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North American Agroforestry
Crop Physiology Case Histories for Major Crops
An ecophysiological simulation model of genotype-by-environment interactions
Respiration and Crop Productivity
Modeling Physiology of Crop Development, Growth and Yield
Crop Systems Dynamics
Physiology and Biotechnology Integration for Plant Breeding
Applied Crop Physiology
Physiology and determination of crop yield : based on the proceedings of an international symposium sponsored by ASA, CSSA, SSSA, USDA-ARS and the University of Florida Institute of Food and Agricultural Sciences and held at the University of Florida, Gainesville, Florida, 10-14 June 1991
Crop Physiology
Chlorophyll Fluorescence
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The Molecular and Physiological Basis of Nutrient Use Efficiency in Crops
Ecology and Physiology of Yield Determination
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Physiology and Determination of Crop Yield
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Physiology and Determination of Crop Yield
Understanding the Fundamentals of Grain Crop Management
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Effect of High Temperature on Crop Productivity and Metabolism of Macro Molecules
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Physiology of Crop Production
Seed Biology and Yield of Grain Crops, 2nd Edition
Emerging Trends of Plant Physiology for Sustainable Crop Production
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Agronomy
Water-Conservation Traits to Increase Crop Yields in Water-deficit Environments
Crop Yield

Physiology and Processes
Understanding Crop Performance - Basics and Applications
Crop Yield

POTTS ROJAS

North American Agroforestry CABI
When humankind began to save seed to plant for the next season, they did so hoping to secure a food supply for the future. With that came the inevitable question: Will it be enough? Scientists today are still asking that question. Our dependence on domesticated cultivated varieties has never been greater, even as increasing populations strain our resource base. This book provides a fascinating snapshot-in-time account of the productivity status of all major U.S. field crops. Each crop has a different story to tell. Plant breeding, biotechnology, and agronomy have shaped these stories. It is imperative that we learn from them to ensure continued productivity. The solution is long-term stewardship and the most effective use of our critical resources—water, soil, genetic resources, and human intellect.
Crop Physiology Case Histories for Major Crops CABI
Potato Physiology provides perspective and knowledge on the biological behavior and potentials of the potato plant. Organized into 15 chapters, this book focuses on tuber development physiology, biochemistry, and anatomy. This text also covers topics on physiological and biochemical aspects of photosynthesis, photoassimilate partitioning, respiration, tuberization, as well as carbohydrate and protein metabolisms. It elucidates potato's rest period, the stage when growth is inhibited as a result of endogenous causes, and the tubers' disorders, environmental responses, frost hardiness, and tissue culture. This text provides a worldwide perspective and is organized and presented to be useful to graduate students, teachers, and potato investigators.
An ecophysiological simulation model of genotype-by-environment interactions Bentham Science Publishers
Efforts to increase efficient nutrient use by crops are of growing importance as the global demand for food, fibre and fuel increases and competition for resources intensifies. The Molecular and Physiological Basis of Nutrient Use Efficiency in Crops provides both a timely summary of the latest advances in the field as well as anticipating directions for future research. The Molecular and Physiological Basis of Nutrient Use Efficiency in Crops bridges the gap between agronomic practice and molecular biology by linking underpinning molecular mechanisms to the physiological and agronomic aspects of crop yield. These chapters provide an understanding of molecular and physiological mechanisms that will allow researchers to continue to target and improve complex traits for crop improvement. Written by leading international researchers, The Molecular and Physiological Basis of Nutrient Use Efficiency in Crops will be an essential resource for the crop science community for years to come. Special Features: coalesces current knowledge in the areas of efficient acquisition and utilization of nutrients by crop plants with emphasis on modern developments addresses future directions in crop nutrition in the light of changing climate patterns including temperature and water availability bridges the gap between traditional agronomy and molecular biology with focus on underpinning molecular mechanisms and their effects on crop yield includes contributions from a leading team of global experts in both research and practical settings
Respiration and Crop Productivity CRC Press
Global demand for wheat, rice, corn, and other essential grains is expected to steadily rise over the next twenty years. Meeting this demand by increasing production through increased land use is not very likely; and while better crop management may make a marginal difference, most agriculture experts agree that this anticipated deficit must be made up through increased crop yields. The first resource of its kind, Physiology and Biotechnology Integration for Plant Breeding assembles current research in crop plant physiology, plant biotechnology, and plant breeding that is aimed toward improving crop plants genetically while supporting a productive agriculture ecosystem. Highly comprehensive, this reference provides access to the most innovative perspectives in crop physiology – with a special emphasis on molecular approaches – aimed at the formulation of those crop cultivars that offer the greatest potential to increase crop yields in stress environments. Surveys the current state of the field, as well as modern options and avenues for plant breeders and biotechnologists interested in augmenting crop yield and stability With the contributions of plant scientists from all corners of the globe who are actively involved in meeting this important challenge, Physiology and Biotechnology Integration for Plant Breeding provides readers with the background information needed to understand this cutting-edge work, as well as detailed information on present and potential applications. While the first half of the book establishes and fully explains the link between crop physiology and molecular biology, the second part explores the application of biotechnology in the effective delivery of the high yield and environmentally stable crop plants needed to avert the very real possibility of worldwide hunger.
Modeling Physiology of Crop Development, Growth and Yield CRC Press
The Physiology of Crop YieldWiley-Blackwell
Crop Systems Dynamics Elsevier
Organization and conduct of plant stress research to increase agricultural productivity. Disease tolerance: reducing the impact of disease-induced stress on crop yields. Thigmomorphogenesis: the effect of mechanical pertubation on the growth of plants, with special reference to anatomical changes, the role of ethylene, and interaction with other environmental stresses. Differential aluminum tolerance in crop plants. Comparative responses of field grown crops to phosphate concentrations in soil solutions. Production of food plants in areas supplied with highy saline water: problems and prospects. Salt resistance in agricultural crops. Effects of freezing and cold acclimation on membrane structure and function. Cold resistance and injury in winter cereals. Strategies for altering chilling sensitivity as a limiting factor in crop production. Frost hardiness: a discussion of possible molecular causes of injury with particular reference to deep supercooling of water. Breeding potatoes for tolerance to stress: heat and frost. Selecting for drought and heat resistance in grain

