Roots

Wurzeln

A comprehensive review of all modern methods for plant root research, both in the field and in the laboratory. It covers the effects of environmental interactions with root growth and function, focussing in particular on the assessment of root distribution and dynamics. It also describes and discusses the processing of root observations, analysis and modelling of root growth and architecture, root-image analysis, computer-assisted tomography and magnetic resonance imaging. Furthermore, a survey of the application of isotope techniques in root physiology is given.

Root Methods

Newly revised and updated, Fundamentals of Periodontal Instrumentation and Advanced Root Instrumentation, Ninth Edition is an instructional guide to periodontal instrumentation that takes students from the basic skills -- patient positioning, intraoral finger rests, and basic instrumentation -- all the way to advanced techniques -- assessment of periodontal patients and instrumentation of the root branches of multirooted teeth, root concavities, and furcation areas. The overarching instructional goal of the text is to simplify the teaching and learning process for both educators and students. The Ninth Edition retains the many features that have positioned it as a market-leading text on periodontal instrumentation and adds new features and a content organization designed to enhance student outcomes.

Fundamentals of Periodontal Instrumentation and Advanced Root Instrumentation

This book contains the majority of the presentations of the Second International Symposium on the Biology of Root Formation and Development that was hcld in Jerusa lem, Israel, June 23---28, 1996. Following the First Symposium on the Biology of Adventi tious Root Formation, held in Dallas. USA, 1993, we perceived the need to include all kinds of roots, not only the shoot-borne ones. The endogenous signals that control root formation. and the subsequent growth and development processes, are very much alike, re gardless of the sites and sources of origin of the roots. Therefore, we included in the Sec ond Symposium contributions on both shoot-borne (i.e., adventitious) roots and root-borne (i.e., lateral) roots. Plant roots have remained an exciting and an intriguing field of sciencc. During thc years that followed the first symposium, an exceptional proliferation of interest in root biology has developed, associated with the intensive research activity in this field and the contemporary developments in the understanding of root function and development. New methods have been applied, and old ideas and interprctations werc rccxamined. Alto gether, it became necessary to update our viewpoints and to expand them.

Biology of Root Formation and Development

This easy-to-follow, full-colour guide was created for instructors teaching plant structure at the high school, college, and university levels. It benefits from the experience of the authors, who in teaching plant anatomy over many years, came to realize that students learn best by preparing their own microscope slides from fresh plant samples. The exercises contained in this book have been tested, require minimal supplies and equipment, and use plants that are readily available. Detailed instructions are given for sectioning and staining of plant material. The book contains a glossary of terms, an index, and a list of suppliers of materials required. A CD-ROM of all the illustrations is included for easy downloading into PowerPoint presentations. \"Although a number of new plant anatomy texts have been published in recent years, none is as innovative, exciting and user-friendly as \"Teaching Plant Anatomy Through Creative Laboratory Exercises\" by

Peterson, Peterson and Melville. What makes this book so usable from high school biology courses on through to upper level university plant structure labs is the wealth of experience that the authors have incorporated into this comprehensive clearly illustrated text. Using mostly photomicrographs of hand sections and wonderfully clear colour illustrations, they cover all aspects of plant structure from organelles to organs. The book also outlines some easy to use techniques, such as hand sections and clearings and macerations, which will certainly be very useful for any plant related lab. This book really does bring plant anatomy to life and will be a must for any course that deals with plant structure even if it's just to prepare plant material for molecular techniques. An excellent contribution to any botanical teaching where you want your students to get a hands-on approach to the subject.\"... Dr. Usher Posluszny, University of Guelph

Early Development of Sweetgum Root Sprouts in Coastal South Carolina

The Second Edition of this bestseller brings together basic plant pathology methods published in diverse and often abstract publications. The Second Edition is updated and expanded with numerous new figures, new culture media, and additional methods for working with a greater number of organisms. Methods are easy to use and eliminate the need to seek out original articles. This reference allows for easy identification of methods appropriate for specific problems and facilities. Scientific names of pathogens and some of their hosts are updated in this edition. The book also acts as a research source providing more than 1,800 literature citations. The Second Edition includes chapters on the following: Sterilization of culture apparatus and culture media Culture of pathogens with detailed techniques for 61 fungi and selected bacteria Long-term storage of plant pathogens Detection and estimation of inoculum for 28 soilborne fungal pathogens and 5 bacterial genera-15 methods for airborne inoculum and 13 methods for seedborne pathogens Establishment of disease and testing for disease resistance Work with soil microorganisms Fungicide evaluation Biological control Bright-field microscopy

