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)

January 5, 2007

Dear Subscribers,

Happy New Year!

In January 2001 we launched the Crop Biotech Update, a bi-weekly e-newsletter synthesizing crop biotechnology developments in the world. It started with an average of five articles per issue and was sent to an initial mailing list of 69 subscribers. Six years, 290 issues, and 2,757 articles later, we now reach 278,210 subscribers in 190 countries. In November 2006, a biofuels supplement was added as a bi-weekly component of the Update.

Based from feedback from subscribers from 101 countries who participated in our e-survey, there was overwhelming appreciation for the Update which is being used as a source for updated information on crop biotechnology, and as an instructional material. Its brevity, conciseness, regularity, and provision of links to original sources were enumerated as plus points for the Update.

Thank you for your continued patronage and we stand committed to bringing more news to even a greater number of subscribers this year!

- Crop Biotech Update Staff

Looking Back at 2006

The Crop Biotech Update released 55 issues and 783 articles in 2006. Highlights of the year include:

- Release of the global status report of commercialized biotech/genetically modified (GM) crops in 2005 by Dr. Clive James, chair of the International Service for the Acquisition of Agri-biotech Applications (ISAAA). He reported that 2005 marked the tenth anniversary of the commercialization of GM crops. It was this year when the billionth acre, equivalent to the 400 millionth hectare of a biotech crop, was planted by one of 8.5 million farmers, in one of 21 countries. The global area of approved biotech crops in 2005 was 90 million hectares, an increase of 11% over that of 2004.

- The World Trade Organization ruled in favor of the United States after it challenged the European Union moratorium on approvals of GM agricultural crops noting that it violated international trade rules and undermined the development and use of biotechnology.

- Approvals of biotechnology policies and laws in several countries. Argentina approved its biotechnology law seeking to promote biotech applications aimed at improving agricultural production. In like manner, a new genetic engineering law was approved by the German Bundesrat. The French State also adopted a GM bill aimed at harmonizing European practices in terms of research, use and marketing of GMOs. Bangladesh approved its national biotechnology policy guidelines aimed at increasing production among others. Kenya adopted a comprehensive national policy to guide research, development and trade in biotechnology products. Malaysia's Biotech Council approved its biosafety act which completes the national biotechnology policy.

- A landmark decision was reached by the Parties of the Cartagena Protocol on Biosafety on detailed documentation requirements for GM organisms in the international trade of agricultural commodities.

- India continued to increase its GM crop production and use by approving more GM cotton hybrids and GM soybean oil derived from Round-Up Ready soybean. Spain, the Philippines, and Australia were some countries that continued to approve new biotech varieties.

- GM field trials of GM mustard in India, Bt Brassicas in New Zealand, blight-resistant potato in the United Kingdom, and GM torenia in Australia were approved.

Archives of news in 2006 and past years are available at http://www.isaaa.org/kc.

In This Week's Issue:

GLOBAL

UN DECLARES 2009 INTERNATIONAL YEAR OF NATURAL FIBERS

The United Nations (UN) General Assembly recently declared 2009 as the International Year of Natural Fiber. According to the Food and Agriculture Organization (FAO), the UN resolution would help millions of people around the world, among them some of the poorest people in some of the poorest countries, which depend on the production and processing of natural fibers for their livelihood. Natural fibers contribute to food security and economic development for these farmers.

The International Year of Natural Fibers is expected to raise consumers' awareness of natural fibers and strengthen demand for natural fiber products, improving the livelihoods of the farmers who produce them and translate to revenues for countries that export them, says FAO. At the same time, promoting the use of natural fibers will enhance the environment.

The wide range of natural fibers includes cotton, wool, jute, flax, silk, sisal, coconut fiber and many others. Some are produced from plants, others from animals, and they are used in clothing and other consumer goods, as well as in industrial applications.

Read the press release at http://www.fao.org/newsroom/en/news/2006/1000472/index.html.

