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Plant Physiology and Development - Lincoln (University of California Taiz, Santa Cruz) - 2018-03

Published by Sinauer Associates, an imprint of Oxford University Press. Throughout its twenty-two year history, the authors of Plant Physiology and Development have continually updated the book to incorporate the latest advances in plant biology and implement pedagogical improvements requested by adopters. This has made Plant Physiology and Development the most authoritative, comprehensive, and widely-used upper-division plant biology textbook.

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Plant Physiology - Lincoln Taiz - 1991

During the past decade the biological sciences have experienced a period of unprecedented progress, and nowhere is the excitement of this new era more apparent than in the field of plant physiology. Innovations such as the patch clamp are unlocking the mysteries of membrane transport. Recombinant DNA techniques are providing new tools for understanding how light and hormones regulate gene expression and development.

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Plant Physiology - Lincoln Taiz - 2002-01-01

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Introduction to Plant Physiology - William G. Hopkins - 2009

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Fundamentals of Plant Physiology - Lincoln Taiz - 2018

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Environmental Plant Physiology - Neil Willey - 2018-10-26

Environmental Plant Physiology focuses on the physiology of plant-environment interactions, revealing plants as the key terrestrial intersection of the biosphere, atmosphere, hydrosphere and geosphere. It provides a contemporary understanding of the topic by focusing on some of humankind's fundamental biological, agricultural and environmental challenges. Its chapters identify thirteen key environmental variables, grouping them into resources, stressors and pollutants, and leading the reader through how they challenge plants and how plants respond at molecular, physiological, whole plant and ecological levels. The importance of taking account of spatial and temporal dimensions of environmental change in order to understand plant function is emphasised. The book uses a mixture of ecological, environmental and agricultural examples throughout in order to provide a holistic view of the topic suitable for a contemporary student audience. Each chapter uses a novel stress response hierarchy to integrate plant responses across spatial and temporal scales in an easily digestible framework.

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Research Experiences in Plant Physiology - T.C. Moore - 2012-12-06

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Cells, tissues, and organs: the architecture of plants; The plant cell building blocks: lipids, proteins, and carbohydrates; Lipids are a class of molecules that includes fats, oils, sterols, and pigments; Proteins playa central role in the biochemistry of cells and are responsible for virtually all the properties of life as we know it; Carbohydrates are the most abundant class of biological molecules; Biological membranes; The membrane lipid forms a bilayer, a highly fluid but very stable structure; Membranes contain significantamounts of protein; Cellular organelles; Most mature plant cells contain a large, central vacuole; The nucleus is the information center of the cell; The endoplasmic reticulum and golgi apparatus are centers of membrane biosynthesis and secretory activities; The mitochondrion is the principal site of cellular respiration; Plastids are a family of organelles with a variety of functions; Microbodies are metabolically very active; Cytoskeleton the extracellular matrix; The primary cell wall is a flexible n etwork of cellulose microfibrils and cross-linking glycans; The cellulose-glycan lattice is embedded in a matrix of pectin and protein; Cellulose microfibrils are assembled at the plasma membrane as they are extruded into the cell wall; The secondary cell wall is deposited on the inside of the primary wall in maturing cells; Plasmadesmata are cytoplasmic channels extend through the wall to connect the protoplasts of adjacent cells; Tissues and organs; Tissues are groups of cells that form organized, functional unit; Meristems are regions of perpetually dividing cells; Parenchyma is the most abundant living tissue in plants; Supporting tissues are distributed throughout the primary and secondary plant bodies; Vascular tissues are the principal conducting tissues for water and nutrients ; Epidermis is a superficial tissue that f orms a continuous layer over the surface of the primary; Plant body; Plant organs; Roots anchor the plant and absorb water and minerais from the soil.

