was the compelling reason for assembling such a comprehensive source of information to stimulate students, teachers, and research workers. This book comprises 34 articles on regeneration of plants, vegetative propagation and cloning; haploids; cytology, cytogenetics and plant breeding; protoplasts, somatic hybridization and genetic engineering; plant pathology; secondary products and a chapter on isoenzymes, radiobiology, and cryobiology of plant cells. Particular attention has been paid to modern, fast-growing and fascinating disciplines - e.g. the induction of haploids, somatic hybridization and genetic manipulation by protoplast culture, which possess an enormous potential for plant improvement.

PLANT AND ANIMAL TISSUE CULTURE Dr. SEEMA J PATEL

Plant Tissue Culture: Theory and Practice S.S. Bhojwani 1996-11-08 Since the publication of the first edition in 1983, several new and exciting developments have taken place in the field of plant tissue culture, which forms a major component of what is now called plant biotechnology. The revised edition presents updated information on theoretical, practical and applied aspects of plant tissue culture. Each chapter has been thoroughly revised and, as before, is written in lucid language, includes relevant media protocols, and is profusely illustrated with self-explanatory diagrams and original photographs. This book includes three new chapters: "Variant selection", "Genetic Engineering" and "Production of Industrial Compounds" and contains a complete bibliography and a glossary of terms commonly used in tissue culture literature. This updated version proves to be an excellent text for undergraduate, postgraduate students and teachers in various fields of plant sciences and a useful reference book for those interested in the application of any aspect of this aseptic technology.

Modern Applications of Plant Biotechnology in Pharmaceutical Sciences Saurabh Bhatia 2015-07-22 Modern Applications of Plant Biotechnology in Pharmaceutical Sciences explores advanced techniques in plant biotechnology, their applications to pharmaceutical sciences, and how these methods can lead to more effective, safe, and affordable drugs. The book covers modern approaches in a practical, step-by-step manner, and includes illustrations, examples, and case studies to enhance understanding. Key topics include plant-made pharmaceuticals, classical and non-classical techniques for secondary metabolite production in plant cell culture and their relevance to pharmaceutical science, edible vaccines, novel delivery systems for plant-based products, international industry regulatory guidelines, and more. Readers will find the book to be a comprehensive and valuable resource for the study of modern plant biotechnology approaches and their pharmaceutical applications. Builds upon the basic concepts of cell and plant tissue culture and recombinant DNA technology to better illustrate the modern and potential applications of plant biotechnology to the pharmaceutical sciences Provides detailed yet practical coverage of complex techniques, such as micropropagation, gene transfer, and biosynthesis Examines critical issues of international importance and offers real-life examples and potential solutions

Plant Tissue Culture: An Introductory Text Sant Saran Bhojwani 2013-03-20 Plant tissue culture (PTC) is basic to all plant biotechnologies and is an exciting area of basic and applied sciences with considerable scope for further research. PTC is also the best approach to demonstrate the totipotency of plant cells, and to exploit it for numerous practical applications. It offers technologies for crop improvement (Haploid and Triploid production, In Vitro Fertilization, Hybrid Embryo Rescue, Variant Selection), clonal propagation (Micropropagation), virus elimination (Shoot Tip Culture), germplasm conservation, production of industrial

phytochemicals, and regeneration of plants from genetically manipulated cells by recombinant DNA technology (Genetic Engineering) or cell fusion (Somatic Hybridization and Cybridization). Considerable work is being done to understand the physiology and genetics of in vitro embryogenesis and organogenesis using model systems, especially Arabidopsis and carrot, which is likely to enhance the efficiency of in vitro regeneration protocols. All these aspects are covered extensively in the present book. Since the first book on Plant Tissue Culture by Prof. P.R. White in 1943, several volumes describing different aspects of PTC have been published. Most of these are compilation of invited articles by different experts or proceedings of conferences. More recently, a number of books describing the Methods and Protocols for one or more techniques of PTC have been published which should serve as useful laboratory manuals. The impetus for writing this book was to make available a complete and up-to-date text covering all basic and applied aspects of PTC for the students and early-career researchers of plant sciences and plant / agricultural biotechnology. The book comprises of nineteen chapters profusely illustrated with self-explanatory illustrations. Most of the chapters include well-tested protocols and relevant media compositions that should be helpful in conducting laboratory experiments. For those interested in further details, Suggested Further Reading is given at the end of each chapter, and a Subject and Plant Index is provided at the end of the book.

