Plant Virology The Principles

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Soilborne Microbial Plant Pathogens and Disease Management, Volume One

Learn to produce healthier crops and better harvests! This uniquely valuable book highlights the tremendous progress of knowledge in different areas of the field over the last decade. Here you'll find new and useful information about plant molecular virology and how the field can improve the world food situation in the coming years. The last decade has seen remarkable advances in plant virological research, owing mainly to the rapid progress made in molecular biology and genetic engineering in recent years. While recombinant DNA technology has significantly contributed to our understanding of plant viruses, new findings are being accumulated every day as reported in various publications. Plant Viruses As Molecular Pathogens is the only book to bring you all of this information--22 chapters--in a single volume, compiled by specialists around the globe! Use Plant Viruses As Molecular Pathogens to enhance your knowledge of: current virus taxonomy the molecular basis of virus transmission movement of plant viruses replication and gene expression of RNA/DNA viruses resistance to viruses molecular epidemiology recombination events and possible mechanisms molecular diversity novel aspects of plant virus detection technologies With helpful illustrations, photos, figures, models that explain viral mechanisms, and easy-to-understand reference tables, Plant Viruses As Molecular Pathogens will stimulate your thinking on this fascinating area of plant science!

Serology and Immunochemistry of Plant Viruses

Reproductive Biology of Plants is a comparative account of reproduction in viruses, bacteria, cyanobacteria, algae, fungi, lichens, bryophytes, pteridophytes, gymnosperms and angiosperms, each chapter written by an expert in the field. Special emphasis is placed on the truly comparative approach illustrating the vast range from simplicity to complexity in structure and function with respect to the various organisms.

Plant Virology

It has been ten years since the publication of the third edition of this seminal text on plant virology, during which there has been an explosion of conceptual and factual advances. The fourth edition updates and revises many details of the previous editon, while retaining the important older results that constitute the field's conceptual foundation. Key features of the fourth edition include: * Thumbnail sketches of each genera and family groups * Genome maps of all genera for which they are known * Genetic engineered resistance strategies for virus disease control * Latest understanding of virus interactions with plants, including gene silencing * Interactions between viruses and insect, fungal, and nematode vectors * New plate section containing over 50 full-color illustrations

Principles and techniques in plant virology

The revised edition of the bestselling textbook, covering both classical and molecular plant breeding Principles of Plant Genetics and Breeding integrates theory and practice to provide an insightful examination of the fundamental principles and advanced techniques of modern plant breeding. Combining both classical and molecular tools, this comprehensive textbook describes the multidisciplinary strategies used to produce new varieties of crops and plants, particularly in response to the increasing demands to of growing populations. Illustrated chapters cover a wide range of topics, including plant reproductive systems, germplasm for breeding, molecular breeding, the common objectives of plant breeders, marketing and societal issues, and more. Now in its third edition, this essential textbook contains extensively revised content that reflects recent advances and current practices. Substantial updates have been made to its molecular genetics and breeding sections, including discussions of new breeding techniques such as zinc finger nuclease, oligonucleotide directed mutagenesis, RNA-dependent DNA methylation, reverse breeding, genome editing, and others. A new table enables efficient comparison of an expanded list of molecular markers, including Allozyme, RFLPs, RAPD, SSR, ISSR, DAMD, AFLP, SNPs and ESTs. Also, new and updated “Industry Highlights” sections provide examples of the practical application of plant breeding methods to real-world problems. This new edition: Organizes topics to reflect the stages of an actual breeding project Incorporates the most recent technologies in the field, such as CRSPR genome edition and grafting on GM stock Includes numerous illustrations and end-of-chapter self-

assessment questions, key references, suggested readings, and links to relevant websites Features a companion website containing additional artwork and instructor resources Principles of Plant Genetics and Breeding offers researchers and professionals an invaluable resource and remains the ideal textbook for advanced undergraduates and graduates in plant science, particularly those studying plant breeding, biotechnology, and genetics.