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Plant Physiology, Development and Metabolism - Satish C Bhatla - 2018-11-28

This book focuses on the fundamentals of plant physiology for undergraduate and graduate students. It consists of 34 chapters divided into five major units. Unit I discusses the unique mechanisms of water and ion transport, while Unit II describes the various metabolic events essential for plant development that result from plants’ ability to capture photons from sunlight, to convert inorganic forms of nutrition to organic forms and to synthesize high energy molecules, such as ATP. Light signal perception and transduction works in perfect coordination with a wide variety of plant growth regulators in regulating various plant developmental processes, and these aspects are explored in Unit III. Unit IV investigates plants’ various structural and biochemical adaptive mechanisms to enable them to survive under a wide variety of abiotic stress conditions (salt, temperature, flooding, drought), pathogen and herbivore attack (biotic interactions). Lastly, Unit V addresses the large number of secondary metabolites produced by plants that are medicinally important for mankind and their applications in biotechnology and agriculture. Each topic is supported by illustrations, tables and information boxes, and a glossary of important terms in plant physiology is provided at the end.

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Plant Macronutrient Use Efficiency - Mohammad Anwar Hossain - 2017-07-27

Plant Macronutrient Use Efficiency presents an up-to-date overview of the latest research on the molecular and genetic basis of macro-nutrient use efficiency (NUE) in plants, and strategies that can be used to improve NUE and nutrient-associated stress tolerance in crop plants. Plant NUE is a measure of how efficiently plants use available nutrients and an understanding of plant NUE has the potential to help improve the use of limited natural resources and to help achieve global food security. This book presents information important for the development of crop plants with improved macro-NUE, a prerequisite to reducing production costs, expanding crop production into noncompetitive marginal lands with low nutrient resources, and for helping to prevent environmental contamination. Plant Macronutrient Use

Efficiency provides a comprehensive overview of the complex mechanisms regulating macro-NUE in crop plants, which is required if plant breeders are to develop modern crop varieties that are more resilient to nutrient-associated stress. Identification of genes responsible for macro-NUE and nutrient-related stress tolerance in crop plants will help us to understand the molecular mechanisms associated with the responses of crop plants to nutrient stress. This volume contains both fundamental and advanced information, and critical commentaries useful for those in all fields of plant science research. Provides details of molecular and genetic aspects of NUE in crop plants and model plant systems Presents information on major macronutrients, nutrient sensing and signaling, and the molecular and genomic issues associated with primary and secondary macronutrients Delivers information on how molecular genetic information associated with NUE can be used to develop plant breeding programs Includes contributions from world-leading plant nutrition research groups

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Handbook of Plant and Crop Stress, Second Edition - Mohammad Pessarakli - 1999-05-19

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OMICS Applications in Crop Science - Debmalya Barh - 2013-12-16

Merging topical data from recently published review and research articles, as well as the knowledge and insight of industry experts, Omics Applications in Crop Science delves into plant science, and various technologies that use omics in agriculture. This book concentrates on crop breeding and environmental applications, and examines the applications of various omics technologies including genomics, transcriptomics, proteomics, metabolomics to important agronomic, horticultural, medicinal, plantation, fiber, forage, and bioenergy crops. It covers the application of omics technologies in several important crops, including cereal, and pulse. It explores the brassica species, drought tolerance in rice, and genetic engineering of the potato. The book discusses temperate fruits; and omics of medicinal plants, the metabolomics of Catharanthus roseus and how the medicinally important alkaloids of the plant are produced, as well as the omics of another important medicinal plant, Withania somnifera. It examines floriculture, the omics advances in tea, and omics strategies in improving the fiber qualities of cotton. It provides omics-related information on forest trees and forage crops, and offers a detailed account on how omics technologies are applicable in molecular farming, along with associated issues such as commercial aspects of molecular farming, clinical trials of plant-produced pharmaceuticals, regulatory issues and intellectual property rights. Written as a resource for plant biologists, plant breeders, agriculture scientists, researchers and college students studying various fields in agriculture, and the agri industries, OMICS Applications in Crop Science compiles the latest research in this essential field of modern crop and plant science utilizing various omics technologies and their applications in a number of important crops/plants from agronomy, pomology, olericulture, floriculture, medicinal plants, plantation and energy crops, agro-forestry, and more.