Experiments In Microbiology, Plant Pathology And Biotechnology K. R. Aneja 2007 Microorganisms Are Living Things Like Plants And Animals But Because Of Their Minute Size And Omnipresence, Performing Experiments With Microbes Requires Special Techniques And Equipment Apart From Good Theoretical Knowledge About Them. This Easy To Use Revised And Updated Edition Provides Knowledge About All The Three I.E., Techniques, Equipment And Principles Involved.The Notable Feature Of This Edition Is The Addition Of New Sections On Bacterial Taxonomy That Deals With The Criteria Used In Identification, Phylogeny And Current System Of Classification Of Prokaryotes Based On The Second Edition Of Bergey Manual Of Systematic Bacteriology And The Section One On History Of Discovery Of Events That Covers Chronologically Important Events In Microbiology With The Contribution Of Pioneer Microbiologists Who Laid The Foundation Of The Science Of Microbiology. In The Subsequent Twenty-Two Sections, Various Microbiological Techniques Have Been Described Followed By Several Experiments Illustrating The Properties Of Microorganisms And Highlighting Their Involvement In Practically Every Sphere Of Life.Along With The Cultivation/Isolation/Purification Of Microbes, This Edition Also Contains Exercises Concerning Air, Soil, Water, Food, Dairy And AgriculturalMicrobiology, Bacterial Genetics, Plant Pathology, Plant Tissue Culture And Mushroom Production Technology. This Manual Contains 163 Experiments Spread Over 22 Different Sections. The Exercises Are Presented In A Simple Language With Explanatory Diagrams And A Brief Recapitulation Of Their Theory And Principle.The Exercises Are Selected By Keeping In Mind The Easy Availability Of Cultures, Culture Media And Equipment. Appendices At The End Of The Manual Provide A Reference To The Source For Obtaining Cultures Of Microbes, Culture Media And Preparation Of Various Stains, Reagents And Media In The Laboratory And Classification Of Prokaryotes According To The First And Second Editions Of Bergey Is Manual Of Systematic Bacteriology.This Book Would Be Useful For The Undergraduate And Postgraduate Students, Teachers And Scientists In Diverse Areas Including The Biological Sciences, The Allied Health Services, Environmental Science, Biotechnology, Agriculture, Nutrition, Pharmacy And Various Other Professional Programmes Like Milk Processing Units, Diagnostic (Clinical) Microbiological Laboratories And Mushroom Cultivation At Small Or Large Scales.

Laboratory Protocols in Applied Life Sciences Prakash Singh Bisen 2014-02-26 As applied life science progresses, becoming fully integrated into the biological, chemical, and engineering sciences, there is a growing need for expanding life sciences research techniques. Anticipating the demands of various life science disciplines, Laboratory Protocols in Applied Life Sciences explores this development. This book covers a wide spectrum of areas in the interdisciplinary fields of life sciences, pharmacy, medical and paramedical sciences, and biotechnology. It examines the principles, concepts, and every aspect of applicable techniques in these areas. Covering elementary concepts to advanced research techniques, the text analyzes data through experimentation and explains the theory behind each exercise. It presents each experiment with an introduction to the topic, concise objectives, and a list of necessary materials and reagents, and introduces step-by-step, readily feasible laboratory protocols. Focusing on the chemical characteristics of enzymes, metabolic processes, product and raw materials, and on the basic mechanisms and analytical techniques involved in life science technological transformations, this text provides information on the biological characteristics of living cells of different origin and the development of new life forms by genetic engineering techniques. It also examines product development using biological systems, including pharmaceutical, food, and beverage industries. Laboratory Protocols in Applied Life Sciences presents a nonmathematical account of the underlying principles of a variety of experimental techniques in disciplines, including: Biotechnology Analytical biochemistry Clinical biochemistry Biophysics Molecular biology Genetic engineering Bioprocess technology Industrial processes Animal Plant Microbial biology Computational biology Biosensors Each chapter is self-contained and written in a style that helps students progress from basic to advanced techniques, and eventually design and execute their own experiments in a given field of biology.