Plant Virology

Principles of Virology, the leading virology textbook in use, is an extremely valuable and highly informative presentation of virology at the interface of modern cell biology and immunology. This text utilizes a uniquely rational approach by highlighting common principles and processes across all viruses. Using a set of representative viruses to illustrate the breadth of viral complexity, students are able to under-stand viral reproduction and pathogenesis and are equipped with the necessary tools for future encounters with new or understudied viruses. This fifth edition was updated to keep pace with the ever-changing field of virology. In addition to the beloved full-color illustrations, video interviews with leading scientists, movies, and links to exciting blogposts on relevant topics, this edition includes study questions and active learning puzzles in each chapter, as well as short descriptions regarding the key messages of references of special interest. Volume I: Molecular Biology focuses on the molecular processes of viral

reproduction, from entry through release. Volume II: Pathogenesis and Control addresses the interplay between viruses and their host organisms, on both the micro- and macroscale, including chapters on public health, the immune response, vaccines and other antiviral strategies, viral evolution, and a brand new chapter on the therapeutic uses of viruses. These two volumes can be used for separate courses or together in a single course. Each includes a unique appendix, glossary, and links to internet resources. Principles of Virology, Fifth Edition, is ideal for teaching the strategies by which all viruses reproduce, spread within a host, and are maintained within populations. This edition carefully reflects the results of extensive vetting and feedback received from course instructors and students, making this renowned textbook even more appropriate for undergraduate and graduate courses in virology, microbiology, and infectious diseases.

Reproductive Biology of Plants

This book focuses on the practical aspects of forest diseases and on practical measures to minimize damage and loss. Forest Pathology is a reference book that deals with the study of the problems and damage to forests due to: plant diseases, insects, fire, weather, and animals. It is both a forestry book and a plant pathology book. The first section deals with general topics and principles, including both abiotic causes and biotic causes such as fungi, bacteria, mycoplasms, and viruses. The second section presents the details of particular forest diseases and offers

practical management suggestions.

Plant Virology

For the past twenty years I have worked as an applied plant virologist, attempting to identify and control virus diseases in field crops. During the last ten years it has been my privilege to present short courses in plant virology to final-year students studying plant pathology, micro biology and general botany. Throughout the period I have been lecturing, it has been possible to recommend several excellent 'library' books for further reading in plant virology, but there has been no publication covering applied plant virology that a student might consider purchasing. With teaching requirements in mind this book has been written to provide a concise introduction to applied plant virology based on the experiences I have gained working on virus diseases, both in an applied laboratory and in the field. The text concentrates on introducing the reader to aspects of plant virology that would be encountered every day by an applied virologist trying to identify viruses and develop control measures for virus diseases of crop plants. Although a brief introduction to virus structure and its terminology is given in the opening chapter of the book, no attempt is made to cover in detail the more fundamental aspects of virus structure, biochemistry and replication. Similarly, the symptoms caused by individual viruses are not described, although the various types of symptoms that plant viruses cause and which might be encountered by a student or research

worker are described.

Principles of Plant Infection

Principles of Molecular Virology (Standard Edition)

Fundamentals of Plant Virology is an introductory student text covering all of modern plant virology. The author, Dr. R.E.F. Matthews, has written this coursebook based on his classic and comprehensive Plant Virology, Third Edition. Four introductory chapters review properties of viruses and cells and techniques used in their study. Five chapters are devoted to current knowledge of all major plant viruses and related pathogens. Seven chapters describe biological properties such as transmission, host response, disease, ecology, control, classification, and evolution of plant viruses. A historical and future overview concludes the text. Fundamentals of Plant Virology is a carefully designed instructional format for a plant virology course. It is also an invaluable resource for students of plant pathology and plant molecular biology. Summarizes knowledge on all aspects of plant virology Condenses all essential material from Plant Virology 3/e Compares basic properties of cells and viruses Outlines principles of gene manipulation technology Discusses serological techniques including monoclonal antibodies

Geared to student level course

Principles of Molecular Virology

Viruses require a special approach to establish their presence in a diseased plant since they are not visible, even under a light microscope. This manual describes in detail a variety of protocols for determining the properties and identity of a virus and its behavior in infected plants. A Springer Lab Manual.

Principles of Plant Breeding

Principles of Plant Infection investigates interactions among pathogens, host plants, the environment, time and space, and their role in plant infection. It describes the principles of infection, particularly of the root, stem, or leaf, as they apply to fungi, bacteria, or viruses. It also highlights the dual nature of resistance and suggests theories of host resistance. Organized into seven chapters, this volume begins with an overview of the relation between the amount of inoculum and the amount of disease it causes. It then turns to a discussion of the disease/inoculum relations of tobacco mosaic virus; how obligate synergism restricts the transmission of pathogens; disease/inoculum relations in root disease; the independent action of spores as inoculum; variable factors other than the

amount of inoculum that affect plant disease; and time as a determining factor of the degree of plant infection. The reader is also introduced to endemic disease of plants, the implications of endemicity for plant resistance to disease, the spread of disease via migration of pathogens, and the genetics of host-pathogen interactions. Plant pathologists and plant breeders will gain valuable information from this book.