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Fundamental Of Plant Physiology - V. K. Jain - 2000-10

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Plant Genes, Genomes and Genetics - Erich Grotewold - 2015-06-02

Plant Genes, Genomes and Genetics provides a comprehensive treatment of all aspects of plant gene expression. Unique in explaining the subject from a plant perspective, it highlights the importance of key processes, many first discovered in plants, that impact how plants develop and interact with the environment. This text covers topics ranging from plant genome structure and the key control points in how genes are expressed, to the mechanisms by which proteins are generated and how their activities are controlled and altered by posttranslational modifications. Written by a highly respected team of specialists in plant biology with extensive experience in teaching at undergraduate and graduate level, this textbook will be invaluable for students and instructors alike. Plant Genes, Genomes and Genetics also includes: specific examples that highlight when and how plants operate differently from other organisms special sections that provide in-depth discussions of particular issues end-of-chapter problems to help students recapitulate the main concepts rich, full-colour illustrations and diagrams clearly showing important processes in plant gene expression a companion website with PowerPoint slides, downloadable figures, and answers to the questions posed in the book Aimed at upper level undergraduates and graduate students in plant biology, this text is equally suited for advanced agronomy and crop science students inclined to understand molecular aspects of organismal phenomena. It is also an invaluable starting point for professionals entering the field of plant biology.

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Advances in Photosynthesis - Mohammad Najafpour - 2012-02-15

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Plant Secondary Metabolites - Anita S. Patil - 2020-02-20

India is known for its Ayurvedic system of medicine significantly based on therapeutic plants. Medicinal plants are used since time immemorial due to its safety, efficacy, cultural acceptability and lesser side effects as compared to synthetic drugs. In this present book, a scientific approach has been extensively applied for isolation, purification and screening of biological potential based on bioassay-guided fractionation methods. More specifically, the traditional values of therapeutic plants are correlated with scientific approach for the validation of “drug- like properties”. This book is quite helpful for finding the hidden values of therapeutic approach of ethno-medicinal plants. This book is inclusively a soul combination of pharmacognosy, biotechnology, bioinformatics and nanotechnology which are the most thrusting subjects of today’s world. This book is a must-read for science students, research scholars and scientific community who are interested in plant science.

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Russian Journal of Plant Physiology - - 1994

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Combined Stresses in Plants - Ramamurthy Mahalingam - 2014-12-05

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Plant Growth Substances - Richard N. Arteca - 2013-03-09

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Photosynthesis III - L. Andrew Staehelin - 2013-12-11

The Encyclopedia of Plant Physiology series has turned several times to the topic of photosynthesis. In the original series, two volumes edited by A. PIRSON and published in 1960 provided a broad overview of the entire field. Although the New Series has devoted three volumes to the same topic, the overall breadth of the coverage has had to be restricted to allow for greater in-depth treatment of three major areas of modern photosynthesis research: I. Photosynthetic Elec tron Transport and Photophosphorylation (Volume 5 edited by A. TREBST and M. AvRON, and published in 1977); II. Photosynthetic Carbon Metabolism and Related Processes (Volume 6 edited by M. GIBBS and E. LATZKO, and published in 1979); and III. Photosynthetic Membranes and Light-Harvesting Systems (this volume). As we approached the organization of the current volume, we chose a set of topics for coverage that would complement the earlier volumes, as well as provide updates of areas that have seen major advances in recent years. In addition, we wanted to emphasize the following changes in the study of photo synthetic systems which have become increasingly important since 1977: the trend toward increased integration of biochemical and biophysical approaches to study photosynthetic membranes and light-harvesting systems, and a renewed appreciation of the structural parameters of membrane organization.

