CropBiotech Update

INTERNATIONAL SERVICE FOR THE ACQUISITION OF AGRI-BIOTECH APPLICATIONS

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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News

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BORLAUG RECOLLECTS ON THE GREEN REVOLUTION

Dr. Norman Borlaug narrates his experience in breeding wheat, encountering the rust epidemic, and advancing the green revolution in his paper published in Euphytica. He reviewed what has happened to cereal production between 1960 and 2000 in developing countries, as well as the positive contribution of high yield agriculture to environmental conservation.

Borlaug describes that the high-yielding semi dwarf wheat and rice varieties were just the catalyst for the Green Revolution. It was the combination of factors, which include the use of fertilizers, weed control, and optimum irrigation schedule that made the difference in productivity. He reiterates that there is no magic in novel, improved crop varieties alone, and also reminds that developing country governments must be prepared to work with and benefit from biotechnology applications.

Borlaug also describes the types of bureaucracies that agricultural scientists and researchers have to deal with in developing nations. He recommends that governments avoid excessively restrictive regulations and that they implement rules and regulations that are reasonable and cost effective, especially when dealing with biotechnology applications.

The abstract, with links to the full article, can be accessed at http://www.springerlink.com/content/d023617827754266/.

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OECD/FAO REPORT: BIOFUEL DEMAND PUSHING UP AGRIC PRICES

According, to a new report published by the Organisation for Economic Co-operation and Development (OECD) and the Food and Agriculture Organization (FAO), temporary factors such as droughts in wheat-growing regions and low stocks are the major culprits of short-term hikes in farm commodity prices. Long-term changes in markets will result from reduced crop surpluses, a decline in export subsidies, and more importantly, the growing use of cereals, sugar, oilseed and vegetable oils to produce fossil fuel substitutes, ethanol and bio-diesel. Ethanol production from biofuels crops are expected to double by 2016 in the United States, the European Union, Brazil, and China.

The report points out that higher commodity prices are a particular concern for net food importing countries as well as the urban poor. Although higher feedstock prices caused by increased bio-fuel production will benefit feedstock providers, it will result in extra costs and lower incomes for farmers who need the feedstock for animal feed.

The news article is available at http://www.fao.org/newsroom/en/news/2007/1000620/index.html.

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CBD SECRETARIAT SIGNS MEMO OF COOPERATION WITH IFAP

This month, the Secretariat of the Convention on Biological Diversity (CBD) signed an agreement with the International Federation of Agricultural Producers (IFAP) on future cooperation between the two organizations. IFAP represents 115 farmers' organizations in over 80 countries, most of them developing, and with a strong representation of small scale farming interests.

The partnership will strengthen the collaboration between CBD and IFAP in the management and conservation of biodiversity. IFAP will contribute to improving the effectiveness of the program of work on agricultural biodiversity through representing farmers' views and by raising awareness among its members on the importance of biodiversity in the context of sustainable agricultural development.

Read the complete article at http://www.cbd.int/doc/press/2007/pr-2007-07-02-ifap-en.pdf.

AFRICA

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AFRICA'S LOOMING RICE CRISIS CONCERNS ECONOMISTS

In the recent Third Annual Meeting of the Africa Policy Research and Advocacy Group at the Africa Rice Center (WARDA), participants expressed deep concern about the current world rice situation and its implications for sub-Saharan Africa. World rice consumption continues to outstrip rice production and rice prices are rising and are expected to double in the next couple of years. World rice reserves remain at the lowest level.

Sub-Saharan Africa gets 40% of its rice from imports, and if it were to meet its rice demand, the region should urgently reconsider its rice import policy to avoid the looming crisis, said WARDA Economist Dr Aliou Diagne. Africa should also consider tapping its immense potential for rice production. According to the Food and Agriculture Organization of the United Nations (FAO), the paddy (unhulled rice) production in Africa has gone up for the sixth consecutive year, reaching 21.6 million tons in 2006.

Participants of the workshop emphasized that African governments should give adequate support to small farmers who form the majority of rice producers in sub-Saharan Africa. Domestic rice production has long been neglected, and it requires the right policies to make African rice sector competitive.
Readers can access the press release at http://www.warda.cgiar.org/warda/newsrel-ricecrisis-jun07.asp.

