Handbook of Cucurbits

Integrating Growth Regulators into Agriculture

Emerging Trends of Plant Physiology for Sustainable Crop Production

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Handbook of Cucurbits

Integrated Management of Salt Affected Soils in Agriculture is a concise guide to evaluating and addressing soil issues related to saline content. Methods focused, the book combines agricultural and soil-based insights to efficiently remediate salt-affected soil. Environmental stress conditions such as salinity have a devastating impact on plant growth and yield, causing considerable loss to agricultural production worldwide. Soil salinity control prevents soil degradation by salinization and reclaim already saline soils. This book will help develop the proper management procedures, to solve problems of crop production on salt-affected soils. Provides both agricultural science and soil science perspectives on soil salinity Identifies differences in salt-affected soils and appropriate remediation options Includes methodologies based on existing scenario and targeted outcomes

Salinity and Water Stress

Emerging Trends of Plant Physiology for Sustainable Crop Production

Water Resources Research Catalog

The Role of Plant Roots in Crop Production presents the state of knowledge on environmental factors in root growth and development and their effect on the improvement of the yield of annual crops. This book addresses the role of roots in crop production and includes references to numerous annual crops. In addition, it brings together the issues and

Sustainable Agriculture

This book explores the impact of soil water deficiency on various aspects of physiological processes in plants. The book explains the effects under soil water deficit condition such as lowering of plant water content, disturbance in carbon metabolism such in photosynthesis, photorespiration and respiration as well as effects of soil water deficit on nitrogen metabolism. The book also educates the readers about, mineral nutrition under soil water deficit condition and roles of different nutrient to overcome water deficit. Changes in growth and development pattern of plant
under soil water deficit condition and effects on growth and development are elaborated. This book is of interest to teachers, researchers, scientists in botany and agriculture. Also the book serves as additional reading material for undergraduate and graduate students of agriculture, forestry, ecology, soil science, and environmental sciences. National and international agricultural scientists, policy makers will also find this to be a useful read. The in depth description of the major physiological issues in plants under soil water deficit that are presented in this book will help breeders tailoring crops for desirable physiological survival traits in the face of increasing soil water deficit. This book is an impactful addition to the library of any faculty members, researchers, agricultural policy planner, post graduate or student studying in plant physiology, biochemistry, microbiology and other subjects related to crop husbandry.

Soil Water Deficit and Physiological Issues in Plants

Emerging Plant Growth Regulators in Agriculture


Black Pepper

Mineral Nutrition of Fruit Trees

The production of cellular oxidants such as reactive oxygen species (ROS) is an inevitable consequence of redox cascades of aerobic metabolism in plants. This milieu is further aggravated by a myriad of adverse environmental conditions that plants, owing to their sessile lifestyle, have to cope with during their life cycle. Adverse conditions prevent plants reaching their full genetic potential in terms of growth and productivity mainly as a result of accelerated ROS generation-accrued redox imbalances and halted cellular metabolism. In order to sustain ROS-accrued consequences, plants tend to manage a fine homeostasis between the generation and antioxidants-mediated metabolisms of ROS and its reaction products. Well-known for their involvement in the regulation of several non-stress-related processes, redox related components such as proteinaceous thiol members such as thioredoxin, glutaredoxin, and peroxiredoxin proteins, and key soluble redox-compounds namely ascorbate (AsA) and glutathione (GSH) are also listed as efficient managers of cellular redox homeostasis in plants. The management of the cellular redox homeostasis is also contributed by electron carriers and energy metabolism mediators such as non-phosphorylated (NAD+) and the phosphorylated (NADP+) coenzyme forms and their redox couples DHA/AsA, GSSG/GSH, NAD+/NADH and NADP+/NADPH. Moreover, intracellular concentrations of these cellular redox homeostasis managers in plant cells fluctuate with the external environments and mediate dynamic signaling in pant stress responses. This research topic aims to exemplify new information on how redox homeostasis managers are modulated by environmental cues and what potential strategies are useful for improving cellular concentrations of major redox homeostasis managers. Additionally, it also aims to provide readers detailed updates on specific topics, and to highlight so far unexplored aspects in the current context.

