Waterlog

Water Log

Land degradation caused by salinity and waterlogging is a global problem afflicting about one billion hectares and endangering the food security of at least 75 countries. Since the social, economic and environmental costs of on and/off-farm reclamation techniques are high, agroforestry is now emerging as a potential tool, not only for arresting salinity and waterlogging, but also for other environmental services like mitigating climate change, sequestering carbon and restoring biodiversity. This publication addresses the vital issues, principles and practices related to rehabilitation using agroforestry and includes many site-specific case studies from a number of the world's typical catchments. Written by leading researchers, the book is a must, not only for scientists whose research interests lie in soil salinity, waterlogging and poor-quality waters, but also policy makers, environmentalists, students, and educationists alike. More importantly, it contributes to reversing the salinity trends and ensuring the livelihoods of resource-poor farming families living in these harsh agro-ecosystems.

Agroforestry for the Management of Waterlogged Saline Soils and Poor-Quality Waters

This work reflects preoccupations with the threats posed to our environment due to climatic factors, major and natural hazards of all kinds and demographic influences. Topics covered include land surface processes, coastal zones and atmospheric risks.

Observing Our Environment from Space - New Solutions for a New Millennium

RACR is a series of biennial international conferences on risk analysis, crisis response, and disaster prevention for specialists and stakeholders. RACR-2015, held June 1-3, 2015 in Tangier, Morocco, was the fifth conference in this series, following the successful RACR-2007 in Shanghai (China), RACR-2009 in Beijing (China), RACR-2011 in Laredo (US

Emerging Economies, Risk and Development, and Intelligent Technology

In the last half century, because of the raising world population and because of the many environmental issues posed by the industrialization, the amount of arable land per person has declined from 0.32 ha in 1961–1963 to 0.21 ha in 1997–1999 and is expected to drop further to 0.16 ha by 2030 and therefore is a severe menace to food security (FAO 2006). At the same time, about 12 million ha of irrigated land in the developing world has lost its productivity due to waterlogging and salinity. Waterlogging is a major problem for plant cultivation in many regions of the world. The reasons are in part due to climatic change that leads to the increased number of precipitations of great intensity, in part to land degradation. Considering India alone, the total area suffering from waterlogging is estimated to be about 3.3 million ha (Bhattacharya 1992), the major causes of waterlogging include super- ous irrigation supplies, seepage losses from canal, impeded sub-surface drainage, and lack of proper land development. In addition, many irrigated areas are s- jected to yield decline because of waterlogging due to inadequate drainage systems. Worldwide, it has been estimated that at least one-tenth of the irrigated cropland suffers from waterlogging.

Waterlogging Signalling and Tolerance in Plants

The book has been logically divided into 8 chapters, successively dealing with the technological components in each chapter. Most of the issues that have been discussed for waterlogged inland saline soils have been

briefly discussed in the last 8th Chapter, for the coastal regions. Finally the socio-economic aspects which are important to decide the economic viability of rehabilitation projects have been included in the last chapter. Computer programmes have been included, which is the modern approach in dealing with issues of design and development.

Crop Production in Waterlogged Saline Soils

The Proceeding contains the following sections: i) Groundwater Exploration and Exploitation; (ii) RS&GIS Applications in Water Resources; (iii) Watershed Management: Hydrological, Socio-Economic and Cultural Models; (iv) Water and Wastewater Treatment Technologies; (v) Rainwater Harvesting and Rural and Urban Water Supplies; (vi) Floods, Reservoir Sedimentation and Seawater Intrusion; (vii) Water Quality, Pollution and Environment; (viii) Irrigation Management; (ix) Water Logging and Water Productivity in Agriculture; (x) Groundwater Quality; (xi) Hydrologic Parameter Estimation and Modelling; (xii) Climate Change, Water, Food and Environmental Security; (xiii) Groundwater Recharge and Modelling; (xiv) Computational Methods in Hydrology; (xv) Soil and Water Conservation Technologies.

Irrigation Management in Relation to Waterlogging and Salinity

Saline land is a resource capable of significant production. Recent advances in research in breeding for salt tolerance in wheat, biotechnology in rice, and selection and rehabilitation of salt-tolerant plants are of economic importance in arid/saline conditions. This book gives some practical approaches for saline agriculture and afforestation, and describes examples of cultivating salt-tolerant/halophytic plants for commercial interest on salt-affected land or with highly salinized water in Australia, China, Central Asia, Egypt, Pakistan, and Russia. It also explores the possibilities of arid/saline agriculture and afforestation in UAE.

