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KEY=HYBRID - SANAA LILLY

An Introduction to Hybrid Rice Breeding

LAP Lambert Academic Publishing *This book consist of basic principles, male sterility systems, one line breeding, fertility restoration systems and its genetics and nucleus seed production of parental lines of hybrid rice. The three line (CGMS) and two line (TGMS, PGMS) systems of male sterility and glossary will be useful for easy understanding of under graduate students and post graduate students who engaged in hybrid rice breeding.*

Hybrid Rice Breeding Manual

Int. Rice Res. Inst. *Heterosis breeding and hybrid rice; Male sterility systems in rice; Organization of hybrid rice breeding program using CMS system; Source nursery; CMS maintenance and evaluation nursery; Testcross nursery; Restorer purification nursery; Backcross nursery; Combining ability nursery; Breeding rice hybrids with TGMS system; Nucleus and breeder seed production of A, B, R, and TGMS lines; Seed production of experimental rice hybrids; Evaluation of experimental rice hybrids; Improvement of parental lines; Methods of enhancing the levels of heterosis; Quality assurance procedures in hybrid rice breeding.*

Rice Breeding And Genetics

Concept Publishing Company

Two-line Hybrid Rice Breeding Manual

Int. Rice Res. Inst.

Heterosis and Hybrid Rice Breeding

Springer Science & Business Media *Rice is the most important food crop of the developing world and the demand for it is growing. Provided here is a concise account of hybrid breeding in rice, a newly deployed breeding approach to increase the yield. Research on heterosis, male sterility systems, outcrossing mechanisms, disease/insect management, and grain quality considerations in hybrid rice are reviewed. The book contains a wealth of useful information for practicing hybrid rice breeders, seed producers, researchers, and students of plant breeding.*

Accelerating Hybrid Rice Development

Int. Rice Res. Inst.

Rice Improvement

Physiological, Molecular Breeding and Genetic Perspectives

Springer Nature *This book is open access under a CC BY 4.0 license. By 2050, human population is expected to reach 9.7 billion. The demand for increased food production needs to be met from ever reducing resources of land, water and other environmental constraints. Rice remains the staple food source for a majority of the global populations, but especially in Asia where ninety percent of rice is grown and consumed. Climate change continues to impose abiotic and biotic stresses that curtail rice quality and yields. Researchers have been challenged to provide innovative solutions to maintain, or even increase, rice production. Amongst them, the 'green super rice' breeding strategy has been successful for leading the development and release of multiple abiotic and biotic stress tolerant rice varieties. Recent advances in plant molecular biology and biotechnologies have led to the identification of stress responsive genes and signaling pathways, which open up new paradigms to augment rice productivity. Accordingly, transcription factors, protein kinases and enzymes for generating protective metabolites and proteins all contribute to an intricate network of events that guard and maintain cellular integrity. In addition, various quantitative trait loci associated with elevated stress tolerance have been cloned, resulting in the detection of novel genes for biotic and abiotic stress resistance. Mechanistic understanding of the genetic basis of traits, such as N and P use, is allowing rice researchers to engineer nutrient-efficient rice varieties, which would result in higher yields with lower inputs. Likewise, the research in micronutrients biosynthesis opens doors to genetic engineering of metabolic pathways to enhance micronutrients production. With third generation sequencing techniques on the horizon, exciting progress can be expected to vastly improve molecular markers for gene-trait associations forecast with increasing accuracy. This book emphasizes on the areas of rice science that attempt to overcome the foremost limitations in rice production. Our intention is to highlight research advances in the fields of physiology, molecular breeding and genetics, with a special focus on increasing productivity, improving biotic and abiotic stress tolerance and nutritional quality of rice.*

Routledge Handbook of Environment and Society in Asia

Routledge *Nowhere is the connection between society and the environment more evident and potentially more harmful for the future of the world than in Asia. In recent decades, rapid development of Asian countries with very large populations has led to an unprecedented increase in environmental problems such as air and water pollution, solid and hazardous wastes, deforestation, depletion of natural resources and extinction of native species. This handbook provides a comprehensive survey of the cultural, social and policy contexts of environmental change across East Asia. The team of international experts critically examine a wide range of environmental problems related to energy, climate change, air, land, water, fisheries, forests and wildlife. The editors conclude that, with nearly half of the human population of the planet, and several rapidly growing economies, most notably China, Asian societies will determine much of the future of human impacts on the regional and global environments. As climate change-related threats to society increase, the book strongly argues for increased environmental consciousness and action in Asian societies. This handbook is a very valuable companion for students, scholars, policy makers and researchers working on environmental issues in Asia.*

Hybrid Rice

Proceedings of the International Symposium on Hybrid Rice : 6-10 October 1986, Changsha, Hunan, China

Int. Rice Res. Inst.

