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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IRRI AND CIMMYT LAUNCH JOINT SCIENTIFIC PROGRAM

After forming an alliance last year, the Philippines-based International Rice Research Institute (IRRI) and the International Maize and Wheat Improvement Center (CIMMYT) in Mexico have come out with their first output – a new lab and research program that unite key databases and research on three important crops.

The Crop Research Informatics Lab at CIMMYT, which will link with existing facilities at IRRI, now allows a common platform for the development of new rice, wheat, and maize varieties. IRRI Director General Robert S. Zeigler said that "Not only will this reduce the time needed to develop new crop varieties – because all three are cereals and so share a range of common characteristics – but we also expect it to reduce the cost of such research."

Scientists are already working on developing a single crop information system and comparative biology infrastructure for the three crops. CIMMYT Director General Masa Iwanaga added that "As we enter the era of genomics research, the efficient and effective management of information, and vitally important databases, is crucial to the ongoing development of new crop varieties."

For more information on the new science program, contact Duncan Macintosh of IRRI at d.macintosh@cgiar.org or David Mowbray of CIMMYT at d.mowbray@cgiar.org.

GM PUBLIC ACCEPTANCE IN U.S. STEADY BUT KNOWLEDGE LOW

Public acceptance of genetically engineered (GE) foods in North America is holding steady but knowledge of these foods remain low. Consumers will respond more positively to products with improved nutritional quality than products that primarily benefit the grower or developer of the product. Patrick Byrne of the Colorado State University forwards these views in "Safety and Public Acceptance of Transgenic Products" published in Crop Science 46:113-117(2006).

Byrne adds that improvements in the regulatory system are needed to address valid concerns and increase public confidence in GE crops. Ensuring the existence of a credible regulatory process is the most important factor in gaining trust. Byrne discussed shortcomings of the current regulatory system, among which include the system as operating in a reactive rather than a proactive mode,

fragmented authority among the government agencies involved in regulation, and few opportunities for public participation.

“For society to benefit from GR crops, the most important step forward is to move away from the polarized positions that have defined the transgenic debate so far, to positions of mutual respect that will allow a rational discussion of both the merits and risks of the technology,” Byrne concludes.

Email Patrick Byrne at Patrick.Byrne@ColoState.edu for additional information.

ALMOST HALF OF BRAZIL’S SOYBEAN HARVEST IS GM

Of the 58 million tons of soybeans to be harvested soon in Brazil, nearly half are transgenic. This figure is expected to be even higher in the coming years, said Ivo Carraro, director of the Research and Production of the Brazilian Seed and Transplant Association (ABRASEM) in a radio interview on “Soybeans – A Big Business” over Radio Nacional. He noted that Rio Grande do Sul will be harvesting 100% genetically modified soybean.

The expansion of transgenic soybean in the country “is only a question of markets” added João Flávio Veloso, deputy head of research and development at the Embrapa (Brazilian Agricultural Research Company) Soybean Unit. He noted that the federal government's agricultural research enterprise is working to obtain approval from the new National Technical Commission on Biosecurity (CTNBio) for various species discovered by members of its research staff.

The English translation of this report by Eduardo Mamcasz, reporter for Agência Brasil is available at http://internacional.radiobras.gov.br/ingles/materia_i_2004.php?materia=253675&q=1&editoria=

FAO PUBLISHES AGRI REPORT

Despite significant progress in income diversification of rural households, agriculture is still the principal activity of rural households in developing countries. This is according to a study detailing the preliminary results of the Rural Income Generating Activities (RIGA) project, an undertaking jointly organized by the UN Food and Agriculture Organization (FAO), the World Bank, and the American University in Washington, DC.

The study shows that 84 percent of rural households participate in agricultural activities. In some countries, statistics indicate that the number reaches as high as 99 percent. The research, however, also states that rural households derive a large share of their incomes from non-farm rural activities.

The RIGA project is building a detailed database to show sources of rural income based on nationally representative household surveys. Its ultimate objective is to use country-by-country analysis and cross-country evidence on rural income-generating activities to help reduce rural hunger and poverty.

For more information, contact John Riddle at john.riddle@fao.org. Read the press release at http://www.fao.org/newsroom/en/news/2006/1000214/index.html

WORKSHOP HIGHLIGHTS BIOTECH IN AFRICA

A five-day international workshop on biotechnology and bio-safety was recently concluded in Accra, Ghana. The workshop was organized by the United Nations Economic Commission for Africa (UNECA), in collaboration from the Ministry of Environment and Science. Present were over 40 participants from Ghana, Nigeria, Burkina Faso, Togo, Liberia, and South Africa.