Emerging Technologies with High Impact for Ocean Sciences, Ecosystem Management, and Environmental Conservation

This book offers a state-of-the-art overview of on abiotic stresses in terms of the challenges; scope and opportunities; copping strategies for adaptation and mitigation using novel tools for building resilience in agricultural crops and livestock; as well as for policy implementation. Divided into four major parts: advances and prospects for understanding stress environments; adaptation and mitigation options; crop-based mitigation strategies; and mitigation options in animal husbandry, the book focuses on problem-solving approaches and techniques that are essential for the medium to long-term sustainability of agricultural production systems The synthesis and integration of knowledge and experiences of specialists from different disciplines offers new perspectives in the versatile field of abiotic stress management, and as such is useful for various stakeholders, including agricultural students, scientists, environmentalists, policymakers, and social scientists.

Technical Bulletin

This book contains papers presented at the 2nd International Conference on Cognitive based Information Processing and Applications (CIPA) in Changzhou, China, from September 22 to 23, 2022. The book is divided into a 2-volume series and the papers represent the various technological advancements in network information processing, graphics and image processing, medical care, machine learning, smart cities. It caters to postgraduate students, researchers, and practitioners specializing and working in the area of cognitive-inspired computing and information processing.

HYDROLOGY AND WATERSHED MANAGEMENT

Climate Change and Crop Stress: Molecules to Ecosystems expounds on the transitional period where science has progressed to 'post-genomics' and the gene editing era, putting field performance of crops to the forefront and challenging the production of practical applicability vs. theoretical possibility. Researchers have concentrated efforts on the effects of environmental stress conditions such as drought, heat, salinity, cold, or pathogen infection which can have a devastating impact on plant growth and yield. Designed to deliver information to combat stress both in isolation and through simultaneous crop stresses, this edited compilation provides a comprehensive view on the challenges and impacts of simultaneous stresses. - Presents a multidisciplinary view of crop stresses, empowering readers to quickly align their individual experience and perspective with the broader context - Combines the mechanistic aspects of stresses with the strategic aspects - Presents both abiotic and biotic stresses in a single volume

Prospects for Saline Agriculture

Stress Tolerance in Horticultural Crops: Challenges and Mitigation Strategies explores concepts, strategies and recent advancements in the area of abiotic stress tolerance in horticultural crops, highlighting the latest advances in molecular breeding, genome sequencing and functional genomics approaches. Further sections present specific insights on different aspects of abiotic stress tolerance from classical breeding, hybrid breeding, speed breeding, epigenetics, gene/quantitative trait loci (QTL) mapping, transgenics, physiological and biochemical approaches to OMICS approaches, including functional genomics, proteomics and genomics assisted breeding. Due to constantly changing environmental conditions, abiotic stress such as high temperature, salinity and drought are being understood as an imminent threat to horticultural crops, including their detrimental effects on plant growth, development, reproduction, and ultimately, on yield. This book offers a comprehensive resource on new developments that is ideal for anyone working in the field of abiotic stress management in horticultural crops, including researchers, students and educators. - Describes advances in whole genome and next generation sequencing approaches for breeding climate smart horticultural crops - Details advanced germplasm tolerance to abiotic stresses screened in the recent past and their performance - Includes advancements in OMICS approaches in horticultural crops

Abiotic Stress Management for Resilient Agriculture

The constant growth of the world’s population and the decline of the availability of land and soil resources are global concerns for food security. Other concerns are the decrease in productivity and delivery of essential ecosystems services because of the decline of soil quality and health by a range of degradation processes. Key soil properties like soil bulk density, organic carbon concentration, plant available water capacity, infiltration rate, air porosity at field moisture capacity, and nutrient reserves, are crucial properties for soil functionality which refers to the capacity of soil to perform numerous functions. These functions are difficult to measure directly and are estimated through indices of soil quality and soil health. Soil degradation, its extent and severity, can also be estimated by assessing indices of soil quality and health. \"Geospatial Technology for Land Degradation Assessment and Management\" uses satellite imagery and remote sensing technologies to measure landscape parameters and terrain attributes. Remote sensing and geospatial technologies are important tools in assessing the extent and the severity of land and soil degradation, their temporal changes, and geospatial distribution in a timely and cost-effective manner. The knowledge presented in the book by Dr. R.S. Dwivedi shows how remote sensing data can be utilized for inventorying, assessing, and monitoring affected ecosystems and how this information can be integrated in the models of different local settings. Through many land degradations studies, land managers, researchers, and policymakers will find practical applications of geospatial technologies and future challenges. The information presented is also relevant to advancing the Sustainable Development Goals of the United Nations towards global food security.