sorghum. Drought stress of cowpea and soybean under tropical conditions. Effects of water and heat stress on carbon metabolism of plants with C3 and C4 photosynthesis. Air pollution stress. Drought resistance and adaptation to water deficits in crop plants. Drought resistance in cereals - rice: a case study. Stomatal behavior and breeding fro drought resistance. Genetic improvement of drought resistance in crop plants: a case for sorghum. Testing and selecting for drought resistance in wheat. Growth and development of chickpeas under progressive moisture stress.

Physiology and Biotechnology Integration for Plant Breeding CRC Press

Systems analysis of natural resources and crop production. Engineering for higher yields. Productivity and the morphology of crop stands: patterns with leaves. Physiological significance of internal water relations to crop yield. Light interception and radiative exchange in crop stands. Gaseous exchange in crop stands. Mechanisms of translocation of plant metabolites. Metabolic sinks. Interrelationships among photosyntesis, respiration, and movement of carbon in developing crops. Mechanisms of carbon fixation and associated physiological responses. Physiological responses to nitrogen in plants. Plant morphology and stand geometry in relation to nitrogen. Development, differentiation, and yield. Cultural manipulation for higher yields. Environmental manipulation for higher yields. Germ plasm manipulation of the future.

Applied Crop Physiology Springer Science & Business Media

This book presents a simple, straightforward discussion of the principles and processes involved in the production of grain yield by agronomic crops, and how these processes underlie and influence management decisions. The focus is on grain crops, principally maize and soybean, although the general principles apply equally well to cereals, grain legumes and oil crops. Intended for researchers in crop science, agronomy and plant science, and crop production practitioners, this book will enable readers to make better, more informed management decisions; decisions that will help maintain a well-fed world in the future.