Hybrid Rice - The Journey

Lulu.com

Plant Breeding Reviews

John Wiley & Sons *Plant Breeding Reviews is an ongoing series presenting state-of-the art review articles on research in plant genetics, especially the breeding of commercially important crops. Articles perform the valuable function of collecting, comparing, and contrasting the primary journal literature in order to form an overview of the topic. This detailed analysis bridges the gap between the specialized researcher and the broader community of plant scientists.*

Recent Advances in Rice Research

BoD – Books on Demand *“Recent Advances in Rice Research” is an interdisciplinary book dealing with diverse topics related to recent developments in rice research. The book discusses the latest research activities in the field of hybrid rice, various metabolites produced in rice and its biology, stress studies, and strategies to combat various biotic and abiotic stresses as well as rice economics, value addition, and product development. The book is written by an international team of researchers from all over the globe sharing their results in the field of rice research. I am hopeful that the scientific information available in this book will provide advanced knowledge for rice researchers, students, life scientists, and interested readers on some of the latest developments in rice research.*

Agricultural Biotechnology in China

Origins and Prospects

Springer Science & Business Media *Agricultural Biotechnology in China: Origins and Prospects is a comprehensive examination of how the origins of biotechnology research agendas, along with the effectiveness of the seed delivery system and biosafety oversight, help to explain current patterns of crop development and adoption in China. Based on firsthand insights from China’s laboratories and farms, Valerie Karplus and Dr. Xing Wang Deng explore the implications of China’s investment for the nation’s rural development, environmental footprint, as well as its global scientific and economic competitiveness.*

Advances in Hybrid Rice Technology

Proceedings of the 3rd International Symposium on Hybrid Rice, 14-16 November 1996, Hyderabad, India

Int. Rice Res. Inst.

Protecting Rice Grains in the Post-Genomic Era

BoD – Books on Demand *This book focuses on recent advances in genetic resources, host - pathogen interactions, assay methods, mechanisms of pathogenesis, and disease resistance. Environmentally benign crop protection methods for major rice diseases such as rice blast, sheath blight, bacterial blight, and newly emerged rice diseases such as false smut and bacterial panicle blight disease are included. The content also contains recent rice breeding methods for higher yield and improved disease resistance, rice processing, delicious rice recipes, and food safety. The book includes a comprehensive understanding of Bacillus thuringiensis toxin and its application for crop protection. Holistically, the book demonstrates successful applications of genomics, physiology, chemistry, genetics, pathology, soil science, and food technology to sustainably protect rice crops for global food safety.*

Rice

Springer Science & Business Media *Rice is the most important cereal crop which feeds more than half the population of the world. It is being grown in more than 144. 641 million ha with a production of over 468. 275 million tons (in 1988). Rice is attacked by a large number of pests and diseases which cause an enormous loss in its yield. Therefore, the major objectives in rice breeding are the development of disease resistance, tolerance to insects, adverse soil water, and drought; and improvement of quality including increased protein content. Tremendous efforts being made at the International Rice Research Institute have resulted in the release of improved varieties. It is estimated that the world's annual rice production must increase from 460 million tons (in 1987) to 560 million tons by the year 2000, and to 760 million tons by 2020 (a 65% increase) in order to keep up with the population growth (IRRI Rice Facts 1988). To achieve this gigantic goal, new strategies have to be evolved. Since the success of any crop improvement program de pends on the extent of genetic variability in the base population, new techniques need to be developed not only to generate the much needed variability but also for its conservation. In this regard the progress made in the biotechnology of rice during the last 5 years has amply demonstrated the immense value of innovative approaches for further improvement of this crop.*

Rice Research in Asia

Progress and Priorities

IRRI *This work discusses the latest work in Rice Research in Asian countries and makes suggestions on future progression and rice research priorities.*

Hybrid Rice for Food Security, Poverty Alleviation, and Environmental Protection

Int. Rice Res. Inst.