Proceedings of the 2nd International Conference on Cognitive Based Information Processing and Applications (CIPA 2022)

This book provides the information that will allow users to recover salt-degraded land with selected plantation timbers and ultimately to make a profit. The authors have drawn on their own experiences plus material from Australia, India, California and Israel where similar saline soil conditions occur. The authors also bring their extensive work in forest biotechnology to the book. The primary species of interest are in the genus Eucalyptus although other species, notably conifers, are referred to. Issues involved in defining the characteristics of sites where plantations may be established and their special management requirements are discussed. Options are presented for the selection and development of appropriate genotypes plus associated management practices. Monitoring of plantations is shown to be a vital management issue. The work includes a chapter on environmental benefits which will broaden the appeal beyond forest managers, extension officers and students of forestry to companies which produce CO2 but which have no prior knowledge of forestry.

Climate Change and Crop Stress

This book provides all aspects of the physiology, stress responses and tolerance to abiotic stresses of the Brassicaceae plants. Different plant families have been providing food, fodder, fuel, medicine and other basic needs for the human and animal since the ancient time. Among the plant families, Brassicaceae has special importance for their agri-horticultural importance and multifarious uses apart from the basic needs. Interest understanding the response of Brassicaceae plants toward abiotic stresses is growing considering the economic importance and the special adaptive mechanisms. The knowledge needs to be translated into improved elite lines that can contribute to achieve food security. The physiological and molecular mechanisms acting on Brassicaceae introduced in this book are useful to students and researchers working on biology, physiology, environmental interactions and biotechnology of Brassicaceae plants.

Stress Tolerance in Horticultural Crops

This book provides information about plant–environment studies and challenges for plant improvement to achieve food security. Plants face a wide range of environmental challenges, which are expected to become more intense as a result of global climate change. Plant–environment interactions play an important role in the functioning of ecosystems. There are habitats throughout the world that present challenges to crop plants, such as through a lack of water and excessive, or toxic, salts in the soil. Soil properties represent a strong selection pressure for plant diversity and influence the structure of plant communities and participate to the generation and maintenance of biodiversity. Plant communities selected by environment grow by modifying soil physical, chemical, and biological properties, with consequent effects on survival and growth of plants. The complexity of plant–environment interactions has recently been studied by developing a trait-based approach in which responses and effects of plants on environment were quantified and modeled. This fundamental research on plant–environment interaction in ecosystems is essential to transpose knowledges of functional ecology to environmental management. Plants have adapted to an incredible range of environment, and extensive researches on ecological and environmental plant physiology have provided mechanistic understanding of the survival, distribution, productivity, and abundance of plant species across the diverse climates of our planet. Ecophysiological techniques have greatly advanced our understanding of photosynthesis, respiration, plant water relations, and plant responses to abiotic and biotic stresses, from instantaneous to evolutionary timescales. Ecophysiological studies also provide the basis for scaling plant physiological processes from the tissue to the canopy, ecosystem, region, and to a large extent, the entire globe. Given the above, the author proposes to bring forth a comprehensive book, “New Frontiers in Plant-Environment Interactions”, highlighting the various emerging techniques and applications that are currently being used in plant–environment interaction research and its future prospects. The author is sure that this book caters the need of all those who are working or have interest in the above topic.

Geospatial Technologies for Land Degradation Assessment and Management

Presents a multidisciplinary analysis of the integration among reactive oxygen species (ROS), reactive

