impact factor of frontiers in plant science

impact factor of frontiers in plant science is a critical metric used by researchers, academicians, and institutions to evaluate the significance and influence of this prominent journal within the field of plant sciences. This article explores the impact factor of Frontiers in Plant Science in detail, examining its current standing, calculation methodology, relevance in academic publishing, and comparisons with peer journals. Understanding this metric helps in assessing the journal’s reputation, citation influence, and its role in disseminating cutting-edge research in plant biology, biotechnology, and ecology. Additionally, this article addresses the broader context of journal metrics and their implications for authors and readers alike. The following sections will provide a comprehensive overview of the impact factor, its calculation, and its significance within the domain of plant science publishing.

Understanding the Impact Factor

The impact factor is a bibliometric indicator that reflects the average number of citations received by articles published in a journal within a specific time frame, typically two years. It serves as a proxy for the journal’s influence and prestige in its academic discipline. The impact factor is widely used by researchers to identify reputable sources and by institutions to assess publication quality. In the context of Frontiers in Plant Science, the impact factor sheds light on the journal’s ability to attract high-quality research and its prominence within the global plant science community.

Definition and Purpose

The impact factor measures how frequently, on average, articles in a journal are cited in other scholarly works. It provides a quantitative basis for ranking journals and is often considered during decisions related to manuscript submissions, funding, and academic evaluations. While the impact factor is not a direct measure of individual article quality, it offers insights into the journal’s overall scholarly reach and citation footprint.

Historical Development

Developed by Eugene Garfield in the 1960s, the impact factor was initially intended to assist librarians in selecting journals for their collections. Over time, it evolved into a benchmark used globally in academic publishing. Today, it is calculated annually and published by Clarivate Analytics in the Journal Citation Reports.

Current Impact Factor of Frontiers in Plant Science

Frontiers in Plant Science has established itself as a leading open-access journal in the plant biology domain, and its impact factor reflects its growing influence. As of the most recent Journal Citation Reports, the impact factor of Frontiers in Plant Science stands at a competitive level within the field. This metric indicates strong citation performance and widespread recognition among plant science researchers worldwide.

Recent Trends

The journal’s impact factor has shown consistent growth over the past several years, signaling increasing visibility and citation rates. This trend is attributed to the journal’s rigorous peer review process, broad thematic coverage, and commitment to publishing innovative research.

Impact Factor Value

The latest available data reports the impact factor of Frontiers in Plant Science to be approximately 5.2. This value places it among the top-tier journals specializing in plant biology, molecular plant science, and related interdisciplinary fields.

Calculation Methodology of Impact Factor

The impact factor is calculated by dividing the number of citations in a given year to articles published in the previous two years by the total number of citable items published in those two years. This straightforward formula provides a snapshot of how frequently a journal’s recent publications are cited.

Formula Explanation

The formula for calculating the impact factor is:

1. Citations in Year X to articles published in Years X-1 and X-2
2. Divided by the total number of articles published in Years X-1 and X-2

This equation yields the average citation rate per article for the journal, emphasizing recent research impact.

Types of Citable Items

Citable items typically include research articles, reviews, and proceedings papers. Editorials, letters, and news items are usually excluded from the denominator, ensuring a balanced assessment of scholarly content.

Significance of Impact Factor in Plant Science Research

The impact factor of Frontiers in Plant Science serves multiple roles in the plant science research community. It guides authors in selecting appropriate journals for submission, helps institutions evaluate research output, and assists readers in identifying influential publications.

Author Considerations

Researchers aiming to maximize the visibility and citation potential of their work consider the journal’s impact factor as a key factor. Publishing in a journal with a high impact factor like Frontiers in Plant Science can enhance an author’s academic profile and career prospects.

Institutional and Funding Implications

Universities and funding agencies often use impact factor metrics as part of their evaluation criteria. A higher impact factor can reflect positively on the perceived quality of research outputs affiliated with particular institutions or funding bodies.

Comparison with Other Plant Science Journals

Frontiers in Plant Science competes with several other reputable journals in the field. Comparing impact factors helps establish its relative standing and influence within the plant biology research landscape.

Top Competitors

Some of the leading plant science journals include Plant Physiology, The Plant Journal, Journal of Experimental Botany, and Plant Cell. Each journal varies in scope, audience, and impact factor values.

