Somaclonal Variation In Crop Improvement I Biotechnology In Agriculture And Forestry

Crop Improvement Advancement in Crop Improvement Techniques Genomics-Assisted Crop Improvement Biotechnologies of Crop Improvement, Volume 1 Crop Improvement Genome Engineering for Crop Improvement Genetic Engineering of Plants Crop Improvement Microbial Strategies for Crop Improvement Genome Engineering for Crop Improvement Molecular Breeding for Sustainable Crop Improvement Model Plants and Crop Improvement Molecular Techniques in Crop Improvement Genetic Resources, Chromosome Engineering, and Crop Improvement Biotechnologies of Crop Improvement, Volume 2 Gene Pool Diversity and Crop Improvement Genomic Selection for Crop Improvement Genetic Resources, Chromosome Engineering, and Crop Improvement Molecular Plant Breeding Somatic Hybridization in Crop Improvement II Polyploidy and Hybridization for Crop Improvement Genetic Resources, Chromosome Engineering, and Crop Improvement Crop Production for Agricultural Improvement Molecular Biology and Crop Improvement Crop Improvement Plant Adaptation and Crop Improvement Molecular Approaches to Crop Improvement Annual Report of the International Crop Improvement Association Wild Germplasm for Genetic Improvement in Crop Plants Haploids in Crop Improvement I Genomics-Assisted Crop Improvement Somaclonal Variation and Induced Mutations in Crop Improvement Advancement in Crop Improvement Techniques Crop Breeding Selection Indices in Plant Breeding Crop Breeding: Strategies for Crop Improvement Molecular Marker Systems in Plant Breeding and Crop Improvement Crop Improvement, Adoption and Impact of Improved Varieties in Food Crops in Sub-Saharan Africa Improving Crop Productivity in Sustainable Agriculture Genetic Validation and its Role in Crop Improvement

Getting the books Somaclonal Variation In Crop Improvement I Biotechnology In Agriculture And Forestry now is not type of challenging means. You could not on your own going once ebook amassing or library or borrowing from your associates to right of entry them. This is an entirely easy means to specifically get guide by on-line. This online publication Somaclonal Variation In Crop Improvement I Biotechnology In Agriculture And Forestry can be one of the options to accompany you later having new time.

It will not waste your time. give a positive response me, the e-book will unconditionally tune you other situation to read. Just invest little grow old to door this on-line message Somaclonal Variation In Crop Improvement I Biotechnology In Agriculture And Forestry as competently as review them wherever you are now.

Genomics-Assisted Crop Improvement Aug 31 2022 This superb volume provides a critical assessment of genomics tools and approaches for crop breeding. Volume 1 presents the status and availability of genomic resources and platforms, and also devises strategies and approaches for effectively exploiting genomics research. Volume 2 goes into detail on a number of case studies of several important crop and plant species that summarize both the achievements and limitations of genomics research for crop improvement.

Somaclonal Variation and Induced Mutations in Crop Improvement Mar 02 2020 Genetic variability is an important parameter for plant breeders in any con ventional crop improvement programme. Very often the desired variation is un available in the right combination, or simply does not exist at all. However, plant breeders have successfully recombined the desired genes from cultivated crop gerrnplasm and related wild species by sexual hybridization, and have been able to develop new cultivars with desirable agronomie traits, such as high yield, disease, pest, and drought resistance. So far, conventional breeding methods have managed to feed the world's ever-growing population. Continued population growth, no further scope of expanding arable land, soil degradation, environ mental pollution and global warrning are causes of concern to plant biologists and planners. Plant breeders are under continuous pressure to improve and develop new cultivars for sustainable food production. However, it takes several years to develop a new cultivar. Therefore, they have to look for new technologies, which could be combined with conventional methods to create more genetic variability, and reduce the time in developing new cultivars, with early-maturity, and improved yield. The first report on induced mutation of a gene by HJ. Muller in 1927 was a major mi1estone in enhancing variation, and also indicated the potential applica tions of mutagenesis in plant improvement. Radiation sources, such as X-rays, gamma rays and fast neutrons, and chemical mutagens (e. g. , ethyl methane sulphonate) have been widely used to induce mutations.