nitrogen species (RNS), and reactive sulfur species (RSS). Since plants are the main source of our food, the improvement of their productivity is the most important task for plant biologists. In this book, leading experts accumulate the recent development in the research on oxidative stress and approaches to enhance antioxidant defense system in crop plants. They discuss both the plant responses to oxidative stress and mechanisms of abiotic stress tolerance, and cover all of the recent approaches towards understanding oxidative stress in plants, providing comprehensive information about the topics. It also discusses how reactive nitrogen species and reactive sulfur species regulate plant physiology and plant tolerance to environmental stresses. Reactive Oxygen, Nitrogen and Sulfur Species in Plants: Production, Metabolism, Signaling and Defense Mechanisms covers everything readers need to know in four comprehensive sections. It starts by looking at reactive oxygen species metabolism and antioxidant defense. Next, it covers reactive nitrogen species metabolism and signaling before going on to reactive sulfur species metabolism and signaling. The book finishes with a section that looks at crosstalk among reactive oxygen, nitrogen, and sulfur species based on current research done by experts. Presents the newest method for understanding oxidative stress in plants. Covers both the plant responses to oxidative stress and mechanisms of abiotic stress tolerance Details the integration among reactive oxygen species (ROS), reactive nitrogen species (RNS) and reactive sulfur species (RSS) Written by 140 experts in the field of plant stress physiology, crop improvement, and genetic engineering Providing a comprehensive collection of up-to-date knowledge spanning from biosynthesis and metabolism to signaling pathways implicated in the involvement of RONSS to plant defense mechanisms, Reactive Oxygen, Nitrogen and Sulfur Species in Plants: Production, Metabolism, Signaling and Defense Mechanisms is an excellent book for plant breeders, molecular biologists, and plant physiologists, as well as a guide for students in the field of Plant Science.

Commercial Forest Plantations on Saline Lands

This book consists of select proceedings of the 6th International Conference on Advances in Civil Engineering (ICACE 2022), covering various fields of civil engineering. Various topics covered in this book are construction and building materials, eco-friendly ground improvement, waste disposal technique, waste management, the durability of different concrete structures, environmental impact studies in relation to covid-19 pandemic, various aspects of foundation engineering, transport planning scenario in developing countries, highway materials and many more. The book will be for researchers and professionals working in the area of civil engineering.

The Plant Family Brassicaceae

This book provides an introduction to the scientific fundamentals of groundwater and geothermal systems. In a simple and didactic manner the different water and energy problems existing in deformable porous rocks are explained as well as the corresponding theories and the mathematical and numerical tools that lead to modeling and solving them. This approach provides the reader with a thorough understanding of the basic physical laws of thermoporoelastic rocks, the partial differential equations representing these laws and the principal numerical methods, which allow finding approximate solutions of the corresponding mathematical models. The book also presents the form in which specific useful models can be generated and solved. The text is introductory in the sense that it explains basic themes of the systems mentioned in three areas: engineering, physics and mathematics. All the laws and equations introduced in this book are formulated carefully based on fundamental physical principles. This way, the reader will understand the key importance of mathematics applied to all the subjects. Simple models are emphasized and solved with numerous examples. For more sophisticated and advanced models the numerical techniques are described and developed carefully. This book will serve as a synoptic compendium of the fundamentals of fluid, solute and heat transport, applicable to all types of subsurface systems, ranging from shallow aquifers down to deep geothermal reservoirs. The book will prove to be a useful textbook to senior undergraduate and graduate students, postgraduates, professional geologists and geophysicists, engineers, mathematicians and others working in the vital areas of groundwater and geothermal resources.

New Frontiers in Plant-Environment Interactions

Water resources stored by dams and reservoirs play an essential role in water resource management, hydropower and flood control. Where there is an extensive network of dam infrastructures, dams have made a major contribution to economic and social development, providing considerable storage capacity per capita. However, dams and reservoirs may also have an important social and environmental impact, and should be studied within the framework of integrated water resource management and sustainable development. Dams and Reservoirs, Societies and Environment in the 21st Century presents the latest research on the role played by dams and reservoirs in 21st century societies, in developed, emergent and developing countries. It analyses the viability of dams and suggests alternative solutions from a holistic perspective, considering the technical, economic, social and environmental aspects. Other issues covered include the social acceptability of dams, public involvement and dam awareness. The book covers subjects ranging from dam engineering, through the benefits and drawbacks of dams, to their social and environmental impact, and contains numerous case studies of the constructive contributions that reservoirs have made to water development and management. The book is a valuable resource for professional and dam engineers, water managers, governmental organizations and commercial enterprises responsible for dam development and management.