Comparative Plant Virology

The knowledge and practice of clinical virology continues to expand. This new fifth edition has thirty-six comprehensive chapters, each of which has been extensively revised or rewritten, with the addition of new colour plates. This updated version takes into account knowledge accumulated in molecular biology with its applications for laboratory diagnosis, immunisation and antiviral chemotherapy. Each chapter highlights the clinical features and epidemiological patterns of infection. Similarly, in response to the global concern of the threat posed by new viruses, a new chapter on Emerging Infections is included. There is also new material on Hospital Acquired Infections, including some advice relating to SARS, that will be of benefit to those dealing with the day-to-day management of patients in hospital.

The Plant Viruses

The seminal text Plant Virology is now in its fifth edition. It has been 10 years since the publication of the fourth edition, during which there has been an explosion of conceptual and factual advances. The fifth edition of Plant Virology updates and revises many details of the previous edition while retaining the important earlier results that constitute the field's conceptual foundation. Revamped art, along with fully updated references and increased focus on molecular biology, transgenic resistance, aphid transmission, and new, cutting-edge topics, bring the volume up to date and maintain its value as an essential reference for researchers and students in the field. Thumbnail sketches of each genera and family groups Genome maps of all genera for which they are known Genetic engineered resistance strategies for virus disease control Latest understanding of virus interactions with plants, including gene silencing Interactions between viruses and insect, fungal, and nematode vectors Contains over 300 full-color illustrations

Matthews' Plant Virology

Serology and Immunochemistry of Plant Viruses investigates the antigenic properties of plant viruses. It looks at the practical aspects of plant virus serology, along with the molecular basis of viral antigenicity, antigenic determinants in

proteins, the structure of antibodies, virus purification, antiserum production, and the theoretical principles and practical implementation of the various serological techniques. It also considers the problems associated with identification and classification of plant viruses. Organized into 10 chapters, this volume begins with an overview of antigens and antigenic determinants before proceeding with a discussion of the immunochemistry of plant viruses, virus-antibody binding, the role of quaternary structure in antigenicity, and the structure of viral antigenic determinants. The reader is also introduced to the methods and principles of purifying plant viruses, preparation of antisera and purification of antibodies, antigen-antibody interaction, immunochemical techniques used with plant viruses, the role of quaternary structure on viral antigenicity, diagnosis of virus diseases, use of serological criteria for measuring the degree of relationship between viruses, and immunochemical studies of plant viruses. The book includes a bibliography with 1,400 references and a list of all the plant viruses that have been studied by serology. This book will be a useful resource for virologists and plant pathologists, as well as for students and research workers in plant virology, plant pathology, microbiology, and general virology.

Applied Plant Virology

Following the considerable success of the first edition of Plant Virology Protocols, this exciting new edition covers the many new techniques that are now applied to

the examination and understanding of plant viruses. Each section presents the most novel methods and step-by-step reproducible laboratory protocols to allow researchers more effective approaches to study plant viruses. This updated book will prove indispensable to laboratory investigators studying plant viruses.

Virology of Flowering Plants

Virology

The second edition of Virology is an accessible introduction designed to enable students to understand the principles of virus structure, replication and genetics. The aim of this book is to help the reader appreciate the relevance of virology in the modern world, including the fields of vaccines, anti-viral drugs and cancer. There is also a chapter on prions. The second edition has been extensively revised and updated to reflect the many developments in virology and offers deeper insights into the subject. Newly-discovered viruses are discussed and there is an additional chapter on the influenza virus.