Impact Factor Rankings

While Frontiers in Plant Science’s impact factor is robust, it ranks competitively against these journals. Its open-access model and broad thematic coverage contribute to its growing citation metrics.

Limitations and Criticisms of Impact Factor

Despite its widespread use, the impact factor has several limitations and has faced criticism within the academic community. These issues are crucial to consider when interpreting the impact factor of Frontiers in Plant Science or any other journal.

Time Frame Restriction

The two-year citation window may not fully capture the long-term impact of research articles, especially in fields like plant science where citation growth can be gradual.

Disciplinary Differences

Citation behaviors vary across disciplines, making direct comparisons of impact factors between different fields potentially misleading.

Potential for Manipulation

Some journals may engage in practices aimed at artificially boosting their impact factor, such as excessive self-citations or preferential publication of review articles, which typically attract more citations.

Alternative Metrics for Evaluating Journal Quality

Given the limitations of the impact factor, alternative metrics have gained traction in assessing journal influence and research quality. These complementary indicators provide a more nuanced understanding of Frontiers in Plant Science’s academic standing.

Eigenfactor Score

The Eigenfactor score considers the origin of citations and accounts for citation patterns across journals, offering a broader perspective on influence beyond raw citation counts.

Article-Level Metrics

Metrics such as Altmetric scores, downloads, and social media mentions assess the broader impact and engagement of individual articles published in Frontiers in Plant Science.

h-Index for Journals

The h-index measures productivity and citation impact collectively, providing insight into a journal’s sustained influence over time.

- Impact factor offers a quick, standardized measure of journal influence
- Alternative metrics provide additional layers of evaluation
- Authors and institutions benefit from a multi-metric approach when assessing journal quality

Frequently Asked Questions

What is the current impact factor of Frontiers in Plant Science?

As of the latest Journal Citation Reports, the impact factor of Frontiers in Plant Science is approximately 6.0, reflecting its influence in the field of plant science research.

How has the impact factor of Frontiers in Plant Science changed over recent years?

The impact factor of Frontiers in Plant Science has shown a steady increase over recent years, indicating growing recognition and citation of its published research in the scientific community.

What does the impact factor indicate about Frontiers in Plant Science?

The impact factor indicates the average number of citations received per paper published in Frontiers in Plant Science during the preceding two years, serving as a metric of the journal's influence and relevance in plant science.

How does Frontiers in Plant Science's impact factor compare to other plant science journals?

Frontiers in Plant Science's impact factor is competitive and often ranks well among plant science journals, positioning it as a reputable venue for publishing high-quality plant biology research.

Can the impact factor of Frontiers in Plant Science influence authors' decision to submit?

Yes, many authors consider the impact factor when choosing where to submit their manuscripts, and a solid impact factor like that of Frontiers in Plant Science can attract high-quality submissions.

Where can I find the official impact factor information for Frontiers in Plant Science?

The official impact factor for Frontiers in Plant Science is published annually in the Journal Citation Reports by Clarivate Analytics, and can also be found on the journal's official website and indexing databases.

Additional Resources

1. *Understanding Impact Factors: A Guide for Researchers in Plant Science*
This book explores the concept of impact factors, particularly focusing on journals like Frontiers in Plant Science. It explains how impact factors are calculated and their significance in academic publishing. The text also discusses the pros and cons of using impact factors as a metric for research quality and career advancement.

2. *Frontiers in Plant Science: Trends and Impact in Botanical Research*
This volume reviews the evolution and growing influence of Frontiers in Plant Science in the botanical research community. It provides an analysis of the journal's impact factor over time and highlights key publications that have shaped current plant science discourse. Readers gain insight into how the journal sets trends in plant biology research.

3. *Measuring Scientific Influence: Impact Factors and Beyond in Plant Science Journals*
Focusing on various metrics, this book delves into the impact factor and alternative indicators for assessing the influence of plant science journals like Frontiers in Plant Science. It offers case studies and statistical analyses to help researchers understand the broader context of journal rankings and research impact.

4. *Publishing in Frontiers in Plant Science: Strategies to Enhance Impact*
This guide provides practical advice for authors aiming to publish in Frontiers in Plant Science and improve the impact of their work. Topics include manuscript preparation, selecting impactful research topics, and engaging with the scientific community. The book also discusses the relationship between publishing practices and impact factor outcomes.

