CROPBIOTECH 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)

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*** GLOBAL ***

BIOTECH RESHAPING WORLD AGRIC SAYS REPORT

Increased trade liberalization, agricultural research and development, and new movements in developing countries are some “Forces reshaping world agriculture”, says a report from the North Dakota State University Department of Agribusiness and Applied Economics, U.S.A.

Authors Jeremy Mattson and Won Koo say that countries can become more competitive through agricultural research and development which has made possible the significant increase in total agricultural production worldwide. It has also led to the development of new, non-food uses for agricultural products. Among the developments that could lead to further increases in agricultural productivity is agricultural biotechnology. Productivity gains are expected to benefit farmers and ultimately consumers in terms of lower real food prices. Aside from biotechnology, other developments that could contribute to increases in farm productivity include precision agriculture and improved technologies for nutrient, soil, water, and pest management.

Read the full report at http://agecon.lib.umn.edu/cgi-bin/detailview.pl?paperid=21789.

*** AFRICA ***

MOTION SEEKING TO BAN GMOS IN KENYA DEFEATED

Kenyan parliamentarians have voted overwhelmingly to reject a motion seeking to ban GMOs from the country. Leading the move against the motion was Alego Usonga MP, Sammy Weya, who together with other legislators recently completed a study tour of South African biotech crop fields. Mr. Weya argued that technology was the key to any country’s development and therefore it would be wrong for Kenya to outlaw it. He called on Kenyans to emulate South Africans who have commercialized GM crops, and are investing heavily on biotech research. “Kenya will lag behind in food production if we continue using traditional methods in our farming systems,” he said.

Most MPs who supported biotechnology called on the government to bring the Biosafety Bill to parliament to clear the way for commercialization of GM crops in

the country. “We need policies to guide us on how to introduce this technology to our farmers,” they said.

Dr Enoch Kibunguchy, an assistant minister for Health, also rejected the motion saying that it sought to confine the poor to perpetual poverty. He said Kenya needs to maximize production of foods to eliminate dependence on relief foods. However, he noted that this would not be possible without the use of new technologies that can eliminate the threat of pests and diseases that affect crops. “Those of us who grow maize sometimes lose up to 50% of our maize to stem borer. If science can be applied to take care of a pest like that, we will be very grateful because we can save up to 50% of our crop”.

For more information contact Dr Margaret Karembu (m.karembu@cgiar.org) or Daniel Otunge (d.otunge@absfafrica.org)

BRAZIL AND GHANA SIGN ACCORD FOR CREATION OF EMBRAPA AFRICA

The first Regional Office of the Brazilian Agricultural Research Corporation (EMBRAPA) will soon open in Accra, Ghana. Brazil and Ghana recently signed an agreement for the creation of EMBRAPA Africa, which will engage in technical assistance and training, and in the development of human resources, under the auspices of the Brazilian Ministry of Agriculture, Livestock, and Food Supply.

“For its importance in the fight against hunger and poverty, we decided to establish, in Accra, the first office of EMBRAPA in Africa. The partnership also aims to act in another field of strategic importance: energy alternatives, a field of strong social impact as it generates income and employment, reduces the emission of pollutants, and decreases dependency of imported fuels”, explained Luiz Inácio Lula da Silva, president of Brazil.

This bilateral cooperation between Ghana and Brazil will focus on technology transfer in the area of tropical agriculture, including grains, vegetables, fruits, pastures, and livestock. Read more at: http://www.embrapa.br/noticias/banco_de_noticias/folder.2006/foldernoticia.2006-07-03.1126368809/noticia.2006-07-10.8962230062/mostra_noticia

DISEASES THREATEN BURUNDI BANANA CROP

The bacterial disease Xanthomonas wilt, the fungus *Fusarium* and other viral diseases threaten to wipe out Burundi’s banana crop. These diseases have already been detected in bananas in surrounding countries, and could sweep

across Burundi, a country heavily dependent on banana as a subsistence crop. One such disease is also threatening cassava, Burundi's staple crop.

While scientists are working on a strain of cassava more resistant to disease, disease-resistant banana seeds may not be available until 2010. Some such varieties are already under trial in Uganda, at a branch Taiwan's International Institute for Tropical Agriculture. Other international agricultural organizations include the African Agriculture Technology Foundation and the Biosciences for Eastern and Central Africa, both based in Nairobi, Kenya.

In the meantime, Burundi banana farmers are exercising counter measures to control the banana diseases by covering all banana trees with plastic sheets, and cutting banana male shoots.

Read the complete story at
http://www.irinnews.org/report.asp?ReportID=54307&SelectRegion=Great_Lakes&SelectCountry=BURUNDI.