Physiology and determination of crop yield : based on the proceedings of an international symposium sponsored by ASA, CSSA, SSSA, USDA-ARS and the University of Florida Institute of Food and Agricultural Sciences and held at the University of Florida, Gainesville, Florida, 10-14 June 1991 The Physiology of Crop Yield

In this major 1993 work, Lloyd Evans provides an integrated view of the domestication, adaptation and improvement of crop plants, bringing together genetic diversity, plant breeding, physiology and aspects of agronomy. Considerations of yield and maximum yield provide continuity throughout the book. Food, feed, fibre, fuel and pharmaceutical crops are all discussed. Cereals, grain legumes and root crops, both temperate and tropical, provide many of the examples, but pasture plants, oilseeds, leafy crops, fruit trees and others are also considered. After the introductory chapter, the increasing significance of crop yields to the world's food supply is highlighted. The next three chapters consider changes to crop plants over the last ten thousand years, including domestication, adaptation and improvement. Aimed at research workers and advanced students in crop physiology and ecology, agronomy and plant breeding, this book also reaches conclusions of relevance to those concerned with developmental policy, agricultural research and management, environmental quality, resource depletion and human history.

Crop Physiology CRC Press

The knowledge of plant responses to various abiotic stresses is crucial to understand their underlying mechanisms as well as the methods to develop new varieties of crops, which are better suited to the environment they are grown in. Environmental Stress Physiology of Plants and Crop Productivity provides readers a timely update on the knowledge about plant responses to a variety of stresses such as salinity, temperature, drought, oxidative stress and mineral deficiencies. Chapters focus on biochemical mechanisms identified in plants crucial to adapting to specific abiotic stressors along with the methods of improving plant tolerance. The book also sheds light on plant secondary metabolites such as phenylpropanoids and plant growth regulators in ameliorating the stressful conditions in plants. Additional chapters present an overview of applications of genomics, proteomics and metabolomics (including CRISPR/CAS techniques) to develop abiotic stress tolerant crops. The editors have also provided detailed references for extended reading to support the information in the book. Environmental Stress Physiology of Plants and Crop Productivity is an informative reference for scholars and researchers working in the field of botany, agriculture, crop science and physiology, soil science, and environmental sciences.

Chlorophyll Fluorescence Springer

Crop Physiology: Case Histories of Major Crops updates the physiology of broad-acre crops with a focus on the genetic, environmental and management drivers of development, capture and efficiency in the use of radiation, water and nutrients, the formation of yield and aspects of quality. These physiological process are presented in a double context of challenges and solutions. The challenges to increase plant-based food, fodder, fiber and energy against the backdrop of population increase, climate change, dietary choices and declining public funding for research and development in agriculture are unprecedented and urgent. The proximal technological solutions to these challenges are genetic improvement and agronomy. Hence, the premise of the book is that crop physiology is most valuable when it engages meaningfully with breeding and agronomy. With contributions from 92 leading scientists from around the world, each chapter deals with a crop: maize, rice, wheat, barley, sorghum and oat; quinoa; soybean, field pea, chickpea, peanut, common bean, lentil, lupin and faba bean; sunflower and canola; potato, cassava, sugar beet and sugarcane; and cotton. A crop-based approach to crop physiology in a G x E x M context Captures the perspectives of global experts on 22 crops

The Physiology of Crop Yield Amer Society of Agronomy

Crops and world food supply, crop evolution, and the origins of crop physiology; maize; sugar cane; rice; wheat; soybean; pea; potato; sugar beet; cotton; The physiological basis of crop yield.

