CROP BIOTECH UPDATE

A weekly summary of world developments in agri-biotech for developing countries, produced by the Global Knowledge Center on Crop Biotechnology, International Service for the Acquisition of Agri-biotech Applications SEAsiaCenter (ISAAA)



Notice:

Due to the coming holiday season, the next issue of the Crop Biotech Update will be released on January 6, 2006. We wish you a blessed Christmas, and a peaceful New Year!

December 22, 2005

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NEWS

IMPROVED RICE CULTIVATION TO REDUCE HUNGER IN AFRICA

A shift in consumer preference in sub-Saharan Africa plus high population growth has resulted in increasing demand for rice. Consequently, rice imports have drained resources otherwise meant for infrastructure development. Dr. Mahabub Hossain, head of the social sciences division of the Philippine-based International Rice Research Institute (IRRI), says that there is a need to explore opportunities by which lowland rice cultivation can be expanded.

Hossain explains in his article “Rice in Africa” that the development of profitable lowland rice technologies should be a central element in increasing African rice productivity and production. He notes however, that the main constraint to increasing rice productivity in Africa is the dominance of unfavorable environments for rice cultivation.

Exploring the potential for growing rice in such conditions may help Africa reduce hunger and poverty.

Other articles on rice are available in Rice Today published by IRRI. Email Adam Barclay of Rice Today at a.barclay@cgiar.org.

ASIAN BIOTECH TRAINING CENTER IN INDIA

The United Nations Educational, Scientific, and Cultural Organization (UNESCO)'s General Conference at its 33rd Session in Paris approved the creation of a Regional Centre for Biotechnology Education and Training.

To be hosted by the Indian government, the center will provide biotechnology trainings and research opportunities for scientists in Asia. UNESCO says that the center will network existing expertise in the region, boost capacity building strategies and address research and development concerns in biotechnology. Specific activities include scientific and information exchange, collaborative research programs, and promotion of South-South cooperation in technology and knowledge transfer.

For more information, contact Lucy Horeau of UNESCO at l.hoareau@unesco.org or visit http://portal.unesco.org/sc_nat/ev.php?URL_ID=4841&URL_DO=DO_TOPIC&URL_SECTIO

GHANA READY TO IMPLEMENT BIOSAFETY FRAMEWORK

Mr Alex Owusu-Biney, lead person for the implementation of Program for Biosafety Systems (PBS) in Ghana, called for the development of critical capacity to implement a mechanism to handle requests for permits for laboratory work and field releases of genetically modified organisms (GMOs).

Speaking in an interview with the Ghana News Agency, Mr Owusu-Biney said Ghana was ready to implement the biosafety framework and a comprehensive program had been developed to build capacity in the development of the legal framework for biosafety and its implementation. He said Ghana's Biosafety Framework, which included biosafety guidelines, regulations, and a law, would be put before Parliament early next year.

According to him, the Ministry of Environment and Science had been the focal point for promoting safe use of biotechnology and a National Biosafety Framework had been developed to promote government policy on biosafety and ensure a regulatory system to address safety in the field of modern biotechnology. This, he said, would include national obligations in the area of trans-boundary movement under the requirements of the Cartagena Protocol on Biosafety, which Ghana had already ratified in May 2003.

Mr Owusu-Biney, who is also the Coordinator of the National Biosafety Committee, said two case studies on Bt Cassava and Bt Maize were analyzed by the regulators for possible consideration and they were also taken through competitive grant facility for environmental risk assessment research under the Biotechnology and Biodiversity Interface (BBI) of the global PBS.

For more information, contact Linda Asante of the Ghana News Agency at lindaagyei13@yahoo.co.uk.

BASF AND CROPDESIGN COLLABORATE ON GM RESEARCH

BASF Plant Science and CropDesign have signed a broad license and research cooperation agreement to genetically improve crops such as corn, soybean, and wheat. Aside from increased yields, the two organizations will look into enhancing agricultural crops' resistance against environmental stress conditions, such as drought. CropDesign's trait portfolio will be used to strengthen and complement BASF's product pipeline.

CropDesign is a biotechnology company delivering traits for the global seed market and for plant-based products while BASF Plant Science deals with agricultural products and chemicals.

To find out more about BASF Plant Science visit http://www.basf.com/biotechnology and http://www.cropdesign.com for additional information on CropDesign.