Plant Biotechnology, Volume 1 Bishun Deo Prasad 2017-12-22 This book, first of this new two-volume set, provides an informative tour of the basics of biotechnology to recent advances in biotechnology. Knowledge of new and fresh approaches is a prerequisite to solving plant biological problems, and to this end, the editors have brought together a group of contributors who address the most recent techniques and their applications in plant biotechnology. The chapters discuss some recent techniques such as TILLING (Targeting Induced Local Lesions In Genomes), advances in molecular techniques to study diversity, protein purification, and methods and analysis in protein-protein interaction detection. The volume also covers molecular markers and QTL mapping, including four chapters that deal with different molecular markers, development of mapping populations, and association mapping for dissecting the genetic basis of complex traits in plants in sufficient detail. The knowledge of biotechnology techniques and their applications will be valuable for researchers and scientists as well as for the many students engaged in plant biotechnology studies.

Plant Tissue Culture Robert H. Smith 2012-12-02 Plant Tissue Culture Techniques and Experiments is a manual that contains laboratory exercises about the demonstration of the methods and different plant materials used in plant tissue culture. It provides an overview on the plant cell culture techniques and plant material options in selecting the explant source. This book starts by discussing the proper setup of a tissue culture laboratory and the selection of the culture medium. It then explains the determination of an explant which is the ultimate goal of the cell culture project. The explant is a piece of plant tissue that is used in tissue culture. Furthermore, the book discusses topics about callus induction, regeneration and morphogenesis process, and haploid plants from anther and pollen culture. The meristem culture for virus-free plants and in vitro propagation for commercial propagation of ornamentals are also explained in this manual. The book also provides topics and exercises on the protoplast isolation and fusion and agrobacterium-mediated transformation of plants. This manual is intended for college students, both graduate and undergraduate, who study chemistry, plant anatomy, and plant physiology.

Development of a simple, reproducible and efficient in-vitro culture protocol for callus proliferation and direct organogenesis from nodal explants of *Scoparia dulcis* Linn, an exotic medicinal plant Prem Jose Vazhacharickal For the development of an efficient callus initiation and direct organogenesis protocol in *Scoparia dulcis* Linn., an important medicinal plant, nodal segments of field grown plants were aseptically cultured on agar solidified MS medium supplemented with different concentrations and combinations of three PGRs, namely IAA, NAA and BA. The explants produced a green or light green compact callus on MS medium fortified with 0.5-2.0 mg/L BA in combination with 0.5-1.0 mg/l IAA or NAA. The maximum amount of callus was produced on MS with 1.5 mg/l BAP + 0.5 mg/l NAA in the case of explants. These callus tissues underwent differentiation when grown on a range of PGRs (BAP, IAA and NAA) supplemented media. The maximum number of callus was developed in medium containing 1.5 mg/l BAP + 0.5 mg/l NAA. Direct organogenesis underwent rapid elongation on elongation media and maximum elongation took place on MS with 1.5 mg/l BAP + 0.5 mg/l IAA. Antimicrobial activity of ethanol extracts of *S. dulcis* was also determined by using various bacterial strains. Ethanolic extracts of *S. dulcis* showed moderate activity against various organisms.

Biotechnological strategies for the conservation of medicinal and ornamental climbers Anwar Shahzad 2015-12-24 The book provides an overview on adoption of biotechnological approaches for the conservation, micropropagation, synseed production of various medicinal and ornamental climbers. The work includes a brief chapter on evolution and diversification of climbers. Other chapters give insights on protocols for in vitro propagation and synseed production of selected threatened medicinal and ornamental climbers. Informative chapter on the production of bioactive compound and their enhancement through genetic transformation and elicitation have been incorporated to cover latest advancement in the field of plant biotechnology. This book also explores the use of molecular marker technique for the desired improvement/magnification of medicinal and aesthetic value of climbing plants.

Plant Tissue Culture Roberta H. Smith 2012-10-22 Plant Tissue Culture, Third Edition builds on the classroom tested, audience proven manual that has guided users through successful plant culturing A.tumefaciens mediated transformation, infusion technology, the latest information on media components and preparation, and regeneration and morphogenesis along with new exercises and diagrams provide current information and examples. The included experiments demonstrate major concepts and can be conducted with a variety of plant material that are readily available throughout the year. This book provides a diverse learning experience and is appropriate for both university students and plant scientists. Provides new exercises demonstrating tobacco leaf infiltration to observe transient expression of proteins and subcellular location of the protein, and information on development of a customized protocol for protoplast isolation for other experimental systems Includes detailed drawings that complement both introductions and experiments Guides reader from lab setup to supplies, stock solution and media preparation, explant selection and disinfection, and experimental observations and measurement Provides the latest techniques and media information, including A. tumefaciens mediated transformation and infusion technology Fully updated literature

