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This book argues that whole cells and whole plants growing in competitive wild conditions show aspects of plant behaviour that can be accurately described as "intelligent," and that behaviour, like intelligence, must be assessed within the constraints of the anatomical and physiological framework of the organism in question.

Authors Cecie Starr, Christine A. Evers, and Lisa Starr partnered with the National Geographic Society to develop this edition of **BIOLOGY: CONCEPTS AND APPLICATIONS**. Renowned for its clear writing style and unparalleled visuals, this trendsetting book applies exclusive National Geographic content to engage students and emphasize that biology is an ongoing endeavor carried out by a diverse community of scientists. Each chapter explores core concepts aligned with the American Association for the Advancement of Science (AAAS) initiative "Vision and Change in Undergraduate Biology Education" to help students master associated learning objectives. By continuously challenging students to question what they read and to apply the concepts they learn, the text allows our citizens and future policy-makers to hone critical thinking skills as they gain scientific literacy. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Optimum Design 2000

This book covers system safety methods related to occupational health and safety. It argues for anticipating hazards, risk reduction strategies for hazards processes, and making sure workers' tasks correspond to human capabilities. To this end, the text provides pro-active methods for identifying hazards, assessing risk,

analyzing hazards, using tools from system safety, conducting post-incident investigations, considering human errors, applying risk reduction strategies, and managing process safety. While emphasizing methods suitable for all countries, it includes references to U.S. military and Department of Energy documents, as well as a discussion of fault-tree construction.

Authors Kenneth Miller and Joseph Levine continue to set the standard for clear, accessible writing and up-to-date content that engages student interest. Prentice Hall Biology utilizes a student-friendly approach that provides a powerful framework for connecting the key concepts a biology. Students explore concepts through engaging narrative, frequent use of analogies, familiar examples, and clear and instructional graphics. Whether using the text alone or in tandem with exceptional ancillaries and technology, teachers can meet the needs of every student at every learning level.

Continuous discoveries in plant and crop physiology have resulted in an abundance of new information since the publication of the second edition of the Handbook of Plant and Crop Physiology, necessitating a new edition to cover the latest advances in the field. Like its predecessors, the Third Edition offers a unique, complete collection of topics in plant and crop physiology, serving as an up-to-date resource in the field. This edition contains more than 90 percent new material, and the remaining 10 percent has been updated and substantially revised. Divided into nine parts to make the information more accessible, this handbook covers the physiology of plant and crop growth and development, cellular and molecular aspects, and production processes. It addresses the physiological responses of plants and crops to environmental stresses, heavy metals, and agrichemicals; presents findings on

small RNAs in response to temperature stress; and discusses the use of bioinformatics in plant/crop physiology. The book deals with the impacts of rising CO2 levels and climate change on plant/crop growth, development, and production. It also offers guidance on plants and crops that can be successfully cultivated under more stressful conditions, presented in six chapters that examine alleviation of future food security issues. With contributions from 105 scientists from 17 countries, this book provides a comprehensive resource for research and for university courses, covering plant physiological processes ranging from the cellular level to whole plants. The content provided can be used to plan, implement, and evaluate strategies for dealing with plant and crop physiology problems. This edition includes numerous tables, figures, and illustrations to facilitate comprehension of the material as well as thousands of index words to further increase accessibility to the desired information.

Renowned for its writing style and trendsetting art, **DIVERSITY OF LIFE** engages students with relevant applications and encourages critical thinking. The new edition offers a new Learning Roadmap in each chapter to help students gain a full understanding. Students are able to focus on key concepts, make connections to other concepts, and see where the material is leading. Helpful learning tools like the section-ending Take-Home Messages and the on-page running glossary ensure they grasp key points. Carefully balancing accessibility and the level of detail, the authors enable students to go beyond rote memorization and prepare them to make important decisions in life that require an understanding of biology and the process of science. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Biotechnology revolutionized traditional plant breeding programs. This rapid change produced new discussions on techniques and opportunities for commerce, as well as a fear of the unknown. *Plant Development and Biotechnology* addresses the major issues of the field, with chapters on broad topics written by specialists. The book applies an informal style that addresses the major aspects of development and biotechnology with minimal references, without sacrificing information or accuracy. Divided into five primary parts, this volume explores how the field emerged from its early theoretical base to the technical discipline of today. It also covers progress being made with genetically engineered plants, providing a snapshot of the field's controversial present. Part III discusses methods for preparing media, creating solutions and dilutions, and accomplishing sterile culture work. It investigates common methods for visualizing and documenting studies, and quantifying responses of tissue culture in research. Part IV delivers the essential foundation of plant tissue culture, introducing the three types of commonly used culture regeneration systems. Part V integrates propagation techniques with other methodologies for the modification and manipulation of germplasm. Part VI concludes with special sections. Subjects include in vitro plant pathology, recent research into genetic and phenotypic variation, the mechanics of commercial plant production, and the importance of clean cultures and problems associated with maintaining in vitro cultures. The final chapter analyzes entrepreneurship in the field and outlines the do's and don'ts to consider when launching an enterprise.