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Plant Propagation Concepts and Laboratory Exercises - Caula A. Beyl - 2016-01-06

Includes a DVD Containing All Figures and Supplemental Images in PowerPoint This new edition of Plant Propagation Concepts and Laboratory Exercises presents a robust view of modern plant propagation practices such as vegetable grafting and micropropagation. Along with foundation knowledge in anatomy and plant physiology, the book takes a look into the future and how cutting edge research may impact plant propagation practices. The book emphasizes the principles of plant propagation applied in both temperate and tropical environments. In addition to presenting the fundamentals, the book features protocols and practices that students can apply in both laboratory and field experiences. The book shows readers how to choose the best methods for plant propagation including proper media and containers as well as performing techniques such as budding, cutting, layering, grafting, and cloning. It also discusses how to recognize and cope with various propagation challenges. Also included are concept chapters highlighting key information, laboratory exercises, anticipated laboratory results, stimulating questions, and a DVD containing all the figures in the book as well as some supplemental images.

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Advances In Plant Physiology Vol. 14 - Hemantaranjan, A. - 2013-10-01

In view of changes in the global environment, it is important to determine and developing technologies to ameliorate metabolic limitations by biological processes most sensitive to abiotic stress factors warning crop productivity. It is reaffirmed that publishing the important Treatise Series has been undertaken with a view to identify the inadequacies under varied environments and to scientifically extend precise and meaningful research so that the significant outcomes including new technologies are judiciously applied for requisite productivity, profitability and sustainability of agriculture. Besides this, meticulous research in some of the very sensible and stirring areas of Plant Physiology-Plant Molecular Physiology are indispensably needed for holistic development of agriculture and crop production in different agro-climatic zones. Ardently, this is also to focus upon excellent new ideas ensuring the best science done across the full extent of modern plant biology, in general, and plant physiology, in particular. In Volume 14, with inventive applied research, attempts have been made to bring together much needed eighteen remarkable review articles distributed in three appropriate major sections of Nutriophysiology and Crop Productivity, Plant Responses to Changing Environment and Environmental Stresses and Technological Innovations in Agriculture written by thirty four praiseworthy contributors of eminence in unequivocal fields mainly from premier

institutions of India and abroad. In reality, the Volume 14 of the Treatise Series is wealth for interdisciplinary exchange of information particularly in the field of nutriophysiology and abiotic stresses for planning meaningful research and related education programmes in these thrust areas. Apart from fulfilling the heightened need of this kind of select edition in different volumes for research teams and scientists engaged in various facets of research in Plant Physiology/Plant Sciences in traditional and agricultural universities, institutes and research laboratories throughout the world, it would be tremendously a productive reference book for acquiring advanced knowledge by post-graduate and Ph.D. scholars in response to the innovative courses in Plant Physiology, Plant Biochemistry, Plant Molecular Biology, Plant Biotechnology, Environ-mental Sciences, Plant Pathology, Microbiology, Soil Science & Agricultural Chemistry, Agronomy, Horticulture, and Botany.

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The Molecular Life of Plants - Russell L. Jones - 2012-08-31

A stunning landmark co-publication 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, 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 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 the subject across a variety of disciplines including plant science, biological science, horticulture and agriculture.

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Phenotyping; From Plant, to Data, to Impact and Highlights of the The International Plant Phenotyping Symposium - IPPS 2018 - Trevor Garnett - 2021-01-19

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Gemmotherapy, and the Scientific Foundations of a Modern Meristemotherapy - Marcello Nicoletti - 2020-08-27

This book reports on the current state of meristemotherapy (also called gemmotherapy or budtherapy) and its possible future directions. Meristemotherapy focuses on the growth of plants, and is based on analytical studies, pre-clinic research, clinical trials and activity tests. The book investigates the determination of preparation methods, collateral effects, posology, and administration methods.