Plant Cell Biotechnology Rudolf Endress 2013-04-18 In the past there were many attempts to change natural foodstuffs into high-value products. Cheese, bread, wine, and beer were produced, traditionally using microorganisms as biological tools. Later, people influenced the natural process of evolution by artificial selection. In the 19th century, observations regarding the dependence of growth and reproduction on the nutrient supply led to the establishment of agricultural chemistry. Simultaneously, efforts were directed at defining the correlation between special forms of morphological differentiation and related biochemical processes. New experimental systems were developed after the discovery of phytohormones and their possible use as regulators of growth and differentiation. In these systems, intact plants or only parts of them are cultivated under axenic conditions. These methods, called "in vitro techniques", were introduced to modern plant breeding. In the field of basic research, plant cell cultures were increasingly developed and the correlations between biochemical processes and visible cell variations were explored further. It should be possible to manipulate the basic laws of regulation and the respective biochemical processes should be regarded as being independent of morphological processes of plant development.

Introduction to Plant Biotechnology H. S. Chawla 2002 Plant biotechnology has created unprecedented opportunities for the manipulation of biological systems of plants. To understand biotechnology, it is essential to know the basic aspects of genes and their organization in the genome of plant cells. This text on the subject is aimed at students.

Introduction to Plant Biotechnology (3/e) H S Chawla 2011-05-24 This book has been written to meet the needs of students for biotechnology courses at various levels of undergraduate and graduate studies. This book covers all the important aspects of plant tissue culture viz. nutrition media, micropropagation, organ culture, cell suspension culture, haploid culture, protoplast isolation and fusion, secondary metabolite production, somaclonal variation and cryopreservation. For good understanding of recombinant DNA technology, chapters on genetic material, organization of DNA in the genome and basic techniques involved in recombinant DNA technology have been added. Different aspects on rDNA technology covered gene cloning, isolation of plant genes, transposons and gene tagging, in vitro mutagenesis, PCR, molecular markers and marker assisted selection, gene transfer methods, chloroplast and mitochondrion DNA transformation, genomics and bioinformatics. Genomics covers functional and structural genomics, proteomics, metabolomics, sequencing status of different organisms and DNA chip technology. Application of biotechnology has been discussed as transgenics in crop improvement and impact of recombinant DNA technology mainly in relation to biotech crops.

Encyclopedia of Biotechnology in Agriculture and Food Dennis R. Heldman 2010-07-21 The Encyclopedia of Biotechnology in Agriculture and Food provides users with unprecedented access to nearly 200 entries that cover the entire food system, describing the concepts and processes that are used in the production of raw agricultural materials and food product manufacturing. So that users can locate the information they need quickly without having to flip through pages and pages of content, the encyclopedia avoids unnecessary complication by presenting information in short, accessible overviews. Addresses Environmental Issues &

Sustainability in the Context of 21st Century Challenges Edited by a respected team of biotechnology experts, this unrivaled resource includes descriptions and interpretations of molecular biology research, including topics on the science associated with the cloning of animals, the genetic modification of plants, and the enhanced quality of foods. It discusses current and future applications of molecular biology, with contributions on disease resistance in animals, drought-resistant plants, and improved health of consumers via nutritionally enhanced foods. Uses Illustrations to Communicate Essential Concepts & Visually Enhance the Text This one-of-a-kind periodical examines regulation associated with biotechnology applications—with specific attention to genetically modified organisms—regulation differences in various countries, and biotechnology's impact on the evolution of new applications. The encyclopedia also looks at how biotechnology is covered in the media, as well as the biotechnology/environment interface and consumer acceptance of the products of biotechnology. Rounding out its solid coverage, the encyclopedia discusses the benefits and concerns about biotechnology in the context of risk assessment, food security, and genetic diversity. ALSO AVAILABLE ONLINE This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for both researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options For more information, visit Taylor & Francis Online or contact us to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367 / (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062 / (E-mail) online.sales@tandf.co.uk Dennis R. Heldman speaks about his work on the CRC Press YouTube Channel.