IFP LAUNCHES BIOECONOMY POLICY AGENDA

The International Futures Programme (IFP) of the Organization for Economic Cooperation and Development (OECD) has launched a two-year project on "The Bioeconomy to 2030: Designing a Policy Agenda". Bioeconomy is the set of economic activities relating to the invention, development, production and use of biological products and processes. Policies ranging from long-term investment to appropriate regulatory frameworks must be set in place to nurture the promise of biotechnology and bioeconomy.

Through collaborative work involving several sectors, the project will, among others:

- Assess the long-term prospects of the bioeconomy over the next 30 years and its economic and social implications.
- Improve the indicators and metrics that are needed to monitor the development of the bioeconomy.
- Identify the most critical issues that may affect the medium- and longer-term prospects for the bioeconomy (e.g. technical, financial, human capital, and regulatory bottlenecks).
- Identify where policies and regulations are increasingly out of step with biotechnology development and propose options for a more dynamic policy framework.

A project brochure detailing more about the policy agenda is available at http://www.oecd.org/dataoecd/7/51/37504590.pdf.

RECENT STUDY WEIGHS UP ECONOMIC BENEFITS OF GM CROPS

According to a new study by the European Commission's Joint Research Centre (JRC) on the economic impact of genetically modified crops worldwide, farmers derive economic benefits from growing GM crops not because of the increased yield, but due to savings on herbicides, pesticides and machinery.

Weighing up the economic impacts, the report finds that for some GM crops, such as herbicide tolerance (HT) soybean in the United States and Bt maize in Spain, the difference between their yield and that of conventional crops is almost negligible. However, the yield of some other GM crops, like the pest resistant cotton (Bt), has been much higher than non-GM crops.

GM farmers agreed that they have made money elsewhere with the introduction of these crops. In the US, farmers of the HT soybean reported net savings in weed control, tillage, labor and machinery costs, which outweigh the higher seed costs and small yield gain. Similarly, Bt cotton farmers in China and India said they were using less insecticide per hectare. However, farmers in the US found that the money gained from using less pesticide was offset by the high price of GM seeds.

In addition to looking at the economic benefits of GM crops, the report also forecasts the benefits should more EU countries decide to grow such crops. It also includes an estimate of the potential costs that farmers may incur in order to adhere to the EU guidelines on co-existence - the separation of organic, traditional and GM crops.

The news release can be accessed at http://cordis.europa.eu/fetch?CALLER=FP6_NEWS&ACTION=D&DOC=7&CAT=NEWS&QUERY=1167449917996&RCN=26856.

GENOMIC STUDIES REVIEWED

The availability of high throughput approaches combined with automation, the rapid increase in sequence data in the public domain, and good expertise and tools in the area of bioinformatics has made it possible for genomics to increase the efficiency of breeding. Large-scale application of genomics to breeding will result from new technologies that reduce the costs and increase the throughput of the assays. The newly developed genetic and genomics tools will however not entirely replace the conventional breeding process. This was the conclusion of Dr. Rajeev K. Varshney, senior scientist of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and colleagues in a cover article published in the journal Trends in Biotechnology.

Varshney and colleagues critically reviewed studies using powerful tools of molecular biology particularly in cereal research. They noted that integration of genetic and genomic approaches together with modern biotechnology and bioinformatics tools is essential for an effective use of genomics in breeding. However, there are several challenges for successful exploitation of genomics-assisted breeding (GAB) which needs to be considered or tackled.

A PDF copy of the article can be obtained from Rajeev Varshney at r.k.varshney@cgiar.org.

*** AFRICA ***

GRANT TO PROMOTE CASSAVA PRODUCTION IN AFRICA

The International Institute of Tropical Agriculture (IITA) recently received a grant from the W.K. Kellogg Foundation to promote NEPAD Pan Africa Cassava Initiative (NPACI) for sustainable economic growth, food security and poverty alleviation in Africa. The program was started by IITA to promote the production of cassava, a drought tolerant crop, to reduce the risk associated with the dependency on maize as major food crop.

Working through the Southern Africa Root Crops Research Network (SARRNET), and in collaboration with the national program in Malawi, IITA initiated the Masinda Cassava Club in Katimba, Malawi as a pilot processing center to turn cassava into industrial starch. With the establishment of the factory, farmers now make over US$800 for every hectare of fresh cassava.