Somatic Hybridization in Crop Improvement II Mar 14 2021 Somatic hybrids through the fusion of plant protoplasts have widened the genetic variability of cultivated plants. As "Somatic Hybridization in Crop Improvement I", published in 1994, this volume describes how this discipline can contribute to the improvement of crops. It comprises 24 chapters dealing with interspecific and intergeneric somatic hybridization and cybridization. It is divided into four sections: I. Cereals: Barley, rice, and wheat. II. Vegetables and Fruits: Arabidopsis, Asparagus, Brassica, chicory, Citrus, Cucumis, Diospyros, Ipomoea, and various Solanaceous species, e.g., tomato, potato, and eggplant. III. Medicinal and Aromatic Plants: Atropa, Dianthus, Nicotiana, and Senecio. IV. Legumes/Pasture Crops: Alfalfa. This book is tailored to the needs of advanced students, teachers and researchers in the fields of plant breeding, genetic engineering, and plant tissue culture.

Biotechnologies of Crop Improvement, Volume 1 Jul 30 2022 During the past 15 years, cellular and molecular approaches have emerged as valuable adjuncts to supplement and complement conventional breeding methods for a wide variety of crop plants. Biotechnology increasingly plays a role in the creation, conservation, characterization and utilization of genetic variability for germplasm enhancement. For instance, anther/microspore culture, somaclonal variation, embryo culture and somatic hybridization are being exploited for obtaining incremental improvement in the existing cultivars. In addition, genes that confer insect- and disease-resistance, abiotic stress tolerance, herbicide tolerance and quality traits have been isolated and re-introduced into otherwise sensitive or susceptible species by a variety of transgenic techniques. Together these transformative methodologies grant access to a greater repertoire of genetic diversity as the gene(s) may come from viruses, bacteria, fungi, insects, animals, human beings, unrelated plants or even be artificially derived. Remarkable achievements have been made in the production, characterization, field evaluation and commercialization of transgenic crop varieties worldwide. Likewise, significant advances have been made towards increasing crop yields, improving nutritional quality, enabling crops to be raised under adverse conditions and developing resistance to pests and diseases for sustaining global food and nutritional security. The overarching purpose of this 3-volume work is to summarize the history of crop improvement from a technological perspective but to do so with a forward outlook on further advancement and adaptability to a changing world. Our carefully chosen “case studies of important plant crops” intend to serve a diverse spectrum of audience looking for the right tools to tackle complicated local and global issues.

Genome Engineering for Crop Improvement May 28 2022 In recent years, significant advancements have been made in the management of nutritional deficiency using genome engineering—enriching the nutritional properties of agricultural and horticultural crop plants such as wheat, rice, potatoes, grapes, and bananas. To meet the demands of the rapidly growing world population, researchers are developing a range of new genome engineering tools and strategies, from increasing the nutraceuticals in cereals and fruits, to decreasing the anti-nutrients in crop plants to improve the bioavailability of minerals and vitamins. Genome Engineering for Crop Improvement provides an up-to-date view of the use of genome editing for crop bio-fortification, improved bioavailability of minerals and nutrients, and enhanced hypo-allergenicity and hypo-immunogenicity. This volume examines a diversity of important topics including mineral and nutrient localization, metabolic engineering of carotenoids and flavonoids, genome engineering of zero calorie potatoes and allergen-free grains, engineering for stress resistance in crop plants, and more. Helping readers deepen their knowledge of the application of genome engineering in crop improvement, this book: Presents genetic engineering methods for developing edible oil crops, mineral translocation in grains, increased flavonoids in tomatoes, and cereals with enriched iron bioavailability Describes current genome engineering methods and the distribution of nutritional and mineral composition in important crop plants Offers perspectives on emerging technologies and the future of genome engineering in agriculture Genome Engineering for Crop Improvement is an essential resource for academics, scientists, researchers, agriculturalists, and students of plant molecular biology, system biology, plant biotechnology, and functional genomics.

Genetic Engineering of Plants Apr 26 2022 "The book...is, in fact, a short text on the many practical problems...associated with translating the explosion in basic biotechnological research into the next Green Revolution," explains Economic Botany. The book is "a concise and accurate narrative, that also manages to be interesting and personal...a splendid little book." Biotechnology states, "Because of the clarity with which it is written, this thin volume makes a major contribution to improving public understanding of genetic engineering's potential for enlarging the world's food supply...and can be profitably read by practically anyone interested in application of molecular biology to improvement of productivity in agriculture."

Crop Breeding Dec 31 2019 This title includes a number of Open Access chapters. Climate change will severely impact the world’s food supply unless steps are taken to increase crop resilience. Otherwise, the negative effects on both the yield and the quality of crop plants are predicted to be immense. Plant genomics is a

potentially powerful defense against this looming threat. This compendium volume offers a global perspective on the topic, with contributions from 42 eminent researchers from 12 nations around the world. The editor is a respected and published scientist in the bioinformatics field, who has chosen articles in the following topics: An overview of the genetic challenges presented by climate change A genomic toolkit for crop-related research Specific methods of improvement for specific crop by means of genomic applications The hand-picked up-to-date research makes this volume an excellent reference not only for university-level academics, but also for policymakers and stakeholders who must tackle the challenge of the world's food security.