Biotechnologies of Crop Improvement, Volume 1 Satbir Singh Gosal 2018-06-22 During the past 15 years, cellular and molecular approaches have emerged as valuable adjuncts to supplement and complement conventional breeding methods for a wide variety of crop plants. Biotechnology increasingly plays a role in the creation, conservation, characterization and utilization of genetic variability for germplasm enhancement. For instance, anther/microspore culture, somaclonal variation, embryo culture and somatic hybridization are being exploited for obtaining incremental improvement in the existing cultivars. In addition, genes that confer insect- and disease-resistance, abiotic stress tolerance, herbicide tolerance and quality traits have been isolated and re-introduced into otherwise sensitive or susceptible species by a variety of transgenic techniques. Together these transformative methodologies grant access to a greater repertoire of genetic diversity as the gene(s) may come from viruses, bacteria, fungi, insects, animals, human beings, unrelated plants or even be artificially derived. Remarkable achievements have been made in the production, characterization, field evaluation and commercialization of transgenic crop varieties worldwide. Likewise, significant advances have been made towards increasing crop yields, improving nutritional quality, enabling crops to be raised under adverse conditions and developing resistance to pests and diseases for sustaining global food and nutritional security. The overarching purpose of this 3-volume work is to summarize the history of crop improvement from a technological perspective but to do so with a forward outlook on further advancement and adaptability to a changing world. Our carefully chosen "case studies of important plant crops" intend to serve a diverse spectrum of audience looking for the right tools to tackle complicated local and global issues.

Propagation and Genetic Manipulation of Plants Iram Siddique 2020-10-12 Plant biotechnology has now become a key tool in improving crop productivity and enhancing commercial value of plant products. The book comprises various methods of in vitro propagation and genetic manipulation of important aromatic and medicinal plants. It puts together latest techniques and innovations in the field of plant biotechnology such as effective protocols of genetic manipulation, isolation of secondary metabolites, use of somaclonal variation, stress management in plants. It also explores the role of various physiological and biochemical factors affecting the genetic stability of in-vitro cultured plants. These themes are of interest to both graduate and postgraduate students. Further this book will be useful for to researchers, academicians and industrialist to review latest progress and future prospects of these technologies.

Plant Tissue Culture : Theory & Practicals 2nd Ed. T. Pullaiah 2017-03-01 Plant Tissue Culture, Second Edition is accompanied with new exercises demonstrating new arrays along with information on development of a customized protocol for protoplast isolation, suspension, haploid cultures, secondary metabolite production, and cryopreservation techniques. All experimental systems are written clear and easy-to-understand manner with the text being well-documented along with detailed drawings containing the plant tissue culture requirements for each particular application. Besides addressing recent advancements on wide variety of topics of Plant Tissue Culture, it gives the practical and technical knowledge required to train the next generation of plant scientists regardless of their ultimate specialization. It includes the complements of both theory and experiments. Plant Scientists, teachers and students will benefit greatly from this clearly presented tissue culture techniques that guides reader from lab setup to supplies, stock solution and media preparation, measurements, explant selection and disinfection, along with their experimental observations.

Practical Skills in Biomolecular Sciences Robert H. Reed 2007 Practical Skills in Biomolecular Science, is an indispensable book for undergraduate students in the life sciences. The book provides useful support at all stages of a degree course and underpins any practical course in biochemistry, biomedical science, genetics, immunology and microbiology. It is also a valuable resource for teachers of biology in colleges and secondary schools. Laboratory and field studies are essential components of undergraduate training in biomolecular science. Practical work must be fully understood and effectively presented, but many students underperform because they lack basic laboratory skills. This book, now in its third edition, continues to provide students with easy-to-use guidance for laboratory and field studies, but in addition it now covers broader transferable skills. As a result the new edition provides guidance and support over the entire range of a typical undergraduate course in biochemistry and biomedical science.

Biotechnology of Fruit and Nut Crops, 2nd Edition Richard E. Litz 2020-01-29 This book covers the biotechnology of all the major fruit and nut species. Since the very successful first edition of this book in 2004, there has been rapid progress for many fruit and nut species in cell culture, genomics and genetic transformation, especially for citrus and papaya. This book covers both these cutting-edge technologies and regeneration pathways, protoplast culture, in vitro mutagenesis, ploidy manipulation techniques that have been applied to a wider range of species. Three crop species, *Diospyros kaki* (persimmon), *Punica granatum* (pomegranate) and *Eriobotrya japonica* (loquat) are included for the first time. The chapters are organized by plant family to make it easier to make comparisons and exploitation of work with related species. Each chapter discusses the plant family and the related wild species for 38 crop species, and has colour illustrations. It is essential for scientists and post graduate students who are engaged in the improvement of fruit, nut and plantation crops.