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MAIZE STREAK VIRUS-RESISTANT GM CORN

Maize streak virus is an endemic pathogen of native corn which was carried to the cultivated corn through green leafhoppers. Centuries of breeding for resistance have produced no resistant plants.

Scientists at the University of Cape Town, South Africa, and the South African Seed Company, PANNAR Pty Ltd. declared that genetic modification of the viral replicating genes and its insertion into the maize genome confers resistance to the pathogen. Their transgenic maize has proven consistently resistant to MSV, and the trait can be reliably transferred on to the next generation and in crosses to other varieties. Further studies on the effectiveness of the technology in the field and its unintended effects on beneficial organisms will be conducted in an upcoming field trial.

For details read http://www.aspb.org/INDEX.cfm.

AMERICAS

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BORLAUG TO RECEIVE CONGRESSIONAL GOLD MEDAL OF HONOR

Dr. Norman E. Borlaug, World Food Prize Founder and 1970 Nobel Peace Price Laureate, will be awarded the Congressional Gold Medal, America's highest civilian honor, by United States President George W. Bush and Speaker of the House Nancy Pelosi on July 17.

Borlaug is widely noted for his important role in the Green Revolution. "It is a remarkable tribute to Dr. Borlaug's legacy of feeding the world," said Amb. Kenneth Quinn, President of the World Food Prize. "It is said of Dr. Borlaug that he has saved more lives than any other person who has ever lived".

See the full press release at
http://www.worldfoodprize.org/press_room/2006/december/borlaug-congressional.htm

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MEXICAN SCIENTISTS PRESENT MAIZE GENOME SEQUENCE

Mexican scientists from the Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV) this week presented the coded genome of maize in a ceremony to the Secretariats of Agriculture and Public Education. The sequencing project was carried out in the National Laboratory of Genomics for Biodiversity of Mexico (LANGEBIO), and the collaborative effort required more than 600 million pesos (approx. US$55.7 million) in funding.

Alberto Cárdenas Jiménez, Secretary of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) highlighted the importance of this scientific breakthrough as it will provide the required knowledge to develop improved maize varieties with pest resistance and better protection against drought and low temperatures. "Our farmers will be able to obtain in three years maize varieties with increased resistance, while this used to take ten years before", added Cárdenas Jiménez.

Marcial Negrete Martínez, representing Mexican maize farmers, asked the authorities to approve biotech maize varieties, adding that presently Mexican farmers are at a disadvantage compared to the farmers of other maize producing countries.

Read the full news at: http://www.sagarpa.gob.mx/cgcs/boletines/2007/julio/B156.htm

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PIONEER RESEARCHERS SPEED UP DEVELOPMENT OF NEW SEED PRODUCTS

The development of new and improved products, traits, and enabling technologies had been made faster with the help of the Accelerated Trait Integration process. This process is being used by researchers at Pioneer Hi-Bred to speed-up the development and to dramatically increase the supply of products with triple stacks - corn rootworm protection, corn borer protection and glyphosate resistance.

Mike Chapman, Pioneer research director, explains that Accelerated Trait Integration is making the inbred conversions earlier in the development pipeline allowing advanced research testing to be conducted on the desired stacked combinations for all pre-commercial hybrids. This requires the integration of the technology traits early in the development process; increasing the number of growing cycles per year by using numerous tropical and temperate locations throughout the world and the use of molecular markers to ensure optimal conversions.

Read the press release at http://www.pioneer.com/web/site/portal/menuitem.682f4124856d56c8b9b44b24d10093a0/.

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ARS STUDY: ORGANIC FARMING BETTER SOIL BUILDER THAN NO-TILL

The U.S. Department of Agriculture's Agricultural Research Service (ARS) scientists have found that organic farming builds up soil organic matter better than conventional no-till farming. Researchers made this discovery during a nine-year study at the Henry A. Wallace Beltsville Agricultural Research Center (BARC).
From 1994 to 2002, ARS plant physiologist John Teasdale compared light-tillage organic corn, soybean and wheat with the same crops grown with no-till plus pesticides and synthetic fertilizers. In a follow-up three-year study, corn was cultivated with no-till practices on all plots to see which ones had the most-productive soils. It was found that the organic plots had more carbon and nitrogen and yielded 18 percent more corn than the other plots did.