*** THE AMERICAS ***

U.S BIOTECH CROP ACREAGE INCREASES IN 2006

The United States increased its planting of biotech soybean, corn, and cotton this year. Of these crops, biotech soybean was a popular choice, accounting for 89 percent of all soybeans grown in the U.S. This was reported by the U.S. Department of Agriculture National Agricultural Statistics Service. Data further show that:

- About 66.68 million acres of biotech soybeans were planted in 2006, up from 62.76 million acres of soybeans planted in 2005.
- Some 12.68 million acres of biotech cotton were planted accounting for 83 percent of all cotton grown. In 2005, 11.25 million acres was planted to biotech cotton.
- A total of 48.4 million acres of corn was planted or 61 percent of all corn planted. This is about 6 million acres more than in 2005.

See a copy of the report at
http://usda.mannlib.cornell.edu/reports/nassr/field/pcp-bba/acrg0606.pdf.

BRAZIL: CURTAILING RESEARCH AND TECHNOLOGICAL INNOVATION

Reginaldo Minaré, lawyer and legal director of the Brazilian Biosafety Association (ANBio), recently commented on the effect of the current legal setup on research and technological innovation in Brazil. Minaré refers to a project of biotech eucalyptus, seeking approval by the National Commission on Biosafety (CNBio).

The new eucalyptus varieties are modified to reduce the accumulation in the cell wall of lignin, an organic polymer that constitutes a main component of wood and is also responsible for the hardness of the wood. In addition, lignin confers dark color to the pulp during paper production, and hence it must be extracted by the use of expensive and polluting chemicals. Trees with reduced lignin content, or with more readily extracted lignin, would therefore have great economical value, and benefit both consumers and the environment.

According to Minaré, the failure of the project to obtain approval is purely due to legal reasons. In addition to the lignin modification, the trees also carry a modification that blocks the formation of pollen. Such modification is both a measure of biosafety, to prevent escape of the transgene to the wild, and of technology protection, and it does not affect the use of conventional varieties. However, article 6 of Law 11,105/05 bans the commercialization of any form of Gene Use Restriction Technologies (GURTs). GURTs are however very effective biosafety tools, and are indispensable for some applications, such as the production of vaccines and medicines in plants.

The Legal Project 5.964/05, submitted to the House of Representatives, has the objective to modify article 6 of Law 11,105/05, to allow a responsible development and use of GURTs. The project is due to be voted this semester, and this represents a chance to deepen the debate on this topic, says Minaré, and to provide better public knowledge concerning the possibilities of use of this technology. Research and technology innovation need not be curtailed again without reasonable motivation, he added.

For more information visit: http://www.anbio.org.br/

BRAZIL DEVELOPS BIOTECH CITRUS

Four Brazilian research institutions have started this month contained greenhouse trials of 120 lines of transgenic oranges to select varieties resistant to the main pathogens and pests attacking this crop. The research activities are centered in the Sylvio Moreira Citrus Center, in collaboration with Esalq/USP, Unicamp, and the Institute for Biology.

Researchers aim to select varieties resistant to citrus leprosies, which currently accounts for up to 50% of yield losses. In addition, the team also intends to select for resistance to Citrus Tristeza Virus (CTV). New, resistant varieties will be field tested before they are released to farmers.

Read more at:
http://www.agrolink.com.br/noticias/pg_detalhe_noticia.asp?cod=42284

STUDY FINDS SUGAR NOT SOLUTION TO LOW ETHANOL SUPPLY

Processing ethanol from sugarcane will be costlier than processing it from corn. This is according to a study released by the United States Department of Agriculture's (USDA) Office of the Chief Economist. According to the study, ethanol processed from sugar cane and sugar beets would cost between $2.35 and $2.40 per gallon in the US, while ethanol produced from corn costs only $1.03 to $1.05 per gallon. The report also found that, in the case of the US, ethanol production costs from using molasses processed from sugarcane or sugar beets would be about $1.27 per gallon.

Brazil is currently the world's top bioethanol producer, and its use of sugarcane and sugar beets demonstrates that these crops are a feasible alternative to corn. Brazil's economy, the report stresses, cannot be compared to that of the US; thus, the cost of ethanol production from sugarcane and sugar beets will not be directly comparable between either countries.

Access the complete report at
http://www.usda.gov/oce/EthanolSugarFeasibilityReport3.pdf.

US ENERGY RELEASES BIOFUELS ROADMAP

The US Department of Energy has published a scientific roadmap recounting advances in biotechnology research contributing to the production of ethanol from cellulose. "Breaking the Biological Barriers to Cellulosic Ethanol: A Joint Research Agenda" also identifies research required to optimizing this technology. Cellulosic ethanol is derived from the inedible portions of plant matter, generally referred to as biomass.