Plant Cell Culture Director Plant Biology Division Richard A Dixon 1994 Plant cell culture techniques are increasingly used in basic research and for plant exploitation in industry (genetic engineering, micropropagation). This monograph describes the biotechnological techniques used in laboratories for isolating and manipulat

Plant Tissue Culture Sunghun Park 2021-02-17 Plant Tissue Culture: Techniques and Experiments, Fourth Edition, builds on the classroom tested, audience proven manual that has guided users through successful plant culturing for almost 30 years. The book's experiments demonstrate major concepts and can be conducted with a variety of plant materials readily available throughout the year. This fully updated edition describes the principles of the newest technologies, including CRISPR/Cas9 gene editing and RNAi technology with plant cell and tissue cultures and their applications. Bridging the gap between theory and practice, this book contains detailed methodology supported by comprehensive illustrations, giving users a diverse learning experience for both university students and plant scientists. Provides fundamental principles, methods and techniques in plant cell, tissue and organ culture that can be applied to all crop plants, including agronomic crops, horticulture and forestry crops for germplasm improvement Guides readers from lab setup to supplies, stock solution and media preparation, explant selection and disinfection, and experimental observations and measurement Contains the latest advances and updates since the previous edition published in 2012

Plant Reproduction T. Pullaiah 2008-08-01 The present book is revised edition of our earlier book Embryology of Angiosperms and we retitled it as Plant Reproduction as per UGC syllabus. In accordance with the title we introduced a chapter on Floral characters, pollination mechanisms and vectors by Prof. A. Janaki Bai, Dept. of Botany, Andhra University, Visakhapatnam and revised several other chapters. This book brings together information on the widest range of topics in Plant Reproduction in a single source. Written in a concise manner, this book is ideally suitable to students and teachers of Colleges and Universities. This fully illustrated book discusses plant reproduction in sufficient depth. The text includes Development and structure of anther and male gametophyte, palynology, development and structure of female gametophyte, pollination, sexual incompatibility, development of endosperm and embryo, polyembryony and apomixis. The text also includes chapters on embryology in relation to taxonomy and experimental embryology.

An Introduction to Plant Tissue Culture M. K. Razdan 1993

Educational Infrastructure for Biotechnology in India R. K. Mishra 2006

Micropropagation P. Debergh 2012-12-06 Micropropagation is a technology that has developed within the past 30 years. Earlier overviews of plant tissue culture have reviewed micropropagation as just one of many tissue culture procedures in use. Since the applications of this technology have multiplied so rapidly in recent years, we decided that a specific overview of the technology was now appropriate. Our book begins with a review of the general principles of tissue culture as applied to micropropagation. This review is concise since the general topic has been covered in numerous other books and reviews. The basic principles of laboratory design and construction are summarized in the second chapter. Common problems encountered in micropropagation, both during and after culture, are examined in detail in four chapters. As micropropagation developed from a laboratory curiosity to a commercial industry, different considerations became important. These are discussed in two chapters. An attempt has been made to assess the current status of commercial production around the world. This has been difficult because commercial production figures are often closely guarded and little has been done to collect statistics on this growing industry. Applications to a broad range of crops are discussed in a series of chapters. These try to report the state of the art in each area, but since applications for some crops are much more advanced than for others, the focus of these chapters varies depending upon the progress that has been made.

Advances in Plant Breeding Strategies: Breeding, Biotechnology and Molecular Tools

Jameel M. Al-Khayri 2016-02-02 The basic concept of this book is to examine the use of innovative methods augmenting traditional plant breeding towards the development of new crop varieties under different environmental conditions to achieve sustainable food production. This book consists of two volumes: Volume 1 subtitled Breeding, Biotechnology and Molecular Tools and Volume 2 subtitled Agronomic, Abiotic and Biotic Stress Traits. This is Volume 1 which consists of 21 chapters covering domestication and germplasm utilization, conventional breeding techniques and the role of biotechnology. In addition to various biotechnological applications in plant breeding, it includes functional genomics, mutations and methods of detection, and molecular markers. In vitro techniques and their applications in plant breeding are discussed with an emphasis on embryo rescue, somatic cell hybridization and somaclonal variation. Other chapters cover haploid breeding, transgenics, cryogenics and bioinformatics.

