Introduction To Plant Tissue Culture By Mk Razdan

Plant Tissue Culture: Theory and TechniquesPlant Tissue Culture, Development, and BiotechnologyPlant Tissue Culture ManualPlant Tissue Culture ManualExperiments in Plant Tissue CulturePlant Tissue CulturePlant Tissue CulturePlant Tissue CulturePlant Propagation by Tissue CulturePlant Tissue CulturePlant Tissue Culture: An Introductory TextPlant Tissue and Cell CultureTissue Culture Techniques and Medicinal PlantsPlant Tissue CulturePlant Tissue Culture Concepts and Laboratory ExercisesPlant Tissue Culture & BiotechnologyPlant Cell CultureAutomation and environmental control in plant tissue culturePlant Tissue CultureAn Introduction to Plant Tissue Culture Shailesh Kumar Robert N. Trigiano K. Lindsey K. Lindsey John H. Dodds Timir Baran Jha B. N. Sathyanarayana Sant Saran Bhojwani Edwin F. George M.P. Singh Sant Saran Bhojwani Herbert Edward Street Azamal Husen Roberta H. Smith Robert N. Trigiano Pravin Chandra Trivedi Hamish A. Collin Jenny Aitken-Christie Margit Laimer
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biotechnology is an emerging field of science and as such the government of india is laying a large and exclusive impetus on it plant tissue culture is the basic and the most important aspect of biotechnology therefore plant tissue culture has been introduced as a compulsory course in the undergraduate and postgraduate syllabi of all the agricultural universities icar institutes and other plant science related educational organizations this book has been designed to benefit the students the research scholars and the scientists for developing a level of self confidence to conduct the experiments independently and can acquire the

practical skills along with the basic know how about the techniques being used each chapter is devoted to a separate aspect of plant tissue culture and the chapters are arranged in the order of increasing technical complexity the opening chapters present a brief historical survey of the field of plant tissue culture a background in sterilization techniques the text deals with the experimental details of each and every technique the protocols have been simplified legibly to include details and notes that we hope will help the user avoid unnecessary errors and confusion all the applications of plant tissue culture have been very well discussed and the techniques associated with them described in detail this being a comp lete book on plant tissue culture will solve all types of problem of the users who will not have to use other resource books for the same purpose

under the vast umbrella of plant sciences resides a plethora of highly specialized fields botanists agronomists horticulturists geneticists and physiologists each employ a different approach to the study of plants and each for a different end goal yet all will find themselves in the laboratory engaging in what can broadly be termed biotechnology addressing a wide variety of related topics plant tissue culture development and biotechnology gives the practical and technical knowledge needed to train the next generation of plant scientists regardless of their ultimate specialization with the detailed perspectives and hands on training signature to the authors previous bestselling books plant development and biotechnology and plant tissue culture concepts and laboratory exercises this book discusses relevant concepts supported by demonstrative laboratory experiments it provides critical thinking questions concept boxes highlighting important ideas and procedure boxes giving precise instruction for experiments including step by step procedures such as the proper microscope use with digital photography along with anticipated results and a list of materials needed to perform them integrating traditional plant sciences with recent advances in plant tissue culture development and biotechnology chapters address germplasm preservation plant growth regulators embryo rescue micropropagation of roses haploid cultures and transformation of meristems going beyond the scope of a simple laboratory manual this book also considers special topics such as copyrights patents legalities trade secrets and the business of biotechnology focusing on plant culture development and its applications in biotechnology across a myriad of plant science specialties this text uses a broad range of species and practical laboratory exercises to make it useful for anyone engaged in the plant sciences

this manual comprises a range of techniques for research workers in the fields of cell and molecular biology physiology plant breeding and propagation and genetic engineering

the second edition of experiments in plant tissue culture makes available new information that has resulted from recent advances in the applications of plant tissue culture techniques to agriculture and industry this comprehensive laboratory text takes the reader

through a graded series of experimental protocols and also provides an introductory review of each topic topics include a plant tissue culture laboratory aseptic techniques nutritional components of media callus induction organ formation xylem cell differentiation root cultures cell suspensions micropropagation embryogenesis isolation and fusion of protoplasts haploid cultures storage of plant genetic resources secondary metabolite production and quantification of procedures this volume offers all of the basic experimental methods for the major research areas of plant tissue culture and it will be invaluable to undergraduates and research investigators in the plant sciences

plant tissue culture in one form or another has become one of the most promising branches of plant science arising from the totipotency of plant cells it now occupies a key position in plant breeding plant propagation and plant biotechnology plant tissue culture basic and applied brings to the student accessible up to date information on this subject basic knowledge of tissue culture methods such as isolation of suitable tissues from the mother plant maintenance of the tissues under in vitro condition in an undifferentiated or de differentiated stage methods of genetic engineering and gene transfer chromosomal studies and the handling of in vitro micro plants are described in detail in this book similarly application aspects of micropropagation haploid cell culture protoplast culture embryo culture somatic embryogenesis and artificial seeds are also discussed

plant tissue culture forms an integral basis of the present day biotechnology plant tissue culture practices and new experimental protocols is being brought out to fill the existing gap in the available literature on plant tissue culture especially focusing on the aspects of practical procedures and protocols of tissue culture this book contains important experimental techniques and gives guidance on carrying out hands on experiences it has been designed in a simple way giving all the necessary procedures as a general guideline and also necessary tips to maneuver any problem encountered these tips are based on the first hand experiences of the author while teaching and researching the techniques of plant tissue culture a unique feature of this book is the inclusion of several techniques describing the actual protocols experimented and developed with different plant species by different scientists a substantial number of original colored plates including fluorescence photographs standout the book this pioneering work is valuable for the students who are looking for fresh outlook and search

the tremendous accumulation of information on plant tissue culture is making it extremely difficult for anyone to keep fully abreast with the literature even in his own specialised area therefore the authors have compiled a bibliography of plant tissue culture as a ready reference for those who are already working in this field and have also made the task easier for those who have become interested in plant tissue culture the idea of preparing the bibliography was conceived after completing the book plant tissue culture theory and

practice elsevier 1982 recognition of the various potential industrial applications of plant biotechnology has considerably enhanced the importance of plant tissue culture ptc as the latter holds a pivotal position in the realisation of the final goal of crop improvement via cell manipulation and multiplication it is also becoming increasingly popular in basic studies in plant sciences consequently there has been an explosion in the literature on ptc since 1970 a distinctive feature of the present compilation is that it covers all aspects of ptc of higher plants including gymnosperms