5. *The Role of Open Access Journals in Plant Science Impact Metrics*
Examining Frontiers in Plant Science as a leading open access journal, this book discusses how open access publishing affects impact factors and research visibility. It evaluates the benefits and challenges of open access models and their influence on citation rates and academic dissemination.

6. *Impact Factor Dynamics in Plant Science: A Decade of Frontiers Journal Growth*
This book provides a comprehensive review of the growth in impact factor for Frontiers in Plant Science over the past ten years. It analyzes factors contributing to the journal's rising prominence and how editorial policies and research focus areas have influenced its metric performance.

7. *Bibliometrics and Plant Science: Analyzing Frontiers in Plant Science*
Offering an in-depth bibliometric analysis, this book examines publication patterns, citation networks, and impact factor trends related to Frontiers in Plant Science. It helps readers understand how bibliometric tools can be used to evaluate journal performance and research influence in the plant science field.

8. *Scientific Publishing and Impact Factor: The Case of Frontiers in Plant Science*
This title explores the broader landscape of scientific publishing with a focus on Frontiers in Plant Science's role within it. It discusses how impact factor influences publishing decisions, funding, and academic recognition, providing a balanced view of the metric's importance and limitations.

9. *Enhancing Research Visibility: Impact Factors and Frontiers in Plant Science*
Focusing on strategies to increase research visibility, this book highlights how publishing in journals like Frontiers in Plant Science can affect an author's impact factor. It covers topics such as networking, social media promotion, and collaboration to maximize citation potential and academic reach.

Impact Factor Of Frontiers In Plant Science

impact factor of frontiers in plant science: Epigenetic Mechanisms in Plant Stress Adaptation Waseem, Muhammad, Pingwu, Liu, 2025-09-24 Plants evolve mechanisms to cope with environmental stressors like drought, salinity, extreme temperatures, and pathogen attacks. Among these mechanisms, epigenetic regulation plays a pivotal role in enabling plants to respond rapidly and effectively to changing conditions. Epigenetic modifications regulate gene activity in response to stress, enabling plants to improve their physiological and metabolic responses. Understanding these epigenetic mechanisms may offer valuable insight into plant adaptation strategies and holds the potential for developing stress-tolerant crops through epigenetic breeding mechanisms and biotechnological interventions. Epigenetic Mechanisms in Plant Stress Adaptation explores the roles of epigenetic modifications in plant responses to various environmental stressors. It examines how epigenetic changes influence plant adaptation and resilience to stresses like drought, salinity, temperature extremes, and pathogen attacks, providing a comprehensive resource that highlights the significance of epigenetics in plant biology and its potential applications in agriculture and environmental sustainability. This book covers topics such as botany, breeding strategies, and crop management, and is a useful resource for biologists, botanists, engineers, agriculturalists, academicians, researchers, and environmental scientists.

impact factor of frontiers in plant science: *Advances in Botanical Research* , 2022-07-01 Lignin is a large phenolic polymer found in the cell wall of most land plants. Volume ABR104, provides in-depth reviews on the most recent discoveries in the field. It revisits the lignin paradigm and reviews the occurrence of unconventional lignin precursors that are derived from both the monolignol biosynthetic pathway, and from other polyphenolic biosynthetic pathways. The volume encompasses the most recent data about the regulation of lignin biosynthesis in a environment of polysaccharides, the importance of oxidases, the pivotal role of feruloylation and coumaroylation of the cell wall both in the lignified stem and in the cereal grain. The volume gives an important part to the transcriptional regulation at different scales. At last, vibrational and fluorescence microscopy

methods to characterize the lignin-decorated cell wall as well the most recent bioengineering approaches towards lignin modification are reviewed. - The paradigm of lignin polymer expanded to new discovered compounds - The fluorescence and vibrational microscopy to detect lignin and phenolics - Spatial and timed transcriptional regulation of lignification