Teaching Plant Anatomy Through Creative Laboratory Exercises

Root Cause Failure Analysis Provides the knowledge and failure analysis skills necessary for preventing and investigating process equipment failures Process equipment and piping systems are essential for plant availability and performance. Regularly exposed to hazardous service conditions and damage mechanisms, these critical plant assets can result in major failures if not effectively monitored and assessed—potentially causing serious injuries and significant business losses. When used proactively, Root Cause Failure Analysis (RCFA) helps reliability engineers inspect the process equipment and piping system before any abnormal conditions occur. RCFA is equally important after a failure happens: it determines the impact of a failure, helps control the resultant damage, and identifies the steps for preventing future problems. Root Cause Failure Analysis: A Guide to Improve Plant Reliability offers readers clear understanding of degradation mechanisms of process equipment and the concepts needed to perform industrial RCFA investigations. This comprehensive resource describes the methodology of RCFA and provides multiple techniques and industry practices for identifying, predicting, and evaluating equipment failures. Divided into two parts, the text first introduces Root Cause Analysis, explains the failure analysis process, and discusses the management of both human and latent error. The second part focuses on failure analysis of various components such as bolted joints, mechanical seals, steam traps, gearboxes, bearings, couplings, pumps, and compressors. This authoritative volume: Illustrates how failures are associated with part integrity, a complete system, or the execution of an engineering process Describes how proper design, operation, and maintenance of the equipment help to enhance their reliability Covers analysis techniques and industry practices including 5-Why RCFA, fault tree analysis, Pareto charts, and Ishikawa diagrams Features a detailed case study of process plant machinery and a chapter on proactive measures for avoiding failures Bridging the gap between engineering education and practical application, Root Cause Failure Analysis: A Guide to Improve Plant Reliability is an important reference and guide for industrial professionals, including process plant engineers, planning managers, operation and maintenance engineers, process designers, chemical engineers, and instrument engineers. It is also a valuable text for researchers, instructors, and students in relevant areas of engineering and science.

Basic Plant Pathology Methods

Victor P. Bulgakov, Yuri N. Shkryl, Galina N. Veremeichik, Tatiana Y. Gorpenchenko and Yuliya V. Vereshchagina: Recent Advances in the Understanding of Agrobacterium rhizogenes-Derived Genes and Their Effects on Stress Resistance and Plant Metabolism. Le Zhao, Guy W. Sander and Jacqueline V. Shanks: Perspectives of the Metabolic Engineering of Terpenoid Indole Alkaloids in Catharanthus roseus Hairy Roots. Jian Wen Wang and Jian Yong Wu: Effective Elicitors and Process Strategies for Enhancement of Secondary Metabolite Production in Hairy Root Cultures. Amanda R. Stiles and Chun-Zhao Liu: Hairy Root Culture: Bioreactor Design and Process Intensification. Marina Skarjinskaia, Karen Ruby, Adriana Araujo, Karina Taylor, Vengadesan Gopalasamy-Raju, Konstantin Musiychuk, Jessica A. Chichester, Gene A. Palmer, Patricia de la Rosa, Vadim Mett, Natalia Ugulava, Stephen J. Streatfield and Vidadi Yusibov: Hairy Roots as a Vaccine Production and Delivery System. Zahwa Al-Shalabi and Pauline M. Doran: Metal Uptake and Nanoparticle Synthesis in Hairy Root Cultures.

The Occurrence of Pasteuria Penetrans Infecting Root-Knot Nematodes In Vegetable Fields In Ecudor And Its Potential Role In Nematode Management

Features review questions at the end of each chapter; Includes suggestions for recommended reading; Provides a glossary of ecological terms; Has a wide audience as a textbook for advanced undergraduate students, graduate students and as a reference for practicing scientists from a wide array of disciplines

Library of Congress Subject Headings

A text book on Biology

Library of Congress Subject Headings

Unique focus on achieving more resilient, ‘climate-smart’ coffee cultivation Distinctive agroecological approach based on improving cultivation through optimising ecosystem services Comprehensive coverage of the value chain in coffee cultivation, from breeding to pest management and post-harvest practices

Soil Genesis, Hydrological Properties, Root Characteristics and Microbial Activity of 1- to 50-year Old Stripmine Spoils

Accompanying CD-ROM includes 600 figures, tables and color plates from the book Plants in action which can be used for the production of color transparencies or for projections in lectures.