The report enumerates the research programs needed to overcome current challenges to the large-scale production of cellulosic ethanol. These include developing better methods to break down biomass materials into sugars; optimizing fermentation processes that convert sugar to ethanol; and maximizing biomass feedstocks to produce more ethanol per feedstock weight.

The report and a supplementary fact sheet are available at http://www.doegenomestolife.org/biofuels.

ARS SCIENTISTS DISCOVER NEW RICE GENES RESISTANT TO BLAST

Scientists led by Wengui Yan of the Agricultural Research Service (ARS) of the U.S. Department of Agriculture (USDA) have discovered new rice genes resistant to the disease rice blast. The disease affects 30 percent of the world's rice plants per year.

ARS reports that the original intention to look for rice genes against the rice blast pathogen Magnaporthe grisea led researchers to the USDA's Rice Core Collection which contains more than 1,700 rice plant accessions from over 100 countries. The USDA Rice Core Collection is part of the National Plant Germplasm System which coordinates efforts by both public and private organizations to preserve crops' genetic diversity.

The discovery is expected to significantly aid rice blast research. ARS adds that the researchers' findings are different from any resistance genes currently available to the U.S. rice industry.

View this report online at http://www.ars.usda.gov/is/pr.

* ASIA *

PHILIPPINES GETS $20M FOR AGRIC MODERNIZATION INCLUDING BIOTECH

Philippine Finance Secretary Margarito B. Teves and U.S. Ambassador Kristie A. Kenny signed on July 14 at the Institute of Plant Breeding, University of the Philippines Los Banos (UPLB) an agreement, PL 480 Program, to promote agricultural development in the Philippines in four priority areas: 1) reinforced post-harvest handling and infrastructure development; (2) biotechnology research and commercialization; (3) livestock development; and (4) human resource development.

'Programs and projects along these priority areas are aimed towards improving food security, alleviating poverty and in promoting broad-based, equitable and sustainable agriculture,' Secretary Teves said. The Department of Agriculture and the National Food Authority will jointly implement the program.

The agreement stipulates that US$ 20M will be used to finance the importation of approximately 69,000 metric tons of rice from the United States which will arrive in early 2007. The proceeds from the sale by the government to the private sector will be invested in the program.

The signing of the agreement took place at a biosafety facility of the Institute of Plant Breeding, UPLB where transgenic papaya research in on-going. This research receives financial support from the U.S. Department of Agriculture PL 480 Program, the Department of Science and Technology-Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (DOST-PCARRD), the University of the Philippines Los Banos, the U.S. Agency for International Development, the Agricultural Biotechnology Support Program II, and the International Service for the Acquisition of Agri-biotech Applications (ISAAA).

For additional details on the signing, email Sonny Tababa of the SEARCA Biotechnology Information Center at spt@agri.searca.org.



Philippine Finance Secretary Margarito B. Teves and U.S. Ambassador Kristie A. Kenny are joined by Agriculture Secretary Domingo Panganiban and UPLB Chancellor Rey Velasco in the signing of PL 480 Program.

CHALLENGES FOR BIOFUELS IN SOUTH ASIA

South Asian countries have enormous potential for liquid biofuels due to their diverse feedstocks and a contiguous land mass. However, it is necessary to prepare a systematic research plan to harness a sustainable biofuel program. In addition, programs for wastelands and marginally productive lands should be identified as well as existing plantations so as not to compromise food production. These are some recommendations forwarded in an article on “Liquid biofuels in South Asia: Resources and technologies” by Linoj Kumar and colleagues for the Asian Biotechnology and Development Review.

The article goes on to say that countries going into biofuels should identify existing resources and site-specific feedstocks. Specifically, this requires selection of appropriate species which suit specific locations that enhance economic viability of production and biological productivity of the land. To complement research efforts, there is need for a policy and legislative framework for biofuels.

Visit http://www.ris.org.in/abdr.html to learn more about the Research and Information System for Developing Countries, publisher of the Asian Biotechnology and Development Review. Email sachin@ris.org.in for editorial inquiries.

NEW PROJECT PAVES WAY FOR BIOFUELS IN CHINA

Over 700 million tons of rice husk and various straws is produced each year in China, and though they may be considered as waste products, researchers from the University of Science and Technology of China (USTC) have already begun work on converting these agricultural residues into environmentally-friendly bio-fuels.