Principles of Plant Genetics and Breeding

Principles of Molecular Virology, Third Edition provides an essential introduction to modern virology in a clear and concise manner. It is a highly enjoyable and readable text with numerous illustrations that enhance the reader's understanding of important principles. This edition has been updated and revised with new figures and text. New to the Third Edition: Viruses and Apoptosis (Chapter 6) Bacteriophages and Human Disease (Chapter 7) Learning objectives for each chapter Pronunciation section in Glossary and abbreviations section (Appendix 1) Key events in the history of virology (Appendix 3) Addition of colour in text and figures to enhance understanding of key points Also: Self assessment questions at the end of each chapter Classification of Subcellular Infectious agents Approx. 20% new material and completely revised throughout Over 120 figures

Plant Virology in Sub-Saharan Africa

Soilborne microbial plant pathogens including oomycetes, fungi, bacteria and viruses cause several economically important destructive diseases and the symptoms of infection can be recognized only after the pathogen has invaded many tissues primarily vascular tissues of susceptible plants. This condition places formidable challenges in investigating different aspects of host-microbial pathogen interactions. Early detection of infection and precise identification, differentiation, and quantification of the microbial plant pathogens in plants, soil and water sources are essential requirements for development of effective tactics to reduce

the incidence and spread of the diseases caused by them. As the microbial plant pathogens differ in their virulence and sensitivity to the environment and chemicals applied, it is imperative to assess the extent of variability in the concerned pathogens. This first volume of a two-volume set introduces disease-causing microorganisms including oomycetes, fungi, bacteria, and viruses found in soils. It focuses on the biology, detection, and identification of soilborne bacterial, fungal, and viral plant pathogens. This volume discusses various techniques based on biological, immunological and genetic properties of the pathogens indicating their advantages and limitations for selecting the appropriate technique to fulfill the requirements. Features: Presents techniques useful for detection, identification, quantification of microbial plant pathogens in plants, soil, and irrigation water from waterbodies. Highlights subversive activities of viruses, resulting in the breakdown of host defense systems. Discusses RNA silencing in infected plants by viruses and posttranscriptional gene silencing (PTGS) functioning as an endogenous mechanism in plants against virus infection. Presents information on methods of assessment of genetic variability and sensitivity of microbial plant pathogens to chemicals and adverse environmental conditions.

Phytobacteriology

Plant viruses are significant as they affect our food supply and are capable of

rapidly spreading to new plant species, so a comprehensive study of plant viruses is important in understanding their pathogenesis and prevention. This book focuses on the plant virus evolution, their molecular classification, epidemics and management. The key features in the book includes genome organization, translation and replication, virus-coded proteinases, structure of virus particles, cell receptors and host range, the RNA polymerase, quasispecies dynamics and virus evolution, and its natural habitats.

Plant Virology Protocols

The book is a compilation of research work carried out on plant viruses during past 100 years in India. Plant viruses are important constraints in Indian agriculture. Tropical and sub-tropical environments and intensive crop cultivation practices ideally favours perpetuation of numerous plant viruses and their vectors in India, which often cause wide spread crop losses. Of all the plant pathogens, studies of plant viruses have received a special attention as they are difficult to manage. A large body of literature has been published on the plant virus research from India during past 100 years; however the information is so far not available in one place. This book provides comprehensive information on the biology, molecular biology, epidemics, crop losses, diagnosis and management of viruses and viroids occurring in India. Description of properties of the viruses are provided in the chapters comprising of different genera such as Allexivirus, Begomovirus, Babuvirus,

Badnavirus, Carlavirus, Carmovirus, Cucumovirus, Closterovirus, Ilavirus, Mandrivirus, Potyvirus, Tospovirus, Tungrovirus and Sobemovirus. Virus-vector research related to aphid, thrips and whitefly is discussed. The work on the management aspects of plant viral diseases has been described with reference to the conventional, antiviral and transgenic approaches. Further, the quarantine mechanism developed in India for the exclusion of viruses and vectors has also been included. The book also provides useful information about the capacity building on the research and education on Plant Virology in India. Overall, the book covers a wide range of accounts of research findings and innovations in Plant Virology in India during past 100 years. The book will be a resourceful reference to the students, scientists, agricultural professionals and policy makers.

Plant Virology

Major developments have taken shape in the ten years since the publication of Plant Virology, Second Edition. This Third Edition of the leading comprehensive text and reference for the field contains more than sixty percent new material, including applications and results of gene manipulation techniques. As with the first and second editions, this volume covers all aspects of plant virology, from molecular to ecological. Plant Virology, Third Edition, is intended for graduate students, researchers, and teachers in plant virology, plant pathology, general virology, and microbiology, and scientists in related areas of molecular biology,

biochemistry, plant physiology, and entomology.