impact factor of frontiers in plant science: *Role of Antioxidants in Mitigating Plant Stress* Azamal Husen, 2025-07-01 Role of Antioxidants in Mitigating Plant Stress explores the fundamental roles and mechanistic approaches of antioxidant stress tolerance strategies. With chapters addressing both enzymatic and non-enzymatic antioxidants, it provides a clear guide for understanding plant responses. Presenting current understanding of these components, the book features their role, molecular properties, and reaction mechanisms to various environmental conditions. This book provides an important reference for researchers and advanced level students seeking to improve plant health.Plants are regularly exposed to various kinds of abiotic and biotic stresses in their natural environmental conditions. These stresses have significant influence on agriculture worldwide and thus, lead to massive economic losses as well as food insecurity. Research has identified many of the effects of, and mitigation techniques for, various stresses that impact plant systems. Strategies for strengthening the antioxidant defense system can increase yields and protect crop plants from a variety of stresses. - Discusses the modulation of antioxidant systems that enable plants to initiate short- and long-term mitigation responses - Examines the potential of non-enzymatic and enzymatic antioxidants in stress response - Explores coordination of antioxidants, plant hormones, and PGPR for higher plant performance under various stresses

impact factor of frontiers in plant science: *Molecular Breeding in Wheat, Maize and Sorghum* Mohammad Anwar Hossain, Mobashwer Alam, Saman Seneweera, Sujay Rakshit, Robert J. Henry, 2021-06-30 The global population is projected to reach almost 10 billion by 2050, and food and feed production will need to increase by 70%. Wheat, maize and sorghum are three key cereals which provide nutrition for the majority of the world's population. Their production is affected by various abiotic stresses which cause significant yield losses. The effects of climate change also increase the frequency and severity of such abiotic stresses. Molecular breeding technologies offer real hope for improving crop yields. Although significant progress has been made over the last few years, there is still a need to bridge the large gap between yields in the most favorable and most stressful conditions.

impact factor of frontiers in plant science: Heat Stress Tolerance in Plants Shabir H. Wani, Vinay Kumar, 2020-01-27 Demystifies the genetic, biochemical, physiological, and molecular mechanisms underlying heat stress tolerance in plants Heat stress—when high temperatures cause irreversible damage to plant function or development—severely impairs the growth and yield of agriculturally important crops. As the global population mounts and temperatures continue to rise, it is crucial to understand the biochemical, physiological, and molecular mechanisms of thermotolerance to develop ‘climate-smart’ crops. Heat Stress Tolerance in Plants provides a holistic, cross-disciplinary survey of the latest science in this important field. Presenting contributions from an international team of plant scientists and researchers, this text examines heat stress, its impact on crop plants, and various mechanisms to modulate tolerance levels. Topics include recent advances in molecular genetic approaches to increasing heat tolerance, the potential role of biochemical and molecular markers in screening germplasm for thermotolerance, and the use of next-generation sequencing to unravel the novel genes associated with defense and metabolite pathways. This insightful book: Places contemporary research on heat stress in plants within the context of global climate change and population growth Includes diverse analyses from physiological, biochemical, molecular, and genetic perspectives Explores various approaches to increasing heat tolerance in crops of high commercial value, such as cotton Discusses the applications of plant genomics in the development of thermotolerant ‘designer crops’ An important contribution to the field, Heat Stress Tolerance in Plants is an invaluable resource for scientists, academics, students, and researchers working in fields of pulse crop biochemistry, physiology, genetics, breeding, and biotechnology.

impact factor of frontiers in plant science: The Model Legume Medicago truncatula, 2 Volume Set Frans J. de Bruijn, 2020-01-29 Fully covers the biology, biochemistry, genetics, and genomics of Medicago truncatula Model plant species are valuable not only because they lead to discoveries in basic biology, but also because they provide resources that facilitate translational biology to improve crops of economic importance. Plant scientists are drawn to models because of their ease of manipulation, simple genome organization, rapid life cycles, and the availability of multiple genetic and genomic tools. This reference provides comprehensive coverage of the Model Legume Medicago truncatula. It features review chapters as well as research chapters describing experiments carried out by the authors with clear materials and methods. Most of the chapters utilize advanced molecular techniques and biochemical analyses to approach a variety of aspects of the Model. The Model Legume Medicago truncatula starts with an examination of M. truncatula plant development; biosynthesis of natural products; stress and M. truncatula; and the M. truncatula-Sinorhizobium meliloti symbiosis. Symbiosis of Medicago truncatula with arbuscular mycorrhiza comes next, followed by chapters on the common symbiotic signaling pathway (CSSP or SYM) and infection events in the Rhizobium-legume symbiosis. Other sections look at hormones and the rhizobial and mycorrhizal symbioses; autoregulation of nodule numbers (AON) in M. truncatula; Medicago truncatula databases and computer programs; and more. Contains reviews, original research chapters, and methods Covers most aspects of the M. truncatula Model System, including basic biology, biochemistry, genetics, and genomics of this system Offers molecular techniques and advanced biochemical analyses for approaching a variety of aspects of the Model Legume Medicago truncatula Includes introductions by the editor to each section, presenting the summary of selected chapters in the section Features an extensive index, to facilitate the search for key terms The Model Legume Medicago truncatula is an excellent book for researchers and upper level graduate students in microbial ecology, environmental microbiology, plant genetics and biochemistry. It will also benefit legume biologists, plant molecular biologists, agrobiologists, plant breeders, bioinformaticians, and evolutionary biologists.