To read more, visit http://www.ars.usda.gov/News/docs.htm?docid=1261.

ASIA AND THE PACIFIC

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CHINA LOOKS FORWARD TO SECOND GENERATION TRANSGENIC COTTONS

The major challenge in the future management of the cotton bollworm, *Helicoverpa armigera*, a major cotton pest, will rely heavily on the introduction of second generation transgenic cottons. This is because if Bt cotton is commercialized in the country, a key refuge for cotton bollworm will be lost and resistance to Bt cotton may evolve more rapidly. This was forwarded by Dr. Kongming Wu, entomologist, State Key Laboratory for Biology of Plant Diseases and Insect Pest, Institute of Plant Protection, Chinese Academy of Agricultural Sciences in "Monitoring and management strategy for *Helicoverpa armigera* resistance to Bt cotton in China" published in the Journal of Invertebrate Pathology.

The increased level of control gained by the double Bt genes currently available in the second generation Bt cotton can be valuable in delaying Bt cotton resistance evolution in cotton bollworm says Wu.

Chinese farmers use a natural refuge system for resistance management. Generally, wheat is the main host of first generation cotton bollworm larvae, while cotton, corn, peanut, vegetables and soybean are the major host plants of subsequent generations.

The article is available online at http://www.sciencedirect.com. Email Kongwing Wu at kmwu@ippcans.cn.

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NATIVE PLANTS MORE DELECTABLE TO INSECTS THAN WEEDS

Foliage eating insects prefer the taste of native plants to those of weeds, according to a study by Queensland University of Technology (QUT). The attack by herbivores gives an advantage to weeds.

"While many plants need insects to reproduce there are many insects that simply feed off plants and this is having an effect on natives," said Eva White, from QUT's School of Natural Resource Sciences. "Herbivores demonstrated a preference for the native plant, causing higher levels of damage to the foliage of the native both in the field and in laboratory trials."

White also found that while pollinators were not ignoring natives, their interest in weeds was producing a hybrid native/weed species of seed. Hybrids that are created are not as healthy as the original plant and hybrids seeds are not able to survive to maturity, wasting much of the reproductive effort.

Read the news release at http://www.news.qut.edu.au/cgi-bin/WebObjects/News.woa/wa/goNewsPage?newsEventID=13153.

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TRANSGENE FLOW TO HYBRID RICE AND ITS MALE-STERILE LINES

Field trials of GM rice have been reported to require big isolation distances to as much as 200 m from the nearest standing rice crop. A study in the Biotechnology Research Institute of the Chinese Academy of Agricultural Sciences in Beijing and its other collaborators in the Guangdong Academy of Agricultural Sciences, Hainan University, and the National 863 Program in Sanya shows that this is not necessary.

Results of their collaborative study revealed that under parallel plantation at the 0-1 m zone, the transgene flow frequency in male sterile lines ranged from 3.145 to 36.116% and was significantly higher than that to hybrid rice cultivars (0.037–0.045%). Gene flow frequency decreased as the distance increased, with a sharp cutoff point at about 1–2 m. The maximum distance of transgene flow measured was 30–40 m to rice cultivars and 40–150 m to ms lines.

The authors are optimistic that these new findings would set-off a change in the regulations on isolation distance applied for GM rice and in risk assessment procedures.

Please read the full paper in http://www.springerlink.com/content/t55571780282/?p=e1dc8deb90f7463bac816ee2aecafa04&pi=0

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INDIA: BT COTTON CONSUMPTION NOT THE CAUSE OF ANIMAL DEATH

The All-India Crop Biotechnology Association (AICBA), an organisation of companies engaged in agriculture biotechnology asserted that the deaths of sheep, goat and cattle were not related to consumption of Bt cotton leaves and plants in Andhra Pradesh. Both Mr R.K. Sinha, Executive Director of AICBA and Mr Raj Ketkar, Joint Managing Director of Mahyco Monsanto report the results from a study by the Centre for Animal Disease Research and Diagnosis of IVRI (Indian Veterinary Research Institute) commissioned by the Genetic Engineering Approval Committee (GEAC).