Crop Improvement Mar 26 2022 The improvement of crop species has been a basic pursuit since cultivation began thousands of years ago. To feed an ever increasing world population will require a great increase in food production. Wheat, corn, rice, potato and few others are expected to lead as the most important crops in the world. Enormous efforts are made all over the world to document as well as use these resources. Everybody knows that the introgression of genes in wheat provided the foundation for the "Green Revolution". Later also demonstrated the great impact that genetic resources have on production. Several factors are contributing to high plant performance under different environmental conditions, therefore an effective and complementary use of all available technological tools and resources is needed to meet the challenge.

Genetic Validation and its Role in Crop Improvement Jun 24 2019

Crop Improvement Oct 09 2020 Crop Improvement: Biotechnological Advances – Biomedical Science The field of biotechnology is advancing at a fast pace. The availability of low-cost DNA/genome sequencing technologies has led to the discovery and functional characterization of myriad of genes imparting stress tolerance and quality traits. The 'omics' group of technologies including genomics, proteomics, transcriptomics and metabolomics has revolutionized the agricultural biotechnology sector. The Nobel Prize-winning technology, such as the genome editing technique, is being employed to edit various gene functions in plants aiding in crop improvement. This technology may be adopted very quickly by consumers compared with the transgenic technique because the genome-edited plants have no adverse effects on the genome of the plant itself and on the environment and related species/non-target organisms. In this book, authors have attempted to compile the latest techniques of agricultural biotechnology and their applications in crop improvement. Certain chapters have been dedicated to describe the use of nanotechnology, a fast emerging new technique in the agriculture sector. Features Development, potential and safety issues in biotechnology Advances in genomics, proteomics and transcriptomics in agriculture Protein bioinformatics and its applications Genetically modified (GM) technology and its implications Genome editing in crop improvement Marker-assisted selection (MAS) in crop improvement Mutation breeding Cryobiotechnology Nanotechnology and biosensors This book includes real-world examples and applications making it accessible to a broader interdisciplinary readership. We hope that it will serve as a reference book for researchers engaged in molecular biology and biotechnology and will act as a ready reckoner for postgraduate (PG) students in the biotechnology discipline.

Crop Breeding: Strategies for Crop Improvement Oct 28 2019 The science of crop breeding delves into the study of genetics of crops to develop desirable characteristics for agriculture and horticulture. Breeding crops is essential for ensuring food security in the context of a growing economy. This is done by developing new crop types that have higher yield, disease resistance, abiotic stress tolerance and also higher adaptability to different environments. Classical plant breeding methods have mostly been replaced by modern methodologies of marker-assisted selection, double haploids and genetic modification. The research in the frontiers of genetic modification and transgenic plants is rapidly progressing with the development of innovative biotechnological tools. This book studies, analyses and upholds the pillars of crop breeding and its utmost significance in modern times. The various advancements in this field are glanced at and their applications as well as ramifications are looked at in detail. This book targets geneticists, food scientists, agronomists, molecular biologists, researchers and students associated with this domain.

Genetic Resources, Chromosome Engineering, and Crop Improvement Sep 19 2021 Summarizing landmark research, Volume 2 of this essential series furnishes information on the availability of germplasm resources that breeders can exploit for producing high-yielding cereal crop varieties. Written by leading international experts, this volume offers the most comprehensive and up-to-date information on employing genetic resources t

Genome Engineering for Crop Improvement Jan 24 2022 This book serves the teachers, researchers and the students as a handy and concise reference as well as guidebook while designing and planning for use of the advanced technologies for crop improvement. The content of the book is designed to cover the latest genome engineering techniques for crop improvement. The conventional breeding has got its limitations such as non-availability of desired genes within the genepool. In many cases, breeding has been highly used and it has nearly reached its highest limit so far as the productivity and production of crops are concerned. However, with increasing need of food and decreasing resources, including water, land, labour, etc., to feed the growing population, the alternative available ways of increasing crop productivity need to be explored and exploited. Genome engineering has a wide scope that includes technologies such as genetic engineering and transgenesis, RNA technologies, CRISPR, cisgenics and subgenics for better productivity and more efficient biotic and abiotic stress management. Therefore, the book is planned to enlighten the readers with the advanced technologies with examples and case studies, whenever possible. Efforts will be made to emphasize on general efforts on various major food crops; however, it would also be made clear that such efforts could be taken as proofs of concepts and that this could be extrapolated keeping the demand in mind.

