

Biology Of Plants P H Raven R F Evert S E Eichhorn

Plant volatiles—compounds emitted from plant organs to interact with the surrounding environment—play essential roles in attracting pollinators and defending against herbivores and pathogenes, plant-plant signaling, and abiotic stress responses. Biology of Plant Volatiles, with contributions from leading international groups of distinguished scientists in the field, explores the major aspects of plant scent biology. Responding to new developments in the detection of the complex compound structures of volatiles, this book details the composition and biosynthesis of plant volatiles and their mode of emission. It explains the function and significance of volatiles for plants as well as insects and microbes whose interactions with plants are affected by these compounds. The content also explores the biotechnological and commercial potential for the manipulation of plant volatiles. Features: Combines widely scattered literature in a single volume for the first time, covering all important aspects of plant volatiles, from their chemical structures to their biosynthesis to their roles in the interactions of plants with their biotic and abiotic environment Takes an interdisciplinary approach, providing multilevel analysis from chemistry and genes to enzymology, cell biology, organismal biology and ecology Includes up-to-date methodologies in plant scent biology research, from molecular biology and enzymology to functional genomics This book will be a touchstone for future research on the many applications of plant volatiles and is aimed at plant biologists, entomologists, evolutionary biologists and researchers in the horticulture and perfume industries.

Priming-Mediated Stress and Cross-Stress Tolerance in Crop Plants provides the latest, in-depth understanding of the molecular mechanisms associated with the development of stress and cross-stress tolerance in plants. Plants growing under field conditions are constantly exposed, either sequentially or simultaneously, to many abiotic or biotic stress factors. As a result, many plants have developed unique strategies to respond to ever-changing environmental conditions, enabling them to monitor their surroundings and adjust their metabolic systems to maintain homeostasis. Recently, priming mediated stress and cross-stress tolerance (i.e., greater tolerance to a second, stronger stress after exposure to a different, milder primary stress) have attracted considerable interest within the scientific community as potential means of stress management and for producing stress-resistant crops to aid global food security. Priming-Mediated Stress and Cross-Stress Tolerance in Crop Plants comprehensively reviews the physiological, biochemical, and molecular basis of cross-tolerance phenomena, allowing researchers to develop strategies to enhance crop productivity under stressful conditions and to utilize natural resources more efficiently. The book is a valuable asset for plant and agricultural scientists in corporate or government environments, as well as educators and advanced students looking to promote future research into plant stress tolerance. Provides comprehensive information for developing multiple stress-tolerant crop varieties Includes in-depth physiological, biochemical, and molecular information associated with cross-tolerance Includes contribution from world-leading cross-tolerance research group Presents color images and diagrams for effective communication of key concepts

The conception of Volume 17 of the International Treatise Series on Advances in Plant Physiology has been made possible entirely due to worthy contributions from World Scientists, teachers and researchers of eminence in unequivocal fields. Scientists are well in search of specific and complete literature pertaining to meaningful research for the holistic development of agriculture. The undertaking of this Treatise Series on Plant Physiology is to genuinely categorize the insufficiencies in view of mounting consecutive researches for increasing productivity, prosperity and sustainability of agriculture through influential and developing technologies for restructuring metabolic limitations most responsive to abiotic stress factors. Certainly, our idea is to recognize innovative science of value across the broad disciplinary range of the treatise. The aim is to make stronger the distinctive outcome of conscientious research in some of the very sensitive areas of Plant Physiology-Plant Molecular Physiology/ Molecular Biology that broadly highlights the recent developments and mechanisms underlying plant resilience to changing environments. This volume brings collectively much needed twenty-one review articles by fifty-one dedicated contributors for this volume assorted into five relevant sections, viz., Section I: Abiotic Stresses & Plant Productivity: Physiological & Molecular Perspectives; Section II:Plant Trace Elements in Plant Physiology; Section III: Plant Functions Research in Agricultural Progression; Section IV: Physiological Basis of Yield; Section V: Nutraceuticals, Medicinal & Aromatic Plant Wealth. This is commendable that the Volume 17 deals with challenges of ongoing international concern over the abiotic stresses under changing climate besides vital aspects related to image-based plant phenotyping; phenomics and its application in physiological breeding; trace elements; plant functions; physiological basis of yield variation; medicinal and aromatic plants and so on. Apart from fulfilling the acute need of this kind of select edition in different volumes for research teams and scientists engaged in various facets of plant sciences research in traditional and agricultural universities, institutes and research laboratories throughout the world, it would be extremely a constructive book and a voluminous reference material 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, Environmental Sciences, Plant Pathology,