Maintains a unique balance of emphasizing concepts without sacrificing scientific accuracy. Provides illustrations, process art and photographs to help readers visualize complex biological processes and to show clearly how the various stages of a dynamic process in biology unfold.

Photobiology is an important area of biological research since a very large number of living processes are either dependent on or governed by light that we receive from the Sun. Among various subjects, photosynthesis is one of the most important, and thus a popular topic in both molecular and organismic biology, and one which has made a considerable impact throughout the world since almost all life on Earth depends upon it as a source of food, fuel and oxygen. However, for growth of plants, light is equally essential, and research on photomorphogenesis has revealed exciting

new developments with the application of newer molecular biological approaches. The present book brings together and integrates various aspects of photosynthesis, biology of pigments, light regulation of chloroplast development, nuclear and chloroplast gene expression, light signal transduction, other photomorphogenetic processes and some photoecological aspects under one cover. The chapters cover biochemical and molecular discussions of most of the above topics in a comprehensive manner and include a wide range of 'hot topics' that are currently under investigation in the field of photobiology of cyanobacteria, algae and plants. The authors of this book are selected international authorities in their fields from USA, Europe, Australia and Asia. The book is designed primarily to be used as a text book by graduates and post-graduates. It is, however, also intended to be a resource book for new researchers in plant photobiology. Several introductory chapters are designed as suitable reading for undergraduate courses in integrative and molecular biology, biochemistry and biophysics.

Issues in Life Sciences—Botany and Plant Biology Research: 2012 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Plant Nutrition and Soil Science. The editors have built *Issues in Life Sciences—Botany and Plant Biology Research: 2012 Edition* on the vast information databases of ScholarlyNews.™ You can expect the information about Plant Nutrition and Soil Science in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of *Issues in Life Sciences—Botany and Plant Biology Research: 2012 Edition* has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Lees' Process Safety Essentials is a single-volume digest presenting the critical, practical content from *Lees' Loss Prevention for day-to-day use and reference*. It is portable, authoritative, affordable, and accessible — ideal for those on the move, students, and individuals without access to the full three volumes of *Lees'*. This book provides a convenient summary of the main content of

Lees', primarily drawn from the hazard identification, assessment, and control content of volumes one and two. Users can access *Essentials* for day-to-day reference on topics including plant location and layout; human factors and human error; fire, explosion and toxic release; engineering for sustainable development; and much more. This handy volume is a valuable reference, both for students or early-career professionals who may not need the full scope of *Lees'*, and for more experienced professionals needing quick, convenient access to information. Boils down the essence of *Lees'*—the process safety encyclopedia trusted worldwide for over 30 years Provides safety professionals with the core information they need to understand the most common safety and loss prevention challenges Covers the latest standards and presents information, including recent incidents such as Texas City and Buncefield

Intended for AS-and A-Level Biology and related courses this book provides coverage of the subject criteria .and also offers option topics such as Biotechnology and Human Health and Disease. Included are multiple choice questions for revision and examination questions for practice.

An overview of crop improvement; Analysis of genotype by environment interactions; Interpretation of genotype by environment interactions; Integrated approaches to plant improvement; Synthesis of strategies for crop improvement.