Reactive Oxygen, Nitrogen and Sulfur Species in Plants

Sustainable Crop Productivity and Quality under Climate Change: Responses of Crop Plants to Climate Change explores the physiological, biochemical, and molecular basis of the responses of major crop plants to a range of climate change scenarios. From the development of climate-resilient crop varieties which lead to enhanced crop productivity and quality to better utilization of natural resources to ensure food security through modern breeding techniques, it presents insights into improving yield while securing the environment. Understanding the impact of climate on crop quality and production is a key challenge of crop science. Predicted increases in climate variability necessitate crop varieties with intrinsic resilience to cooccurring abiotic stresses such as heat, drought, and flooding in a future climate of elevated CO2. This book presents a much-needed mechanistic understanding of the interactions between multiple stress responses of plants that is required to identify and take advantage of acclimation traits in major crop species as a prerequisite for securing robust yield and good quality. This book is an excellent reference for crop and agricultural scientists, plant scientists, and researchers working on crop plant ecophysiology/stress physiology and future crop production. - Includes breeding strategies for developing climate-resilient crop varieties - Presents a comprehensive overview of the current challenges, approaches, and best practices - Authored by frontline researchers and experts who work at the fields of climate change impacts on crop productivity

Proceedings of the 6th International Conference on Advances in Civil Engineering

Desertification and land degradation are complex phenomena, and we need to understand their causes, consequences, and means to mitigate and combat their impact. Therefore, this book aims to explain the concept and characteristics of drylands, desert and desertification, land degradation, wastelands, and the concept of ecosystem services. It also discusses various types of processes of land degradations, their characteristics, physics and indicators along with mapping, monitoring and assessment of methods involved. Concept of Ocean Biological Deserts is discussed along with international and regional efforts towards combating land degradation and desertification. Key Features: • Provides all the aspect of desertification and land degradation at one place • Includes comprehensive methods to monitor different desertification/land degradation processes • Comprehensive overview of the mapping, monitoring and modelling techniques • Role of space borne data in identifying, monitoring and combating desertification is evaluated and reported with real case studies • Explains the concept of ocean biological deserts, their characteristics and mapping

Introduction to the Numerical Modeling of Groundwater and Geothermal Systems

Legumes under Environmental Stress Legumes under Environmental Stress Yield, Improvement and Adaptations Leguminous crops have been found to contribute almost 27% of the world's primary crop production. However, due to environmental fluctuations, legumes are often exposed to different environmental stresses, leading to problems with growth and development, and ultimately, decreased yield. This timely review explains the transcriptomics, proteomics, genomics, metabolomics, transgenomics, functional genomics and phenomics of a wide range of different leguminous crops under biotic and abiotic stresses, and their genetic and molecular responses. Amongst others the text describes the effect of nutrient deficiency, pesticides, salt and temperature stress on legumes. Importantly, the book explores the physiobiochemical, molecular and omics approaches that are used to overcome biotic and abiotic constraints in legumes. It looks at the exogenous application of phytoprotectants; the role of nutrients in the alleviation of abiotic stress; and the microbial strategy for the improvement of legume production under hostile environments. Key features: demonstrates how to mitigate the negative effect of stress on leguminous crops, and how to improve the yield under stress the most up-to-date research in the field written by an international team of active researchers and practitioners across academia, industry and non-profit organisations This volume is a valuable and much-needed resource for scientists, professionals and researchers working in plant science, breeding, food security, crop improvement and agriculture worldwide. In universities it will educate postgraduate and graduate students in plant science and agriculture; it will also benefit those in scientific institutions and in biotech and agribusiness companies, who deal with agronomy and environment.

Dams and Reservoirs, Societies and Environment in the 21st Century

This text details the principal concepts and developments in wood science, chemistry and technology. It includes new chapters on the chemical synthesis of cellulose and its technology, preservation of wood resources and the conservation of waterlogged wood.

Sustainable Crop Productivity and Quality under Climate Change

\"Respected and known worldwide in the field for his research in plant nutrition, Dr. Horst Marschner authored two editions of Mineral Nutrition of Higher Plants. His research greatly advanced the understanding of plant nutrition ranging from rhizosphere processes to nutrient uptake and utilization by plants in the field. While visiting field experiments in West Africa in 1996, Dr. Marschner contracted malaria and passed away, and until now this legacy title went unrevised. Despite the passage of time, it remains the definitive reference on plant mineral nutrition. Since the last edition, great progress has been made in the understanding of various aspects of plant nutrition. In recent years, the perspective on the mode of action of nutrients in plant metabolism and yield formation has shifted. Much progress has been made in the molecular aspects of nutrient uptake and transport within plants as well as the responses of plants to nutrient deficiency or toxicity. These and many other developments are covered in this long-awaited new edition.\"--P. [4] of cover.