Microbiology, Soil Science & Agricultural Chemistry, Agronomy, Horticulture, and Botany. 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

Genetically Encoded PH Sensors and Their Applications in Plants and Fungi

Biology

Proceedings of the 10th International Symposium on Aquatic Weeds, European Weed Research Society

Handbook of Plant Growth pH as the Master Variable

Achiever’s Biology

The history of channel catfish farming in the United States serves as a model for the development of pond-based aquaculture industries worldwide. Channel catfish farming is the largest and economically most important aquaculture industry in the United States. In 2003, over 300,000 metric tons (662 million pounds) of channel catfish were processed, representing about half the total United States aquaculture production. Demand for farm-raised catfish is strong, with record processing years in 2002 and 2003. In 22 chapters written by active scientists in the field, Biology and Culture of Channel Catfish comprehensively synthesizes over 30 years of research on this American icon. Throughout the book, fundamental biological aspects of channel catfish are linked to practical culture techniques. Topics include: • Latest information on reproductive physiology, genetics, and breeding • Comprehensive treatment of catfish nutrition, feeds, and feeding practices • Water quality management and pond dynamics • In-depth review of immunology in channel catfish • Practical information on diseases and health management • Techniques for commercial culture, including innovative techniques such as raceways, recirculating systems, and partitioned aquaculture systems • Catfish economics and marketing • Exploration of environmental concerns, including recommended Best Management Practices

The maintenance of a stable acid-base status within biological tissue is a fundamental homeostatic process in all organisms, necessary to preserve the metabolic function of proteins and other macromolecules. The study of acid-base regulation has advanced enormously over recent decades due to the development of increasingly accurate and sensitive techniques for measuring acid-base variables. This volume brings together contributions from leading comparative physiologists working on factors affecting the acid-base status of the internal fluids of animals and plants. The result is a broad-ranging, authoritative and accessible review of this area, together with a critical look at techniques and tools.

The seventh edition of this book includes chapter overviews, checkpoints, detailed summaries, summary tables, a list of key terms and end-of-chapter questions. There is also a new chapter on recombinant DNA technology, plant biotechnology, and genomics.

For the past decade, it has been apparent to both of us that a reference text covering all aspects of tree defense mechanisms to fungi was missing, needed and long overdue. Such a book would provide a clear, comprehensive overview of how living roots, stems and leaves respond to fungal pathogens. The need for such a book became increasingly clear to us from our conversations with each other, as well as from our interactions with students and colleagues who desired a sourcebook containing reviews of morphological, biochemical and physiological aspects of host-parasite interactions in trees. During a field trip sponsored by the Forest Pathology Committee of the Ameri can Phytopathological Society, on a bus from one site to another, we decided to take the responsibility to prepare a book of this type and began to plan its composition. To adequately address the topic of this book as we had envisioned it, we believed that well-illustrated chapters were needed in order to reflect the important advances made by the many investigators who have examined the anatomical and physiological changes that occur when trees are attacked by fungi. We are grateful to Dr. Tore Timell, the Wood Science editor for Springer-Verlag, for supporting our efforts and for providing an avenue to publish such a profusely il lustrated volume.