Cotton production today is not to be undertaken frivolously if one expects to profit by its production. If cotton production is to be sustainable and produced profitably, it is essential to be knowledgeable about the growth and development of the cotton plant and in the adaptation of cultivars to the region as well as the technology available. In addition, those individuals involved in growing cotton should be familiar with the use of management aids to know the most profitable time to irrigate, apply plant growth regulators, herbicides, foliar fertilizers, insecticides, defoliant, etc. The chapters in this book were assembled to provide those dealing with the production of cotton with the basic knowledge of the physiology of the plant required to manage the cotton crop in a profitable manner.

Renowned for its writing style and trendsetting art, *BIOLOGY: THE UNITY AND DIVERSITY OF LIFE* engages students with relevant applications and encourages critical thinking. The new edition offers a new Learning Roadmap in each chapter to help students gain a

full understanding. Students are able to focus on key concepts, make connections to other concepts, and see where the material is leading. Helpful learning tools like the section-ending Take-Home Messages and the on-page running glossary ensure they grasp key points. Carefully balancing accessibility and the level of detail, the authors enable students to go beyond rote memorization and prepare them to make important decisions in life that require an understanding of biology and the process of science. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

In past decades and in association with a continuing global industrial development, the global atmospheric concentration of carbon dioxide has been rising. Among the many predictions made concerning this disturbing trend is global warming sufficient to melt polar ice-caps thereby dramatically altering existing shorelines. This book will help fill an obvious gap in the carbon dioxide debate by substituting data for speculation. * * Includes contributions from leading authorities around the world * Serves as a companion to Carbon Dioxide and Terrestrial Ecosystems * The first book of its kind to explore evolutionary responses of both populations and communities to elevated carbon dioxide

Plant Life under Changing Environment: Responses and Management presents the latest insights, reflecting the significant progress that has been made in understanding plant responses to various changing environmental impacts, as well as strategies for alleviating their adverse effects, including abiotic stresses. Growing from a focus on plants and their ability to respond, adapt, and survive, Plant Life under Changing Environment: Responses and Management addresses options for mitigating those responses to ensure maximum health and growth. Researchers and advanced students in environmental sciences, plant ecophysiology, biochemistry, molecular biology, nano-pollution climate change, and soil pollution will find this an important foundational resource. Covers both responses and adaptation of plants to altered environmental states Illustrates the current impact of climate change on plant productivity, along with mitigation strategies Includes transcriptomic, proteomic, metabolomic and ionic approaches

This book provides current information on synthesis of plant hormones, how their concentrations are regulated, and how they modulate various plant processes. It details how plants sense and tol-

erate such factors as drought, salinity, and cold temperature, factors that limit plant productivity on earth. It also explains how plants sense two other environmental signals, light and gravity, and modify their developmental patterns in response to those signals. This book takes the reader from basic concepts to the most up-to-date thinking on these topics. * Provides clear synthesis and review of hormonal and environmental regulation of plant growth and development * Contains more than 600 illustrations supplementary information on techniques and/or related topics of interest * Single-authored text provides uniformity of presentation and integration of the subject matter * References listed alphabetically in each section

This book presents the state-of-the-art in plant ecophysiology. With a particular focus on adaptation to a changing environment, it discusses ecophysiology and adaptive mechanisms of plants under climate change. Over the centuries, the incidence of various abiotic stresses such as salinity, drought, extreme temperatures, atmospheric pollution, metal toxicity due to climate change have regularly affected plants and, and some estimates suggest that environmental stresses may reduce the crop yield by up to 70%. This in turn adversely affects the food security. As sessile organisms, plants are frequently exposed to various environmental adversities. As such, both plant physiology and plant ecophysiology begin with the study of responses to the environment. Provides essential insights, this book can be used for courses such as Plant Physiology, Environmental Science, Crop Production and Agricultural Botany. Volume 1 provides up-to-date information on the impact of climate change on plants, the general consequences and plant responses to various environmental stresses.