Root Cause Failure Analysis

Imaging of the Spine—an exhaustive, full-color reference—combines the ease of use of an atlas with the comprehensive coverage of a definitive reference work. Renowned experts Drs. Thomas P. Naidich, Mauricio Castillo, Charles Raybaud, James G. Smirniotopoulos, Soonmee Cha, and Spyros Kollias cover every aspect of spine imaging, including the latest diagnostic modalities, interventional techniques, and image-guided procedures through over 1300 digital quality illustrations. - View 1300 digital quality images of both radiographic images and cutting edge modalities—MR, multislice CT, ultrasonography, and nuclear medicine. - Consult the expertise of a diverse group of experts from around the globe on the imaging of the spine. - Tap into comprehensive coverage that includes diagnostic and therapeutic options, with an emphasis on cost-effective imaging. - Find information quickly and easily thanks to consistent and tightly focused chapters, a full color design, and key points boxes.

Economic Analysis, Root Control, and Backwater Flow Control as Related to Infiltration/inflow Control

Secretions and emissions in biological systems play important signaling roles within the organism but also in its communications with the surrounding environment. This volume brings together state-of-the-art information on the role of secretions and emissions in different organs and organisms ranging from flowers and roots of plants to nematodes and human organs. The plant chapters relate information regarding the biochemistry of flower volatiles and root exudates, and their role in attracting pollinators and soil microbial communities respectively. Microbial chapters explain the biochemistry and ecology of quorum sensing and how microbial communities highly co-adapted to plants can aid in bio-energy applications by degrading ligno-cellulosic materials. Other chapters explain the biology of secretions by nematodes, algae and humans, among other organisms. This volume will be a welcome addition to the literature, as no other book covers aspects related to biological secretion in such a holistic and integrative manner.

Root Morphology of Co-occurring African Fruit Tree Species with Contrasting Strategies of Exploration and Exploitation

Illustrating the fascinating interplay between physics and mathematics, Groups, Representations and Physics, Second Edition provides a solid foundation in the theory of groups, particularly group representations. For this new, fully revised edition, the author has enhanced the book's usefulness and widened its appeal by adding a chapter on the Cartan-Dynkin treatment of Lie algebras. This treatment, a generalization of the method of raising and lowering operators used for the rotation group, leads to a systematic classification of Lie algebras and enables one to enumerate and construct their irreducible representations. Taking an approach that allows physics students to recognize the power and elegance of the abstract, axiomatic method, the book focuses on chapters that develop the formalism, followed by chapters that deal with the physical applications. It also illustrates formal mathematical definitions and proofs with numerous concrete examples.

Biotechnology of Hairy Root Systems

Set includes revised editions of some issues.

Mechanics' and Engineers' Pocketbook of Tables

This book gives basic facts about litter decomposition studies, which are of guidance for scientists who start studies. Since the publication of the third edition, there has been quite a development not only in the field of litter decomposition but also in supporting branches of science, which are important for fruitful work on and understanding of decomposition of plant litter and sequestration of carbon. A consequence is that ‘old established truths’ are becoming outdated. New knowledge in the fields of phytochemistry and microbial ecology has given a new baseline for discussing the concepts ‘litter decomposition’ and ‘carbon sequestration’. We can also see a rich literature on litter decomposition studies using roots and wood as substrates. These have given new insights in factors that regulate the decomposition rate and as regards roots their contribution to sequestered carbon in humus. Additional facts on the role of temperature vs the litters’ chemical composition may in part change our view on effects of climate change. Further information on applications of the new analytical technique (13C-NMR) for determining organic-chemical compounds has allowed us to develop these parts. Focus is laid on needle litter of Scots pine as a model substrate as this species has been considerably more studied than other litter species. Also the boreal/northern temperate coniferous forest has in part been given this role. Still, new information may allow us to develop information about litter from further tree species.