The grant will help the New Partnership for African Development NEPAD/IITA Facilitation Unit that is being established by NPACI/SARRNET at Chitedze Research Station. Read the news article at http://www.iita.org/cms/details/news_details.aspx?articleid=596&zoneid=81.

*** AMERICAS ***

GM PEANUT TO BE DEVELOPED

The American Peanut Council and its research arm, the Peanut Foundation, has given the go signal for scientists to develop genetically modified (GM) peanuts that could be safer, more nutritious, and easier to grow than conventional counterparts. For consumers, work on GM peanut might lead to a product with enhanced flavor, more nutrients, and possibly even nuts that are less likely to trigger allergic reactions. The Council, which represents growers, shellers, exporters and manufacturers, urged scientists to move ahead with "due diligence" on the development of GM peanuts.

A team of scientists from 14 universities, the United States Agriculture Department, and the food industry prepared a report on biotech peanuts for the Peanut Foundation. The scientists concluded the technology could reduce growing costs, improve nutrition and overall quality for consumers and have the potential to reduce the allergy threat by peanuts.

Read the article by Elliot Minor in
http://www.growersforwheatbiotechnology.org/html/news.cfm?ID=330

NEW APPROACH TO FINDING GENETIC BASIS OF PLANT VARIATION

Researchers studying the genetic basis of plant variation can now circumvent the lengthy processes performed in the laboratory, thanks to a new method developed by scientists at Purdue University in Indiana. The approach may offer researchers a tool to pinpoint genetic differences in naturally occurring plant populations many times faster than currently possible and help shed light on the likely origin of such differences.

"We've combined a variety of techniques to get at the gene behind a specific trait," said David Salt, a horticulture professor at Purdue University. These techniques include the new technology of

DNA microarrays and the use of a large genetic database. From the database, one can look for “candidate genes”, or genes that warrant further study. This information is then cross-referenced with the results from DNA microarrays, small chips that can identify miniscule genetic differences between populations of a single species.

The full article is available at http://news.uns.purdue.edu/hp/SaltSalt.html.

STUDY SEEKS MOLECULAR DIFFERENCES BETWEEN CULTIVATED AND WEEDY RICE

Red rice may conjure up images of an exotic dish, but it's a weed, the biggest nuisance to American rice growers. Complicating matters is the fact that red rice and cultivated rice belong to the same species, so a selective herbicide is difficult to be developed. Another problem with red rice is that some red rice strains look remarkably like cultivated rice and behave like cultivated rice. The plants are as tall as cultivated rice and flower at the same time. These "crop mimics" are difficult to spot.

Kenneth M. Olsen, Washington University assistant professor of biology, and colleagues from the University of Massachusetts and the United States Department of Agriculture National Rice Research Center have been bestowed with a US$1.12 million funding by the US National Science Foundation to perform genetic studies on red rice to find molecular differences from cultivated rice, which someday could provide the basis for a plan to eradicate the weed.

"By looking at candidate genes and those genes surrounding them we can test the hypotheses of the origins of traits and see if the traits have been introduced by hybridization of weedy and wild species, or, conversely, we can look at the molecular level to see if the de-domestication phenomenon is going on", said Olsen.

The readers can access the news article at http://news-info.wustl.edu/tips/page/normal/8054.html.

*** ASIA ***

GOVT OF INDIA ISSUES REGULATIONS ON PROTECTING PLANT VARIETIES AND FARMERS’ RIGHTS

India’s Ministry of Agriculture has issued a new set of regulations aiming to protect plant varieties and farmers' rights. This is part of an effort to expedite the implementation of the Protection of Plant Varieties and Farmers' Rights Act 2001. The new regulations came into force on December 7, 2006, immediately after the notification by the Ministry of Agriculture through an official gazette.

The new regulations stipulated the duties and jurisdiction of the registrar, gave criteria and detailed guidelines for registration of plant varieties and essentially derived varieties, mechanism of seed deposit, and also provided sample authorization and application forms.