Plant Physiology: A Treatise, Volume X: Growth and Development explores the physiology of plant growth and development, considering the morphogenesis and morphogenetic systems, dormancy, environmental cues in plant growth and development, plant senescence, the role of hormones in growth regulation, cell division, and growth and development in space. This volume is organized into eight chapters and begins with an introduction to morphogenesis as a developmental phenotype, emphasizing the cell and the shoot. The next chapters cover events in the life of the plant, reflecting the importance of the whole plant concept to the subject, and the ways in which these events are controlled and integrated into environmental signals and events. An experimental ap-

proach to a model system for dormancy is described, and then the discussion shifts to senescence and death of plants as aspects of plant development. This volume also presents a clear and illuminating overview of the major plant growth regulators and their modes of action. This book also introduces the reader to cell division and its effect on most major developmental events after fertilization, along with the genetic analysis of development and its control by genes. The final chapter focuses on the integration of plant growth studies with the technology of space travel, which permits analysis of plant behavior in the complete absence of gravity. This book is intended for researchers, students, and specialists in related fields who wish to gain insight on the concepts and research trends in plant growth and development.

Abscisic Acid in Plants, Volume 92, the latest release in the Advances in Botanical Research series, is a compilation of the current state-of-the-art on the topic. Chapters in this new release comprehensively describe latest knowledge on how ABA functions as a plant hormone. They cover topics related to molecular mechanisms as well as the biochemical and chemical aspects of ABA action: hormone biosynthesis, catabolism, transport, perception, signaling in plants, seeds and in response to biotic and abiotic stresses, hormone evolution and chemical biology, and much more.

Chlorophyll a Fluorescence: A Signature of Photosynthesis highlights chlorophyll (Chl) a fluorescence as a convenient, non-invasive, highly sensitive, rapid and quantitative probe of oxygenic photosynthesis. Thirty-one chapters, authored by 58 international experts, provide a solid foundation of the basic theory, as well as of the application of the rich information contained in the Chl a fluorescence signal as it relates to photosynthesis and plant productivity. Although the primary photochemical reactions of photosynthesis are highly efficient, a small fraction of absorbed photons escapes as Chl fluorescence, and this fraction varies with metabolic state, providing a basis for monitoring quantitatively various processes of photosynthesis. The book explains the mechanisms with which plants defend themselves against environmental stresses (excessive light, extreme temperatures, drought, hyper-osmolarity, heavy metals and UV). It also includes discussion on fluorescence imaging of leaves and cells and the remote sensing of Chl fluorescence from terrestrial, airborne, and satellite bases. The book is intended for use by graduate students, beginning researchers and advanced undergraduates in the areas of integra-

tive plant biology, cellular and molecular biology, plant biology, biochemistry, biophysics, plant physiology, global ecology and agriculture.

Handbook of Maize: Its Biology centers on the past, present and future of maize as a model for plant science research and crop improvement. The book includes brief, focused chapters from the foremost maize experts and features a succinct collection of informative images representing the maize germplasm collection.

This new edition of *Fundamentals of Plant Physiology* continues to provide a comprehensive coverage on the basic principles of the subject with its focus on the concepts of plant physiological form, functions and its behaviour. While this new edition includes several contemporary topics to keep students abreast with the new ongoing research in the field, it also includes 11 new experiments to further strengthen the scientific outlook of the reader. Besides fulfilling the needs of undergraduate students, this book would also be useful for postgraduate students as well as aspirants of various competitive examinations.

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

Since the publication of the third edition of the *Handbook of Plant and Crop Stress*, continuous discoveries in the fields of plant and crop environmental stresses and their effects on plants and crops have resulted in the compilation of a large volume of the latest discoveries. Following its predecessors, this fourth edition offers a unique and comprehensive collection of topics in the fields of plant and crop stress. This new edition contains more than 80% new material, and the remaining 20% has been updated and revised substantially. This volume presents 10 comprehensive sections that include information on soil salinity and sodicity problems; tolerance mechanisms and stressful conditions; plant/crop responses; plant/crop responses under pollution and heavy metal; plant/crop responses under biotic stress; genetic factors and plant/crop genomics under stress conditions; plant/crop breeding under stress conditions; empirical investigations; improv-

ing tolerance; and beneficial aspects of stressors. Features: Provides exhaustive coverage written by an international panel of experts in the field of agriculture, particularly in plant/crop stress areas Contains 40 new chapters and 10 extensively revised and expanded chapters Includes three new sections on plant breeding, stress exerted to weeds by plants, and beneficial aspects of stress on plants/crops Numerous case studies With contributions from 100 scientists and experts from 20 countries, this Handbook provides a comprehensive resource for research and for university courses, covering soil salinity/sodicity issues and plant/crop physiological responses under environmental stress conditions ranging from cellular aspects to whole plants. The content can be used to plan, implement, and evaluate strategies to mitigate plant/crop stress problems. This new edition includes numerous tables, figures, and illustrations to facilitate comprehension of the material as well as thousands of index words to further increase accessibility to the desired information.

