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

GLOBAL

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SCIENTIFIC RISK ASSESSMENT CRITICAL IN RISK ANALYSIS OF GM CROPS

Scientific risk assessment plays an important part in the regulation of activities that can potentially harm the environment. Decisions derived from scientific risk assessments include the permission to commercially plant or market a particular genetically modified (GM) crop. However, even after conducting a scientific risk assessment debates concerning the safety of GM crops still persist. The group led by Guy Poppy in the United Kingdom has identified two possible reasons why, and they have recommended these be rectified to regain confidence in the risk assessment process.

One of the reasons is that data often come from non relevant studies which can only be used to answer very few questions about risk. These 'answers in search of questions' give the impression of significant risk, though if relevant studies are conducted it can be determined that there is negligible actual risk. Poppy's group suggests that scientific risk assessment needs to test well-defined hypotheses.

The second reason is that some concerns of the stakeholders cannot be answered by science alone, so they are

outside the area of scientific risk assessment. An example of this is the fear that social and political change will occur with the use of GM crops. The group suggests that these 'non-scientific' questions be also integrated in the regulatory decision making. This will help bring back society's trust of scientific applications and the regulatory process.

The complete opinion paper published by the journal Trends in Plant Science can be accessed by subscribers at http://dx.doi.org/10.1016/j.tplants.2006.11.004

AFRICA

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MAIZE RESEARCH FOR AFRICA'S FARMERS

A vital maize research program in Africa that stems from a partnership between the International Maize and Wheat Improvement Center (CIMMYT) and the International Institute of Tropical Agriculture (IITA) recently received funding from the Bill and Melinda Gates Foundation. As part of the research program, CIMMYT and IITA, in cooperation with a wide range of partners in countries throughout sub-Saharan Africa, have been developing drought-tolerant maize for farm families who depend on maize for their food security and livelihoods. CIMMYT and IITA will continue to use both participatory breeding strategies and drought-stress screening, combined with the new techniques of marker-assisted selection, to improve the efficiency of breeding. The scientists will also analyze bottlenecks in seed systems and identify high-priority areas for future poverty-reducing investments.

The complete news article is available at http://www.iita.org/cms/details/news_details.aspx?articleid=678&zoneid=81.

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STRATEGIC PRIORITIES FOR AGRIC DEVT IN AFRICA

Alternative approaches are necessary if agriculture in Africa can achieve the Millennium Development Goal of halving poverty by 2015. "Strategic priorities for agricultural development in Easter and Central Africa", a research report by Steven Were Omamo and colleagues at the International Food Policy Research Institute, recommend the following tactics to increase both agricultural and overall economic growth based on socio-economic models and tools:

- Tailoring agricultural production to demand within Eastern and Central Africa
- Encouraging a wide variety of agricultural production to match the diversity of national demands and capacities; and
- Promoting regional cooperation in agricultural development

The report is available online at http://www.ifpri.org/pubs/abstract/rr150.asp.

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PUBLIC, PRIVATE PARTNERSHIPS NEEDED TO REVOLUTIONIZE AFRICAN AGRIC

An African agricultural revolution can happen if government action along with public and private partnerships is formed to support new technologies and investments. "We must work together to not only increase agricultural

productivity in Africa to help people feed themselves, but also increase their profitability and help them move to farming as a source of income, " said DuPont Group Vice President J. Erik. Fyrwald during the World Economic Forum Annual Meeting in Davos, Switzerland.

Fyrwald explained that the government must protect the rule of the law and intellectual property rights and develop policies and regulations to encourage intense agricultural growth, innovation and advanced technology development. "Public, private and non-profit institutions must invest in developing scientific expertise, appropriate technologies and agricultural research and development."

The World Economic Forum is an independent international organization committed to improving the state of the world by engaging leaders in partnerships to shape global, regional and industry agendas.

