Genetic Engineering In Agriculture Articles

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Mendel in the Kitchen Routledge

Research on gene drive systems is rapidly advancing. Many proposed applications of gene drive research aim to solve environmental and public health challenges, including the reduction of poverty and the burden of vector-borne diseases, such as malaria and dengue, which disproportionately impact low and middle income countries. However, due to their intrinsic qualities of rapid spread and irreversibility, gene drive systems raise many questions with respect to their safety relative to public and environmental health. Because gene drive systems are designed to alter the environments we share in ways that will be hard to anticipate and impossible to completely roll back, questions about the ethics surrounding use of this research are complex and will require very careful exploration. Gene Drives on the Horizon outlines the state of knowledge relative to the science, ethics, public engagement, and risk assessment as they pertain to research directions of gene drive systems and governance of the research process. This report offers principles for responsible practices of gene drive research and related applications for use by investigators, their institutions, the research funders, and regulators.

The Ecological Risks of Engineered Crops Springer Nature

Ten years after the first generation of genetically engineered (GE) varieties became commercially available, adoption of these varieties by U.S. farmers is widespread for major crops. Despite the benefits, however, environmental and consumer concerns may have limited acceptance of GE crops, especially in Europe. This report focuses on GE crops and their adoption in the U.S. over the past 10 years. It finds that: (1) the pace of R&D activity by producers of GE seed has been rapid; (2) farmers have adopted some GE varieties widely and at a rapid rate and benefited from such adoption; and (3) the level of consumer concerns about foods that contain GE ingred. varies by country, with European consumers being most concerned. Illustrations.

Nanotechnology in Sustainable Agriculture Springer Nature

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.

Measuring the Economic Impacts of Transgenic Crops in Developing Agriculture During the First Decade Springer Science & Business Media

This book compiles the latest applications of the cutting-edge gene editing tool CRISPR/Cas in the area of crop improvement. It begins with an introduction to the technique and its application in crop plants. Next, it gives an updated overview of available delivery methods, design tools and resources in CRISPR/Cas. The book subsequently reviews the applications of CRISPR/Cas in connection with e.g. insect stress, disease stress, abiotic stress, nutritional and yield improvement in crop plants, etc. It also discusses the various regulatory, ethical and social aspects of the technique that must be kept in mind when designing experiments. In closing, the book summarizes the status quo and outlines future prospects for the tool in crop improvement and food security. Given its scope, the book will especially benefit students and researchers in food science, biotechnology, agriculture and the plant sciences.

The Intended and Unintended Effects of U.S. Agricultural and Biotechnology Policies Cabi

Policy Issues in Genetically Modified Crops: A Global Perspective contains both theoretical and empirical evidence of a broad range of aspects of GM crop policies throughout the world. Emphasizing world agriculture production and ethics of GM crops, the book balances insights into the various discussions around the use of GM crops including soil health, effects on animals, environmental sustainability impact, and ethical issues. The book presents aspects of GM crop policies and prevailing controversies throughout the world, in 5 sections containing 23 chapters. Beginning with the discussion of the policies related to GM crops, the book dives deep into issues related to food insecurity, agricultural sustainability, food safety, and environmental risks. Section 5 also captures the recent advances in agricultural biotechnology encompassing research trends, the nano-biotech approach to plant genetic engineering, and other transformation techniques in crop development. The

contributors of the book represent different backgrounds, providing a holistic overview of diverse approaches and perspectives. Policy Issues in Genetically Modified Crops: A Global Perspective is a valuable resource for researchers in agricultural policy and economics, agricultural biotechnology, soil science, genetic engineering, ethics, environmental management, sustainable development, and NGOs. - Discusses ethics, varieties, research trends, success, and challenges of genetic modification - Addresses both crop production and potential health impacts - Includes extensive theoretical research and studies

Regulating Agricultural Biotechnology CRC Press

Introduction: genes out of place -- Free markets, sound science -- The maize movement and expert advice -- The politics of biosafety monitoring -- Patents on out-of-place genes -- Protecting organic markets -- Conclusion: science and struggles for change.

Foodopoly Intl Food Policy Res Inst

This work evaluates the merits of a widely-used approach to natural resource management, participatory action research (PAR), an approach to resource management that strives to link researchers with farmers and other local residents whose lives are effected by long-range conservation programmes. The authors begin the book with the history of PAR, and then use a variety of case studies that chronicle sustainable development efforts in Brazil. They evaluate the strengths and weaknesses of these efforts and suggest specific ways to improve on future PAR efforts.