Issues in Life Sciences: Botany and Plant Biology Research: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Life Sciences—Botany and Plant Biology Research. The editors have built *Issues in Life Sciences: Botany and Plant Biology Research: 2011 Edition* on the vast information databases of ScholarlyNews.™ You can expect the information about Life Sciences—Botany and Plant Biology Research in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of *Issues in Life Sciences: Botany and Plant Biology Research: 2011 Edition* has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Examines real life problems and solutions for operators and engineers running process controls Expands on the first book with the addition of five new chapters as well as new troubleshooting examples Written for the working operator and engineer, with straightforward instruction not hinged on complex math Includes real-life examples of control problems that commonly arise and

how to fix them Emphasizes single and well-established process engineering principles that will help working engineers and operators switch manual control loops to automatic control

Increasing Population Levels On A Near Stabilized Agricultural Land Places A Heavy Burden On The Soil Source Particularly Its Nutrient Supplying Power. Chemical Fertilizers Have Come To Increase The Output Of Agricultural Product And To Meet Ever Increasing Demand Of Human Population. The Problem Is Further Compounded In Several Areas Due To Excessive Use Of Chemical Fertilizers Which Resulted Into Considerable Deterioration In The Quality Of Indigenous Soil. Intensive Agriculture With The Use Of Chemical Fertilizers In Large Amount Has, No Doubt, Resulted In Manifold Increase In The Productivity Of Farm Commodities But The Adverse Effect Of These Chemicals Are Clearly Visible On Soil Structure, Microflora, Quality Of Water, Food And Fodder. Organic Farming Has Emerged As The Only Answer To Bring Sustainability To Agriculture And Environment. Organic Farming Is A Farming Integration Of Biological, Cultural And Natural Inputs Including Integrated Diseases And Pest Management Practices. Integrated Plant Nutrition Can Be Best If It Is Practised On Scientific Facts, Local Conditions And Microeconomics. We Hope This Publication Will Create A Balanced, Objective And Science Based Appreciation For Meeting The Nutrient Needs Of Agriculture. This Book Has Been Written For Agricultural Planners, Soil Scientists, Biologists, Microbiologists, Students, Teachers, Fertilizer Industry, Personnel Research And Development Units, Organisation Engaged In Biofertilizer Production, Training Centres, All Those Interested In The Efficient Use And Recycling Of Wastes, Resource Management And Sustainable Farming. Contents Chapter 1: Integrated Plant Nutrition Systems; Chapter 2: Organic Manures: Their Nature And Characteristics; Chapter 3: Livestock And Human Wastes: Characteristics And Value; Chapter 4: Potential Of Organic Materials And Plant Nutrients; Chapter 5: Preparation, Processing And Preservation Of Organic Manures; Chapter 6: Biogas Potential From Livestock Wastes And Human Excreta; Chapter 7: Response Of Crops To Organic Manures; Chapter 8: Response Of Crops To Organic Materials In Salt Affected Soils; Chapter 9: Nitrogen Fixation; Chapter 10: Mycorrhizae In Agriculture; Chapter 11: Fertilizers With Organics And Biofertilizers; Chapter 12: Bulky Organic Manures And Crop Residues; Chapter 13: Green Manuring: Nutrient Potentials; Chapter 14: Biological And Industrial Wastes: Source Of Plant Nu-