For details, visit: http://www.plantauthority.in/PDFile/Indgazette.pdf or contact Bhagirath Choudhary of ISAAA South Asia Center at b.choudhary@isaaa.org.

INDIA'S SUPREME COURT OKS GM FIELD TRIALS

India's Ministry of Environment and Forests said that the country's Supreme Court has not restricted ongoing field trials of genetically modified (GM) crops. It noted that field trials being conducted with the approval of the Review Committee on Genetic Manipulation (RCGM) and the Genetic Engineering Approval Committee (GEAC) are legal. Documentary evidence on the approval issued by the RCGM and the status of compliance in respect of physical and biological containment stipulated in the approval order must be verified before considered as illegal.

For more information visit: http://pib.nic.in/release/release.asp?relid=23705 or http://pib.nic.in/release/release.asp?relid=23452 or contact Bhagirath Choudhary of ISAAA South Asia Center at b.choudhary@isaaa.org.

ADDITIONAL BT COTTON VARIETIES IN INDIA

India's JK Agri Genetics Ltd. has developed 15 more cotton varieties in collaboration with IIT Kharagpur. The New Delhi-based company now joins MAHYCO and Nath Seeds in the genetically modified (GM) cotton arena in India.

For the last two years, JK Agri Genetics has been working on GM seeds in major crops like cotton, rice, and mustard. It released four Bt cotton varieties in different regions after getting approval for commercialization from the Genetic Engineering Approval Committee in May.

For the full news article visit the following link:
http://economictimes.indiatimes.com/articleshow/1011650.cms

ADB GRANTS LOAN TO IMPROVE VIETNAM'S AGRI S & T

The Asian Development Bank has granted a US$30 M grant to Vietnam to enable the country to improve and modernize its science and technology efforts in agriculture. Vietnam's counterpart of US$10 M will up the total allotment to US$40 M to cover a five year period.

Funds are to be used to boost agricultural research and rural-based training. It will also be used to support further training and graduate studies for staff of agricultural research institutes, and upgrade research and laboratory equipment in selected institutes.

Contact Hien Le of Agbiotech Vietnam at hientttm@yahoo.com for more information.

* EUROPE *

GLYPHOSATE HERBICIDES HELP ERADICATE UK'S INVASIVE WEED

Glyphosate herbicides proved very useful in controlling the spread of an invasive weed, the water primrose (*Ludwigia grandiflora*), in the United Kingdom (UK). The species has been touted as a nuisance plant because it grows rapidly, blocks waterways, invades shallow lakes, interrupts boat navigation, and negatively affects aquatic life. The Department for Environment Food and Rural Affairs (DEFRA) reported that the plants can double their biomass in just 40 days.

DEFRA announced that the water primrose is now nearly eradicated in UK regions where it has been a problem. DEFRA initiated a project in 2006 to control the spread of the weed using a glyphosate-based herbicide and a glyphosate and 2,4-D amine mixture-based herbicide.

The water primrose is native to South America and was introduced to the UK for horticultural purposes. However, it has escaped garden cultivation and has been rapidly growing in the wild. The successful control of water primrose have demonstrated that glyphosate herbicides are also effective in eradicating non-native aquatic plants and their use may help reduce control costs in the future.

The complete press release can be accessed at
http://www.defra.gov.uk/news/issues/2007/environ-0102.htm.
Additional information about the weed control project is at
http://www2.defra.gov.uk/research/project_data/More.asp?I=PH0422&M=KWS&V=ludwigia&SCOPE=0

RESEARCH

RESEARCH TO AID DEVELOPMENT OF ANTI-BROWNING SWEET POTATOES

Chinese researchers have cloned and characterized a complementary DNA (cDNA) encoding polyphenol oxidase (PPO), the enzyme responsible for browning in sweet potato (Ipomoea batatas). Z. Liao and colleagues are hoping that their find will eventually result to the development of sweet potato varieties with anti-browning properties.

Sweet potato is an important crop worldwide which is being used as feed and food. Browning however, decreases the commercial value of sweet potato products. The researchers said that antisense technology or RNA interference (RNAi) technology may help prevent it.