World Hunger Oxford University Press

By the year 2050, Earth's population will double. If we continue with current farming practices, vast amounts of wilderness will be lost, millions of birds and billions of insects will die, and the public will lose billions of dollars as a consequence of environmental degradation. Clearly, there must be a better way to meet the need for increased food production. Written as part memoir, part instruction, and part contemplation, Tomorrow's Table argues that a judicious blend of two important strands of agriculture--genetic engineering and organic farming--is key to helping feed the world's growing population in an ecologically balanced manner. Pamela Ronald, a geneticist, and her husband, Raoul Adamchak, an organic farmer, take the reader inside their lives for roughly a year, allowing us to look over their shoulders so that we can see what geneticists and organic farmers actually do. The reader sees the problems that farmers face, trying to provide larger yields without resorting to expensive or environmentally hazardous chemicals, a problem that will loom larger and larger as the century progresses. They learn how organic farmers and geneticists address these problems. This book is for consumers, farmers, and policy decision makers who want to make food choices and policy that will support ecologically responsible farming practices. It is also for anyone who wants accurate information about organic farming, genetic engineering, and their potential impacts on human health and the environment.

CRISPR-Cas Systems Routledge

The authors argue that the commercialization and release of transgenic crops on millions of acres of farmland can pose serious and costly consequences. They propose a practical, feasible method of conducting precommercialization evaluations that will balance the needs of ecological safety with those of agriculture and business.--From publisher description.

Safety of Genetically Engineered Foods Academic Press

CRISPR/Cas is a recently described defense system that protects bacteria and archaea against invasion by mobile genetic elements such as viruses and plasmids. A wide spectrum of distinct CRISPR/Cas systems has been identified in at least half of the available prokaryotic genomes. On-going structural and functional analyses have resulted in a far greater insight into the functions and possible applications of these systems, although many secrets remain to be discovered. In this book, experts summarize the state of the art in this exciting field.

Eat Your Genes MDPI

Written in easy to follow language, the book presents cutting-edge agriculturally relevant plant biotechnologies and applications in a manner that is accessible to all. This book introduces the scope and method of plant biotechnologies and molecular breeding within the context of environmental analysis and assessment, a diminishing supply of productive arable land, scarce water resources and climate change. Authors who have studied how agro ecosystems have changed during the first decade and a half of commercial deployment review effects and stress needs that must be considered to make these tools sustainable.

Sustainable Food Production National Academies Press

This book is a printed edition of the Special Issue "Sustainable Agriculture–Beyond Organic Farming" that was published in Sustainability

Genetically Engineered Crops Elsevier

Genetic Engineering of Horticultural Crops provides key insights into commercialized crops, their improved productivity, disease and pest resistance, and enhanced nutritional or medicinal benefits. It includes insights into key technologies, such as marker traits identification and genetic traits transfer for increased productivity, examining the latest transgenic advances in a variety of crops and providing foundational information that can be applied to new areas of study. As modern biotechnology has helped to increase crop productivity by introducing novel gene(s) with high quality disease resistance and increased drought tolerance, this is an ideal resource for researchers and industry professionals. - Provides examples of current technologies and methodologies, addressing abiotic and biotic stresses, pest resistance and yield improvement - Presents protocols on plant genetic engineering in a variety of wide-use crops - Includes biosafety rule regulation of genetically modified crops in the USA and third world countries

Tomorrow's Table Joseph Henry Press

"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."

Uncertain Peril Springer Science & Business Media

The genetic modification of crops continues to be the subject of intense debate, and opinions are often strongly polarised. Environmental Impact of Genetically Modified Crops addresses the major concerns of scientists, policy makers, environmental lobby groups and the general public regarding this controversial issue, from an editorially neutral standpoint. While the main focus is on environmental impact, food safety issues, for both humans and animals are also considered. The book concludes with a discussion on the future of agricultural biotechnology in the context of sustainability, natural resource management and future global population and food supply.

Experiments in Plant-hybridisation University of Chicago Press

Gathering some 90 entries from the Encyclopedia of Sustainability Science and Technology, this book covers animal breeding and genetics for food, crop science and technology, ocean farming and sustainable aquaculture, transgenic livestock for food and more.

Seeds, Science, and Struggle New Press, The

An increasingly hot-button issue, genetically modified (GM) food is considered by some as the best way to feed the world's growing population, and by others as an experiment gone wrong on the unsuspecting public. Genetically Modified Foods: Basics, Applications, and Controversy details the basics of biotechnology and its applications in the laborat

Labeling Genetically Modified Food National Academies Press

Describes the economic, scientific, and social factors that will influence the future of biotechnology in agriculture. Shows that both private and public sector R&D are contributing significantly to the development of biotechnologies. A review of 23 published studies on the subject.

Environmental Impact of Genetically Modified Crops Beacon Press

In the past decade, a number of advances have been made in genetic engineering as applied to farmed animals. This book has been developed from invited presentations at a conference held in California in August 1997, to address this issue. It is written by representatives from the leading laboratories involved in attempts to improve agriculturally important mammals, poultry and fish. Current knowledge, methodology, technical improvements and successes in the applications of transgenic technology to a range of animals which are important in agriculture are brought together for the first time under one cover. This book is essential reading for research workers in animal genetics, breeding and biotechnology.

Agricultural Biotechnology Zed Books

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.