Gene Pool Diversity and Crop Improvement Jul 18 2021 The world population is estimated to reach to more than 10 billion by the year 2050. These projections pose a challenging situation for the agricultural scientists to increase crops productivity to meet the growing food demands. The unavailability and/or inaccessibility to appropriate gene pools with desired traits required to carry out genetic improvement of various crop species make this task formidable for the plant breeders. Incidentally, most of the desired genes reside in the wild genetic relatives of the crop species. Therefore, exploration and characterization of wild genetic resources of important crop species is vital for the efficient utilization of these gene pools for sustainable genetic improvements to assure food security. Further, understanding the myriad complexities of genic and genomic interactions among species, more particularly of wild relatives of crop species and/or phylogenetically distant germplasm, can provide the necessary inputs to increase the effectiveness of genetic improvement through traditional and/or genetic engineering methods. This book provides comprehensive and latest insights on the evolutionary genesis of diversity, access and its utilization in the evolution of various crop species. A comprehensive account of various crops, origin, exploitation of the primary, secondary and tertiary gene pools through breeding, biosystematical, cytogenetical and molecular phylogenetical relationships, and genetic enhancement through biotechnological interventions among others have been provided as the necessary underpinnings to consolidate information on the effective and sustainable utilization of the related genetic resources. The book stresses upon the importance of wild germplasm exploration, characterization and exploitation in the assimilation of important crop species. The book is especially intended for students and scientists working on the genetic improvement of crop species. Plant Breeders, Geneticists, Taxonomists, Molecular Biologists and Plant Biotechnologists working on crop species are going to find this book very useful.

Biotechnologies of Crop Improvement, Volume 2 Aug 19 2021 During the past 15 years, cellular and molecular approaches have emerged as valuable adjuncts to supplement and complement conventional breeding methods for a wide variety of crop plants. Biotechnology increasingly plays a role in the creation, conservation, characterization and utilization of genetic variability for germplasm enhancement. For instance, anther/microspore culture, somaclonal variation, embryo culture and somatic hybridization are being exploited for obtaining incremental improvement in the existing cultivars. In addition, genes that confer insect- and disease-resistance, abiotic stress tolerance, herbicide tolerance and quality traits have been isolated and re-introduced into otherwise sensitive or susceptible species by a variety of transgenic techniques. Together these transformative methodologies grant access to a greater repertoire of genetic diversity as the gene(s) may come from viruses, bacteria, fungi, insects, animals, human beings, unrelated plants or even be artificially derived. Remarkable achievements have been made in the production, characterization, field evaluation and commercialization of transgenic crop varieties worldwide. Likewise, significant advances have been made towards increasing crop yields, improving nutritional quality, enabling crops to be raised under adverse conditions and developing resistance to pests and diseases for sustaining global food and nutritional security. The overarching purpose of this 3-volume work is to summarize the history of crop improvement from a technological perspective but to do so with a forward outlook on further advancement and adaptability to a changing world. Our carefully chosen "case studies of important plant crops" intend to serve a diverse spectrum of audience looking for the right tools to tackle complicated local and global issues.

Annual Report of the International Crop Improvement Association Jul 06 2020

Molecular Approaches to Crop Improvement Aug 07 2020 Although plant genes were first isolated only some twelve years ago and transfer of foreign DNA into tobacco cells first demonstrated some eight years ago, the application and extension of biotechnology to agricultural problems has already led to the field-testing of genetically modified crop plants. The promise of tailor-made plants containing resistance to pests or diseases as well as many other desirable characteristics has led to the almost compulsory incorporation of molecular biology into the research programs of chemical and seed companies as well as Governmental agricultural agencies. With the routine transformation of rice and the early evidence of transformation of maize the possibility of the world's major cereal crops being modified for improved nutritional value or resistance characteristics is now likely in the next few years. The increasing number of cloned plant genes and the increasing

sophistication of our knowledge of the major developmental and biochemi cal pathways in plants should eventually allow us to engineer crop plants with higher yields and with less detrimental impact on the environment than now occurs in our current high input agricultural systems. This book draws together many of the expanding areas of plant molecular biology and genetic engineering that will make a substantial contribution to the development of the more productive and efficient crop plants that the world's farmers will be planting in the next decade.