Introduction to Plant Tissue Culture M. K. Razdan 2003 Introduction and techniques; Introductory history; Laboratory organisation; Media; Aseptic manipulation; Basic aspects; Cell culture; Cellular totipotency; Somatic embryogenesis; Applications to plant breeding; Haploid production; Triploid production; In vitro pollination and fertilization; Zygotic embryo culture; Somatic hybridisation and cybridisation; Genetic transformation; Somaclonal and gametoclonal variant selection; Application to horticulture and forestry; Production of disease-free plants; clonal propagation; General applications; Industrial applications: secondary metabolite production; Germplasm conservation.

Plant Propagation by Tissue Culture Edwin F. George 2007-10-24 For researchers and students, George's books have become the standard works on in vitro plant propagation. For this, the third edition of the classic work, authors with specialist knowledge have been brought on board to cover the hugely expanded number of topics in the subject area. Scientific knowledge has expanded rapidly since the second edition and it would now be a daunting task for a single author to cover all aspects adequately. However, this edition still maintains the integration that was characteristic of the previous editions. The first volume of the new edition highlights the scientific background of in vitro propagation. The second volume covers the practice of micropropagation and describes its various applications.

Clockwork orange Anthony Burgess 2012-06-05 In de nabije toekomst maken jongeren de straten onveilig. Een van de benedeleiders wordt opgepakt maar maakt ook in detentie amok. De overheid besluit tot een wetenschappelijk experiment: geweld moet hem wezensvreemd worden. Maar niet alles verloopt volgens plan. Dit legendarische boek gaat over de vrije wil, puberteit en genetische dispositie voor misdaad en geweld. Maar ook over wanhoop, sadisme en fascisme. En wraak. Veel grotere thema's zijn er niet. Met zijn nadsat, een sociaal dat de hoofdpersonen onderling spreken, schiep Burgess bovendien een straattaal van teenagers gone bad. Ultrageweld is van alle tijden. Lees en huiver. Vijftig jaar na publicatie van het origineel verschijnt eindelijk de Nederlandse vertaling die de roman verdient. Hun grote staat van dienst, hun virtuositeit, hun taalgevoel en hun inventiviteit

make Harm Damsma en Niek Miedema tot de ideale vertalers van A Clockwork Orange.

Introduction to Plant Tissue Culture Razdan M. K. 2006

Biotechnology and Plant Breeding Aluizio Borém 2014-01-21 Biotechnology and Plant Breeding includes critical discussions of the newest and most important applications of biotechnology in plant breeding, covering key topics such as biometry applied to molecular analysis of genetic diversity, genetically modified plants, and more. This work goes beyond recombinant DNA technology to bring together key information and references on new biotech tools for cultivar development, such as double-haploids, molecular markers, and genome-wide selection, among others. It is increasingly challenging for plant breeders and agricultural systems to supply enough food, feed, fiber and biofuel for the global population. As plant breeding evolves and becomes increasingly sophisticated, a staggering volume of genetic data is now generated. Biotechnology and Plant Breeding helps researchers and students become familiar with how the vast amounts of genetic data are generated, stored, analyzed and applied. This practical resource integrates information about plant breeding into the context of modern science, and assists with training for plant breeders including those scientists who have a good understanding of molecular biology/biotechnology and need to learn the art and practice of plant breeding. Plant biologists, breeding technicians, agronomists, seed technologists, students, and any researcher interested in biotechnologies applied to plant breeding will find this work an essential tool and reference for the field. Presents in-depth but easy-to-understand coverage of topics, so plant breeders can readily comprehend them and apply them to their breeding programs Includes chapters that address the already developed and optimized biotechnologies for cultivar development, with real-world application for users Features contributions by authors with several years of experience in their areas of expertise

Handbook of Molecular and Cellular Methods in Biology and Medicine, Third Edition