Read the news release at http://pioneer.mediaroom.com/index.php?s=press_releases&item=229

AMERICAS

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TOMATO GENOMICS PROJECT RECEIVES FUNDING FROM NSF

The National Science Foundation awarded a $1.8 million funding to Cornell and the Boyce Thompson Institute for Plant Research (BTI) at Cornell for an international project that aims to sequence the tomato genome and create a database of genomic sequences and information on the tomato and related plants. Sequencing the tomato genome is the first step in creating the comprehensive International Solanaceae Genomics Project (SOL) Genomics Network database. This will tie together maps and genomes of all plants in the Solanaceae family, which includes the potato, eggplant, pepper and petunia. The database will be made public to provide much-needed information to scientists doing research in plant breeding and genetics.
Read more: http://www.news.cornell.edu/stories/Jan07/SolanacaeNSF.kr.html

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SYNGENTA STACKED INSECT TRAIT APPROVED BY US EPA

The United States Environmental Protection Agency (US EPA) recently approved the stacked combination trait developed by Syngenta from its new corn rootworm trait and its European corn borer trait. The double stack, AgrisureTM CB/RW, will be available in limited quantities for the 2007 growing season. This approval also enables Syngenta to launch next year its triple stacked corn, Agrisure GT/CB/RW, which includes glyphosate tolerance.

This registration follows the first EPA approval for the corn rootworm resistant trait in October 2006. The stacks will be available to US growers in various combinations through elite hybrids from Garst®, Golden Harvest® and NK® in addition to single trait offerings.

The press release can be read at http://www.syngenta.com/en/media/press/2007/01-25.htm.

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DuPont TECHNOLOGIES TO HELP FARMERS MEET BIOFUELS CHALLENGE

In his State of the Union address, President Bush called for mandatory fuel standards that require 35 billion gallons of renewable and alternative fuels be used by 2017. Corn ethanol, ethanol from cellulosic feedstocks, advanced biofuels including biobutanol, and biodiesel are expected to provide a significant percentage of US energy requirements. To help farmers and other stakeholders meet the biofuels challenge, DuPont has been investing in a three-part strategy that aims to: 1) improve existing ethanol production through differentiated agriculture seed products and crop protection chemicals; 2) develop and supply new technologies to allow conversion of cellulose to biofuels; and 3) develop and supply next-generation biofuels with improved performance.

To accomplish its agenda, DuPont has partnered with the United States Department of Energy in developing a cost-effective technology package to produce cellulosic ethanol from entire corn plants. The program is developing the value drivers to economically convert cellulose to sugar and allow for the volumes needed to meet the demands of the biofuels market. The company also announced last year a joint venture with the BP company that will bring biobutanol to the market. Biobutanol has low vapor pressure and tolerance to water contamination in gasoline blends, facilitating its use in existing gasoline supply and distribution channels.

Read the press release at http://pioneer.mediaroom.com/index.php?s=press_releases&item=228.

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BP ANNOUNCED $500 MILLION DOLLAR INSTITUTE FOR BIOFUELS RESEARCH

The oil giant BP announced recently its contribution to plant molecular biology: a new $500 million biofuels institute to be built at the University of California (UC), Berkeley. UC Berkeley beat out four other research powerhouses in the competition for the institute: UC San Diego, MIT, Imperial College London and the John Innes Center. Details of the Energy Biosciences Institute (EBI) are still being decided, but the basic outlines of the partnership have been sketched out. A new building will be erected by UC Berkeley for the institute to house UC Berkeley researchers and faculty, many yet to be hired. The main focus will be making new biofuels for automobiles, although researchers will also pursue biological studies related to using microorganisms for carbon sequestration and fossil fuel recovery.

The news article can be read at http://sciencenow.sciencemag.org/cgi/content/full/2007/201/1.

ASIA AND THE PACIFIC

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SINGAPORE'S OPPORTUNITIES IN BIOTECH CROPS

Singapore, though a non-agricultural country, should exploit the opportunities brought about by biotech crops. The country is a knowledge hub, generating biotechnology intellectual property (IP), and exploiting economic gains from technology licensing and provision of reliable support services. It is also a net importer, sourcing reliable, quality-assured supplies. This was forwarded by Dr. Paul Teng, Dean of the Graduate Programs and Research, Nanyang Institute of Education, Singapore during a public forum on the commercialization of biotech crops 1996-2006 and future prospects held at the Matrix, Biopolis, Singapore.

Dr. Teng enumerated several opportunities for Singapore. These include:

- Capability development through specialized professional development courses, seminars and conferences; workshops; and on-the-job assignments
- Intellectual property generation/product development through IP audits, public-private IP brokering/technology transfer
- Incubator support (support infrastructure)

- Financing (public/private equity development)
- Services (food/feed safety testing for regulatory compliance)

The forum highlighted the gains of biotech crops in the world through a presentation by Dr. Clive James, chair of the International Service for the Acquisition of Agri-biotech Applications (ISAAA). An executive summary of the global status of commercialized biotech/GM crops in 2006 is available online at http://www.isaaa.org.