Wolf Prize in Agriculture

New Developments for Embracing Genomic Selection in Breeding Applications

Frontiers Media SA

Hybrid Rice Technology

New Developments and Future Prospects : Selected Papers from the International Rice Research Conference

Int. Rice Res. Inst. *Papers from a symposium on hybrid rice held during the International Rice Research Conference in 1992.*

Agricultural Research for Sustainable Food Systems in Sri Lanka

Volume 1: A Historical Perspective

Springer Nature *A food system comprises the entire range of actors and interlinked activities related to food production, processing, distribution, marketing and trade, preparation, consumption, and disposal. When a food system operates without compromising the needs of future generations, it is considered to be a "Sustainable Food System." The present-day food systems in Sri Lanka are diverse, and the natural and physical environment, infrastructure, institutions, society and culture, and policies and regulations within which the food systems operate, as well as the technologies employed, have shaped their outcomes. Agricultural research is a key factor in terms of innovation and technological advances. Innovation has been the main driver of food systems' transformation over the past few decades and will be critical to addressing the needs of a rapidly growing population in a context of climate change and scarcity of natural resources. In addition, agricultural research must help meet the rising demand for food at affordable prices. Comprising 17 chapters written by specialist(s) in their respective subject-areas, this Contributed Volume on "Agricultural Research for Sustainable Food Systems in Sri Lanka: A Historical Perspective" shares the scientific knowledge accumulated by the National Agricultural Research System of Sri Lanka, including universities, and offers recommendations on how to make food systems more sustainable in order to address the current needs of Sri Lankan society. It presents perspectives on four key thematic areas, namely: (i) Crop and animal production, management, and improvement, (ii) Agro-product processing technologies, (iii) Natural resource management, and (iv) Socio-economic development and agri-business management.*

Realizing Africa's Rice Promise

CABI *At a time when Africa's food security stands threatened, Realizing Africa's Rice Promise provides a comprehensive overview of state-of-the-art research and recommendations for dealing with future challenges. With contributions from the key scientists working on rice in Africa, this volume addresses policy, genetic diversity and improvement, sustainable productivity enhancement, innovations and value chains. The book is useful for researchers, policy makers, agricultural ministries, donors, regional and sub-regional organizations, non-governmental development organizations and universities.*

Biotechnology in Agriculture

Proceedings of the First Asia-Pacific Conference on Agricultural Biotechnology, Beijing, China, 20–24 August 1992

Springer Science & Business Media *The First Asia --- Pacific Conference on Agricultural Biotechnology was held in Beijing, China on 20-24, August, 1992. Over half the population in the world is in the Asian and Pacific Region. With an increasing population and decreasing farming lands, it is important to develop agricultural biotechnology for improvement of the productivity, profitability and stability of the farming system. The Conference's main objectives were to bring together scientists working in different fields of agricultural biotechnology to stimulate discussion on this important process and to have an appraisal of the most recent studies concerning genetic manipulation of plants, plant cell and tissue culture, plant gene regulation, plant-microbe interaction, animal biotechnology etc. The Conference was attended by 391 scientists from different countries and regions. This volume presents the contributions of the lectures and a selected number of posters, which are an up-to-date account of the state of knowledge on agricultural biotechnology. The book provides a valuable reference source not only for specialists in agricultural biotechnology, but also for researchers working on related aspects of agronomy, biochemistry, genetics, molecular biology, microbiology and animal sciences. It is with great pleasure to acknowledge the contributions of the authors in assuring the prompt publication of this volume. We would also extend our sincere thank to Kluwer Academic Publishers for the publication of these proceedings.*

Hybrid

The History and Science of Plant Breeding

University of Chicago Press *Disheartened by the shrink-wrapped, Styrofoam-packed state of contemporary supermarket fruits and vegetables, many shoppers hark back to a more innocent time, to visions of succulent red tomatoes plucked straight from the vine, gleaming orange carrots pulled from loamy brown soil, swirling heads of green lettuce basking in the sun. With Hybrid, Noel Kingsbury reveals that even those imaginary perfect foods are themselves far from anything that could properly be called natural; rather, they represent the end of a millennia-long history of selective breeding and hybridization. Starting his story at the birth of agriculture, Kingsbury traces the history of human attempts to make plants more reliable, productive, and nutritious—a story that owes as much to accident and error as to innovation and experiment. Drawing on historical and scientific accounts, as well as a rich trove of anecdotes, Kingsbury shows how scientists, amateur breeders, and countless anonymous farmers and gardeners slowly caused the evolutionary pressures of nature to be supplanted by those of human needs—and thus led us from sparse wild grasses to succulent corn cobs, and from mealy, white wild carrots to the juicy vegetables we enjoy today. At the same time, Kingsbury reminds us that contemporary controversies over the Green Revolution and genetically modified crops are not new; plant breeding has always had a political dimension. A powerful reminder of the complicated and ever-evolving relationship between humans and the natural world, Hybrid will give readers a thoughtful new perspective on—and a renewed appreciation of—the cereal crops, vegetables, fruits, and flowers that are central to our way of life.*