Genetic Resources, Chromosome Engineering, and Crop Improvement Jan 12 2021 Summarizing landmark research, Volume 4 of this essential seriesfurnishes information on the availability of germplasm resources that breeders can exploit for producing high-yielding oilseed crop varieties. Written by leading international experts, this volume presents the most up-to-date information on employing genetic resources to increas

Molecular Marker Systems in Plant Breeding and Crop Improvement Sep 27 2019 Successful release of new and better crop varieties increasingly requires genomics and molecular biology. This volume presents basic information on plant molecular marker techniques from marker location up to gene cloning. The text includes a description of technical approaches in genome analysis such as comparison of marker systems, positional cloning, and array techniques in 19 crop plants. A special section focuses on converting this knowledge into general and specific breeding strategies, particularly in relation to biotic stress. Theory and practice of marker assisted selection for QTL, gene pyramiding and the future of MAS are summarized and discussed for maize, wheat, and soybean. Furthermore, approaches in silviculture on the examples of Fagus, Populus, Eucalyptus, Picea and Abies are presented. The volume ends with a comprehensive review of the patents relevant for using molecular markers and marker assisted selection.

Crop Production for Agricultural Improvement Dec 11 2020 In the recent years, the looming food scarcity problem has highlighted plant sciences as an emerging discipline committed to devise new strategies for enhanced crop productivity. The major factors causing food scarcity are biotic and abiotic stresses such as plant pathogens, salinity, drought, flooding, nutrient deficiency or toxicity which substantially limit crop productivity world-wide. In this scenario, strategies should be adopted to achieve maximum productivity and economic crop returns. In this book we have mainly focused on physiological, biochemical, molecular and genetic bases of crop development and related approaches that can be used for crop improvement under environmental adversaries. In addition, the adverse effects of different biotic (diseases, pathogens etc.) and abiotic (salinity, drought, high temperatures, metals etc) stresses on crop development and the potential strategies to enhance crop productivity under stressful environments are also discussed.

Polyploidy and Hybridization for Crop Improvement Feb 10 2021 Many of our current agricultural crops are natural or agricultural hybrids (between two or more species), or polyploids (containing more than one genome or set of chromosomes). These include potato, oats, cotton, oilseed rape, wheat, strawberries, kiwifruit, banana, seedless watermelon, triticale and many others. Polyploidy and hybridization can also be used for crop improvement: for example, to introgress disease resistance from wild species into crops, to produce seedless fruits for human consumption, or even to create entirely new crop types. Some crop genera have hundreds of years of interspecific hybridization and ploidy manipulation behind them, while in other genera use of these evolutionary processes for crop improvement is still at the theoretical stage. This book brings together stories and examples by expert researchers and breeders working in diverse crop genera, and details how polyploidy and hybridization processes have shaped our current crops, how these processes have been utilized for crop improvement in the past, and how polyploidy and interspecific hybridization can be used for crop improvement in the future.

Advancement in Crop Improvement Techniques Jan 30 2020 Advancement in Crop Improvement Techniques presents updates on biotechnology and molecular biological approaches which have contributed significantly to crop improvement. The book discusses the emerging importance of bioinformatics in analyzing the vast resources of information regarding crop improvement and its practical application and utilization. Throughout this comprehensive resource, emphasis is placed on various techniques used to improve agricultural crops, providing a common platform for the utility of these techniques and their combinations. Written by an international team of contributors, this book provides an in-depth analysis of existing tools and a framework for new research. Reviews techniques used for crop improvement, from selection and crossing over, to microorganismal approaches Explores the role of conventional biotechnology in crop improvement Summarizes the combined approaches of cytogenetics and biotechnology for crop improvement, including the importance of molecular techniques in this process Focuses on the emerging role of bioinformatics for crop improvement

Molecular Biology and Crop Improvement Nov 09 2020 This book identifies targets for plant transformation by molecular biology for two crops of major importance in European agriculture - wheat and oilseed rape - and the potentially important protein crop faba beans. Modern techniques have enabled researchers to identify, isolate and modify plant genes, and much effort is now being devoted to improving these techniques and to adapting them to crop plants. By these means, it should prove possible to make defined changes to plants of commercial value, to improve their yield, quality and resistance to stresses, pests and diseases. This volume results from a report prepared for the Genetics and Biotechnology Division of the Commission of the European Communities by Dr Austin and his colleagues at the Plant Breeding Institute, where some of the work is being carried out. It therefore provides an authoritative account of the area for research workers and students.