impact factor of frontiers in plant science: Biotechnology, Multiple Omics, and Precision Breeding in Medicinal Plants Jen-Tsung Chen, 2025-03-27 Biotechnology, Multiple Omics, and Precision Breeding in Medicinal Plants explores the various methods for advancing medicinal plant research. It covers a wide range of approaches, including integrated and advanced plant biotechnology, mutagenesis, nanotechnology, genome-wide association studies, multiple omics tools, and high-throughput technologies. The book highlights the significant impact of combining pan-genomics with metabolomics in medicinal plant research, particularly in understanding how genetic diversity influences the profiles of secondary metabolites and the therapeutic potential of these plants. FEATURES: Explores ways to improve the production of secondary metabolites and bioactive compounds in key medicinal plants Features information on bioinformatics, artificial intelligence models, molecular markers, and genome editing techniques such as CRISPR-assisted precision breeding Promotes specific prebiotic formulas to ward off adverse effects of antibiotics Covers information on epigenetic regulation in boosting secondary metabolite production and the use of speed breeding combined with high-throughput technologies Proposing a multitude of technologies and methodologies in plant biotechnology with focus on enhancing the production of secondary metabolites and bioactive compounds from medicinal plants, this book is an ideal resource for researchers and academia in plant sciences/breeding, agriculture, and horticulture industries.

impact factor of frontiers in plant science: Impact of Climate Change on Medicinal and Herbal Plant microRNA Kanchanlata Tungare, Parul Johri, Sachidanand Singh, Surojeet Das, 2025-09-30 Climate change poses unprecedented challenges to plant growth, biodiversity, and productivity, necessitating innovative strategies for sustainability. Impact of Climate Change on Medicinal and Herbal Plant microRNA delves into the intricate relationship between climate-induced stress and the molecular mechanisms underpinning plant adaptation, with a special focus on microRNAs (miRNAs). This book provides an in-depth exploration of miRNAs as pivotal regulators in

plant biology, offering insights into their biogenesis, functional roles, and applications in stress management and crop improvement. Highlighting the interdisciplinary approach to understanding plant resilience, this book examines critical topics, including the impact of abiotic stressors like heavy metals and elevated CO2 levels, regulatory roles of miRNAs in photosynthesis and productivity, and the integration of bioinformatics and epigenetics in miRNA research. Through comprehensive chapters, readers gain knowledge about miRNA-mediated bioengineering, genome stability, and the emerging potential of omics technologies to combat the effects of climate change on agriculture. Key Features: A thorough analysis of miRNA biogenesis, regulation, and degradation, along with their myriad functional roles in plant biology Exploration of abiotic stress tolerance mechanisms in medicinal, cereal, legume, tuber, fruit, biofuel, and beverage crops Insights into bioinformatics tools and databases for miRNA analysis and their implications for stress tolerance studies Discussions on miRNA-mediated bioengineering for climate-resilient crops and recent advances in omics approaches Designed for researchers, students, and professionals in plant sciences, bioinformatics, and climate studies, this book bridges fundamental and applied research, making it an essential resource for addressing climate variability through molecular innovations.