Desertification and Land Degradation

This book presents comprehensive coverage of differentiated plant responses to changing environments. It focuses on how multiple and combined stress factors influence plant survival. It examines the latest data on the capacity of roots to alter growth patterns due to disturbances in physical and/or chemical soil constraints, water supply, and other traumas. It contains over 85% new and updated material with more than 1500 new citations, tables, drawings, and photographs.

Legumes under Environmental Stress

The First Edition of this treatise on Irrigation Engineering duly subsidised by national Book trust,Government of India,published in 1984.was highly acclaimed by the engineering teachers and taughts and its revised edition appeared in 1990.The dynamism inherent in the subject necessitated drastic changes in the text,prompted by theoverwhelming response of irrigation and agriculture engineering students and

practising engineers in the country and abroad duly patronised by the publications,Shri Ravindra Kumar Gupta,Managing Director,S.Chand & Company Ltd.,New Delhi

Wood and Cellulosic Chemistry, Second Edition, Revised, and Expanded

Advances in Ecology Environment and Conservation Research and Application: 2013 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about ZZZAdditional Research in a concise format. The editors have built Advances in Ecology Environment and Conservation Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about ZZZAdditional Research in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Advances in Ecology Environment and Conservation Research and Application: 2013 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/.

Marschner's Mineral Nutrition of Higher Plants

This comprehensive edited volume collects the most recent information with up-to-date citations, on the decrease in plant productivity under climatic changes and its link with global food security. The book emphasis on the crop management practices and recent advancement in the techniques for mitigating the negative effects of climate induced biotic and abiotic stress. It brings together 19 chapters developed by eminent researchers in the area of plant and environmental sciences. Global climate change is increasingly becoming a concern for future of agriculture. High levels of inorganic and organic pollutants and climatic stress adversely affects the sensitive and complex equation of natural resources and ecosystem services. To meet the increased food demand, plant productivity needs to be enhanced, therefore this book fills in the gap and brings together information on the physiological and molecular approaches for improving crop productivity. The book is resourceful reading material for researchers, faculty members, graduate and post graduate students of plant science, agriculture, agronomy, soil science, botany, Molecular biology and environmental science.

Plant-Environment Interactions

This book is a collection of research findings presented at 2023 2nd International Joint Conference on Frontiers of Energy and Environmental Engineering (CFEEE 2023), held in Sanya, China on September 1-3, 2023. The conference was co-organized by Hainan Institute of Zhejiang University, Sanya Global Energy Research Institute, South China University of Technology, IEEE PES China Satellite Technical Committee - Smart Buildings, Loadsand Customer Systems, and supported by CoreShare Academy Exchange Center. The book covers topics including Planning, Operation, Economics and Market in Modern Power Systems, Renewable Energy, Energy Storage, Advanced Power System Technologies, Electric Vehicle, Integrated Energy System, Energy Internet, Environmental Analysis and Monitoring, Energy Security and Clean Use, Environmental Pollution and Pollution Control. The contributions from leading experts in the field highlight innovative solutions and strategies developed to address pressing global challenges. It offers valuable insights into the latest technologies and future directions of the frontiers of energy and environmental engineering fields, making it a must-read for researchers, practitioners, policymakers, and students interested in these fields.

Irrigation Engineering (Including Hydrology)

An understanding of the mineral nutrition of plants is of fundamental importance in both basic and applied

plant sciences. The Second Edition of this book retains the aim of the first in presenting the principles of mineral nutrition in the light of current advances.This volume retains the structure of the first edition, being divided into two parts: Nutritional Physiology and Soil-Plant Relationships. In Part I, more emphasis has been placed on root-shoot interactions, stress physiology, water relations, and functions of micronutrients. In view of the worldwide increasing interest in plant-soil interactions, Part II has been considerably altered and extended, particularly on the effects of external and interal factors on root growth and chapter 15 on the root-soil interface.The second edition will be invaluable to both advanced students and researchers.Key Features* Second Edition of this established text* Structure of the book remains the same* 50% of the reference and 50% of the figures and tables have been replaced* Whole of the text has been revised* Coverage of plant (soil interactions has been increased considerably)

Advances in Ecology Environment and Conservation Research and Application: 2013 Edition