Crop Improvement Nov 02 2022 The book covers the latest development in the biosciences field covering key topics in crop improvement including ‘omic approaches to improving sustainable crop production, advancement in marker technology, strategies in genetic manipulation, crop quality and sustainability and plant microbe interaction detailing on proven technologies to address critical issue for agricultural sustainability which are beneficial for researchers and students. The book also includes aspects of preserving crops after harvest as this is a key factor in promoting sustainable crop quality in terms of addressing waste, choosing the appropriate packaging and moving crops through the food and industrial supply chain. An important strategy to overcome the challenges in providing food for the world population in a sustainable manner is through concerted efforts by crop scientists to embrace new technologies in increasing yield, quality and improving food safety while minimizing adverse environmental impact of the agricultural activities. Most of the proven molecular and genetic technologies in crop science have been tested and verified in model plants such as Arabidopsis and tomato. The technologies, when deployed on various plant species of importance for human nutrition and industrial applications, including cereals, vegetables, fruits, herbs, fibre and oil crops, face many challenges, not only due to their longer life cycle but many other physiological and environmental factors affecting yield and quality of plant products. Furthermore, major impacts on crop production due to catastrophic diseases and global climate change needs urgent and innovative solutions. Therefore a systematic approach, employing various leading-edge technologies that enable the functional elucidation of key pathway genes via ‘omics tools, genome wide association with desired phenotypes and development of cost effective and practicable molecular tools for selection, is vital. The International Conference on Crop Improvement was held to address these and other pressing issues. This volume summarizes the keynote presentations from the meeting and highlights addition discussions that are critical to crop improvement in a challenging time.

Molecular Breeding for Sustainable Crop Improvement Dec 23 2021 The world population is estimated to reach to more than 10 billion by the year 2050. These projections pose a challenging situation for the agricultural scientists to increase crops productivity to meet the growing food demands. The unavailability and/or inaccessibility to appropriate gene pools with desired traits required to carry out genetic improvement of various crop species make this task formidable for the plant breeders. Incidentally, most of the desired genes reside in the wild genetic relatives of the crop species. Therefore, exploration and characterization of wild genetic resources of important crop species is vital for the efficient utilization of these gene pools for sustainable genetic improvements to assure food security. Further, understanding the myriad complexities of genic and genomic interactions among species, more particularly of wild relatives of crop species and/or phylogenetically distant germplasm, can provide the necessary inputs to increase the effectiveness of genetic improvement through traditional and/or genetic engineering methods. This book provides comprehensive and latest insights on the evolutionary genesis of diversity, access and its utilization in the evolution of various crop species. A comprehensive account of various crops, origin, exploitation of the primary, secondary and tertiary gene pools through breeding, biosystematical, cytogenetical and molecular phylogenetical relationships, and genetic enhancement through biotechnological interventions among others have been provided as the necessary underpinnings to consolidate information on the effective and sustainable utilization of the related genetic resources. The book stresses upon the importance of wild germplasm exploration, characterization and exploitation in the assimilation of important crop species. The book is especially intended for students and scientists working on the genetic improvement of crop species. Plant Breeders, Geneticists, Taxonomists, Molecular Biologists and Plant Biotechnologists working on crop species are going to find this book very useful.

Model Plants and Crop Improvement Nov 21 2021 Within the past decade, there has been an explosion of research in both the public and private sectors regarding the use of plant genetic models to improve crop yield. Bringing together experts from across the globe, Model Plants and Crop Improvement provides a critical assessment of the potential of model plant species for crop improvement. The first comprehensive summary of the use of model plant systems, the book delineates the model species' contribution to understanding the genomes of crop species. The book provides an in-depth examination of the achievements and limitations of the model paradigm. It explores how continued research in models can contribute to the goal of delivering the outputs of molecular biology to crops. Covering the major genetic models such as Arabidopsis thaliana, Lotus japonicus, and Medigago, the book goes on to discuss applications to food plants of global

importance including rice, canola, and legumes. The book introduces the evolutionary, genetic, genomic, and morphological attributes of B. distachyon that make it such an attractive new model plant system. As the post-genomic era dawns, a key question to address is how this growing body of genetic and biological information can be extended beyond the model to the modeled species. This book takes you one step closer to applying modeling results to crops in the field.

Genomics-Assisted Crop Improvement Apr 02 2020 This superb volume provides a critical assessment of genomics tools and approaches for crop breeding. Volume 1 presents the status and availability of genomic resources and platforms, and also devises strategies and approaches for effectively exploiting genomics research. Volume 2 goes into detail on a number of case studies of several important crop and plant species that summarize both the achievements and limitations of genomics research for crop improvement.

Selection Indices in Plant Breeding Nov 29 2019 First Published in 1986, this book explores the application of Selection Indices in the process of plant breeding. Carefully compiled and filled with a vast repertoire of notes, diagrams, and references this book serves as a useful reference for Students of Medicine, Chiropractors, and other practitioners in their respective fields.