Proven Successes in Agricultural Development

A Technical Compendium to Millions Fed

Intl Food Policy Res Inst *The world has made enormous progress in the past 50 years toward eliminating hunger and malnutrition. While, in 1960, roughly 30 percent of the world's population suffered from hunger and malnutrition, today less than 20 percent doessome five billion people now have enough food to live healthy, productive lives. Agricultural development has contributed significantly to these gains by increasing food supplies, reducing food prices, and creating new income and employment opportunities for some of the world's poorest people.This book examines where, why, and how past interventions in agricultural development have succeeded. It carefully reviews the policies, programs, and investments in agricultural development that have reduced hunger and poverty across Africa, Asia, and Latin America over the past half century. The 19 successes included here are described in in-depth case studies that synthesize the evidence on the intervention's impact on agricultural productivity and food security, evaluate the rigor with which the evidence was collected, and assess the tradeoffs inherent in each success. Together, these chapters provide evidence of "what works" in agricultural development.*

Integrative Advances in Rice Research

BoD – Books on Demand *This book describes some recent advances in rice research in terms of crop breeding and improvement (Section 1), crop production and protection (Section 2), and crop quality control and food processing (Section 3). It contains fourteen chapters that cover such topics as two-line rice breeding in India, the different aspects of aromatic rice, bacterial diseases of rice, quality control and breeding strategies, and much more. This volume is a useful reference for professionals and graduate students working in all areas of rice science and technology.*

Hybrid Rice Economics

Lulu.com *This book sets out a framework for determining the value and economic viability of a rice hybrid. The book is written for hybrid rice breeders, farmers, millers, seed producers and the managers of hybrid rice development programs. The methodology provides insight into the key factors that drive hybrid value. The economic model is accompanied by tabular and graphical displays that allow the results to be visualized and understood. The model allows global comparisons to be made between countries and regions where hybrid rice is grown.*

Heterosis and Hybrid Seed Production in Agronomic Crops

CRC Press *Heterosis and Hybrid Seed Production in Agronomic Crops discusses how heterosis or “hybrid vigor” has played a major role in improving crop productivity and quality in order to feed the ever-increasing human population, particularly in developing countries. Plant breeders, agronomists, seed producers, and farmers will discover why the development of hybrids in the world's major food crops and why the methods of hybrid seed production are critical for achieving this goal. This landmark book deals with heterosis and hybrid seed production of major agronomic crops such as wheat, rice, maize, sorghum, cotton, sunflower, and rapeseed. Through Heterosis and Hybrid Seed Production in Agronomic Crops, you will discover valuable information on hybrid seed production methods that is not available in any other single volume. This unique book contains relevant and essential information about important procedures to help increase crop yield, including: methods for deriving second cycle inbred lines for hybrid maize possibilities for hybrid seed production in wheat techniques of hybrid sorghum seed production production of hybrid seeds using male sterile lines of cotton agronomic management in seed production plots of sunflower seed production technology of hybrid rapeseed advances in hybrid seed production technology of rice in China Heterosis and Hybrid Seed Production in Agronomic Crops gives you a global perspective on essential food crops in all parts of the world. This informative guide will help you use hybrid seed production methods with important agricultural crops and increase the quality of these vital and essential food sources.*

Successful Agricultural Innovation in Emerging Economies

New Genetic Technologies for Global Food Production

Cambridge University Press *World population is forecast to grow from 7 to 9 billion by 2050, 1 in 6 is already hungry and food production must increase by 70-100% if it is to feed this growing population. No single solution will solve this problem but recent developments in the genetic technologies of plant breeding can help to increase agricultural efficiencies and save people from hunger in a sustainable manner, particularly in African nations where the need is greatest. These advances can rapidly incorporate new traits and tailor existing crops to meet new requirements and also greatly reduce the time and costs taken to improve local crop varieties. This book provides a collected, reliable, succinct review which deals expressly with the successful implementation of the new plant genetic sciences in emerging economies in the context of the interrelated key regulatory, social, ethical, political and trade matters.*

Innovative Approaches to Rice Breeding

Int. Rice Res. Inst.