Plants, Genes, and Crop Biotechnology

Plant Responses to Environmental Stresses

News - what the Plants Told Us : Mendel University of Agriculture and Forestry Brno, Czech Republic, 30th June - 1st July 2009 : Book of Abstracts

A Functional Biology of Crop Plants

An Ancient Molecule with Emerging Roles

As new information is introduced and environmental changes occur, Plant Biology continues to develop and evolve as a science. Updated and revised to keep pace with these developments, the Fifth Edition of Botany: An Introduction to Plant Biology provides a modern and comprehensive overview of the fundamentals of botany while retaining the important focus of natural selection, analysis of botanical phenomena, and diversity. Students are first introduced to topics that should be most familiar (plant structure), proceed to those less familiar (plant physiology and development), and conclude with topics that are likely least familiar to the introductory student (genetics, evolution, and ecology). Mauseath is sure to provide the latest material on molecular biology and plant biotechnology in an effort to keep pace with these advancing areas of study. All sections are written to be self-contained allowing for a flexible presentation of course material. Key Features: - Includes new content on molecular biology, plant biotechnology, and the most recent coverage of taxonomy and phylogeny of plants. - Now available with a new electronic laboratory manual. - Plants Do Things Differently boxes help students understand and compare plant biology with human biology. - End-of-chapter study guide includes nearly 50 or more questions in each chapter, urging students to test themselves on the most important points in the chapter. - Alternatives boxes encourage students to think expansively about alternative aspects of plant biology that are more advantageous in certain conditions.

While many books are available on biological control, this is the only book to detail the application of molecular biology to control of pests and diseases. Each chapter deals with a different pathogen and the application of new molecular biological techniques to the biocontrol of the pathogen. This new reference presents the most comprehensive list of organisms available. Internationally respected experts discuss viruses, bacteria, fungi, nematodes, protozoa, weeds, and insects. Types of control methods are described, and techniques commonly used in molecular biology to identify the etiological agents, diagnose diseases, and develop control methods are reviewed.

Emphasizing the unpredictable nature of plant behaviour under stress and in relation to complex interactions of biological pathways, this work covers the versatility of plants in adapting to environmental change. It analyzes environmentally triggered adaptations in developmental programmes of plants that lead to permanent, heritable DNA modifications.

Plant bugs--Miridae, the largest family of the Heteroptera, or true bugs--are globally important pests of crops such as alfalfa, apple, cocoa, cotton, sorghum, and tea. Some also are predators of crop pests and have been used successfully in biological control. Certain omnivorous plant bugs have been considered both harmful pests and beneficial natural enemies of pests on the same crop, depending on environmental conditions or the perspective of an observer.As high-yielding varieties that lack pest resistance are planted, mirids are likely to become even more important crop pests. They also threaten crops as insecticide resistance in the family increases, and as the spread of transgenic crops alters their populations. Predatory mirids are increasingly used as biocontrol agents, especially of greenhouse pests such as thrips and whiteflies. Mirids provide abundant opportunities for research on food webs, intraguild predation, and competition.Recent worldwide activity in mirid systematics and biology testifies to increasing interest in plant bugs. The first thorough review and synthesis of biological studies of mirids in more than 60 years, Biology of the Plant Bugs will serve as the basic reference for anyone studying these insects as pests, beneficial IPM predators, or as models for ecological research.