Practical Plant Virology

Comparative Plant Virology provides a complete overview of our current knowledge of plant viruses, including background information on plant viruses and up-to-date aspects of virus biology and control. It deals mainly with concepts rather than detail. The focus will be on plant viruses but due to the changing environment of how virology is taught, comparisons will be drawn with viruses of other kingdomes, animals, fungi and bacteria. It has been written for students of plant virology, plant pathology, virology and microbiology who have no previous knowledge of plant viruses or of virology in general. Boxes highlight important information such as virus definition and taxonomy Includes profiles of 32 plant viruses that feature extensively in the text Full color throughout

Seed-borne plant virus diseases

This comprehensive manual of phytobacteriology is heavily illustrated with over 200 colour photographs and line illustrations. It begins by outlining the history and science of bacteriology and gives an overview of the diversity and versatility of complex bacteria. It then explains the characterization, identification and naming

of complex bacteria, and explores how bacteria can cause disease and how plants react to such disease. The book also discusses the economic importance of bacterial diseases as well as strategies for their control and the reduction of crop losses. It concludes with fifty examples of plant pathogenic bacteria and the diseases that they cause.

Principles of Plant Pathology

Plant Virology, Second Edition, was written to cover the substantial developments in many areas of plant virology since the first edition was published. Advances have been made in all branches of the subject, but these have been most far reaching with respect to the structure of viruses and of their components, and in the understanding of how viral genomes are organized and how viruses replicate in cells. Significant developments have also occurred in the understanding of how viruses are transmitted by invertebrates and in the application of control measures for specific diseases. The taxonomy of viruses has advanced significantly, and there are now 25 internationally approved families and groups of plant viruses. All these developments have required that most sections be entirely rewritten. This book is intended primarily for graduate students in plant pathology, plant virology, general virology, and microbiology, and for teachers and research workers in these fields. It should also prove useful to some people in related disciplines—molecular biologists, biochemists, plant physiologists, and entomologists.

Testing Methods for Seed-transmitted Viruses

All the information you need on plant viruses in a single volume The Handbook of Plant Virology is a comprehensive guide to the terms and expressions commonly used in the study of plant virology, complete with descriptions of plant virus families down to the generic level. Rather than simply listing terms in alphabetical order, this unique book links each term to related terms within a theme and adds commentary from authors whose specific expertise adds additional dimensions to the topics. The result is an invaluable resource for research workers, educators, and students working in plant virology and pathology, crop protection, molecular biology, and plant breeding. The Handbook of Plant Virology provides enough details and background in the discussion of each topic to present a clear and thorough understanding of terms without the lengthy analysis found in most textbooks. The book's first section covers: the mechanics of virus classification internal and external symptoms (with color illustrations) isolation and purification genome packaging replication and gene expression detection and identification various methods of virus transmission serology forecasting disease development recombination control strategies economic importance and much more The second section of The Handbook of Plant Virology is devoted to concise descriptions of the 81 genera and 18 families of plant viruses, including: positive-sense, single-stranded RNA viruses, such as Potyviridae, Sequiviridae, and Comoviridae double-stranded RNA viruses, such as Reoviridae and Partitiviridae negative-sense, single-

stranded RNA viruses, such as Rhabdoviridae and Bunyaviridae single-stranded DNA viruses, such as Geminiviridae, Pseudoviridae, Metaviridae The Handbook of Plant Virology also includes photos, illustrations, figures, diagrams, and brief, but detailed, bibliographies. The book's concise mix of information on currently assigned taxonomic families and the genera of plant viruses make it an essential reference tool for practitioners, researchers, educators, and students.

Handbook of Plant Virology

The history and scope of plant virology. Some plant viruses and their names. Effects of viruses on plants. Experimental transmission. The composition and structure of the particles of plant viruses. The purification of virus particles, and some properties of purified preparations. Infectivity assay. Serological methods. Physical and chemical methods of assay and analysis. Variation, strains and classification. Transmission by vectors and in other natural ways. Virus ecology. Ways of preventing crop losses. Viruses of organisms other than higher plants. Origins of viruses. Plant pathogens confused with viruses.