The abstract in the journal Molecular Biology, with links for subscribers, can be accessed at
http://dx.doi.org/10.1134/S0026893306060094.

EFFICIENT TISSUE CULTURE PROTOCOL FOR WILD EGGPLANTS

Japanese researchers Yuzuri Iwamoto and Hiroshi Ezura have reported a more efficient protocol for protoplast regeneration using leaves, cotyledons, and hypocotyls of four wild eggplant species. They also presented the first successful regeneration of the wild species Solanum scabrum from protoplasts. The researchers believe that the protocol may help in performing somatic hybridization in eggplants, a technique that will allow the transfer of desirable characters of wild species to the cultivated varieties.

Wild eggplants are highly resistant to soil-borne wilt diseases such as Fusarium wilt and Verticillum wilt. Because of this, they have been identified as possible sources of disease resistance genes that may be used to improve the cultivated eggplant, S. melongena. Wild species are currently often used as rootstocks, where cultivated varieties are grafted to prevent them from getting soil borne diseases during eggplant propagation. Iwamoto and Ezura wrote that their

improved protocol may aid in the development of disease-resistant eggplant varieties and avoid the need for grafting during propagation.

The article is available at http://www.jstage.jst.go.jp/article/plantbiotechnology/23/5/525/_pdf.

GENE FLOW IN THE COMMON BEAN PHASEOLUS

The common bean (*Phaseolus vulgaris*) is predominantly a self-pollinating species. However, varying degrees of outcrossing may occur contributing to gene flow between varieties. To quantify gene flow, Brazilian researchers at the Federal University of Viçosa tested the rates of outcrossing between common bean cultivars using the purple-flowered 'Diamante Negro' and the white-flowered 'Talisma' varieties. These were planted in concentric square plots with 'Diamante Negro' in the center plots. Offsprings of 'Talisma' with purple flowers indicate outcrossing.

The researchers found that the highest outcrossing rate between the common bean varieties is 0.136% at a distance of 0.5 m between the cultivars. The natural outcrossing rate was practically zero beyond a distance of 3.25 m. The researchers wrote that their data may help address biosafety concerns when transgenic varieties become available on the market in the future.

The abstract, with links to the full paper for subscribers, is available at http://www.springerlink.com/content/d20749rw55h3576v/.

ENGINEERING DEHYDRATION-STRESS TOLERANT PLANTS

A review discussing the progress towards engineering plants with dehydration-stress tolerance has been presented by S. Cherian and colleagues in a paper published by the journal Biologia Plantarum. Dehydration-stress tolerant plants are those that can withstand drought and saline conditions.

The researchers discussed the use of several genes that helped successfully in manipulating dehydration-stress tolerance in plants. Among these are those responsible for the production of osmoprotectants and osmolytes - molecules that maintain water in plant cells. Also reviewed are genes coding for water channel proteins and ion transporters in plant cell membranes.

S. Cherian and colleagues conclude that the use of a multigene approach in engineering abiotic resistant plants would be better than the current single gene approach. They also predict that in the future, stress inducible promoters, RNA interference (RNAi) technology, and transposable elements will help produce better transgenics with abiotic stress resistance.

The abstract, with links for subscribers, can be accessed at http://www.springerlink.com/content/f6122205551620k8/.

DOCUMENT REMINDERS

OPEN ACCESS JOURNAL PLOS ONE LAUNCHED

PLoS ONE, is a new international, peer-reviewed, open-access, online publication of the Public Library of Science (PLoS) that reports results of research from any scientific discipline.

Submission to the online publication will be assessed by one member of the PLoS ONE Editorial Board for its technical content. Published papers will then be available for community-based open peer review involving online annotation, discussion, and rating – a method that differs from the usual peer review process.

The publication is available at http://www.plosone.org.

FAO WEBCASTS

The Food and Agriculture Organization of the United Nations (FAO) is providing webcasts (online video broadcasts) about a broad range of topics in agriculture, forestry, fisheries and rural development. The videos can be accessed at http://www.fao.org/webcast.