Ms. Christine Churcher, Ghana's Minister of Environment and Science, opened the workshop. "Ghana, specifically and indeed Africa as a whole [needs] to take advantage of the progress that has been made in modern biotechnology to be able to meet the Millennium Development Goals (MDGs)," she told the participants during her opening remarks. She also added that the progress biotechnology had made in agriculture, health, energy, and industry could go a long way to help Ghana to meet the targets set in the MDGs.

Also present at the conference was Professor Walter Sandow Alhassan, West African Coordinator for the Program for Bio-Safety Systems (PBS), who expressed regret that no West African country had yet put in place a biosafety law.

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

BIOTECH INFO CENTERS LAUNCHED IN SRI LANKA, PAKISTAN

Sri Lanka's University of Colombo recently launched a new Biotechnology Education and Information center in December 2005. The inauguration ceremony took place at the University's Department of Science, with the participation of members of the industry and the academe. The university's Vice Chancellor, Professor T. Hettiarachchi, officially inaugurated the center. Guests included Prof. Karim Maredia and Dr. Cholani Weebadde from Michigan State University.

This new center is a unique initiative to provide biotechnology education and share science-based biotechnology information with various stakeholders in Sri

Lanka. The center is housed by the Department of Plant Sciences at the University of Colombo and is a collaborative activity between the University of Colombo, ISAAA, and Michigan State University in the US.

For more information, visit the center's website at http://www.slbic.org.

Similarly, the Pakistan Biotechnology Information Center (PABIC) was established at Latif Ebrahim Jamal National Science Center under the patronage of Dr. Anwar Nasim, Chairman National Commission on Biotechnology. PABIC is planning to publish regularly newsletters and web-based information bulletins on current activities related to biotechnology research and development Pakistan.

Additional information about the PBIC can be obtained by emailing Dr. Iqbal Choudhary of the International Center for Chemical Sciences, University of Karachi at hej@cyber.net.pk.

PHILRICE TO PURSUE NEW DIRECTION FOR 2006

The Philippine Rice Research Institute (PhilRice) will pursue a streamlined direction for 2006 with a new R&D program structure focusing on addressing key constraints to farmers' production capabilities. The new program is a result of a review conducted by the PhilRice Program Structure Review Committee, and consists of three major subjects: favorable (irrigated lowland) and unfavorable (rain-fed lowland) ecosystems, and knowledge management and promotion.

"PhilRice will focus on developing technologies, not just generating more information," PhilRice Executive Director Leocadio S. Sebastian says.

PhilRice also aims to acquire an ISO 9001 certification on quality management systems coupled with an OHSAS 18001 certification on occupational safety and health, both of which they hope to obtain within the year.

Visit http://www.philrice.gov.ph for additional information, or send an email to webteam@philrice.gov.ph.

RESEARCH

RESEARCH FINDS HORMONES THAT RIPEN GRAPES

Based on their ripening patterns and physiological differences, fruits can be categorized as climacteric or non-climacteric. The first class encompasses fruits which have a well-characterized peak of the hormone ethylene during the onset of ripening, and includes fruits such as tomatoes, apples, and bananas. The second class, on the other hand, includes species such as citrus, strawberries, grapes, and other fruits whose ripening processes are not well understood.

The ripening process is important to food supply, nutrition, and health, and controlling it may allow fruits to be transported without worry that they will be bruised or damaged. How this process occurs in grape is explored in “Grapes on Steroids. Brassinosteroids Are Involved in Grape Berry Ripening,” an article by Gregory M. Symons, of the University of Tasmania, and colleagues. Their work is published in the latest issue of Plant Physiology.

By isolating the genes coding for steroidal hormones known as brassinosteroids (BRs), and the receptors for their gene products, researchers confirmed that the grape brassinosteroid-6-oxidase gene is involved in the grape ripening process. They also found that applying BRs to grape berries (cv. Cabernet Sauvignon) significantly promoted ripening, while brassinazole, an inhibitor of BR biosynthesis, significantly delayed fruit ripening.

Previous research has shown that BRs are essential for normal plant growth and development, but they have not hitherto been found to be involved in ripening. The new findings can aid scientists in their work on improving grapes, and can likewise allow researchers a deeper understanding of how ripening can be controlled in other important non-climacteric fruits.

Subscribers to Plant Physiology can read the article at http://www.plantphysiol.org/cgi/content/full/140/1/150. Other readers may take a look at the abstract at http://www.plantphysiol.org/cgi/content/abstract/140/1/150.