impact factor of frontiers in plant science: Current Omics Advancement in Plant Abiotic Stress Biology Deepesh Bhatt, Manoj Nath, Saurabh Badoni, Rohit Joshi, 2024-05-07 Applied Biotechnology Strategies to Combat Plant Abiotic Stress investigates the causal molecular factors underlying the respective mechanisms orchestrated by plants to help alleviate abiotic stress in which Although knowledge of abiotic stresses in crop plants and high throughput tools and biotechnologies is avaiable, in this book, a systematic effort has been made for integrating omics interventions across major sorts of abiotic stresses with special emphasis to major food crops infused with detailed mechanistic understanding, which would furthermore help contribute in dissecting the interdisciplinary areas of omics-driven plant abiotic stress biology in a much better manner. In 32 chapters Applied Biotechnology Strategies to Combat Plant Abiotic Stress focuses on the integration of multi-OMICS biotechnologies in deciphering molecular intricacies of plant abiotic stress namely drought, salt, cold, heat, heavy metals, in major C3 and C4 food crops. Together with this, the book provides updated knowledge of common and unique set of molecular intricacies playing a vital role in coping up severe abiotic stresses in plants deploying multi-OMICS approaches This book is a valuable resource for early researchers, senior academicians, and scientists in the field of biotechnology, biochemistry, molecular biology, researchers in agriculture and, crops for human foods, and all those who wish to broaden their knowledge in the allied field. - Describes biotechnological strategies to combat plant abiotic stress - Covers the latest evidence based multipronged approaches in understanding omics perspective of stress tolerance - Focuses on the integration of multi-OMICS technologies in deciphering molecular intricacies of plant abiotic stress

impact factor of frontiers in plant science: Edible Oilseeds Research , 2024-10-23 Plant-based edible oils rank second only to carbohydrates as an important source of calories in the human diet and are primarily derived from edible oilseeds. These oilseeds are rich in essential fatty acids, high-quality protein, fiber, vitamins, and minerals. They also contain important phytochemicals including sterols, polyphenols, tocopherols, and carotenoids, making the oils they produce critical for metabolic functions, human health benefits, and addressing malnutrition and undernutrition. The global cultivation of edible oilseed crops has seen a significant rise. However, various biotic and abiotic stresses, poor agronomic practices, and extreme climate conditions, either in isolation or combination, negatively affect plant health, thus limiting both the quantity and quality of oilseed productivity. Edible Oilseeds Research - Updates and Prospects provides a comprehensive exploration of the origins, botanical characteristics, challenges, and recent advancements associated with major herbaceous edible oilseed-bearing plants. It offers historical insights into edible oilseeds, highlights recent advancements and future directions, and provides an overview of the important bioactive dietary compounds (including tocopherols and tocotrienols) present in common oilseeds. This volume also discusses key approaches to improving the health and productivity of oil palm and presents critical insights into the applications and achievements of CRISPR-Cas9 technology in

oilseed research. This book serves as a valuable resource for plant biologists engaged in teaching and research, offering detailed knowledge on various aspects of important edible oilseeds.

impact factor of frontiers in plant science: *Role of Antioxidants in Abiotic Stress Management* Zaid Ulhassan, Yasir Hamid, Weijun Zhou, 2025-08-01 Role of Antioxidants in Abiotic Stress Management covers the antioxidant defense system in plants, providing key insights on how to generate tolerant varieties that can adapt to harsh environmental conditions without adverse impacts on crop productivity. The book covers a broad range of antioxidant responses, describing how global climate changes and the overexploitation of natural or anthropogenic resources creates abiotic stressors. The potential impacts of factors such as heavy metals/metalloids, drought/water deficit, salinity, extreme temperatures, anoxia, and high light intensity are covered, along with discussions on how to improve crop growth and development at different stages.Written by a team of international experts, this book provides an important reference on morphological, physiological, biochemical, metabolic, anatomical and molecular responses of plants under stress factors. - Provides important insights for improved breeding success - Highlights management strategies for enzymatic and non-enzymatic antioxidant-mediated stress tolerance in plants - Includes illustrations to clarify and demonstrate key aspects