Fertilizer Abstracts

Most crop plants grow in environments that are suboptimal, which prevents the plants from attaining their full genetic potential for growth and reproduction. Stress due to abiotic and biotic agents has a significant effect on world food production. Annually, an estimated 15% of global yields are lost, but this figure belies far greater losses for specific food systems and the people whose existence is dependent upon them, particularly in developing countries. Current efforts to mitigate these losses are worryingly over-reliant on the use of sophisticated and costly chemicals /measures with substantial economic and environmental costs, or on the development of efficient and smart crop varieties, which can take decades. What we need is a broad range of safe, robust and equitable...
solutions for food producers. One under-investigated approach is that of utilizing the crop plant’s innate immune system to resist stress. More specifically, the innate immune system can be sensitized or ‘primed’ to respond more quickly and strongly to protect the plant against stresses. However, a strategy of employing priming in combination with reduced pesticide use can enhance protection, and help to meet commitments to reducing chemical inputs in agriculture. This book discusses in detail different segments of priming in addressing stress factors and traits to increase competitiveness against all odds. Adopting a holistic and systematic approach, it addresses priming to counter climate-change related adverse effects coupled with pest and pathogen related stress on the productivity of crops utilizing natural resources to reap sustainable environmental, economic and social benefits for potential productivity of crops, maintaining synergy between soil, water and plants in ways that mimic nature.

Pakistan Journal of Botany Improving Cereal Productivity through Climate Smart Practices is based on the presentations of the 4th International Group Meeting on “Wheat productivity enhancement through climate smart practices,” and moves beyond the presentations to provide additional depth and breadth on this important topic. Focused specifically on wheat, and with chapters contributed by globally renowned pioneers in the field of cereal science, the book helps readers understand climate change and its effects on different aspects of wheat production in different parts of the world. This book will be important for those in research and industry seeking to contribute to the effective feeding of the world’s population. Encompasses the possible impact of climate change and future strategies to enhance wheat production on a sustainable basis Explores the genetic manipulation of wheat to mitigate the effects of climate change Includes both biotic and abiotic stresses and their management under changing climate

Engineering Practices for Management of Soil Salinity

Advances in Seed Priming Advances in Agronomy continues to be recognized as a leading reference and first-rate source for the latest research in agronomy. Each volume contains an eclectic group of reviews by leading scientists throughout the world. As always, the subjects covered are rich, varied, and exemplary of the abundant subject matter addressed by this long-running serial. Includes numerous, timely, state-of-the-art reviews on the latest advancements in agronomy Features distinguished, well recognized authors from around the world Builds upon this venerable and iconic review series Covers the extensive variety and breadth of subject matter in the crop and soil sciences

Bibliography of Agriculture Analysis, Fate, and Toxicity of Engineered Nanomaterials in Plants, Volume 84 in the Comprehensive Analytical Chemistry series, highlights new advances in the field, with this new volume presenting interesting chapters on the Current status of environmental monitoring, Physical principles of infrared, Chemical principles of infrared, Instrumentation and hardware, Data analysis, Sampling, Applications in water, Application in soil and sediments, Applications in ecology of animals and plants, Applications in air monitoring, Applications in contamination, Applications in marine environments, Advantages and pitfalls, and more. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Comprehensive Analytical Chemistry series Updated release includes the latest information on the field of engineered nanomaterials in plants
Improving Cereal Productivity through Climate Smart Practices

The practice of biotechnology, though different in style, scale and substance in globalizing science for development involves all countries. Investment in biotechnology in the industrialised, the developing, and the least developed countries, is now amongst the widely accepted avenues being used for economic development. The simple utilization of kefir technology, the detoxification of injurious chemical pesticides e.g. parathion, the genetic tailoring of new crops, and the production of a first of a kind of biopharmaceuticals illustrate the global scope and content of biotechnology research endeavour and effort. In the developing and least developed nations, and in which the 9 most populous countries are encountered, problems concerning management of the environment, food security, conservation of human health resources and capacity building are important factors that influence the path to sustainable development. Long-term use of biotechnology in the agricultural, food, energy and health sectors is expected to yield a windfall of economic, environmental and social benefits. Already the prototypes of new medicines and of prescription fruit vaccines are available. Gene based agriculture and medicine is increasingly being adopted and accepted. Emerging trends and practices are reflected in the designing of more efficient bioprocesses, and in new research in enzyme and fermentation technology, in the bioconversion of agro industrial residues into bio-utility products, in animal healthcare, and in the bioremediation and medical biotechnologies. Indeed, with each new day, new horizons in biotechnology beckon.