EUROPE

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TEN YEARS OF LABELING IN EUROPE

Ten years after the *Novel Food Regulation* was passed, and foodstuffs and ingredients made from genetically modified organisms became subject to particular regulation orders, the European Union is still divided over the issue of labeling. Lawmakers perceive it as a neutral consumer information tool, while consumers are more likely to perceive such labeling as a warning notice. Consequently, producers avoid preliminary products and ingredients which are liable for labeling.

In 2004, the European Union Commission changed the status of GM foodstuff and removed it from the *Novel Food Regulation*. Under the new policy, GM foodstuffs require labeling even when an applied GMO is no longer detectable in the final product. The labeling provision however does not include an array of applications of gene technology such as the use of genetically modified plants as fodder for farm animals.

Read the news article at http://www.gmo-compass.org/eng/news/messages/200701.docu.html#88.

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EU NEEDS TO BEEF UP REGULATORY SYSTEM FOR MOLECULAR FARMING

Molecular farming is about to gain a foothold in Europe, hence biosafety regulators in the EU is about to face a big challenge, says Armin Spök of the IFZ–Inter-University Research Centre for Technology, Work and Culture in Austria. Spök presented that there are evident increases in EU commercial and academic activities in molecular farming, and soon the first generation plant-made pharmaceuticals will hit the market.

Spök recommends that “policy development for molecular farming will have to be pursued in a complex environment, where unresolved problems with first-generation GM crops are still prevalent”. In his paper published by the journal Trends in Biotechnology, he suggests that the risks associated with products from molecular farming might be different from those in first generation GM crops.

Among the considerations is the plant made pharmaceuticals (PMPs) are designed to have a biological effect on humans. Also, the crops for molecular farming are to be optimized for maximum yield of the target substance, thus human and environmental exposure could therefore be increased. The current risk-mitigation measures that are in place might not be sufficient, Spök concluded.

The complete paper can be accessed by subscribers at http://dx.doi.org/doi:10.1016/j.tibtech.2006.12.003

Research

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TRIPLOID PAPAYA – POTENTIAL USES IN BREEDING AND FRUIT PRODUCTION

Triploid (with one extra set of chromosomes) papayas that were derived through anther culture may be used for direct exploitation in commercial fruit production, said researchers in Japan and Kenya. The group of T. Etoh studied the characteristics of 26 anther derived papaya strains and compared them with commercial papaya cultivar 'Wonder blight', which is diploid.

Etoh and his group determined that triploid papayas produce fruits that are relatively heavier than the commercial diploid papaya. The fruits are also seedless. The triploids were observed to produce plants that are dwarf, semi-dwarf or tall. The dwarf and semi-dwarf strains are those that were observed to produce high yields. Combined with their short stature, these strains make harvesting the fruits manageable.

The paper published by the journal Scientia Horticulturae. The abstract, with links to the full paper for subscribers, can be accessed at http://dx.doi.org/10.1016/j.scienta.2006.10.015

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CAROTENOID PRODUCTION IN TRANSGENIC TOMATO

Researchers in Metapontum Agrobios, Italy have reported the results of their open field evaluation of 'HighCaro' (HC), a tomato carrying the transgene lycopene beta-cyclase (t*Lcy-b*). The HC tomato has orange fruits due to the complete conversion of lycopene to b-carotene, a carotenoid. Carotenoids are popular organic color pigments that are often used as component of dietary supplements due to their pro Vitamin A activity.

The paper published by the journal Transgenic Research showed that agronomic performances and fruit quality of the HC line in the T6 generation were comparable with a parental line and a commercial variety, especially when the marketable yield parameter is considered.

The researchers also used quantitative real-time PCR analysis using HC fruits collected at four distinct development stages to determine transcriptional regulation of genes involved in carotene formation. Results showed that the transgene can maintain its activity even under field conditions. However, the total carotenoids were lower under high field temperature, a trend similar to what was observed in prior greenhouse studies.

Complete details on the study can be accessed by journal subscribers at
http://www.springerlink.com/content/u0740761j7683713/

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BT TRANSGENE DETECTED IN AQUATIC SYSTEMS

The Canadian Department of the Environment (also known as Environment Canada) has determined that the Bt gene *cry1Ab* from biotech corn persisted in aquatic areas near the site where the insect resistant crop was planted.