The USTC, an affiliate of the Chinese Academy of Sciences (CAS) recently announced that with the success of their study of a pilot plant, a demonstration plant could be established in two years. The USTC Laboratory of Biomass Clean Energy (BCEL) pilot plant can manufacture fuel from agricultural and forest biomass. This fuel, in turn, can be used directly as fuel for boilers and kilns, or as refinery feedstock for automobile fuels.

Read the complete article at
http://english.cas.cn/eng2003/news/detailnewsb.asp?InfoNo=26116

*** EUROPE ***

EC DRAFTS NEW RULES FOR PLANT PROTECTION PRODUCTS

The European Commission (EC) has proposed new rules to cover plant protection products in the European Union (EU). These rules aim to streamline procedures, reduce bureaucracy, and increase transparency in the EU to make plant protection products available to all those who need them.

Among the proposed regulations is a shortened time span for approval of active substances. Authorizations for such substances once had to be renewed every ten years; in the new regulations, they may be renewed only once after the first ten-year period, unless concerns arise about the substance's safety. Also included in the regulations are provisions for the substitution of active substances with safer alternatives, as well as reduction in testing on vertebrate animals.

Under the proposed legislation, the EU will be divided into three zones with similar climatic and ecological features, and plant protection products authorized by any one Member State will automatically be cleared for use in the other Member States in that particular zone. This will avoid duplication of work and speed up decision making with regard to the availability of plant protection products.

For more information, see: http://ec.europa.eu/food/plant/protection/evaluation/index_en.htm. Read the complete press release at http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/982&format=HTML&aged=0&language=EN&guiLanguage=en.

EFSA STARTS CONSULTATION ON GMOS

The European Food Safety Authority (EFSA) has launched an open consultation on the approach of its Panel on Genetically Modified Organisms (GMO Panel) in assessing 'hybrid' genetically modified (GM) plants. Hybrids are plants obtained by combining two GM plants which have been previously accessed. A draft guidance document will be made available for review. It informs applicants how its Panel evaluates the potential interactions between the combined GM plants of the 'hybrids' in terms of their toxicity, allergenicity, nutritional value and environmental impact. In addition, it describes what type of information and test results the Panel expects applicants to deliver. The consultation document is available at: http://www.efsa.europa.eu/science/gmo/gmo_consultations/1596_en.html.

EFSA will also publish its final guidance document for the risk assessment of GM microorganisms (GMMs) which underwent an extensive public consultation process. It will assist applicants requesting authorizations for GMMs and their derived products intended for food and feed use. The document provides guidance for the risk assessment of a broad spectrum of GMMs and derived products ranging from single compounds used in food and feed to products containing viable GMMs. Typical GMMs covered by the guidance document are various non-harmful bacteria, yeasts, fungi and microalgae used in food or feed.

The GMM guidance is available at:
http://www.efsa.europa.eu/science/gmo/gmo_guidance/catindex_en.html.

RESEARCH

RICE GENE MAKES TOBACCO DISEASE RESISTANT, SALT TOLERANT

Plants are exposed to various environmental stresses, to which they respond by regulating plant signaling pathways, or expressing certain stress tolerance genes or proteins. Important in these pathways are the ethylene-responsive element binding proteins (EREBPs), a family of transcription factors that play important roles in abiotic stress responses. One such protein is present in rice, and encoded by the OsBIERF3 gene. This protein has been shown to be expressed at high concentrations in rice infected with blast fungus, or treated with extreme stress conditions such as salt and cold.

Can this gene also confer disease resistance and salt tolerance to other plants? Yifei Caoa and colleagues at Zhejiang University, China transferred the rice gene to tobacco plants, and found that “Overexpression of the rice EREBP-like gene OsBIERF3 enhances disease resistance and salt tolerance in transgenic tobacco.” Their research is documented in a recent issue of the Journal of Physiological and Molecular Plant Pathology.

Researchers introduced the OsBIERF3 to tobacco by transformation with *Agrobacterium*. They then measured transgene expression levels, and conducted disease resistance and salt tolerance assays in both transgenic and wild type control plants. Researchers found that: 1) transgenic plants had enhanced resistance against infection by the tomato mosaic virus and the bacterial wild fire pathogen, *Pseudomonas syringae* pv. tabaci and 2) transgenic plants also showed increased tolerance to salt stress. This suggests that OSBIERF3, when overexpressed in plants, can regulate abiotic and pathogen stress responses. How it does so, however, will be the next challenge for scientists.

Subscribers to the journal can read the complete article at http://dx.doi.org/10.1016/j.pmpp.2006.01.004.