Hybrid

The History and Science of Plant Breeding

University of Chicago Press *"Noel Kingsbury reveals that even those imaginary perfect foods are themselves far from anything that could properly be called natural, rather, they represent the end of a millennia-long history of selective breeding and hybridization. Starting his story at the birth of agriculture, Kingsbury traces the history of human attempts to make plants more reliable, productive, and nutritiousa story that owes as much to accident and error as to innovation and experiment. Drawing on historical and scientific accounts, as well as a rich trove of anecdotes, Kingsbury shows how scientists, amateur breeders, and countless anonymous farmers and gardeners slowly caused the evolutionary pressures of nature to be supplanted by those of human needs and thus led us from sparse wild grasses to succulent corn cobs, and from mealy, white wild carrots to the juicy vegetables we enjoy today. At the same time, Kingsbury reminds us that contemporary controversies over the Green Revolution and genetically modified crops are not new, plant breeding has always had a political dimension."--Publisher's description.*

Advances in Plant Breeding Strategies: Breeding, Biotechnology and Molecular Tools

Springer *The basic concept of this book is to examine the use of innovative methods augmenting traditional plant breeding towards the development of new crop varieties under different environmental conditions to achieve sustainable food production. This book consists of two volumes: Volume 1 subtitled Breeding, Biotechnology and Molecular Tools and Volume 2 subtitled Agronomic, Abiotic and Biotic Stress Traits. This is Volume 1 which consists of 21 chapters covering domestication and germplasm utilization, conventional breeding techniques and the role of biotechnology. In addition to various biotechnological applications in plant breeding, it includes functional genomics, mutations and methods of detection, and molecular markers. In vitro techniques and their applications in plant breeding are discussed with an emphasis on embryo rescue, somatic cell hybridization and somaclonal*

variation. Other chapters cover haploid breeding, transgenics, cryogenics and bioinformatics.

Advances in International Rice Research

BoD – Books on Demand *Rice provides staple food for more than 50% of the world's population and is an important crop in the world. With the new technologies such as high-throughput genome sequencing and integrated "-omis" methods applied in rice researches, great advancements have been made. This book was aimed to show a glance of new advancements in the international rice researches. The first section of the book introduced rice cultivation and production. As core sections of the book, the second and third sections introduced physiological and genetic mechanisms on grain quality and biotic and abiotic stress resistance as well as breeding. In the last section, we introduced new technologies such as chromatin immunoprecipitation, integrated "-omis" methods, and bistatic interferometry technology in rice research.*

A Holistic Approach to Rice Research and Genetic Engineering

World Scientific *The aim of this book series is to familiarize scientists, students and the general public with exciting new discoveries and developments in rice genomics. Leading scientists in rice genomics and related fields are invited to write articles in a cohesive format that appeals to both researchers and laypersons with an interest in genomics and biotechnology. The first volume provides the background information and highlights the major achievements in rice genomics; ongoing developments in this exciting field are also discussed. This volume promotes genomics as a holistic approach to rice research and genetic engineering. The chief editor of the series is Prof Huanming Yang of the Beijing Genomics Institute. As one of the most distinguished scientists in rice research today, Prof Yang led a team of researchers who successfully sequenced and analyzed the draft sequence of the indica rice subspecies. In Vol 1 of the series, he co-authors an article entitled ?An International Campaign for Agricultural and Livestock Genomics?.*

Book of abstracts: Arnel R. Hallauer international symposium on plant breeding

CIMMYT

Principles and Practices of Rice Production

Int. Rice Res. Inst.

Genetic Improvement of Field Crops

Scientific Publishers *Opportunities exist for increasing food production in a sustainable manner through the genetic improvement of field crops. One of the potential tools for improvement of the crop performance is the genetic alteration and selection.*

An Introduction to Plant Breeding

John Wiley & Sons *Plants have been successfully selectively bred for thousands of years, culminating in incredible yields, quality, resistance and so on that we see in our modern day crops and ornamental plants. In recent years the techniques used have been rapidly advanced and refined to include molecular, cell and genetic techniques. An Introduction to Plant Breeding provides comprehensive coverage of the whole area of plant breeding. Covering modes of reproduction in plants, breeding objectives and schemes, genetics, predictions, selection, alternative techniques and practical considerations. Each chapter is carefully laid out in a student friendly way and includes questions for the reader. The book is essential reading for all those studying, teaching and researching plant breeding.*

Food Security, Biological Diversity and Intellectual Property Rights

Routledge *This volume advances the claim that the FAO International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) adopted in 2001 is the only existing international agreement with the potential to promote food security, conservation of biodiversity and equity. However, for germplasm-rich countries, national interests come into conflict with the global interest. This work shows that the pursuit of national interests is counterproductive when it comes to maintaining genetic resources, food-security and rent-seeking and that optimally, the coverage of the FAO Treaty should be widened to apply to all crops.*