The Protection of Sugarcane and Sugar Beets, January 1979-February 1988

Agricultural Conservation Practices and Related Issues Emerging Plant Growth Regulators in Agriculture: Roles in Stress Tolerance presents current PGR discoveries and advances for agricultural applications, providing a comprehensive reference for those seeking to apply these tools for improved plant health and crop yield. As demand for agricultural crops and improved nutritional requirement continue to escalate in response to increasing population, plant researchers have focused on identifying scientific approaches to minimize the negative impacts of climate change on agriculture crops. Among the various applied approaches, the application of plant growth regulators (PGRs) have gained significant attention for their ability to enhance stress tolerance mechanisms. This book was developed to provide foundational and emerging information to advance the discovery of novel, cost-competitive, specific and effective PGRs for applications in agriculture. Highlights the latest developments in stress signaling, cross-talk and PGR mechanisms as applied to agriculture and agronomy Includes case studies and examples to provide real-world insights Presents resources for future research and field application

Integrated Management of Salt Affected Soils in Agriculture The book provides in-depth knowledge on the physiology of soybean. It is written lucidly, systematically, and in depth. The book provides recent information and findings, explained with illustrations to express the ideas and concepts vividly to university students and researchers, and provides a better understanding of the improvement of the productivity of soybean to cope with the future demand. It describes the physiology of growth, development, flowering, pod development and seed yield as well as C, O, N and Oil metabolisms – their hormonal regulations under normal and stress environmental conditions. Molecular approaches are also described.

Advances in Agronomy Sustainability is extremely important in dryland farming under global climatic change. Technology devised by various agricultural institutions is provided in this book. Variation in environmental factors may influence entire ecological system which may not be ideal for agriculture. Under such global scenario, plant growth is under geopardy. New varieties have to be developed to suit the varied climate or crop strategy in view of crop domain suiting ideal available temperature has to be framed to make dryland farming sustainable. Various agrotechnology needs to be adapted to avoid depletion in productivity. Global climatic change in future may limit the productivity of available...
The book discusses the effects of growth regulators on growth yield and ions in various crop varieties. Corporate farming may come to rescue the problem under present scenario. Various agrotechnologies described in this book may help the farmers and planners to overcome the situation in future. Critical problems have been dealt with probable solutions to suit the requirements.

Multicropping system, organic farming, watersheds promotion, reclamation of degraded soils, soil health cards, use of portals of weather forecast, early harvest on physiological maturity and use of instant remedies timely under unfavourable season shall ease the failure of crop. Long outstanding demand has thus fulfilled with this book.

Nuclear Science Abstracts Plant physiology is now considered as an essential ingredient for improving crop productivity, a continuing necessity with today's ever-increasing world population. This new volume provides an understanding of the physiological basis of the various plant processes and their underlying mechanisms under fluctuating environments, which is of great importance for sustainable crop production. Further advances in cellular and molecular biology hold promise to modify physiological processes, thereby improving the quality and quantity of major food crops and ensuring stability in yield of the produce even under severe abiotic stress. This book covers the latest information on the physiological basis of plant productivity, including abiotic stress adaptation and management, plant nutrition, climate change and plant productivity, transgenic and functional genomics, and plant growth regulators and their applications. The chapters in this volume tackle some of these key issues of sustainable plant production and evolve future strategies in overcoming challenges faced by the agricultural sector as a whole. The topics covered in this book presents important from research reputed scientists. This volume is a rich source of information in one place. It will be a useful resource for researchers and extension workers involved in plant physiology and related disciplines.

Key features:
- Provide the latest information on developments in plant physiology
- Covers abiotic and biotic stress on economically important crop species
- Presents a detailed collection of biotechnological approaches in plant physiology
- Covers plant growth regulators, secondary metabolites, germination, crop growth and development of different crop species
- Provides research from experts at internationally renowned institutes