They further added that none of the reports or analyses concluded that Bt toxin was responsible for sheep mortality

in Adilabad and Warangal districts of Andhra Pradesh. The nitrates and nitrites found in the viscera of sheep were in no way connected to Bt cotton.

For details please visit http://www.bharattextile.com/news/bycountry/india-10.html

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GENOME TECHNOLOGY TO IMPROVE MALAYSIAN OIL PALM

A local company, Asiatic Centre for Genome Technology Sdn Bhd (ACGT) will collaborate with US-based Synthetic Genomics Inc (SGI) in a multi-year research and development joint venture to improve oil palm production through genome technology.

This research collaboration will focus on the improvement of oil palm for increased yield and oil composition to meet food, cosmetic and pharmaceutical market needs. The current average yield of 3.7 tons per hectare is projected to double in seven years through this partnership. The oil palm genomic sequence in which 20% was sequenced by the local scientist will also be fast tracked and expected to finish in 18 months, added Dr. Cheah Suan Choo, the Chief Scientific Officer of ACGT.

For details of the press release, visit http://www.bic.org.my

EUROPE

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ASSESSING THE ENVIRONMENTAL IMPACT OF GM PLANTS

The European Food Safety Authority (EFSA) recently held a two-day Scientific Colloquium in Parma, Italy on the Environmental Risk Assessment of Genetically Modified (GM) plants. Discussions focused on the latest developments in genetically modified organisms (GMOs), environmental risk assessment methodology and practices; and other issues including environmental fitness, effects on non-target organisms, long-term and large scale environmental effects, broader environmental considerations and the assessment of risk versus environmental benefit.

Participants of the colloquium agreed on the current case-by-case approach to environmental risk assessment, while expressing that a more specific guidance may be needed for the assessment of the potential impact on non-target organisms in terms of design and statistical power of testing. Statistical modeling tools are also considered useful to predict potential effects that GM plants might have over time and when cultivated on a larger scale in Europe.

Read the press release at http://www.efsa.europa.eu/en/press_room/news/wns_scientifc_colloquium.html.

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JOINT RESEARCH UNIT ON PLANT-PATHOGEN INTERACTIONS GET ISO CERTIFICATION

The Joint Research Unit on Biology and Genetics of Plant-Pathogen Interactions (CIRAD-INRA-SupAgro) scored a first by being the first joint research unit in France to be granted ISO 9001/2000 certification. The ISO 9001 certificate is a globally recognized quality management standard developed by the International Organization for Standardization

(ISO). The certification is valid only for three years, after which time it may be renewed following a review. It covers all the unit's operations in terms of research, appraisal and training students and professionals in plant-pathogen interactions. Research in the UMR BGPI includes studies on the mechanisms that lead to parasite development on plants on the changes in the mechanisms of plant resistance and parasite pathogenicity; and on the biology of organisms with a major role in epidemics. Researchers also conduct work on model species, which will facilitate methodological transfers to less widely studied species.

Readers can access the news article at http://www.cirad.fr/en/actualite/communique.php?id=729.

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SYNGENTA TO ACQUIRE ISRAELI VEGETABLE SEEDS COMPANY

Syngenta recently announced its impending acquisition of Zeraim Gedera Ltd., a high quality Israeli vegetable seeds company focusing on high-value crops, including tomato, pepper and melon. Syngenta will buy all outstanding shares in the company from Markstone Capital Partners, an Israeli private equity group. This acquisition will reinforce the growth and quality of Syngenta's vegetable seeds business.
The transaction is expected to close in 2007 pending regulatory approvals.

Read the press release at http://www.syngenta.com/en/media/press/2007/07-09.htm.