Proceedings of the Fifth International Workshop on Seeds, Reading, 1995

DNA Fingerprinting in Plants and Fungi

Basic and Applied Aspects of Seed Biology

New Scientist

Botany

The study of plant cell physiology is currently experiencing a profound transformation. Novel techniques allow dynamic in vivo imaging with subcellular resolution, covering a rapidly growing range of plant cell physiology. Several basic biological questions that have been inaccessible by the traditional combination of biochemical, physiological and cell biological approaches now see major progress. Instead of grinding up tissues, destroying their organisation, or describing cell- and tissue structure, without a measure for its function, novel imaging approaches can provide the critical link between localisation, function and dynamics. Thanks to a fast growing collection of available fluorescent protein variants and sensors, along with innovative new microscopy technologies and quantitative analysis tools, a wide range of plant biology can now be studied in vivo, including cell morphology & migration, protein localization, topology & movement, protein-protein interaction, organelle dynamics, as well as ion, ROS & redox dynamics. Within the cell, genetic targeting of fluorescent protein probes to different organelles and subcellular locations has started to reveal the stringently compartmentalized nature of cell physiology and its sophisticated spatiotemporal regulation in response to environmental stimuli. Most importantly, such cellular processes can be monitored in their natural 3D context, even in complex tissues and organs – a condition not easily met in studies on mammalian cells. Recent new insights into plant cell physiology by functional imaging have been largely driven by technological developments, such as the design of novel sensors, innovative microscopy & imaging techniques and the quantitative analysis of complex image data. Rapid further advances are expected which will require close interdisciplinary interaction of plant biologists with chemists, physicists, mathematicians and computer scientists. High-throughput approaches will become increasingly important, to fill genomic data with ‘life’ on the scale of cell physiology. If the vast body of information generated in the -omics era is to generate actual mechanistic understanding of how the live plant cell works, functional imaging has enormous potential to adopt the role of a versatile standard tool across plant biology and crop breeding. We welcome original research papers, methodological papers, reviews and mini reviews, with particular attention to contributions in which novel imaging techniques enhance our understanding of plant cell physiology and permits to answer questions that cannot be easily addressed with other techniques.

New Scientist magazine was launched in 1956 "for all those men and women who are interested in scientific discovery, and in its industrial, commercial and social consequences". The brand's mission is no different today - for its consumers, New Scientist reports, explores and interprets the results of human endeavour set in the context of society and culture.

Plant Micronutrient Use Efficiency: Molecular and Genomic Perspectives in Crop Plants presents information on the complex mechanisms regulating micronutrient use efficiency in plants. Understanding this science is essential for the development of new varieties of crop plants that are more resilient to micronutrient stress, as well as plants with increased bioavailable concentrations of essential micronutrients. This book explores the discovery of novel genes and key metabolic pathways associated with micronutrient use efficiency in plants, gives an analyses of the gene expression patterns in plants in response to low and/or high nutrient levels, and investigates the potential functions of these genes and their products. Strategies to enhance micronutrient use efficiency and stress tolerance, to develop bio-fortified crop, and to improve the sustainable utilization of natural resources are critically evaluated. The book contains both fundamental and advanced information as well as critical commentaries that are useful for those involved in the various fields that make up the plant sciences. Presents in-depth information on mineral nutrition, including coverage of all the major micronutrients Explores the molecular and genetic aspects of micronutrient use efficiency in crop plants Provides information and critical discussion of the latest developments in the micronutrient biofortification of crop plants with an aim to prevent micronutrient deficiencies in humans Includes contributions from experts in plant micronutrient use efficiency and crop biofortification

Plants provide a source of survival for all life on this planet. They are able to capture solar energy and convert it into food, feed, wood and medicines. Though sessile in nature, over many millions of years, plants have diversified and evolved from lower to higher life forms, spreading from sea level to mountains, and adapting to different ecozones. They have learnt to cope with challenging environmental conditions and various abiotic and biotic factors. Plants have also developed systems for monitoring the changing environment and efficiently utilizing resources for growth, flowering and reproduction, as well as mechanisms to counter the impact of pests and diseases and to communicate with other biological systems, like microbes and insects. This book discusses the “awareness” of plants and their ability to gather information through the perception of environmental cues, such as light, gravity, water, nutrients, touch and sound, and stresses. It also explores plants’ biochemical and molecular “computing” of the information to adjust their physiology and development to the advantage of the species. Further, it examines how plants communicate between their different organs and with other organisms, as well as the concepts of plant cognition, experience and memory, from both scientific and philosophical perspectives. Lastly, it addresses the phenomenon of death in plants. The epilogue presents an artist’s view of the beauty of the natural world, especially plant “architecture”. The book provides historical perspectives, comparisons with animal systems where needed, and general biochemical and molecular concepts and themes. Each chapter is selfcontained, but also includes cross talk with other chapters to offer an integrated view of plant life and allow readers to appreciate and admire the functioning of plant life from within and without. The book is a tribute by the Editor to his students, colleagues and co-workers and to those in whose labs he has worked.