A Century of Plant Virology in India

The fourth edition of the hugely successful Principles of Molecular Virology takes on

a molecular approach, presenting the principles of virology in a clear and concise manner. This work explores and explains the fundamental aspects of virology, including structure of virus particles and genome, replication, gene expression, infection, pathogenesis and subviral agents. The self-assessment questions, glossary and abbreviations section provide excellent revision aids and serve as handy references to students, tutors and researchers alike. NEW TO FOURTH EDITION: * New material on virus structure and virus evolution * Updated pathogenesis section covering Ebola, SARS and HIV * New section on Bioterrorism * Fully updated references * New material on virus structure, virus evolution, zoonoses, bushmeat, SARS and bioterrorism

Applied Plant Virology

This volume of the series The Plant Viruses is devoted to viruses with rod-shaped particles belonging to the following four groups: the toba moviruses (named after tobacco mosaic virus), the tobraviruses (after to bacco rattle), the hordeiviruses (after the latin hordeum in honor of the type member barley stripe mosaic virus), and the not yet officially rec ognized furoviruses (fungus-transmitted rod-shaped viruses, Shirako and Brakke, 1984). At present these clusters of plant viruses are called groups instead of genera or families as is customary in other areas of virology. This pe culiarity of plant viral taxonomy (Matthews, 1982) is due to the fact that the current Plant Virus Subcommittee of the International Committee of

Taxonomy of Viruses is deeply split on what to call the categories or ranks used in virus classification. Some plant virologists believe that the species concept cannot be applied to viruses because this concept, according to them, necessarily involves sexual reproduction and genetic isolation (Milne, 1984; Murant, 1985). This belief no doubt stems from the fact that these authors restrict the use of the term species to biological species. According to them, a collection of similar viral isolates and strains does constitute an individ ual virus, i. e. , it is a taxonomy entity separate from other individual viruses.

Principles and Practice of Clinical Virology

Written for advanced undergraduate students, this book is a practical, in-depth guide to plant virology. Beginning with an introduction to viruses and their classification, the text describes virus pathology, including how viruses enter and move through plant cells and induce disease. Subsequent chapters discuss how viruses spread in the field and how to measure this. Throughout, the book remains reader-friendly, using focus boxes for clear, easy to obtain information, enabling students to quickly access relevant information but supply sufficient detail for advanced studies. In addition to basic information on virus biology there is an additional focus on applied virology, ideal for students undertaking agricultural studies for whom study of disease and its control is essential.

Comprehensive Virology 11

Molecular Virology of Human Pathogenic Viruses presents robust coverage of the key principles of molecular virology while emphasizing virus family structure and providing key context points for topical advances in the field. The book is organized in a logical manner to aid in student discoverability and comprehension and is based on the author's more than 20 years of teaching experience. Each chapter will describe the viral life cycle covering the order of classification, virion and genome structure, viral proteins, life cycle, and the effect on host and an emphasis on virus-host interaction is conveyed throughout the text. Molecular Virology of Human Pathogenic Viruses provides essential information for students and professionals in virology, molecular biology, microbiology, infectious disease, and immunology and contains outstanding features such as study questions and recommended journal articles with perspectives at the end of each chapter to assist students with scientific inquiries and in reading primary literature. Presents viruses within their family structure Contains recommended journal articles with perspectives to put primary literature in context Includes integrated recommended reading references within each chapter Provides access to online ancillary package inclusive of annotated PowerPoint images, instructor's manual, study guide, and test bank

Plant Virology Protocols

Plant Viruses As Molecular Pathogens

The time seems ripe for a critical compendium of that segment of the biological universe we call viruses. Virology, as a science, having passed only recently through its descriptive phase of naming and num bering, has probably reached that stage at which relatively few new truly new-viruses will be discovered. Triggered by the intellectual probes and techniques of molecular biology, genetics, biochemical cytology, and high resolution microscopy and spectroscopy, the field has experienced a genuine information explosion. Few serious attempts have been made to chronicle these events. This comprehensive series, which will comprise some 6000 pages in a total of about 22 volumes, represents a commitment by a large group of active investigators to analyze, digest, and expostulate on the great mass of data relating to viruses, much of which is now amorphous and disjointed, and scattered throughout a wide literature. In this way, we hope to place the entire field in perspective, and to develop an invalu able reference and sourcebook for researchers and students at all levels. This series is designed as a continuum that can be entered anywhere, but which also provides a logical progression of developing facts and integrated concepts.