trients; Chapter 15: Role Of Biofertilizers In Crop Production; Chapter 16: Biofertilizers For Flooded Rice Ecosystem; Chapter 17: Production, Distribution And Promotion Of Biofertilizers; Chapter 18: Effect Of Biofertilizers On Growth; Chapter 19: Biofertilizer: A Supplementary Nutrient; Chapter 20: Bioinoculation And Biofertilizer On Growth; Chapter 21: Significance And Azospirillum Brassilense And Pseudomonas On Growth; Chapter 22: Application Of Mycorrhizae And Rhizobium On Biomass Production; Chapter 23: Effect Of Vam Fungi On Banana Plants; Chapter 24: Mungbean With Solubilizing Bacteria; Chapter 25: Performance Of Azymbiotic Biofertilizers; Chapter 26: Effect Of Azospirillum On Quality Of Sugarcane; Chapter 27: Bioinoculants For Recycling Banana Wastes; Chapter 28: Pressmud As Plant Growth Promoter; Chapter 29: Biofertilizer For Multipurpose; Chapter 30: Tree Legumes Seedlings; Chapter 30: Infectivity On Growth Of Cajanus Cajan; Chapter 32: Saline Soil Tolerance; Chapter 33: Importance Of Vam Mycorrhizae; Chapter 34: Biochemical And Genetic Characterisation Of Mineral Phosphate; Chapter 35: Effect Of Phosphobacterium On Growth; Chapter 36: Effect Of Phosphomicrobes; Chapter 37: Recommendations.

One program that ensures success for all students

Under ongoing climate changes, natural and cultivated habitats of major crops are being continuously disturbed. Such conditions impose and exacerbate abiotic and biotic stressors. Drought, salinity, flood, cold, heat, heavy metals, metalloids, oxidants, irradiation, etc. are important abiotic stressors, while diseases and infections caused by plant pathogens, such as fungal agents, bacteria and viruses, are major biotic stresses. In many instances, stresses have become the major limiting factor for agricultural productivity and exert detrimental role on growth and yield of the crops. To help feed an ever increasing world population and to ensure glob-

al food security, concerted efforts from scientists and researchers have identified strategies to manage and mitigate the impacts of climate-induced stresses. This book, summarizing their findings, is aimed at crop improvement beyond such kind of barriers, by agronomic practices (genetics, breeding, phenotyping, etc.) and biotechnological applications, including molecular markers, QTL mapping, genetic engineering, transgenesis, tissue culture, various 'omics' technologies and gene editing. It will cover a wide range of topics under environmental challenges, agronomy and agriculture processes, and biotechnological approaches. Additionally, fundamental mechanisms and applied information on stress responses and tolerance will be discussed. This book highlights problems and offers proper solutions for crop stress management with recent information and up-to-date citations. We believe this book is suitable for scientists, researchers and students working in the fields of agriculture, plant science, environmental biology and biotechnology.

The dynamic and expanding knowledge of environmental stresses and their effects on plants and crops have resulted in the compilation of a large volume of information in the last ten years since the publication of the second edition of the Handbook of Plant and Crop Stress. With 90 percent new material and a new organization that reflects this incre

Eukaryotic Microbes presents chapters hand-selected by the editor of the Encyclopedia of Microbiology, updated whenever possible by their original authors to include key developments made since their initial publication. The book provides an overview of the main groups of eukaryotic microbes and presents classic and cutting-edge research on content relating to fungi and protists, including chapters on yeasts, algal blooms, lichens, and intestinal protozoa. This concise and affordable book is an essential reference for students and researchers in microbiology, mycology, im-

munology, environmental sciences, and biotechnology. Written by recognized authorities in the field Includes all major groups of eukaryotic microbes, including protists, fungi, and microalgae Covers material pertinent to a wide range of students, researchers, and technicians in the field

Adverse environmental factors can impose stress on plants and influence the expression of the full genetic potential for growth and reproduction. The capability of plants to develop plastic response reactions, to adapt to environmental stress situations, is unique in the biological world. A goal of the research described in this volume is to increase crop productivity, particular in regions where the environment imposes stress. An understanding of the principles involved in plant adaptation to environmental stress will enable optimisation of practices to improve agronomic production and minimise damaging environmental impact. The aim of this volume is to link the rapidly advancing and increasingly specialist field of molecular biology with plant physiology at the ecosystem level. The book includes chapters focused on some principle methods and a series of up-to-date review chapters on plant adaptation to a variety of specific stresses. The utilisation of newly available genome information is emphasised. Of particular importance is the desire to highlight the current potential of such approaches, and how diverse disciplines can interact and complement one another. The book is aimed at both the specialist and the advanced student.

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.