A Reappraisal of Current Techniques

Plants 1e

Priming-Mediated Stress and Cross-Stress Tolerance in Crop Plants

Peterson's Guide to Graduate Programs in the Biological and Agricultural Sciences

Biology of PlantsMacmillan

Nitric Oxide in Plant Biology: An Ancient Molecule with Emerging Roles is an extensive volume which provides a broad and detailed overview of Nitric Oxide (NO) in plant biology. The book covers the entirety of the crucial role NO plays in the plant lifecycle, from the regulation of seed germination and growth to synthesis, nitrogen fixation and stress response. Beginning with NO production and NO homeostasis, Nitric Oxide in Plant Biology goes on to cover a variety of NO roles, with a focus on NO signalling, crosstalk and stress responses. Edited by leading experts in the field and featuring the latest research from laboratories from across the globe, it is a comprehensive resource of interest to students and researchers working in plant physiology, agriculture, biotechnology, and the pharmaceutical and food industries. Provides a broad and detailed overview on NO in plant biology, including NO production, NO signaling, NO homeostasis, crosstalk and stress responses Edited by leading experts in the field Features the latest research from laboratories from across the globe

This edition of Plant Biology will introduce you to the science of plants with current, real-world examples of plant biodiversity and ecology- beginning with the familiar world of flowering plants and progressing into issues of biodiversity, evolution, and ecology.--[book cover].

Since the publication of the best-selling Handbook of Molecular and Cellular Methods in Biology and Medicine, the field of biology has experienced several milestones. Genome sequencing of higher eukaryotes has progressed at an unprecedented speed. Starting with baker's yeast (Saccharomyces cerevisiae), organisms sequenced now include human (Homo sapiens), model crucifer (Arabidopsis thaliana), and rice (Oryza sativa). The invention of DNA microarray technology and advances in bioinformatics have generated vast amounts of genomic data. Reflecting these revolutionary advances Handbook of Molecular and Cellular Methods in Biology and Medicine, Second Edition documents conventional and modern approaches to tackle scientific research in the post-genomics era. Maintaining the step-by-step format that popularized the first edition, each chapter provides the principles behind the featured method, a detailed description of each protocol, applications of the protocol to different systems, and references for further study. Handbook of Molecular and Cellular Methods in Biology and Medicine, Second Edition now includes: New protocols in all chapters, including alternative protocols In vitro

transcription methods Analysis of DNA sequences New bioseparation techniques New chapters covering: mRNA differential display Inhibition of gene expression In situ hybridization (Localization of gene expression) Combinatorial techniques Computational data mining methods applied to combinatorial chemistry libraries With this book at hand, researchers, teachers, and students can understand and utilize the major techniques and methods currently employed in cellular and molecular biology.

Plant Macronutrient Use Efficiency

Plant Micronutrient Use Efficiency

Biology and Culture of Channel Catfish

Sensory Biology of Plants

7th International Conference of Ph.D. Students on Experimental Plant Biology

The Fifth International Workshop on Seeds was held at the University of Reading, UK, from 10 to 15 September, 1995. Some 230 seed scientists, from a wide range of disciplines (botanists, biochemists, ecologists, agriculturalists, foresters, and commercial seedsmen), from 31 countries (Europe, the Americas, and Asia) participated in the workshop. A large number of oral and poster presentations was made during the workshop and we are pleased to publish so many of them in these Proceedings. The papers herein are listed by the sessions in which they were presented but, as is often the case, many papers cover a broader range of topics than the session titles imply. For seed physiologists, ecologists, and technologists, this book collates much of the current research on seeds.