VIETNAM DRAFTS ACTION PLAN ON BIOLOGICAL DIVERSITY

A collaborative team of international and local experts through the Department of Environmental Protection and the International Support Group on Natural Resources and Environment has helped Vietnam draft an action plan to preserve and develop its diversified gene pool. The draft plan incorporates efforts to develop sustainable biodiversity and at the same time help Vietnam fully implement its commitments with the international community.

Email Le Hien of Biotech Vietnam at hienbiotechvn@pmail.vnn.vn for other news summaries on biotechnology.

RESEARCH

IMPROVED NEW MEXICO COTTON ASSESSED

The cotton breeding program for New Mexico's cultivars has hitherto led to the release of over 30 Acala 1517 cotton cultivars, and a variety of germplasm lines with high fiber quality and tolerance to Verticillium wilt. By analyzing “Genetic Improvement of New Mexico Acala Cotton Germplasm and Their Genetic Diversity,” J. F. Zhang of New Mexico State University and colleagues look at the products of the breeding program, and take a look at the cotton at both the molecular and macromolecular model.

By using such parameters as yield, boll size, and fiber strength; and measuring genetic divergence by molecular markers, researchers found, among others that: 1) lint yield and lint percentage have increased since the program's inception, while boll size and seed index have gradually decreased since the 1960s; 2) fiber strength has been enhanced, while fiber length has tended to shorten; and 3) there is substantial genetic diversity among the Acala 1517 cotton germplasm.

Researchers state that the Acala 1517 cultivars are “most genetically diverse from other current commercial cultivars and should be promising sources in breeding to be used as parental lines to broaden genetic variations within upland cotton.”

Subscribers to Crop Science can access the complete article at http://crop.scijournals.org/cgi/content/full/45/6/2363. Other readers may see the abstract at http://crop.scijournals.org/cgi/content/abstract/45/6/2363.

HERBICIDE FOUND TO RAISE SOY DEFENSES

The herbicide lactofen, though effective in keeping weeds away from crops, can also cause the same crops' leaves to be bronzed and damaged. In “The Diphenylether Herbicide Lactofen Induces Cell Death and Expression of Defense-Related Genes in Soybean,” Madge Y. Graham of Ohio State University shows, among others, that such bronzing is actually accompanied by cell death in a plant.

The paper, which appears in the latest issue of Plant Physiology, tested the effects of lactofen on soybean plants, and tracked what genes were expressed during application of the herbicide. Graham found that the isoflavone synthase genes were expressed at higher levels during herbicide applications. These genes play a part in the crop's defenses, and are usually expressed when a plant is wounded, or is being attacked by a disease.

Graham concludes that lactofen has the potential to be a disease resistance-inducing agent.

Subscribers to Plant Physiology can read the complete article at http://www.plantphysiol.org/cgi/reprint/139/4/1784. Other readers may access the abstract at http://www.plantphysiol.org/cgi/content/abstract/139/4/1784.

OXYLIPINS DEFEND PLANTS, DELAY MICROBE GROWTH

Oxylipins are molecules believed to occur in all higher plants. Over a hundred types of such molecules have been found, and they are thought to contribute to the plant defense mechanism. Some studies have shown that they work to protect the plant from harmful microbes, and can contribute to the regulation of plant cell death.

How exactly oxylipins work is still not widely understood, which prompted Isabelle Prost of the Unité Mixte de Recherche and colleagues to investigate the molecules. In their article, which appears in the latest issue of Plant Physiology, they conclude that “Evaluation of the Antimicrobial Activities of Plant Oxylipins Supports Their Involvement in Defense against Pathogens.”

Researchers worked on 43 natural oxylipins, and assayed their effects against a set of 13 plant pathogens, including bacteria and fungi. Their tests showed that: 1) most oxylipins could impair growth of some pathogens, but not kill them entirely; 2) 26 of the oxylipins tested inhibited the spread of at least three different microbes, and 3) oxylipin treatment could also result in spore death.

Subscribers to Plant Physiology can read the complete article at http://www.plantphysiol.org/cgi/reprint/139/4/1902. Other readers may access the abstract at http://www.plantphysiol.org/cgi/content/abstract/139/4/1902.

NEW MARKER REPORTED FOR TRANSFORMING DURUM WHEAT

Marker genes are used in genetic engineering to check if a plant has been successfully transformed with a desired trait. Such marker genes may allow a plant cell to be resistant to a certain antibiotic, or to express a certain color, or produce a certain protein. Some concerns on the persistence of such marker genes have been expressed, however, prompting scientists to turn to other possible markers, or alternative methods for selecting successfully transformed cells.