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Therapeutic Use of Medicinal Plants and their Extracts: Volume 2 - A.N.M. Alamgir - 2018-06-23

This book starts with a general introduction to phytochemistry, followed by chapters on plant constituents, their origins and chemistry, but also discussing animal-, microorganism- and mineral-based drugs. Further chapters cover vitamins, food additives and excipients as well as xenobiotics and poisons. The book also explores the herbal approach to disease management and molecular pharmacognosy and introduces methods of qualitative and quantitative analysis of plant constituents. Phytochemicals are classified as primary (e.g. carbohydrates, lipids, amino acid derivations, etc.) or secondary (e.g. alkaloids, terpenes and terpenoids, phenolic compounds, glycosides, etc.) metabolites according to their metabolic route of origin, chemical structure and function. A wide variety of primary and secondary phytochemicals are present in medicinal plants, some of which are active phytomedicines and some of which are pharmaceutical excipients.

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Environmental Perception in Relation to Plant Physiology - Dr. Kavita Sharma - 2018-10-01

This Book deals with all the major aspects of Environmental Perception. It traces the historical perspective and scope of Environmental Perception and provides the reader with the methodological and theoretical perspective of the field. Also, it discusses the applications of environmental psychology to community problems. Further, this book also explains the effect of environment on plant physiology. As the volume is designed as a reference book, it will be useful for students and researchers.

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Encyclopedia of Ecology - - 2014-11-03

The groundbreaking Encyclopedia of Ecology provides an authoritative and comprehensive coverage of the complete field of ecology, from general to applied. It includes over 500 detailed entries, structured to provide the user with complete coverage of the core knowledge, accessed as intuitively as possible, and heavily cross-referenced. Written by an international team of leading experts, this revolutionary encyclopedia will serve as a one-stop-shop to concise, stand-alone articles to be used as a point of entry for undergraduate students, or as a tool for active researchers looking for the latest information in the field. Entries cover a range of topics, including: Behavioral Ecology Ecological Processes Ecological Modeling Ecological Engineering Ecological Indicators Ecological Informatics Ecosystems Ecotoxicology Evolutionary Ecology General Ecology Global Ecology Human Ecology System Ecology The first reference work to cover all aspects of ecology, from basic to applied Over 500 concise, stand-alone articles are written by prominent leaders in the field Article text is supported by full-color photos, drawings, tables, and other visual material Fully indexed and cross referenced with detailed references for further study Writing level is suited to both the expert and non-expert Available electronically on ScienceDirect shortly upon publication

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Plant Nanotechnology - Chittaranjan Kole - 2016-10-13

This book highlights the implications of nanotechnology in plant sciences, particularly its potential to improve food and agricultural systems, through innovative, eco-friendly approaches, and as a result to increase plant productivity. Topics include various aspects of nanomaterials: biophysical and biochemical properties; methods of treatment, detection and quantification; methods of quantifying the uptake of nanomaterials and their translocation and accumulation in plants. In addition, the effects on plant growth and development, the role of nanoparticles in changes in gene and protein expression, and delivery of genetic materials for genetic improvement are discussed. It also explores how nanotechnology can improve plant protection and plant nutrition, and addresses concerns about using nanoparticles and their compliances. This book provides a comprehensive overview of the application potential of nanoparticles in plant science and serves as a valuable resource for students, teachers, researchers and professionals working on nanotechnology.

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Hydroponics - Toshiki Asao - 2012-03-23

Hydroponics-A standard methodology for plant biological researches provides useful information on the requirements and techniques needs to be considered in order to grow crops successfully in hydroponics. The main focuses of this book are preparation of hydroponic nutrient solution, use of this technique for studying biological aspects and environmental controls, and production of vegetables and ornamentals hydroponically. The first chapter of this book takes a general description of nutrient solution used for hydroponics followed by an outline of in vitro hydroponic culture system for vegetables. Detailed descriptions on use of hydroponics in the context of scientific research into plants responses and tolerance to abiotic stresses and on the problems associated with the reuse of culture solution and means to overcome it are included. Some chapters provides information on the role of hydroponic technique in studying plant-microbe-environment interaction and in various aspects of plant biological research, and also understanding of root uptake of nutrients and thereof role of hydroponics in environmental clean-up of toxic and polluting agents. The last two chapters outlined the hydroponic production of cactus and fruit tree seedlings. Leading research works from around the world are brought together in this book to produce a valuable source of reference for teachers, researcher, and advanced students of biological science and crop production.