BIOTECHNOLOGY ONLINE

Biotechnology Online is being provided by Biotechnology Australia (an Australian Government Initiative). The site contains resources for secondary school teachers and students. Up-to-date information about biotechnology is made available to supplement other education resources in school.

The site is accessible at http://www.biotechnologyonline.gov.au/.

ANNOUNCEMENTS

U.S. PLANT BREEDING NATIONAL WORKSHOP

The United States Department of Agriculture (USDA) and North Carolina State University (NCSU) will organize a national workshop to be held on 8-9 February 2007 in Raleigh, North Carolina. The theme of the workshop is “Plant breeding: A vital capacity for U.S. national goals”. The workshop’s goal is to come up with a strategic response to address various challenges in U.S. public and private plant breeding. Among these is the continued decline in the amount of investments in plant breeding in the U.S.

More information at http://www.plantbreedingworkshop.ncsu.edu.

AFRICA WORKSHOP ON BIOTECH CROPS BIOSAFETY

A regional workshop with the theme "Principles of Biosafety Research for the Release of Genetically Engineered Crops" will be held on 4-9 February 2007 in Khartoum, Sudan. The workshop is organized by the Sudan's Ministry of Science and Technology, International Service for National Agricultural Research (ISNAR), and the International Food Policy Research Institute (IFPRI) Ethiopia. For more information please contact Dr. Eisa Ibrahim El Gaali (email: elgaali@hotmail.com or i.eujayl@cgiar.org; phone: +249-183-466373; fax: +249-183-770701).

CONFERENCE ON AGRI-, FOOD-, AND BIO-ENGINEERING & POST HARVEST TECHNOLOGY

An international conference on agricultural, food, and biological engineering and post harvest/production technology will be held at the Sofitel Raja Orchid Hotel, Khon Kaen, Thailand on January 21 to 24, 2007. The conference aims to serve as a venue for researchers, academics, professionals, and entrepreneurs to meet and share experiences and disseminate new knowledge and technology. Among the topics to be discussed include: food and process engineering, biological engineering and renewable energy, and post harvest and production technology. The conference is hosted by the Thai Society of Agricultural Engineering, Khon Kaen University, and co-sponsored by the American Society of Agricultural and Biological Engineers. For conference details, visit the following link: http://www.ae-thailand.com/pre/conference_b2_1.html.

BIOTECHNOLOGY RISK ASSESSMENT RESEARCH GRANTS PROGRAM

The United States Department of Agriculture Biotechnology Risk Assessment Research Grants Program 2007 request for application is now available online. Applications to the Program must seek partial funding for a conference or should address environmental assessment issues related to the introduction of genetically engineered organisms into the environment. Deadline for submissions is February 15, 2007.

For more information, visit http://www.csrees.usda.gov/fo/fundview.cfm?fonum=1075.

FROM THE BICS

BANGLADESH CONDUCTS BIOTECH WORKSHOP FOR EXTENSION EXPERTS

Misinformation about biotechnology was cleared during a workshop for extension experts of the Ministry of Agriculture of Bangladesh. In a two-day workshop organized by the Bangladesh Biotechnology Information Center based at the Bangladesh Agricultural University, participants listened to discussion on biotech myths and facts, did a laboratory exercise to understand DNA and biotechnology, and practices their writing skills.

During the workshop, Prof. Dr. Muyeen Uddin Ahmad, Dean, Faculty of Agriculture, Bangladesh Agricultural University, noted the importance of biotechnology in helping to feed citizens of a densely-populated country like Bangladesh.

Contact Dr. Khondoker Nasiruddin of the Bangladesh Biotechnology Information Center at nasirbiotech@yahoo.com for more information on the workshop.

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

To stop receiving this newsletter, please send an e-mail message to knowledge.center@isaaa.org and write, "unsubscribe newsletter" in the subject box.

Please visit CropBiotech Net web pages (http://www.isaaa.org/kc) to view previous issues of this newsletter and see other available resources for download.

While we are still developing this site, feel free to e-mail (knowledge.center@isaaa.org) us for your views and comments on any crop biotechnology product and related issues.