Using various DNA extraction methods and real time PCR, the group of C. André has determined that there were varying amounts of the *cry1Ab* gene in sediment, soil, and surface water samples. The sediments were found to contain about 100-fold more *cry1Ab* DNA than did the surface water.

Because of the concern that the release of DNA in the environment increases the probability of *in situ* horizontal gene transfers in microorganisms by transduction, transformation, and conjugation, André's group recommends that monitoring strategies must not be ignored and that there should be sustained attention about the fate of exogenous genes in the environment.

The abstract in the journal Ecotoxicology and Environmental Safety, with links to the complete paper for subscribers can be accessed at http://dx.doi.org/10.1016/j.ecoenv.2006.01.002.

Announcements

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WORKSHOP ON RISK ASSESSMENT FOR THE DELIBERATE RELEASE OF GMOS

A biosafety workshop organized by the International Centre for Genetic Engineering and Biotechnology (ICGEB), in collaboration with the Istituto Agronomico per l'Oltremare, will be held on 14-18 May 2007 in Ca' Tron di Roncade, Italy. The workshop's theme is ''Introduction to Risk Assessment for the Deliberate Release of GMOs: Assisting decision-making in a Biosafety Framework''.

For more information please contact: ICGEB - Conferences and Meetings, Padriciano 99, I-34012 Trieste, Italy; Tel.: +39-040-3757333; Fax: +39-040-226555; or visit http://www.icgeb.org/MEETINGS/CRS07/BSF1_14_18_May.pdf.

CONFERENCE ON PLANT TISSUE CULTURE AND AGRIBIOTECH

The Asia Pacific Conference on Plant Tissue Culture and Agribiotechnology (APaCPA) 2007 with the theme "Biotechnology for Better Food, Health and Quality Living" is to be held on 17-21 June, 2007 in Kuala Lumpur, Malaysia. The 2007 conference will be the fourth conference in the series. In addition to the opportunity to hear and discourse on the numerous achievements in the field of modern biotechnology, participants will be able to take part in the celebration of Malaysia's anniversary of its 50th year of independence. There will also be Orchid Symposium during the last day of the conference.

More information on this event is at http://ns.aimst.edu.my/apacpa2007/introduction.htm.

INTERNATIONAL CONFERENCE ON WEED CONTROL

XIIth International Symposium on Biological Control of Weeds (ISBCW) will be on 22-27 April 2007 in La Grande Motte, France. The XIIth ISBCW provides a window to show the public and policy makers in the EU and around the world, that biological control of weeds uses internationally accepted scientific rigor and analysis to provide permanent and non-chemical weed control benefits, far outweighing any risks or costs.

For more information and to register please visit http://www.cilba.agropolis.fr/Weeds2007/Welcome.html.

ICABR 11th INTERNATIONAL CONFERENCE ON AGBIOTECH

The International Consortium on Agricultural Biotechnology Research (ICABR) will convene the 11th International Conference on "Agricultural Biotechnologies: New Frontiers and Products – Economics, Policies and Science". The conference will take place on July 26-29, 2007 in Ravello, Italy. Topics will include impact of agricultural

biotechnology on international trade, ethanol, biodiesel and other renewable energies, and biopharmaceuticals. Deadline for proposals for paper presentation is on February 20, 2007.

For more information, visit: http://www.economia.uniroma2.it/conferenze/icabr2007/call_for_paper.asp or contact ICABR through email: icabr@economia.uniroma2.it.

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Document Reminders

PIONEER'S VIRTUAL ETHANOL PLANT TOUR

Pioneer's web page on ethanol production contains links to a virtual tour of an ethanol plant. Pioneer, a DuPONT company, is a major supplier of corn hybrids in the United States and worldwide.

Links to the ethanol plant tour is at http://www.pioneer.com/ethanol/default.htm.

FAO Fertilizer and Plant Nutrition Bulletin 17

This publication of Food and Agriculture Organization of the United Nations (FAO) is based on 21 country reports on fertilizer use by crop between 2002 and 2006. Its objective is to demonstrate the importance of information on fertilizer use by crop, not only on a national level but also by agro-ecological zone. It also aims to demonstrate how the correct use of fertilizers could help to achieve the first target of the Millennium Development Goals (MDGs) of the United Nations.

The document can be accessed at ftp://ftp.fao.org/agl/agll/docs/fertusebycrop.pdf