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

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

nature is the most potent source of cure and care with the advent of the herbal renaissance the dependence on medicinal plants has increased in all spheres ranging from their use as raw material for medicinal nutraceutical cosmetic preparations and food the tissue culture technique has proven to be extremely advantageous not only for large scale propagation of medicinal plants in a limited space and time but also for conservation storage for prolonged use genetic improvement and metabolite production this book describes in detail the different methods of plant tissue culture that have been employed for the mass production of medicinal plants the chapters on methods of organogenesis embryogenesis haploid plant production virus free medicinal plant production and so forth will be of interest to a wide range of readers dedicated chapters on the tissue culture of high altitude medicinal plants cannabis and so on are some of the book s highlights the book also discusses the implementation of advanced biotechnological interventions such as the production of phytochemicals cryopreservation nanotechnology and bioinformatics in medicinal plant studies with contributions from world leading specialists in plant tissue culture the knowledge presented in this book will aid in the translation of plant tissue culture techniques for the production and improvement of medicinal plants the information presented has the potential to be utilized for commercial production and formulations key features comprehensive guide for tissue culture systems as potential methods for the production of clones new varieties improved germplasms haploids and in vitro preservation of medicinal plants elaborates on standardization of in vitro systems for propagation and transplantation of important medicinal plants and enhanced secondary metabolite production enriches the understanding of advanced technologies like cryopreservation bioinformatics and nanotechnology in medicinal plants tissue culture

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 disinfestations and experimental observations and measurement provides the latest techniques and media information including a tumefaciens mediated transformation and infusion technology fully updated literature

alternating between topic discussions and hands on laboratory experiments that range from the in vitro flowering of roses to tissue culture of ferns plant tissue culture concepts and laboratory exercises second edition addresses the most current principles and methods in plant tissue culture research the editors use the expertise of some of the top researchers and educators in plant biotechnology to furnish students instructors and researchers with a broad consideration of the field divided into eight major parts the text covers everything from the history of plant tissue culture and basic methods to propagation techniques crop improvement procedures specialized applications and nutrition of callus cultures new topic discussions and laboratory exercises in the second edition include micropropagation of dieffenbachia micropropagation and in vitro flowering of rose propagation from nonmeristematic tissue organogenesis variation in culture and tissue culture of ferns it is the book s extensive laboratory exercises that provide a hands on approach in illustrating various topics of discussion featuring step by step procedures anticipated results and a list of materials needed what s more editors trigiano and gray go beyond mere basic principles of plant tissue culture by including chapters on genetic transformation techniques and photographic methods and statistical analysis of data in all plant tissue culture concepts and laboratory exercises second edition is a veritable harvest of information for the continued study and research in plant tissue culture science

biotechnological developments and genetic engineering are revolutionising agriculture and medical science the many applications of biotechnology include the production of new and improved foods industrial chemicals pharmaceuticals and livestock and offer hope for restoring the environment and protecting endangered species plant tissue culture and biotechnology contains 17 chapters on varied aspects of current interest and progress made in the field of biotechnology in the recent past a major section includes articles on plant tissue culture and application of biotechnology in agriculture medicine and environmental management the potential role of biotechnology in food and agriculture transgenic in oil seeds genetically modified plants for sustainable food security synthetic seed plant genetic engineering biotechnological achievement in sugarcane etc provide information on application of biotechnology in crop improvement the book also covers information on stem cell therapy nanotechnology and role of biotechnology in bioremediation other topics include survey of alkaloids steroids and flavonoids of in vivo and in vitro grown medicinal plants role of tissue culture in floriculture micropropagation of aloe barbadensis and datura metel plant propagation and bioreactors application in tissue

culture and regeneration studies in brassica species provide necessary information using tissue culture technique a comprehensive account of the role of plant based anti cancer drugs in the management of cancer and identification of orchid hybrids through isozyme analysis have added to the value of the book this book will be useful to biotechnologists biologists agriculture scientists researchers teachers and students of plant sciences

all the information necessary to set up and run a tissue culture facility is provided in this introductory book includes an overview of all the basic tissue culture techniques and describes in detail both the theoretical background and the practical a

automation and environmental control in plant tissue culture rigorously explores the new challenges faced by modern plant tissue culture researchers and producers worldwide issues of cost efficiency automation control and optimization of the in vitro microenvironment this book achieves a critical balance between the economic engineering and biological viewpoints and presents well balanced unique and clearly organized perspectives on current initiatives in the tissue culture arena each chapter offers guidelines leading towards an exhaustive unprecedented level of control over in vitro growth based on emerging technologies of robotics machine vision environmental sensors and regulation and systems analysis unlike other tissue culture books which focus on specific crops and techniques this book spans the broad range of major tissue culture production systems and advances evidence on how some underrated aspects of the process actually determine the status of the end product key researchers from industry and academia have joined to give up to date research evidence and analysis the collection comprises an essential reference for industrial scale tissue culture producers as well as any researcher interested in optimizing in vitro production

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