RESEARCH STUDIES BT COTTON EFFECTS ON VARIOUS INSECT PESTS

The cotton bollworm, *Helicoverpa armigera* (Hubner), is one of the most devastating pests of cotton, cereals, and food crops worldwide. Farmers control this pest through chemical means, but indiscriminate use of these control methods can also lead *H. armigera* to develop resistance to insecticides. It is thus important to determine what agro-climatic conditions determine the effectiveness of insecticides, as well as their coordinated use with insect-resistant transgenic crops, so that farmers may still be able to practice sustainable crop production.

H.C. Sharma and G. Pampapathya of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) report on the "Influence of transgenic cotton on the relative abundance and damage by target and non-target insect pests under different protection regimes in India." Their work is published in a recent issue of Crop Protection.

Scientists grew transgenic cotton hybrids, their conventional counterparts, commercial varieties, and indigenous cotton under insecticide protected and unprotected conditions during the 2002-2004 rainy seasons. They then measured egg and larval density, damage to various cotton plant parts, seed cotton yield, and the effect of transgenic cotton and insecticides on non-target insect pests.

Major findings include the following: 1) there were no significant differences in egg-laying behavior of *H. armigera* under both protected and unprotected conditions; 2) there were fewer larvae on transgenic hybrids, but only in conditions of high infestation; 3) with few exceptions, bollworm damage in squares and bolls was significantly lower in the transgenic cotton hybrids than in the non-transgenic ones; 4) there were no significant differences in seed cotton yield under moderate infestation levels, but yields of transgenic hybrids were significantly greater during high infestation; and 5) there were no differences between transgenic and non-transgenic hybrids in their relative susceptibility to the cotton jassid, serpentine leaf miner, white fly, green bug, ash weevil, and red cotton bug.

According to the authors, results suggest that it would be useful to combine transgenic resistance to *H. armigera* with plant characteristics conferring resistance to the target or non-target insect pests in the region in order to realize the full potential of transgenic plants for sustainable crop production.

Subscribers to the journal can read the complete article through http://dx.doi.org/10.1016/j.cropro.2005.11.002.

ANNOUNCEMENTS

RICE CONGRESS TO BE HELD IN INDIA

The International Rice Congress (IRC) will bring together all aspects of the rice industry with a special focus on the latest research, science, and technology. Hosted by the Indian Ministry of Agriculture, and co-sponsored by the Indian Council for Agricultural Research (ICAR) and the International Rice Research Institute (IRRI), it will be held in Delhi from October 9-13 and includes three main events: The 26th International Rice Research Conference, the 2nd International Rice Commerce Conference, and the 2nd International Rice Technology and Cultural Exhibition. For more information, visit http://www.icar.org.in/irc2006.

INDIA HOSTS AGRI ONTOLOGY WORKSHOP

Bangalore, India will host the 7th Agricultural Ontology Service (AOS) Workshop on Ontology-based knowledge discovery: Using metadata and ontologies for improving access to agricultural information on the 9th-10th of November 2006. The goal of the workshop is to provide a platform for implementers to demonstrate how ontologies can extract and acquire additional knowledge from existing agricultural information systems. It aims to bring together research communities, with special focus on agriculture, whose members are interested in efficiently capturing knowledge and in creating representations and formalizations that can be useful for reasoning and knowledge discovery. For more information, visit: http://www.fao.org/aims/pub_aos7.jsp

CONFERENCE ON IRRIGATION SLATED FOR SEPTEMBER

The first International Conference on Sustainable Irrigation Management, Technologies and Policies will be held on the 5th-7th of September, 2006, in Bologna, Italy. This conference seeks to address the different aspects of irrigation, including not only the management of water resources and scientific and technical aspects, but also matters related to policy and economics. Its objective is also to discuss how to reach the sustainable management of irrigation resources in the future by applying modern simulation methods, advanced and new technologies as well as analyzing different policies and

economic forecasting techniques. For more information, visit http://www.wessex.ac.uk/conferences/2006/irrigation06/.

NOMINATIONS OPEN FOR SCI COMM AWARDS

The Biosciences Federation Science Communication Award recognizes research-active bioscientists from UK universities and institutes who make an outstanding and consistent contribution to communicating science to the public. Nominations for this award must be made by an individual from a Biosciences Federation Member or Associate Member Organization by submission of a completed Nomination Form. The deadline for receipt of nominations is 14th September 2006. For more information and nomination forms see http://www.bsf.ac.uk/awards/sci_comm2006.htm.

Do not hesitate to tell other colleagues/contacts about this mail list. If they wish to join, they should send an e-mail message to knowledge.center@isaaa.org leaving the subject blank and entering the one-line text message as follows: SUBSCRIBE Crop Biotech Network

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