Some markers are also suited only to certain plants, and it can be difficult to find markers which could aid in engineering better crop species. One such plant is durum wheat, and A. Gadaletam of the University of Bari, Italy and colleagues use it as their subject in their study. In an article in the latest issue of the Journal of Cereal Science, researchers report “Phosphomannose isomerase, pmi, as a selectable marker gene for durum wheat transformation.”

Scientists compared the selection efficiency of two genes: bar, from *Streptomyces hygroscopicus*, which allows cells to be resistant to the herbicide bialaphos; and phosphomannose isomerase (pmi) from *Escherichia coli*, which allows transformed cells to be selected by a color assay. By using these genes as markers on durum wheat cv. Svevo, they found that selection efficiency was higher for plants with pmi (90.1%) than with bar (26.4%). The enzyme for which pmi codes is, moreover, common in nature, and present in soybean and several other legumes.

Subscribers to the Journal of Cereal Science can read the article at http://dx.doi.org/10.1016/j.jcs.2005.06.004.

DOCUMENT REMINDERS

POCKET K ON GENE SWITCHING & GURTS

Pocket K No. 21 on Gene Switching and GURTs is now available online at http://www.isaaa.org/kc. It explains what gene switching and Generic Use Restriction Technologies (GURTs) technologies are, how they work, and why public and private sector scientists, as well as governments, are pursuing further research and development in this area.

Pocket Ks are Pockets of Knowledge, packages of information on crop biotechnology products and related issues. They are produced by the Global Knowledge Center on Crop Biotechnology (KC) of the International Service for the Acquisition of Agri-biotech Applications (ISAAA). Twenty other topics are available at http://www.isaaa.org/kc.

UPDATED PEW BRIEF ON TRADE DISPUTE OVER GM CROPS

The Pew Initiative on Food and Technology has released an updated brief on the United States (U.S.)-European Union (EU) trade dispute over genetically modified crops. Several updates include the new EU laws on approval of GM crops, labeling, and traceability. The new issue brief provides an overview of the history of the dispute; and estimates of the impacts that the EU de facto moratorium on GM crop approvals has had on U.S. trade, among others.

View the issue brief online at http://pewagbiotech.org/resources/issuebriefs/useu.pdf.

CONSENSUS DOC ON PAPAYA AND MUSHROOM

The Organization for Economic Cooperation and Development's (OECD) Working Group on Harmonization of Regulatory Oversight in Biotechnology has published the “Consensus document on the biology of Papaya (Carica Papaya)" and the "Consensus document on the biology of *Pleurotus* spp. (Oyster Mushroom)". The documents are intended for scientists and regulatory personnel involved in assessing transgenic organisms for commercialization. See http://appli1.oecd.org/olis/2005doc.nsf/linkto/env-jm-mono(2005)16 and http://appli1.oecd.org/olis/2005doc.nsf/linkto/env-jm-mono(2005)17 respectively, or contact ehscont@oecd.org for more information.

ANNOUNCEMENTS

EPA SEEKS PROPOSALS

The U.S. Environmental Protection Agency (EPA), as part of its Science to Achieve Results (STAR) program, is seeking proposal applications to develop methods to assess the potential allergenicity of genetically engineered foods. The development of these methods will help to identify substances that induce dietary allergy in humans and lead to improved evaluation of the relative potency of unknown proteins. For more information, visit http://es.epa.gov/ncer/rfa/2005/2005_star_biotech.html.

ICAC CONFERENCE SET FOR 2007

The World Cotton Research Conference-4 will be held in Lubbock, Texas, USA from September 10-14, 2007. Organized by the Washington D.C.-based International Cotton Advisory Committee, the theme of the conference is 'Nature's High-Tech Fiber." Free online pre-registration is available at http://www.icac.org/. The full registration package along with more details on the program and hotel booking will be available close to mid 2006. For more information, contact Dr. Dean Ethridge (Chairman, US Organizing Committee) at melvin.ethridge@ttu.edu or Dr. M. Rafiq Chaudhry (Head, Technical Information Section, ICAC) at rafiq@icac.org.

CONFERENCE ON BIOTECH SET FOR JANUARY 2006, MANILA

The 2nd Annual Philippine Conference on Biotechnology Enterprise and Investment will be held on January 17-20, 2006. Organized by Hybridigm Consulting, and Businessmaker Academy Educational Center, the conference aims to promote the advancement and better understanding of biotechnology in the Philippines by calling together Philippine scientists, academics, regulators, policy formulators, venture capitalists, and mainstream businessmen to discuss new trends, discoveries, and business opportunities. Interested attendees may register online through http://www.philbiotech.com.

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