Leland J. Cseke 2011-12-12 Several milestones in biology have been achieved since the first publication of the Handbook of Molecular and Cellular Methods in Biology and Medicine. This is true particularly with respect to genome-level sequencing of higher eukaryotes, the invention of DNA microarray technology, advances in bioinformatics, and the development of RNAi technology. Now in its third edition, this volume provides researchers with an updated tool kit that incorporates conventional as well as modern approaches to tackle biological and medicinal research in the post-genomics era. Significantly revised to address these recent changes, the editors have evaluated, revised, and sometimes replaced protocols with more efficient, more reliable, or simpler ones. The book has also been reorganized with section headings focusing on different biological levels connected to one another, taking into account the central dogma of biology (DNA → RNA → protein → metabolites). The book first explores traditional approaches and then moves to the modern "omics" approaches, including genomics, proteomics, and metabolomics. It also discusses the manipulation of biological systems (including RNAi) and macromolecular analyses, focusing on the use of microscopy. In each chapter, various notes and cautionary considerations are presented for potentially hazardous reagents. Filled with diagrams, tables, and figures to clarify methods, most chapters also contain Troubleshooting Guides indicating problems, possible causes, and solutions that may be incurred in carrying out the procedures. Researchers and scientists who master the techniques in this book are putting themselves at the cutting edge of biological and medicinal research.

Ascorbate-Glutathione Pathway and Stress Tolerance in Plants Naser A. Anjum

2010-08-20 Plants are sessile organisms that live under a constant barrage of biotic and abiotic insults. Both biotic and abiotic stress factors have been shown to affect various aspects of plant system including the acceleration in the formation of reactive oxygen species (ROS). The ascorbate (AsA)-glutathione (GSH) pathway is a key part of the network of reactions involving enzymes and metabolites with redox properties for the detoxification of ROS, and thus to avert the ROS-accrued oxidative damage in plants. The present book mainly deals with the information gained through the cross-talks and inter-relationship studies on the physiological, biochemical and molecular aspects of the cumulative response of various components of AsA-GSH pathway to stress factors and their significance in plant stress tolerance.

Mulberry Maharaj Krishen Razdan 2021-07-26 Mulberry (*Morus* spp.) is an important horticultural plant in the sericulture industry. It belongs to the family Moraceae. The leaf of mulberry is used to feed the silkworm *Bombyx mori* L. It is also used as a fodder. Due to its economic and agricultural importance, mulberry is cultivated in many parts of the world. An estimated 60% of the total cost of silk cocoon production is for production and maintenance of mulberry plants. Therefore, much attention is needed to improve the quality and quantity of mulberry leaves. It is vital to increase the production of superior quality mulberry leaves with high nutritive value for the sericulture industry. Although a lot of research is going on in mulberry, very little effort has been made to compile the results of this research in a single book. This book provides an update of recent research works going on in this plant. It describes the taxonomy, conservation of germplasm, genetic diversity of various mulberry species, application of breeding techniques to improve the quality of mulberry, in vitro conservation, application of tissue culture techniques to improve mulberry species, production of haploids and triploids in mulberry and improvement of abiotic stress adaptive traits in mulberry with relevance to adaptiveness to global warming.

Plant Biotechnology Mahipal Singh Shekhawat 2019-06-11

In vitro Plant Biotechnology: Status and Scope, In vitro Plant Regeneration—An Overview, In vitro Culture Laboratory— Organization and Management, Sterilization Techniques, Plant Cell In vitro Nutrition: Culture Medium, Cell Differentiation and Totipotency, Micropropagation: A Source of Clonal Regeneration, Callus: Induction and Differentiation, Cell Suspension Culture, Single Cell Culture: Technology and Applications, Embryo Culture, Somatic Embryo: Induction and Regeneration, Haploid Production-I (Androgenesis), Haploid Production-II (In vitro Pollination Fertilization and Gynogenesis), Endosperm and Nucellus Culture, Protoplast Technology— Isolation and Regeneration of Protoplast, Protoplast Technology— Somatic Hybridization and Cybridization, Somaclonal Variation: Source and Significance, Biodiversity and Preservation of Germplasm, Artificial (synthetic) Seed Production Technology, Secondary Metabolite Production-I, Secondary Metabolite Production-II, Transgenic Production-I, Transgenic Production-II, Transgenic Production-III, G M Crops and their Impacts, Plastid Engineering, Plant In vitro Biotechnology in Agriculture, Plant In vitro Biotechnology in Forestry, Plant In vitro Biotechnology in Industry.