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NFU VP: BRITAIN MUST BOOST BIOFUELS PRODUCTION

Paul Temple, Vice President of the National Farmers Union in the United Kingdom urged the country to catch up with other biofuels producing nations, stating that growing energy crops would help producers move from a subsidised toa market economy. "This (biofuel) is a big win for both urban and rural economies because we already produce significant exportable surpluses at the bottom end of the market," Temple said.

While the financial and ecological advantages of growing crops like oilseed rape have been well publicized, only 3.5 million of the 258 million tons of cereals grown in Europe last year went to bioethanol. The United States, Germany, and France were all much quicker than Britain to act on the biofuel issue - the US alone already grows tens of millions of energy crops, leading the world market.

Read the press release at http://www.nfuonline.com/nfulivepub/x16940.xml.

Research

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GENETIC MANIPULATION OF MEDICINAL AND AROMATIC PLANTS

Medicinal and aromatic plants are important sources of compounds that have benefited human health. Among these plant-derived compounds are those having anti-cancer properties such as taxol from the Pacific Yew tree, and vinblastine from the periwinkle plant. These compounds are usually products of plant secondary metabolic pathways.

The cloning of genes in the secondary metabolic pathways can help facilitate the manipulation of the metabolites from medicinal plants, said researchers at the Universitat de Lleida and the Institucio Catalana de Recerca i Estudis Avancats (ICREA) in Spain. Their paper published in Plant Cell Reports discussed the advances in metabolic pathway engineering of specific classes of compounds in medicinal and aromatic plants. The compounds mentioned in the review include indole, nicotine, and menthol.

The researchers recommend that commercial cultivation practices be developed for medicinal plants as most of these are still gathered from the wild. In addition, the development of high throughput screening systems for chemical and biological activity, and advances in the cloning of genes involved in relevant pathways, may help advance the discovery and engineering of plants with the compound of interest, the researchers added.

More details can be found on the paper, accessible to journal subscribers at http://www.springerlink.com/content/r13821t125275h07/.

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HIGH THROUGHPUT PLANT GENE EXPRESSION ANALYSIS

A technique used by the biomedical community was demonstrated to have possible applications in studying gene expressions in plants. The application utilizes a microplate-based high-throughput array-based gene expression system, called qNPA, which may have advantages over conventional microarrays due to lower cost, higher reproducibility and accuracy.

The group of Richard Kris, who reviewed results of their tests on *Arabidopsis thaliana*, said that the qNPA platform may speed up gene-based discovery and development programs as it is capable of providing accurate dose-response. They likewise dispelled the premise that the expression system is difficult to use in plants because of the tough cell wall which impedes homogenization and cell breakage and also due to the presence of plant secondary compounds, which affects homogenization.

The open access article published in Plant Physiology can be viewed at http://www.plantphysiol.org/cgi/content/abstract/144/3/1256.

Announcements

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13TH EUROPEAN CONGRESS ON BIOTECHNOLOGY

In line with the European Federation of Biotechnology's mission, the 13th European Congress on Biotechnology from 16 to 19 September 200 7in Barcelona, Spain will focus on addressing the great challenges to humanity through the crucial theme of Symbiosis, applying cutting-edge Science and Industry in support of Society.

Online registration, submission of abstracts and sponsorship and exhibition opportunities at Europe's longest running international and multidisciplinary biotechnology congress are now open: http://www.ecb13.eu/

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Document Reminders

ABSP II NEWSLETTER NOW AVAILABLE ONLINE

The June 2007 issue of the Agricultural Biotechnology Support Project II Southeast Asia newsletter can now be accessed at http://www.isaaa.org/programs/supportprojects/abspii/download/ABSP_Newsletter_vol3_no3.pdf. Among other news, the newsletter reports on the latest developments in Bt eggplant and PRSV-resistant papaya in the Philippines. ABSPII is a USAID-funded consortium of public and private sector institutions that supports scientists, regulators, and the general public in developing countries to make informed decisions about agricultural biotechnology.

Visit the ABSPII website at http://www.isaaa.org/Regional_centers/SEAsiacenter/ABSPII/default.html for more information.

FROM THE BICS

MABIC MOVED ITS LOCATION

The Malaysian Biotechnology Information Center (MABIC) moved its location. For details visit http://www.bic.org.my