After decades of dominance of genetics and genomics, the importance of structural biology is growing exponentially in the field of plant biology. The main objectives of this new book series is to "demystify" structural biology for plant researchers and to provide important insights into the basic molecular mechanisms underlying plant development through the diverse approaches utilized by structural biologists. The book series starts with a theme dedicated to hormonal signaling that has benefited from the application of structural biology. "Plant Structural Biology: Hormonal Regulations" provides up-to-date knowledge of the structural aspects of hormonal signal recognition, signal transduction, hormonal control of downstream regulatory pathways and hormonal crosstalk. The most distinctive features of this book as well as future titles is/will be to provide overview of cutting-edge research in the field of plant structural biology, and to serve as a compendium of various approaches that could be applied to problems being solved in modern plant biology. Last but not least, we hope this book will facilitate and broaden the community of (not only) plant scientists who are interested in structural biology approaches and tools. For these reasons, the style of this series is concise and general, in order to avoiding unnecessary details. Explanatory boxes describing the basics of specific approaches (e.g. X-ray crystallography, NMR, SAXS, molecular dynamics simulations, etc.) are included.

Explores the molecular, biochemical, functional, structural, and developmental mechanisms of pH in plant growth. Examines the role of pH in plant symplasm, plant apoplasm, the rhizosphere, the ecosystem, and plant interaction with biotic and abiotic environments.

Reproductive Ecology of Tropical Forest Plants reviews recent developments in the reproductive ecology of tropical forest plants and explores the implications of current findings on forest structure, function, management, and conservation. It examines how insights gained from reproductive ecology can be helpful in the management of tropical forest resources and discusses directions of future research.

From Growing to Biology

Reproductive Ecology of Tropical Forest Plants

Advanced Human and Social Biology

The Origin, Expansion, and Demise of Plant Species

Molecular Biology of the Biological Control of Pests and Diseases of Plants

This exciting new book describes the use of DNA fingerprinting and its application in a wide area of plant and fungal research. It presents a thorough theoretical introduction to DNA fingerprinting, the practical aspects of extraction of DNA from the plant or fungus under study, and the statistical analysis of the data. An overview presents all species to which DNA fingerprinting is currently being applied and highlights many future technical developments.

This book integrates many fields to help students understand the complexity of the basic science that underlies crop and food production.

Biochemistry and Molecular Biology of Plants, 2nd Edition has been hailed as a major contribution to the plant sciences literature and critical acclaim has been matched by global sales success.

Maintaining the scope and focus of the first edition, the second will provide a major update, include much new material and reorganise some chapters to further improve the presentation. This book is meticulously organised and richly illustrated, having over 1,000 full-colour illustrations and 500 photographs. It is divided into five parts covering: Compartments, Cell Reproduction, Energy Flow, Metabolic and Developmental Integration, and Plant Environment and Agriculture. Specific changes to this edition include: Completely revised with over half of the chapters having a major rewrite. Includes two new chapters on signal transduction and responses to pathogens. Restructuring of section on cell reproduction for improved presentation. Dedicated website to include all illustrative material.

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

Take a New Look at Raven! "BIOLOGY" is an authoritative majors textbook focusing on evolution as a unifying theme. In revising the text, McGraw-Hill consulted with numerous users, noted experts and professors in the field. "Biology" is distinguished from other texts by its strong emphasis on natural selection and the evolutionary process that explains biodiversity. The new 8th edition continues that tradition and advances into modern biology by featuring the latest in cutting edge content reflective of the rapid advances in biology. That same modern perspective was brought into the completely new art program offering readers a dynamic, realistic, and accurate, visual program. To view a sample chapter, go to www.ravenbiology.com

Biology of Plant Volatiles

Regulation of Tissue pH in Plants and Animals

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

Molecular and Genomic Perspectives in Crop Plants

From Phytohormones to Genome Reorganization: From Phytohormones to Genome Reorganization