impact factor of frontiers in plant science: Amino Acids in Plant Protection Muhammad Bilal Hafeez, Abdul Wahid, Muhammad Farooq, Noreen Zahra, 2025-07-01 Amino Acids in Plant Protection: Mechanisms, Metabolism and Coordination highlights the increasingly evident importance of amino acids in plant development and stress defense, addressing the needs of basic and applied plant scientists around the world. It provides the only comprehensive overview of the general direction of amino acid metabolism and genetic regulation under abiotic stress conditions, presenting a complete map of all currently known enzymatic steps involved in amino acid synthesis and degradation, including the initial steps leading to the synthesis of secondary metabolites.Higher plants are sessile and therefore cannot escape hostile environmental conditions that are a constant threat throughout their lifecycle. Unfavorable growth conditions such as extreme temperatures, drought, flood, and contamination of soils with high salt concentrations are considered the major abiotic environmental stressors that can not only limit plant growth and development, but also determine the geographic distribution of plant species and directly affect agronomical yield. - Explores amino acids in a range of environmental conditions to enable accurate assessment and response - Presents comprehensive insights into the practical application of amino acids for specific stress scenarios - Provides in-depth details of metabolic and signaling functions of amino acids

impact factor of frontiers in plant science: Plant Phosphorus Nutrition Hatem Rouached, Santosh B. Satbhai, 2023-10-19 This book is an up-to-date reference on phosphorus nutrition in plants. Phosphorus has no substitute in food production, and the use of phosphate (Pi) fertilisers has increased crop yields to feed billions of people. This book covers phosphorus metabolism and phosphorus sensing molecular mechanisms and signalling in plants. It covers functions of phosphorus and crosstalk with other nutrients. It discusses how plants sense Pi deficiency and coordinate the responses via signalling pathways and networks for the regulation of Pi-deficiency responses. FEATURES Discusses the latest developments in phosphate management in plants Provides insights on emerging topics for sustainable approaches to managing phosphate shortage Throws light on the resilience of plants to phosphate deficiency Provides extensive updates that serve as primary points for further research Explains molecular and physiological mechanisms of phosphate transport This book compiles the latest research from experts in the field. It is useful for advanced graduates and researchers in plant sciences and agriculture.

impact factor of frontiers in plant science: Epigenetics for Climate-Smart and Sustainable Agriculture Jen-Tsung Chen, 2025-07-29 This book provides a state-of-the-art overview of current achievements and future possibilities for the application of epigenetic and epigenomic techniques to the improvement of crops. Creating crops more resilient to the stresses caused by climate change will be an important part of a climate-smart and sustainable agriculture strategy for the future. All critical environmental stressors are explored: temperature, salt, drought, pollutants, pests, fungi,

bacteria, and viruses. The exciting possibilities for the integration of epigenetic resources and technologies with plant functional genomics and the new field of precision molecular breeding in crops are discussed. Examples are shown of crops showing better growth performance, enhanced yields, more efficient nutrient utilization, and higher quality food production. This book is an ideal complete guide for students, researchers, experts, and professionals to overview this critical topic.

impact factor of frontiers in plant science: Exogenous Priming and Engineering of Plant Metabolic and Regulatory Genes Manish Kumar Patel, Lam-Son Phan Tran, Sonika Pandey, Avinash Mishra, 2025-01-30 Exogenous Priming and Engineering of Plant Metabolic and Regulatory Genes: Stress Mitigation Strategies in Plants provides insights into metabolic adjustment, their regulation, and the regulatory networks involved in plants responding to stress situations. It contains comprehensive information, combining mechanistic priming and engineering approaches from the conventional to those recently developed. In addition, the book addresses seed priming, tolerance mechanisms, pre-and post-treatment, as well as sensory response, and genetic manipulation. From basic concepts to modern technologies and prevailing policies, readers will find this book useful in enhancing their understanding of the area as well as helping in identifying approaches for future research. - Provides detailed information on developing stress-tolerant crop varieties using two distinct approaches - Highlights advancements in OMICS approaches for different crops - Assists readers in designing and evaluating plan for future research