Plant Physiology for Sustainable Agriculture Academic Press

This volume explores specific approaches that have shown to result in crop yield increases. Research on the physiological understanding of these methods has led to the development of practical applications of plant breeding approaches to genetically improve crops to achieve higher yields. Authoritative entries from crop scientists shed new light on two water-conservation traits: one that is based on an initiation of the decrease in transpiration earlier in the soil drying cycle, and the second that is based on a sensitivity of transpiration rate under high atmospheric vapor pressure deficit that results in partial stomatal closure. Both these approaches involve partial stomatal closure under well-defined situations to decrease the rate of soil water loss. Readers will be able to

analyze the circumstances under which a benefit is achieved as a result of the water-limitation trait; and key discussion points in the case studies presented will help answer questions such as what species, which environments, how often will yield be benefited for various crop species? Contributions also review the genetic variation for these two traits within each crop species and the physiological basis for the expression of these traits.

The Molecular and Physiological Basis of Nutrient Use Efficiency in Crops Springer

The entire range of the developmental processes in plants is regulated by the shift in the hormonal concentration, tissue sensitivity and their interaction with the factors operating around the plants. Out of the recognized hormones, attention has largely been focused on five (Auxins, Gibberellins, Cytokinin, Abscisic acid and Ethylene). However, in this book, the information about the most recent group of phytohormones (Brassinosteroids) has been compiled by us. It is a class of over 40 polyhydroxylated sterol derivatives, ubiquitously distributed throughout the plant kingdom. A large portion of these steroids is restricted to the reproductive organs (pollens and immature seeds). Moreover, their strong growth-inducing capacity, recognized as early as prior to their identification in 1979, tempted the scientists to visualize the practical importance of this group of phytohormones. The brassin solution, from rape pollen, was used in a collaborative project by the scientists of Brazil and U. S. A. in a p- sowing seed treatment to augment the yield. This was followed by large-scale scientific programmes in U. S. , Japan, China, Germany and erstwhile U. S. S. R. , after the isolation of the brassinosteroids. This approach suits best in today’s context where plants are targeted only as producers and hormones are employed to get desired results. Chapter 1 of this book (which embodies a total of 10 chapters), gives a comprehensive survey of the hitherto known brassinosteroids, isolated from lower and higher plants.

Ecology and Physiology of Yield Determination Elsevier

This book has been prepared for those seeking a better understanding of the functioning of crop plants, particularly the processes that lead to the genera tion of products valued by human beings. The contributors, who are among the world's foremost experts on the important crops upon which humanity depends for food or fibre, address the relevant processes for their specific crop. Currently, the world population is continuing to increase. It is projected to plateau around the middle of the next century, and while there is considerable controversy regarding the population level when this plateau is achieved, most estimates are in the area of 10 000 000 000. At present, there are about 800000000 people in the world who do not have secure access to food. Over the last 50 years various aspects of agricultural research have been combined to increase the output of world crops approximately 2.5-fold. Given the need to feed the increasing population, and to provide better access, it is predicted that during the next 50 years the agricultural research community must repeat this achievement.

Physiology and Determination of Crop Yield CUP Archive

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

Handbook of Plant and Crop Physiology John Wiley & Sons

Explore the many benefits of alternative land-use systems with this incisive resource Humanity has become a victim of its own success. While we've managed to meet the needs—to one extent or another—of a large portion of the human population, we've often done so by ignoring the health of the natural environment we rely on to sustain our planet. And by deteriorating the quality of our air, water, and land, we've put into motion consequences we'll be dealing with for generations. In the newly revised Third Edition of North American Agroforestry, an expert team of researchers delivers an authoritative and insightful exploration of an alternative land-use system that exploits the positive interactions between trees and crops when they are grown together and bridges the gap between production agriculture and natural resource management. This latest edition includes new material on urban food forests, as well as the air and soil quality benefits of agroforestry, agroforestry's relevance in the Mexican context, and agroforestry training and education. The book also offers: A thorough introduction to the development of agroforestry as an integrated land use management strategy Comprehensive explorations of agroforestry nomenclature, concepts, and practices, as well as an agroecological foundation for temperate agroforestry Practical discussions of tree-crop interactions in temperate agroforestry, including in systems such as windbreak practices, silvopasture practices, and alley cropping practices In-depth examinations of vegetative environmental buffers for air quality benefits, agroforestry for wildlife habitat, agroforestry at the landscape level, and the impact of agroforestry on soil health Perfect for environmental scientists, natural resource professionals and ecologists, North American Agroforestry will also earn a place in the libraries of students and scholars of agricultural sciences interested in the potential benefits of agroforestry.