Genomic Selection for Crop Improvement Jun 16 2021 Genomic Selection for Crop Improvement serves as handbook for users by providing basic as well as advanced understandings of genomic selection. This useful review explains germplasm use, phenotyping evaluation, marker genotyping methods, and statistical models involved in genomic selection. It also includes examples of ongoing activities of genomic selection for crop improvement and efforts initiated to deploy the genomic selection in some important crops. In order to understand the potential of GS breeding, it is high time to bring complete information in the form of a book that can serve as a ready reference for geneticist and plant breeders.

Plant Adaptation and Crop Improvement Sep 07 2020 An overview of crop improvement; Analysis of genotype by environment interactions; Interpretation of genotype by environment interactions; Integrated approaches to plant improvement; Synthesis of strategies for crop improvement.

Wild Germplasm for Genetic Improvement in Crop Plants Jun 04 2020 Wild Germplasm for Genetic Improvement in Crop Plants addresses the need for an integrated reference on a wide variety of crop plants, facilitating comparison and contrast, as well as providing relevant relationships for future research and development. The book presents the genetic and natural history value of wild relatives, covers what wild relatives exist, explores the existing knowledge regarding specific relatives and the research surrounding them and identifies knowledge gaps. As understanding the role of crop wild relatives in plant breeding expands the genetic pool for abiotic and biotic stress resistance, this is an ideal reference on this important topic. Provides a single-volume resource to important crops for accessible comparison and research Explores both conventional and molecular approaches to breeding for targeted traits and allows for expanded genetic variability Guides the development of hybrids for germplasm with increased tolerance to biotic and abiotic stresses

Crop Improvement, Adoption and Impact of Improved Varieties in Food Crops in Sub-Saharan Africa Aug 26 2019 Following on from the CGIAR study by Evenson and Gollin (published by CABI in 2003), this volume provides up-to-date estimates of adoption outcomes and productivity impacts of crop variety improvement research in sub-Saharan Africa. The book reports on the results of the DIIVA Project that focussed on the varietal generation, adoption and impact for 20 food crops in 30 countries. It also compares adoption outcomes in sub-Saharan Africa to those in South Asia, and guides future efforts for global agricultural research

Microbial Strategies for Crop Improvement Feb 22 2022 With an ever-increasing human population, the demand placed upon the agriculture sector to supply more food is one of the greatest challenges for the agrarian community. In order to meet this challenge, environmentally unfriendly agroch- icals have played a key role in the green revolution and are even today commonly recommended to circumvent nutrient de?ciencies of the soils. The use of ag- chemicals is, though, a major factor for improvement of plant production; it causes a profound deteriorating effect on soil health (soil fertility) and in turn negatively affects the productivity and sustainability of crops. Concern over disturbance to the microbial diversity and consequently soil fertility (as these microbes are involved in biogeochemical processes), as well as economic constraints, have prompted fun- mental and applied research to look for new agro-biotechnologies that can ensure competitive yields by providing suf?ciently not only essential nutrients to the plants but also help to protect the health of soils by mitigating the toxic effects of certain pollutants. In this regard, the role of naturally abundant yet functionally fully unexplored microorganisms such as biofertilizers assume a special signi?cance in the context of supplementing plant nutrients, cost and environmental impact under both conventional practices and derelict environments. Therefore, current devel- ments in sustainability involve a rational exploitation of soil microbial communities and the use of inexpensive, though less bio-available, sources of plant nutrients, which may be made available to plants by microbially-mediated processes.

Crop Improvement Jun 28 2022 Learn to integrate molecular genetic techniques with traditional plant breeding methods! This comprehensive book provides the latest authoritative scientific information on improvement of both temperate and tropical crops. Crop Improvement: Challenges in the Twenty-First Century brings together expert plant breeders and geneticists to address issues related to crop adaptability and stability across environments for important food and fiber crops. It emphasizes the need to integrate molecular genetic techniques with traditional plant breeding methods to develop hardier, more productive crops. Crop Improvement includes the latest research on physiological and biochemical responses of plants to drought and heat stress, which should help breeders develop effective strategies for improving resistance to abiotic stresses. In addition, this helpful book elucidates the use of mixed models and best linear unbiased prediction. To make the book comprehensive, chapters discuss stability analysis in crop performance trials and genotype-by-environment interactions. Crop Improvement includes detailed information on breeding specific crops, including: rice tropical maize sorghum common bean sugar beet bananas and plantain cotton Crop Improvement offers both practical information and up-to-date research. It also suggests a vision of new directions and partnerships that are expected to evolve in this century. This book is an essential resource for practicing plant breeders and geneticists at universities, government agencies, and industry. It should also be of use to teachers and students engaged in crop breeding.