impact factor of frontiers in plant science: Climate Change Impacts on Soil-Plant-Atmosphere Continuum Himanshu Pathak, Dibyendu Chatterjee, Saurav Saha, Bappa Das, 2024-04-01 This book explores the interaction between climate change phenomena and the soil–plant–atmosphere continuum (SPAC), which inspects the crucial role of anthropogenic greenhouse gas emissions in modifying the net ecosystem response towards the modified environment. Increasing concentration of anthropogenic greenhouse gases (carbon dioxide, methane and nitrous oxide) from massive deforestation, fossil fuel burning and rapid industrialization in the post-nineteenth century have led to adverse changes in our global climate system. The book evaluates the net impact of climate change on soil, plants and the atmosphere individually and in totality. Among the topics it covers are the impact of climate change on soil environment which encompasses soil processes, nutrient cycling, soil carbon sequestration, soil biota response and soil health management. Also included are the impact on plants with respect to the dry matter assimilation pattern, modification in resource use efficiency, rhizosphere interactions, management of biotic and abiotic stress factors, and regulatory mechanisms of biotic stress factors in modifying the net agroecosystem response towards climate change. Moreover, potential genetic engineering options for establishing C4 or Crassulacean acid metabolism (CAM) in C3 plants, heat–drought stress on pollen biology, breeding ideotype, ecological indicators and crop simulation modelling are considered. Lastly, the impact on the atmosphere takes into account greenhouse gas measurements, mitigation options, eddy covariance measurement of greenhouse gasses, satellite-based monitoring, ecosystem services, abiotic stress management options, air pollution and atmospheric modelling. This book is a valuable resource for researchers, students and policymakers in understanding climate change impacts on interaction processes among the atmosphere, soil and plants from the local to regional scales.

impact factor of frontiers in plant science: *Mitigation of Plant Abiotic Stress by Microorganisms* Gustavo Santoyo, Ajay Kumar, Mohd Aamir, Sivakumar Utandhi, 2022-04-30 The microbial ecosystem provides an indigenous system for improving plant growth, health and stress resilience. Plant microbiota, including isolated microbial communities, have been studied to further understand the functional capacities, ecological structure and dynamics of the plant-microbe interaction. Due to climatic changes, there is an urgent need to bring microbial innovations into practice. Mitigation of Plant Abiotic Stress by Microorganisms: Applicability and Future Directions is a comprehensive review of the different strategies available to improve the plant microbiome. Chapters include key topics such as: harnessing endophytic microbial diversity, microbial genes for improving abiotic stress tolerance, and microbial bioformulations. Putting these strategies into

practice can have varying success in the field, so it is crucial that scientists are equipped with the knowledge of which microorganisms are needed, as well as the use and suitability of delivery approaches and formulations. This title will be an essential read for researchers and students interested in plant microbial technologies and plant bio stimulants, plant pathology, biocontrol, agronomy, and environmental mediation. - Discusses adaptive mechanisms of plant against multiple stresses - Highlights diversity of symbiotic microorganisms associated with insects and their impact on host plants - Provides functional genomics tools for studying microbe-mediated stress tolerance

impact factor of frontiers in plant science: Climate Change and Biotic Factors Ashutosh Singh, Saurabh Pandey, Amarjeet Kumar, 2025-05-07 Climate change has more impact on the world than just rising temperatures and extreme weather events. It also impacts the intricate interactions between organisms, including pests, pathogens, and other biotic factors, which are critical components of the balance maintained in nature. This new book delves into the intricate relationship between climate change and the interplay of biotic factors, shedding light on the molecular mechanisms underlying these interactions.

impact factor of frontiers in plant science: Phytohormones in Abiotic Stress Dhandapani Raju, R Ambika Rajendran, Ayyagari Ramlal, Virendra Pal Singh, 2024-06-14 Plants are continuously exposed to different environmental stresses that negatively impact their physiology and morphology, resulting in production reduction. As a result of constant pressure, plants evolve different mechanisms for sustenance and survival. Hormones play a major role in defences against the stresses and stimulate regulatory mechanisms. One of the ways through which they mitigate stress is via the production of hormones like auxins, ethylene, jasmonic acid, etc. The phytohormones help in signaling and enhance the chances of their survival. Plant hormones play many vital roles from integrating developmental events, physiological and biochemical processes to mediating both abiotic and biotic stresses. This book aims to highlight these issues and provide scope for the development of tolerance in crops against abiotic stresses to maximize yield for the growing population. There is an urgent need for the development of strategies, methods and tools for the broad-spectrum tolerance in plants supporting sustainable crop production under hostile environmental conditions. The salient features are as follows: • It includes both traditional and non-traditional phytohormones and focuses on the latest progress emphasizing the roles of different hormones under abiotic stresses. • It provides a scope of the best plausible and suitable options for overcoming these stresses and puts forward the methods for crop improvement. • It is an amalgamation of the biosynthesis of phytohormones and also provides molecular intricacies and signalling mechanisms in different abiotic stresses. • This book serves as a reference book for scientific investigators from recent graduates, academicians and researchers working on phytohormones and abiotic stresses.

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