Bibliographies and Literature of Agriculture

Agrotechnology for Dryland Farming 2nd. Revised Ed. Researches have made tremendous progress in the area of Plant Physiology, greatly increasing our understanding of living processes, necessary for biotechnological research. Different volumes of the treatise "Advances in Plant Physiology" covers the entire spectrum of Plant Physiology including the Plant Molecular Biology in order to encourage meaningful research in the coming twenty-first century. The true endeavor in this direction is the result of comprehensive, authoritative and timely publication of this valuable treatise, provides the reader with the most recent information, views and references focused on individual topics through a rich collection of reviews contributed by pioneer workers and of those actively engaged in the studies of various specific areas in different parts of the world with extensive experience, established record of eminence and noted authorities. In fact, this treatise is a treasure for interdisciplinary exchange of information and the approach to topic ranges from theoretical to applied molecular to organismic and single to multivariable systems. Apart from fulfilling the need of this treatise for research teams and scientists actively working in the areas of plant physiology biochemistry and plant molecular biology in universities institutes and research laboratories throughout the world, it would be extremely a useful book and a voluminous reference material for acquiring advanced knowledge by students in response to innovative courses in Plant Physiology, Plant Biochemistry, Agronomy, Genetics and Plant Breeding, Genetic Engineering, Microbiology, Plant Biotechnology and Botany. Over eighteen (18) chapters of Vol. 1 extensively elucidate the needful topics of Biological Nitrogen Fixation, Plant Cell and Tissue Culture, Plant Metabolism, certain rare Techniques in Plant Physiology, Herbicides Physiology, Plant Growth Regulators, Physiology of Rooting, Tree Physiology, Stress Physiology (in 5 / 8...
Redox Homeostasis Managers in Plants under Environmental Stresses Introduces readers to the chemical biology of plant biostimulants. This book brings together different aspects of biostimulants, providing an overview of the variety of materials exploited as biostimulants, their biological activity, and agricultural applications. As different groups of biostimulants display different bioactivity and specificity, advances in biostimulant research is illustrated by different examples of biostimulants, such as humic substance, seaweed extracts, and substances with hormone-like activities. The book also reports on methods used to screen for new biostimulant compounds by exploring natural sources. Combining the expertise of internationally-renowned scientists and entrepreneurs in the area of biostimulants and biofertilisers, The Chemical Biology of Plant Biostimulants offers in-depth chapters that look at: agricultural functions and action mechanisms of plant biostimulants (PBs); plant biostimulants from seaweed; seaweed carbohydrates; and the possible role for electron shuttling capacity in elicitation of PB activity of humic substances on plant growth enhancement. The subject of auxins is covered next, followed closely by a chapter on plant biostimulants in vermicomposts. Other topics include: exploring natural resources for biostimulants; the impact of biostimulants on whole plant and cellular levels; the impact of PBs on molecular level; and the use of use of plant metabolites to mitigate stress effects in crops. Provides an insightful introduction to the subject of biostimulants Discusses biostimulant modes of actions Covers microbial biostimulatory activities and biostimulant application strategies Offers unique and varied perspectives on the subject by a team of international contributors Features summaries of publications on biostimulants and biostimulant activity The Chemical Biology of Plant Biostimulants will appeal to a wide range of readers, including scientists and agricultural practitioners looking for more knowledge about the development and application of biostimulants.
Advances in Plant Physiology (Vol. 4) The Handbook of Cucurbits: Growth, Cultural Practices, and Physiology contains information on cultural practices, nutrition, and physiological processes of cucurbits under both normal and stressful conditions. It presents the history and importance of cucurbit crop production as well as exhaustive information on growth responses of cucurbits to variety of factors.

Analysis, Fate, and Toxicity of Engineered Nanomaterials in Plants
New Horizons in Biotechnology

It is known that dryland farming is not remunerative due to several constraints. Location specific technologies have been evolved for yield stabilization in dryland farming and conservation of fragile ecosystem by sustainable use of soil and water resources. Drought and flood situations are experienced somewhere in the country despite plentiful resources of water, although the number of sunshine hours but poverty among farmers still exists. This is a serious concern.

Agrotechniques are alone the answer for low productivity (0.8 t/ha) of 90% rainfed farming. To feed over one billion galloping population of the country, there is a need to increase the productivity to 1.5 t/ha by 2010 AD. This book deals with seed, soil, watersheds, crop, weed and nutrient management, use of weather forecast, measures to save crops under abiotic stresses like drought and flooding, selection of crops and variety, reclamation of degraded land, organic recycling, agro-meterological approaches, water requirement, early harvest on physiological maturity, agro-hydro modelling and suitable medicinal and aromatic crops to make dry farming remunerative for welfare of common farmers. This is the first comprehensive book where a large number of agro-techniques are incorporated. Chapters are written by eminent scientists of national repute who have devoted their life time to solve probable problems of dryland. Agro-techniques can well be adopted with ease by farmers through extension agencies to avoid bankruptcy. Book includes all relevant aspects of rainfed farming and is therefore a valuable addition in Dry Farming and meets the expectations of all those interested in rainfed farming in the country and abroad. Long outstanding demand has thus fulfilled with this book. The novel approach of the editor has made the reader's task quick and minimized their efforts by compiling all agro-techniques together at one place for benefit of farmers.