Introduces readers to the chemical biology of plant biostimulants This book brings together different aspects of biostimulants, providing an overview of the variety of materials exploited as biostimulants, their biological activity, and agricultural applications. As different groups of biostimulants display different bioactivity and specificity, advances in biostimulant research is illustrated by different examples of biostimulants, such as humic substance, seaweed extracts, and substances with hormone-like activities. The book also reports on methods used to screen for new biostimulant compounds by exploring natural sources. Combining the expertise of internationally-renowned scientists and entrepreneurs in the area of biostimulants and biofertilisers, The Chemical Biology of Plant Biostimulants offers in-depth chapters that look at: agricultural functions and action mechanisms of plant biostimulants (PBs); plant biostimulants from seaweed; seaweed carbohydrates; and the possible role for electron shuttling capacity in elicitation of PB activity of humic substances on plant growth enhancement. The subject of auxins is covered next, followed closely by a chapter on plant biostimulants in vermicomposts. Other topics include: exploring natural resources for biostimulants; the impact of biostimulants on whole plant and cellular levels; the impact of PBs on molecular level; and the use of use of plant metabolites to mitigate stress effects in crops. Provides an insightful introduction to the subject of biostimulants Discusses biostimulant modes of actions Covers microbial biostimulatory activities and biostimulant application strategies Offers unique and varied perspectives on the subject by a team of international contributors Features summaries of publications on biostimulants and biostimulant activity The Chemical Biology of Plant Biostimulants will appeal to a wide range of readers, including scientists and agricultural practitioners looking for more knowledge about the development and application of biostimulants.

Combining insights from observation, experimentation, and theory, The Origin, Expansion, and Demise of Plant Species offers a broad overview of species as dynamic entities that arise, have unique evolutionary histories, and ultimately go extinct. It begins with a review of species concepts and the exposition of a new concept; it then addresses plant speciation, the expansion of species from their narrow centers of origin, intraspecific differentiation, and contact zones between differentiated population systems. Special attention is given to the breakdown of cohesion among populations by reproductive and spatial barriers. Also, the ecological and genetic properties of small populations and fragmented population systems are discussed with a focus on the role of hybridization in the demise of species. It ends with an exploration of the longevity of species and the tempo of diversification, contrasting different groups of plants in these respects as well as in rates of chromosomal differentiation. This book provides a new synthesis of evolutionary biology and ecology. It examines species from their origins, then follows them through their expansion, differentiation and loss of cohesion, and decline and extinction. The stages in the lives of species are viewed through ecological and genetic theory, and topics typically addressed independently are woven into a continuous fabric. As the first synthetic treatment of the stages through which plant species pass, this book is very useful for botanists, evolutionary biologists, conservation biologists, as well as all curious students of the biological sciences.

There is a growing need for appropriate management of aquatic plants in rivers and canals, lakes and reservoirs, and drainage channels and urban waterways. This management must be based on a sound knowledge of the ecology of freshwater plants, their distribution and the different forms of control available including chemical and physical, and biological and biomanipulation. This series of papers from over 20 different countries was generated from the tenth in the highly successful series of European Weed Research Society symposia on aquatic plant management, this being the tenth. It provides a valuable insight into the complexities involved in managing aquatic systems, discusses state-of-the-art control techniques and deals with patterns of regrowth and recovery post-management. Careful consideration is given to the use of chemicals, a practice which has come under scrutiny in recent years. Underpinning the development of such control techniques is a growing body of knowledge relating to the biology and ecology of water plants. The authorship of the papers represents the collective wisdom of leading scientists and experts from fisheries agencies, river authorities, nature conservation agencies, the agrochemical industry and both governmental and non-governmental organisations.

NOT AVAILABLE SEPARATELY

The Chemical Biology of Plant Biostimulants

An Introduction to Plant Biology

Plant Structural Biology: Hormonal Regulations

Defense Mechanisms of Woody Plants Against Fungi

Biology of Plants