Physiology and Determination of Crop Yield CABI

This book presents a generic process-based crop growth model, GECROS (Genotype-by-Environment interaction on CROp growth Simulator), recently developed in Wageningen. The model uses robust yet simple algorithms to summarize the current knowledge of individual physiological processes and their interactions and feedback mechanisms. It was structured from the basics of whole-crop

systems dynamics to embody the physiological causes rather than descriptive algorithms of the emergent consequences.It also attempts to model each process at a consistent level of detail, so that no area is overemphasized and similarly no area is treated in a trivial manner. Main attention has been paid to interactive aspects in crop growth such as photosynthesis-transpiration coupling via stomatal conductance, carbon-nitrogen interaction on leaf area index, functional balance between shoot and root activities, and interplay between source supply and sink demand on reserve formation and remobilization. GECROS combines robust model algorithm, high computational efficiency, and accurate model output with minimum number of input parameters that require periodical destructive sampling to estimate.

Potato Physiology BoD – Books on Demand

This single volume explores the theoretical and the practical aspects of crop physiological processes around the world The marked decrease over the past century in the land available for crop production has brought about mounting pressure to increase crop yields, especially in developing nations. Physiology of Crop Production provides cutting-edge research and data for complete coverage of the physiology of crop production, all in one source, right at your fingertips. This valuable reference gives the extensive in-depth information soil and crop professionals need to maximize crop productivity anywhere the world. Leading soil and plant scientists and researchers clearly explain theory, practical applications, and the latest advances in the field. Crop physiology is a vital science needed to understand crop growth and development to facilitate increases of plant yield. Physiology of Crop Production presents a wide range of information and references from varying regions of the world to make the book as complete and broadly focused as possible. Discussion in each chapter is supported by experimental data to make this book a superb resource that will be used again and again. Chapter topics include plant and root architecture, growth and yield components, photosynthesis, source-sink relationship, water use efficiency, crop yield relative to water stress, and active and passive ion transport. Several figures and tables accompany the extensive referencing to provide a detailed, in-depth look at every facet of crop production. Physiology of Crop Production explores management strategies for: ideal plant architecture maximizing root systems ideal yield components maximizing photosynthesis maximizing source-sink relationship sequestration of carbon dioxide reducing the effects of drought improving N, P, K, Ca, Mg, and S nutrition improving micronutrient uptake Physiology of Crop Production is an essential desktop resource for plant physiologists, soil and crop scientists, breeders, agronomists, agronomy administrators in agro-industry, educators, and upper-level undergraduate and graduate students.

Environmental Stress Physiology of Plants and Crop Productivity CRC Press

First published in 1989, Physiology of Crop Yield was the first student textbook to digest and assimilate the many advances in crop physiology, within a framework of resource capture and use. Retaining the central core of the first edition, this long-awaited second edition draws on recent developments in areas such as phenology, canopy dynamics and crop modelling, and the concepts of sustainable crop production. A broad perspective is developed, from the gene through the plant and crop to the ecosystem, covering: Advances in molecular biology relating to crop science Limitation of crop yield by the supply of water or nitrogen Global climate change and its impact on crop modelling Physiological aspects of crop quality A wider range of species, with emphasis on wheat, maize and soybean This book will be a valuable tool for advanced undergraduate and postgraduate students of agricultural science, plant science, applied ecology and environmental science. It will be an essential addition to all libraries in universities and relevant research establishments.

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