Irrigation Efficiency Sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. Starving people in poor nations, obesity in rich nations, increasing food prices, on-going climate changes, increasing fuel and transportation costs, flaws of the global market, worldwide pesticide pollution, pest adaptation and resistance, loss of soil fertility and organic carbon, soil erosion, decreasing biodiversity, desertification, and so on. Despite unprecedented advances in sciences allowing to visit planets and disclose subatomic particles, serious terrestrial issues about food show clearly that conventional agriculture is not suited any longer to feed humans and to preserve ecosystems. Sustainable agriculture is an alternative for solving fundamental and applied issues related to food production in an ecological way. While conventional agriculture is driven almost solely by productivity and profit, sustainable agriculture integrates biological, chemical, physical, ecological, economic and social sciences in a comprehensive way to develop new farming practices that are safe and do not degrade our environment. In that respect, sustainable agriculture is not a classical and narrow science. Instead of solving problems using the classical painkiller approach that treats only negative impacts, sustainable agriculture treats problem sources. As most actual society issues are now intertwined, global, and fast-developing, sustainable agriculture will bring solutions to build a safer world. This book gathers review articles that analyze current agricultural issues and knowledge, then propose alternative solutions. It will therefore help all scientists, decision-makers, professors, farmers and politicians who wish to build a safe agriculture, energy and food system for future generations.
Physiology of Soybean Plant Abiotic stresses are known to adversely impact agricultural productivity on millions of hectares globally, and it is projected that these problems are likely to increase, primarily due to anthropogenic interventions as well as climatic changes. Understanding abiotic stresses—especially salt stress on soil—calls for an interdisciplinary approach because salt-stressed soils need hydro-technical, chemical, and agronomic interventions as well as an understanding of plant response when exposed to these stresses. This volume explores and conveys the latest information on emerging technologies in the management of abiotic salt stress and their field applications. It brings together experts from various fields (academia, technology, and engineering) to provide the latest information and knowledge on this important challenge.

Abstracts on Tropical Agriculture

Rice Research for Quality Improvement: Genomics and Genetic Engineering Salinity and water stress limit crop productivity worldwide and generate substantial economic losses each year, yet innovative research on crop and natural resource management can reveal cost-effective ways in which farmers can increase both their productivity and their income. Presenting recent research findings on salt stress, water stress and stress-adapted plants, this book offers insights into new strategies for increasing the efficiency of crops under stressful environments. The strategies are based on conventional breeding and advanced molecular techniques used by plant physiologists, and are discussed using specific case studies to illustrate their potential. The book emphasizes the effects of environmental factors on specific stages of plant development, and discusses the role of plant growth regulators, nutrients, osmoprotectants and antioxidants in counteracting their adverse affects. Synthesising updated information on mechansisms of stress tolerance at cell, tissue and whole-plant level, this book provides a useful reference text for post graduate students and researchers involved in the fields of stress physiology and plant physiology in general, with additional readership amongst researchers in horticulture, agronomy, crop science, conservation, environmental management and ecological restoration.

The Chemical Biology of Plant Biostimulants

Sustainable Dryland Farming This book focuses on the conventional breeding approach, and on the latest high-throughput genomics tools and genetic engineering / biotechnological interventions used to improve rice quality. It is the first book to exclusively focus on rice as a major food crop and the application of genomics and genetic engineering approaches to achieve enhanced rice quality in terms of tolerance to various abiotic stresses, resistance to biotic stresses, herbicide resistance, nutritional value, photosynthetic performance, nitrogen use efficiency, and grain yield. The range of topics is quite broad and exhaustive, making the book an essential reference guide for researchers and scientists around the globe who are working in the field of rice genomics and biotechnology. In addition, it provides a road map for rice quality improvement that plant breeders and agriculturists can actively consult to achieve better crop production.

Responses of Some Legume Crops to Irrigation and Growth Regulators Black Pepper is the first monograph on this important and most widely used spice. This volume includes chapters on all aspects of the crops' botany; crop improvement, agronomy, chemistry, post-harvest technology, processing, diseases, insect pests, marketing, economy and uses. All the available information has been collected and presented by expert

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