Haploids in Crop Improvement I May 04 2020 Haploid plants have the gametophytic number of chromosomes. They are of great importance, especially in studies on the induction of muta tions and also for the production of homozygous plants, they are needed in large numbers. The conventional methods employed by plant breeders for their production are cumbersome, time-consuming, laborious and rather inefficient. Sometimes it may take years to produce a pure line. However, with the introduction of in vitro techniques, especially anther culture for the induction of androgenesis, it has become increasingly evi dent that these methods considerably accelerate the production of haploids for plant breeding programs. During the last decade, in vitro-produced haploids have been incor porated into breeding programs of many agricultural crops, and positive results have been obtained especially with rice, wheat, potato, barley, maize, asparagus, sunflower, brassica, tobacco, etc. Among these, rice and wheat are the best examples in which a number of improved varieties have been released. In wheat, the breeding cycle can be shortened by three or four generations when the pollen haploid breeding method is used instead of conventional cross-breeding. The release of the wheat varieties Jinghua 1 and Florin is a typical example of what can be achieved with other crops. Taking these developments into considera tion, the present volume, Haploids in Crop Improvement I, was compil ed.

Molecular Techniques in Crop Improvement Oct 21 2021 This book provides comprehensive information on the latest tools and techniques of molecular genetics and their applications in crop improvement. It thoroughly discusses advanced techniques used in molecular markers, QTL mapping, marker-assisted breeding, and molecular cytogenetics.

Improving Crop Productivity in Sustainable Agriculture Jul 26 2019 An up-to-date overview of current progress in improving crop quality and quantity using modern methods. With a particular emphasis on genetic engineering, this text focusses on crop improvement under adverse conditions, paying special attention to such staple crops as rice, maize, and pulses. It includes an excellent mix of specific examples, such as the creation of nutritionally-fortified rice and a discussion of the political and economic implications of genetically engineered food. The result is a must-have hands-on guide, ideally suited for the biotech and agro industries.

Advancement in Crop Improvement Techniques Oct 01 2022 Advancement in Crop Improvement Techniques presents updates on biotechnology and molecular biological approaches which have contributed significantly to crop improvement. The book discusses the emerging importance of bioinformatics in analyzing the vast resources of information regarding crop improvement and its practical application and utilization. Throughout this comprehensive resource, emphasis is placed on various techniques used to improve agricultural crops, providing a common platform for the utility of these techniques and their combinations. Written by an international team of contributors, this book provides an in-depth analysis of existing tools and a framework for new research. Reviews techniques used for crop improvement, from selection and crossing over, to microorganismal approaches Explores the role of conventional biotechnology in crop improvement Summarizes the combined approaches of cytogenetics and biotechnology for crop improvement, including the importance of molecular techniques in this process Focuses on the emerging role of bioinformatics for crop improvement

Genetic Resources, Chromosome Engineering, and Crop Improvement May 16 2021 Medicinal Plants, Volume 6 of the Genetic Resources, Chromosome Engineering, and Crop Improvement series summarizes landmark research and describes medicinal plants as nature’s pharmacy. Highlights Examines the use of molecular technology for maintaining authenticity and quality of plant-based products Details reports on individual medicinal plants including their history, origin, genetic resources, cytogenetics, and varietal improvement through conventional and modern methods, and their use in pharmaceutical, cosmeceutical, nutrition,

and food industries Explains how to protect plants with medicinal properties from deforestation, urbanization, overgrazing, pollution, overharvesting, and biopiracy Brings together information on germplasm resources of medicinal plants, their history, taxonomy and biogeography, ecology and biodiversity, genetics and breeding, exploitation, and utilization in the medicine and food industries Written by leading international experts and an innovative panel of scientists, Medicinal Plants offers the most comprehensive and up-to-date information on medicinal plant genetic resources and their increasing importance in pharmaceutical and cosmeceutical industries, medicine, and nutrition around the world. Includes eight-page color insert more than 25 full color figures

Molecular Plant Breeding Apr 14 2021 Recent advances in plant genomics and molecular biology have revolutionized our understanding of plant genetics, providing new opportunities for more efficient and controllable plant breeding. Successful techniques require a solid understanding of the underlying molecular biology as well as experience in applied plant breeding. Bridging the gap between developments in biotechnology and its applications in plant improvement, Molecular Plant Breeding provides an integrative overview of issues from basic theories to their applications to crop improvement including molecular marker technology, gene mapping, genetic transformation, quantitative genetics, and breeding methodology.