Abiotic Stress and Legumes: Tolerance and Management is the first book to focus on these important factors in legume productivity. As a primary and increasingly important food source, efficient legume productivity relies on the plant's ability to effectively adapt to environmental challenges. The book takes a targeted approach to understanding the methods and means of ensuring survival and productivity of the legume plant. It illustrates the progress that has been made in managing abiotic stress effects in legumes, including the development of several varieties that show tolerance against abiotic stress with high yield using transcriptomic, proteomic, metabolomic and ionomic approaches. Further, exogenous application of various stimulants, such as plant hormones, nutrients, sugars and polyamines has emerged as an alternative strategy to induce capability within legume plants to manage their productivity under abiotic stresses. This book thoroughly examines these emerging strategies and serves as an important resource for researchers, academicians, scientists, and those interested in enhancing their knowledge and aiding further research. Explores the progress made in managing abiotic stress, specifically with high yield legumes Highlights the molecular mechanisms related to acclimation Presents proven strategies and emerging approaches to guide additional research

Managing Plant Production Under Changing Environment

Plants are important for a permanent ecosystem, because in the ecological pyramid plants support all the other living organisms at the base. Very important organization is thought to be the integral process of resource, transport, partitioning, metabolism, and production, which involves yield, biomass, and productivity in plants. Accordingly, it is important to obtain more information about the knowledge concerning yield, biomass, and productivity in plants. Soybean is one of the main crops largely contributing to our life, which is thought to be connected to our ecosystem through the above-mentioned integral process. This book focuses on the soybean, and reviews and research concerning the yield, biomass, and productivity of soybean are presented herein. This text updates the book published in 2017. Although there are many difficulties, the main aim of this book is to present a basis for the above-mentioned integral processes of resource, transport, partitioning, metabolism, and production, which involves yield, biomass, and productivity in plants (soybean), and to understand what supports this basis and the integral process. It is hoped that this and the preceding book will be essential reads.

Frontiers of Energy and Environmental Engineering

This book deals with the development of irrigation in the subcontinent since the beginning of settled agriculture, and its possible connections with the occurrence of salinity and alkalinity in irrigated lands.

Mineral Nutrition of Higher Plants

This open access book showcases the innovative practices of Big Earth Data methods through a collection of comprehensive case studies from China to monitor and evaluate indicators for seven SDGs, i.e., zero hunger (SDG 2), clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), sustainable cities and communities (SDG 11), climate action (SDG 13), life below water (SDG 14), life on land (SDG 15), and to analyze the interactions among multiple SDGs indicators. The emphasis on Big Earth Data is highly relevant within the context of growing global challenges. Disaster risk mitigation, climate change, global food security, resource management, and environmental challenges all are interlinked through earth systems and processes that are independent of human constructs. Therefore, these case studies highlight methods and practices of spatial information mining and integrated SDG evaluation, which include evaluating the synergy and trade-off relationships among the SDGs in the context of their correlations; simulating multiple indicators' interactions in future environmental, economic and social scenarios in the context of their temporal variations; designing integrated evaluations of regional SDGs in the context of experience with the study of multiple indicators. Big Earth Data therefore has the potential to support informed policy and decision support at global, regional, and local scales.

Abiotic Stress and Legumes

This book presents a comprehensive survey of the Indian Economy in terms of GDP growth, savings, investment and developments in various sectors such as agriculture, industry and services. A contradiction observed in India is that while the reform process has resulted in boosting GDP growth, it has failed to yield acceleration in the process of poverty reduction and growth of employment.

Soybean

Plants, like other living organisms, require oxygen and water supplies for sustaining their normal growth and development. The water requirement is generally met through a coordinated system of root-to-shoot communication. However, excessive soil moisture in the rhizosphere can impact normal functioning of plants by restricting oxygen supplies to the roots. To survive under hypoxic conditions, plants show cellular, molecular, and functional level adaptations. One temporary response could be switching to anaerobic respiration, and maintain energy production to some extent, via glycolysis and ethanol fermentation. However, root respiration, water, and nutrient uptake, and hormonal synthesis are severely impacted under sustained periods of oxygen deficiency. These belowground changes, in turn, affect shoot performance and yield formation by interfering with the key physiological processes.

Irrigation and Soil Salinity in the Indian Subcontinent

Big Earth Data in Support of the Sustainable Development Goals (2022) - China