Principles of Terrestrial Ecosystem Ecology

The third edition of a standard resource, this book offers a state-of-the-art, multi-disciplinary presentation of

plant roots. It examines structure and development, assemblage of root systems, metabolism and growth, stressful environments, and interactions at the rhizosphere. Reflecting the explosion of advances and emerging technologies in the field, the book presents developments in the study of root origin, composition, formation, and behavior for the production of novel pharmaceutical and medicinal compounds, agrochemicals, dyes, flavors, and pesticides. It details breakthroughs in genetics, molecular biology, growth substance physiology, biotechnology, and biomechanics.

Dominion Experimental Farms in ...

Legislation, Technology and Practice of Mine Land Reclamation contains the proceedings of the Beijing International Symposium on Land Reclamation and Ecological Restoration (LRER 2014, Beijing, China, 16-19 October 2014). The contributions cover a wide range of topics: - Monitoring, prediction and assessment of environmental damage in mining areas - Subsidence land reclamation and ecological restoration - Soil, vegetation and biological diversity - Mining methods and measures for minimization of land and environmental damage - Solid wastes and AMD treatment - Contaminated land remediation - Land reclamation and ecological restoration policies and management - Surface mined land reclamation and ecological restoration - Case study on mining reclamation and ecological restoration Legislation, Technology and Practice of Mine Land Reclamation will be of interest to engineers, scientists, consultants, government officials and students involved in environmental engineering, soil science, ecology, forestry, mining, and land reclamation and ecological restoration in mining areas.

Biology-vol-I

Plants offer some of the most elegant applications of soft matter principles in Nature. Understanding the interplay between chemistry, physics, biology, and fluid mechanics is critical to forecast plant behaviour, which is necessary for agriculture and disease management. It also provides inspiration for novel engineering applications. Starting with fundamental concepts around plant biology, physics of soft matter and viscous fluids, readers of this book will be given a cross-disciplinary and expert grounding to the field. The book covers local scale aspects, such as cell and tissue mechanics, to regional scale matters covering movement, tropism, roots, through to global scale topics around fluid transport. Focussed chapters on water stress, networks, and biomimetics provide the user with a concise and complete introduction. Edited by internationally recognised leading experts in this field with contributions from key investigators worldwide, this book is the first introduction to the subject matter and will be suitable for both physical and life science readers.

Climate-smart production of coffee

The updated and revised 13th edition of the Book Comprehensive guide to SBI Bank PO (Probationary Officers and Local Based Officers, LBOs) Exam is now a more powerful preparatory material with the addition of updated PYQs & Practice mcqs. # This new edition incorporates new chapters/ variety of questions as per latest SBI PO exams. # The book covers all the sections of the Preliminary & Main PO Exams - English Language, Quantitative Aptitude, Data Analysis & Data Interpretation, Reasoning Ability, Computer Aptitude, and Banking knowledge & General Awareness and Current Updates. # The book provides well illustrated theory in 49 chapters with exhaustive fully solved examples for learning. # This is followed with an exhaustive collection of solved questions in the form of Exercise. # The book incorporates last 10 years SBI PO Prelim & Main Question papers with solutions in the respective chapters. # A total of 5250 + MCQs with 100% explanations to quant, Reasoning & English sections. Study material for Banking/ economics financial Awareness with Past years' Questions & Practice Questions is covered in the book. # Also cover high level questions on latest SBI PO Exam pattern.

Plants in Action

The effective management of plants is fundamental to all agricultural enterprise, making plant science a key discipline for all growers. This book provides an integrated explanation of all aspects of plant structure and function for students of agriculture, horticulture and applied biology, with the aim of highlighting the practical relevance of plant science to agriculture. Each chapter is self-contained and self-explanatory, with specific chapters covering energy, water, minerals, structure, growth and development from sowing to harvest, environmental effects and controls, breeding, vegetative propagation, field production and yield, and the nutritional content of produce. Taken as a whole, Plants in Agriculture fulfills the need for a single text which promotes a comprehensive understanding of how plants operate in agriculture.

Quantitative Aptitude For Cat And Other Mba Entrance Examinations, 3/E (With Cd)

A practical guide to soil tests for Australian soils and conditions.

Imaging of the Spine E-Book

Secretions and Exudates in Biological Systems