Principles of Forest Pathology

Applied Plant Virology: Advances, Detection, and Antiviral Strategies provides an overview on recent developments and applications in the field of plant virology. The book begins with an introduction to important advances in plant virology, but then covers topics including techniques for assay detection and the diagnosis of plant viruses, the purification, isolation and characterization of plant viruses, the architecture of plant viruses, the replication of plant viruses, the physiology of virus-infected hosts, vectors of plant viruses, and the nomenclature and classification of plants. The book also discusses defense strategies by utilizing antiviral agents and management strategies of virus and viroid diseases. With contributions from an international collection of experts, this book presents a practical resource for plant virologists, plant pathologists, horticulturalists, agronomists, biotechnologists, academics and researchers interested in up-to-date technologies and information that advance the field of plant virology. Covers the detection, control and management of plant viruses Discusses antiviral strategies, along with mechanisms of systemic induced resistance to enhance the defense of plants against viruses Provides contributory chapters from expert plant virologists from different parts of the world

Plant Viruses

Plant Virology Protocols: New Approaches to Detect Viruses and Host Responses addresses recent developments in genome analyses and cytological technologies being used today to learn more about plant virology. Opening with chapters covering techniques relevant to the detection of unknown viruses and disease diagnosis, this detailed volume continues with chapters on the utilization of meta-genome sequencing and global gene expression analyses for the search and identification of viruses, as well as the elucidation of host responses to viral infection, construction methods of infectious cDNAs, and methods relevant to plant virus control. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Plant Virology Protocols: New Approaches to Detect Viruses and Host Responses will be an invaluable guide to researchers working in the field of plant sciences.

Applied Plant Virology

Plant genetic engineering has revolutionized our ability to produce genetically improved plant varieties. A large portion of our major crops have undergone genetic improvement through the use of recombinant DNA techniques in which microorganisms play a vital role. The cross-kingdom transfer of genes to

incorporate novel phenotypes into plants has utilized microbes at every step-from cloning and characterization of a gene to the production of a genetically engineered plant. This book covers the important aspects of Microbial Biotechnology in Agriculture and Aquaculture with and aim to improve crop yield.

Molecular Virology of Human Pathogenic Viruses

This practical guide covers the commonly used detection methods for seed-transmitted viruses and viroids that affect both tropical and temperate crops. It contains 25 complete step-by-step procedures for biological, serological and molecular techniques to detect and identify such viruses. Combining helpful practical notes with more detailed explanations of the principles behind the techniques, the book describes the general characteristics of seed-transmitted viral diseases and discusses outlines for the organization and interpretation of seed health assays. The techniques reviewed are also applicable to non-seed-transmitted viral agents.

Principles of Virology, Volume 1

As ancient as agriculture itself, plant breeding is one of civilization\'s oldest activities. Today, world food production is more dependent than ever on the

successful cultivation of only a handful of major crops, while continuing advances in agriculture rely on successfully breeding new varieties that are well-adapted to their human-influenced ecological circumstances. Plant breeding involves elements of both natural and cultural selection-a process which operates on individual plants and on plant populations. This book offers the most recent detailed knowledge of plant reproduction and their environmental interaction, which can help guide new breeding programs and help insure continuing progress in providing more food for growing populations produced with better care of the environment.

Principles of Plant Virology

Seeds provide an efficient means in disseminating plant virus and viroid diseases. The success of modern agriculture depends on pathogen free seed with high yielding character and in turn disease management. There is a serious scientific concern about the transmission of plant viruses sexually through seed and asexually through plant propagules. The present book provides the latest information along with the total list of seed transmitted virus and viroid diseases at global level including, the yield losses, diagnostic techniques, mechanism of seed transmission, epidemiology and virus disease management aspects. Additional information is also provided on the transmission of plant virus and virus-like diseases through vegetative propagules. It is also well known that seed transmitted viruses are introduced into new countries and continents during large-

scale traffic movements through infected germplasm and plant propogules. The latest diagnostic molecular techniques in different virus-host combinations along with disease management measures have been included. The book shall be a good reference source and also a text book to the research scientists, teachers, students of plant pathology, agriculture, horticulture, life sciences, green house managers, professional entrepreneurs, persons involved in quarantines and seed companies. This book has several important features of seed transmitted virus diseases and is a good informative source and thus deserves a place in almost all university libraries, seed companies and research organizations.

Fundamentals of Plant Virology