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Comprehensive Biotechnology - - 2019-07-17

Comprehensive Biotechnology, Third Edition unifies, in a single source, a huge amount of information in this growing field. The book covers scientific fundamentals, along with engineering considerations and applications in industry, agriculture, medicine, the environment and socio-economics, including the related government regulatory overviews. This new edition builds on the solid basis provided by previous editions, incorporating all recent advances in the field since the second edition was published in 2011. Offers researchers a one-stop shop for information on the subject of biotechnology Provides in-depth treatment of relevant topics from recognized authorities, including the contributions of a Nobel laureate Presents the perspective of researchers in different fields, such as biochemistry, agriculture, engineering, biomedicine and environmental science

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Plant Solute Transport - Anthony R. Yeo - 2008-04-15

This book provides a broad overview of solute transport in plants. It first determines what solutes are present in plants and what roles they play. The physical bases of ion and water movement are considered. The volume then discusses the ways in which solutes are moved across individual membranes, within and between cells, and around the plant. Having dealt with the role of plant solutes in ‘normal’ conditions, the volume proceeds to examine how the use of solutes has been adapted to more

extreme environments such as hot, dry deserts, freezing mountains and saline marshes. A crucial stage in the life cycle of most plants, the internally-controlled dehydration concomitant with seed formation, is also addressed. Throughout the volume the authors link our increasing understanding of the cellular and molecular bases of solute movement with the roles that these fulfil in the whole plant under both ideal and stressful conditions, showing how these are dictated by the physical laws that govern solute and water movement. The book is directed at postgraduates, researchers and professionals in plant physiology, biochemistry and molecular biology.

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Oxidative Damage to Plants - Parvaiz Ahmad - 2014-01-29

With contributions that review research on this topic throughout the world, Oxidative Damage to Plants covers key areas of discovery, from the generation of reactive oxygen species (ROsS), their mechanisms, quenching of these ROsS through enzymatic and non-enzymatic antioxidants, and detailed aspects of such antioxidants as SOD and CAT. Environmental stress is responsible for the generation of oxidative stress, which causes oxidative damage to biomolecules and hence reduces crop yield. To cope up with these problems, scientists have to fully understand the generation of reactive oxygen species, its impact on plants and how plants will be able to withstand these stresses. Provides invaluable information about the role of antioxidants in alleviating oxidative stress Examines both the negative effects (senescence, impaired photosynthesis and necrosis) and positive effects (crucial role that superoxide plays against invading microbes) of ROS on plants Features contributors from a variety of regions globally

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Improvement of Quality in Fruits and Vegetables Through Hydroponic Nutrient Management - Md Asaduzzaman - 2019-04-23

The book Potassium - Improvement of Quality in Fruits and Vegetables Through Hydroponic Nutrient Management provides useful information regarding potassium nutrition management in hydroponic cultivation, which will help in producing quality horticultural crops. The first few chapters describe the role of potassium nutrition in plants, its interaction with other nutrients, its source fertilizers, the role in postharvest produce qualities, and human nutrition. Potassium fertilizer management, its metabolism in plants, and cultivation techniques of fruits and leafy vegetables are also included in the middle section. The final chapter illustrates the software development for the calculation of hydroponic nutrients including potassium for easy management of cultural solution. As a whole, this book covers several major aspects on the topic for making it a complete and useful resource.

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Seed Development and Germination - Jaime Kigel - 2017-11-01

This text is intended for plant physiologists, molecular biologists, biochemists, biotechnologists, geneticists, horticulturalists, agromnomists and botanists, and upper-level undergraduate and graduate students in these disciplines. It integrates advances in the diverse and rapidly-expanding field of seed science, from ecological and demographic aspects of seed production, dispersal and germination, to the molecular biology of seed development. The book offers a broad, multidisciplinary approach that covers both theoretical and applied knowledge.

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