MAIZE MOLECULE ATTRACTS PEST ENEMIES

Plants can protect themselves from herbivores through a process known as “indirect defense”: they emit a complex mixture of plant volatiles to attract natural enemies of the herbivores. For instance, once attacked by lepidopteran larvae, maize releases a mixture that is highly attractive to females of various parasitic wasp species, natural enemies of the lepidopterans.

Christiane Schnee, of the Max Planck Institute for Chemical Ecology, and colleagues unscramble the complex mixture and find that “The products of a single maize sesquiterpene synthase form a volatile defense signal that attracts natural enemies of maize herbivores.” Their work is published in the latest issue of The Proceedings of the National Academy of Sciences.

By overexpressing tps10, the gene coding for terpene synthase in maize, in Arabidopsis, researchers were able to grow plants emitting high quantities of the gene product. These plants were then used as odor sources in olfactometer assays, where researchers found that females of the parasitoid Cotesia marginiventris used the odor to locate their lepidopteran hosts.

Terpene synthase is an enzyme which, when activated, allows plant cells to produce a number of volatiles. Research showed that introduction of the gene coding only for terpene synthase was enough to mediate the indirect defense of maize against herbivore attack – allowing scientists another option in designing suitable strategies for protecting agricultural crops against insect pests.

Read the complete article at http://www.pnas.org/cgi/content/full/103/4/1129.

TRANSGENIC AND WILD WHEAT COMPARED

One aspect of safety studies on genetically modified (GM) crops involves global gene expression analysis, to see if there are any differences in gene expression patterns between a transgenic line and the mother variety. This may be carried out by studying the messenger RNA molecules (transcript profiling) or proteins produced by the crop species.

Such an activity was carried out by Per L. Gregersen and colleagues of the Danish Institute of Agricultural Sciences, as they conducted “A microarray-based comparative analysis of gene expression profiles during grain development in transgenic and wild type wheat.” Their work appears in the December 2005 issue of Transgenic Research.

Researchers compared gene expression profiles of developing seeds of wild type wheat and wheat transformed for endosperm-specific expression of an Aspergillus fumigatus phytase. To accomplish this, they crafted a cDNA microarray, and used the microarray to profile the transgenic wheat and its mother variety at three developmental stages. Researchers found that there were only slight differences in gene expression between either wheat type, and these were for genes which were strongly expressed over a short interval of seed development.

Read the abstract at http://dx.doi.org/10.1007/s11248-005-1526-y. Subscribers to Transgenic Research can download the complete article on the same page.

DOCUMENT REMINDER

IFPRI Releases Report on Latin America

The International Food Policy Research Institute (IFPRI) has released "Agricultural Innovation in Latin America: Understanding the Private Sector's Role," a report by Carlos Pomareda and Frank Hartwich. The study explores alternatives Latin American countries have taken in fostering agricultural innovation among local input providers, farmers, and processing companies. It likewise makes recommendations to improve the present state of agriculture in the region.

Download the report at http://www.ifpri.org/pubs/ib/ib42.pdf

ANNOUNCEMENTS

USDA TO PROMOTE FOOD AT TRADE SHOW

The U.S. Department of Agriculture's Foreign Agricultural Service invites U.S. food and beverage exporters to showcase their products in the USA Pavilion at Food Taipei 2006 in Taipei, Taiwan, June 21-24, 2006. Products with the best prospects include fresh fruits and vegetables, selected dairy products, seafood, poultry, beef, snack and health foods, rice, tree nuts, wines, and fruit juices. Food Taipei 2006 is Taiwan's largest international food and beverage trade show. Last year's show welcomed 1,789 exhibitors and more than 37,000 trade representatives. Visitors included industry professionals, hotel and restaurant sector representatives, and international news media.

For more information on exhibiting in the USA Pavilion at FOOD TAIPEI 2006 or for information on other USDA-supported trade shows, contact Tobitha Jones at Tobitha.Jones@usda.gov. To find out more about Food Taipei 2006, visit http://www.taipeitradeshows.com.tw/food/. Read the complete press release at http://www.fas.usda.gov/scriptsw/PressRelease/pressrel_dout.asp?Entry=valid&PrNum=0007-06.

AGENCY HOLDS ONLINE CONSULTATION

The Canadian Food Inspection Agency (CFIA) is holding an online consultation from January 25 to February 15, 2006 to solicit feedback on CFIA's efforts to develop preliminary draft guidelines for regulating the commercial environmental release of plants with novel traits that produce pharmaceutical and industrial compounds. Interested parties are requested to contact Tanya Fielding at fieldingt@inspection.gc.ca. For more information, visit http://www.inspection.gc.ca/english/plaveg/bio/mf/molecule.shtml.

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