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 19, 2007

In This Week's Issue:

NEWS

*** GLOBAL ***

GLOBAL BIOTECH AREA BREAKS 100 MILLION HECTARE MARK

Biotech crop adoption increased to 12 million hectares or 13 percent to reach 102 million hectares in 2006 – breaking the 100 million hectare mark for the first time and achieving the second highest growth in the last five years. Growth for the period 1996 to 2006 registered an unprecedented 60-fold increase, the highest adoption rate of any crop technology. The number of farmers planting biotech crops also increased to 10.3 million farmers, up from 8.5 million farmers in 2005. These were forwarded in a report by Dr. Clive James, chairman and founder of the International Service for the Acquisition of Agri-biotech Applications (ISAAA).

The growth of biotech crop adoption was also substantially higher in the developing world at 21 percent versus the industrialized nations where adoption grew 9 percent. This growth is expected to continue in the second decade of commercialization.

The press release about the report is available in English, Portuguese, Spanish, Italian, German, and French, while the Executive Summary is available in English, French, Portuguese, Spanish, Arabic, Thai, and Bangla. Other language editions (i.e. Chinese, Swahili, Hindi, and Korean) of the press release and Executive Summary will be released on dates to coincide with national media launches. Visit http://www.isaaa.org to download these documents.

BANANAS WITH MORE VITAMINS

Bananas are rich sources of potassium, contain vitamin C and B6, and provide soluble fibers. Researchers in EMBRAPA, the Brazilian Agricultural Research Corporation, are now exploring ways to make bananas also important sources for vitamin A, by developing varieties rich in carotenoids, the precursor molecules of the vitamin. Vitamin A deficiency is prevalent in the developing world, particularly in countries with the highest rates of child mortality. It leads to blindness, and it weakens the immune system.

The project aims to develop transgenic bananas carrying a gene from tomato. In addition, researchers will collect and characterize native banana varieties of Brazil to select those with high carotenoid levels. “Some native bananas have levels of carotenoids approaching those of carrots”, explained EMBRAPA researchers Damares de Castro Monte and Elionor de Almeida. In addition to their benefits in improving nutrition standards, these varieties, currently not grown for commercial purposes, could represent new income opportunities for small-scale farmers, and an opportunity to raise their standards of living.

Bananas are cultivated in 80 tropical countries, which represent the fourth most important food crop worldwide, and the second most important fruit crop in Brazil.

The full news (in Portuguese) is available at
http://www.embrapa.br/noticias/banco_de_noticias/2007/janeiro/foldernoticia.2007-01-15.0775390832/noticia.2007-01-16.5945024370/mostra_noticia

RUST STRAIN SPREAD THREATENS GLOBAL WHEAT HARVEST

Observations by scientists from the International Maize and Wheat Improvement Center (CIMMYT) and its partners, indicated that majority of wheat germplasm are susceptible to the stem rust called Ug99. This rust strain was first identified in Uganda but has been observed in Kenya, Ethiopia, and very recently in Yemen, across the Red Sea.

Scientists have also found out that last year's rust resistant wheat lines are now susceptible to the Ug99 strain. This indicates that at least one of the major stem rust resistance genes that have protected many of the world's wheats is no longer effective. In the long term, the replacement of all the world's wheat cultivars need to be done, said Rick Ward, coordinator of the CIMMYT-ICARDA led Global Rust Initiative. For the meantime, scientists are tracking the spread of stem rust, characterizing the pathogen, and trying to find new sources of resistance to the disease and breed them into new wheats.

For the press releases, visit http://www.cimmyt.org/english/wps/news/2006/dec/wheatRust.htm, and http://www.globalrust.org/images/IR2007_002_GRI.pdf

* AFRICA *

AfDB AND IFAD TO REVIEW AGRIC AND RURAL DEVELOPMENT OPERATIONS

The African Development Bank (AfDB) and the International Fund for Agricultural Development (IFAD) will be reviewing this month the partnership's agricultural and rural development policies and operations in Africa between 1996 and 2005. The two institutions want to identify what existing operations have been effective in fighting rural poverty in Africa, according to IFAD President Lennart Båge. The evaluation will also assess how to improve the contribution of agriculture and rural development to growth and poverty reduction, the sectors' international competitiveness and policy environment, and investment potential in vital sub-sectors, such as water, rural infrastructure and microfinance.

Readers can access the press release at http://www.ifad.org/media/press/2007/1.htm.

WORLD BANK PROVIDES GRANT TO FIGHT FOOD INSECURITY IN ETHIOPIA

The World Bank extended its support to Ethiopia through a US$175 million grant to finance the second phase of an existing operation, the Productive Safety Net Program (PSNP). The program provides direct grants for those physically unable to work, and at the same time, supports a large-scale public works initiative which pays wages to food insecure but able-bodied citizens. By replacing food aid with jobs and cash payments, the program helps stimulate rural economies while also addressing some of the underlying causes of food insecurity. With the help of the PSNP, Ethiopia is now on the road to recovery, posting a comparatively strong growth performance in recent years.

Visit http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:21178555~pagePK:34370~piPK:34424~theSitePK:4607,00.html to read the press release.

*** THE AMERICAS ***

SUGARCANE FOR BIOFUELS RESEARCH KICKS-OFF IN BRAZIL

A US$2.25 million research initiative led by the Brazilian Agricultural Research Corporation (EMBRAPA) has kick-started in Brazil to improve the use of sugarcane for biofuel production. The project is funded by the Technological Innovation and New Management Approaches in Agricultural Research Program (Agrofuturo), with support from the Inter-American Bank of Development (BID) and the government of Brazil, and by the Studies and Projects Financing Entity (FINEP).

Main research lines include the genetic improvement of existing sugarcane varieties for improved resistance to the sugar cane giant borer, the principal pest for the crop in the north of Brazil, and for increased tolerance to drought. On their way are also efforts to identify bacteria capable of fixing atmospheric nitrogen to reduce the need of added chemical fertilizers, and to develop new biofertilizers containing bacterial extracts. Socio-economic and environmental studies on the potential impact of expanding sugarcane production are also included in the portfolio of projects.

Read the full news (in Portuguese) at
http://www.embrapa.br/noticias/banco_de_noticias/2007/janeiro/foldernoticia.2007-01-08.6783822109/noticia.2007-01-12.0346870086/mostra_noticia

CHILE: FIA/PIPRA AGREEMENT PROVIDES ACCESS TO 6600 NEW AGRIC PATENTS

An agreement between the Foundation for Agrarian Innovation (FIA) and the Public Intellectual Property Resource for Agriculture (PIPRA), a non-for profit organization in the United States, will allow Chilean agricultural researchers to access over 6000 new patents in innovation and novel technologies. The patents are held in a database with contributions from 39 universities and non-for profit institutions in over 10 countries.

“Traditional agriculture requires novel technological instruments to solve problems like the poverty of soils, and plant diseases and pests that reduce productivity, and this agreement will allow us to avail on more technological options to face these problems”, said Rodrigo Vega, Executive Director of FIA.

Read the news at: http://www.fia.cl/contenido.asp?id_contenido=1164&id_tipo=1

SMALL-SCALE FARMERS IN NORTH OF BRAZIL TO RECEIVE IMPROVED SEEDS

The Brazilian Agricultural Research Corporation (EMBRAPA) has started this week distributing to small-scale farmers in the North-east of the country maize and bean seeds with improved resistance to climatic stresses and with increased croppings per season. More than 44000 farmers from 83 cities will benefit from the project, aimed at raising the productivity of small farms, and thereby the income of rural families.

“These are varieties that have a production potential above the average, compared to conventional seeds. Therefore they can meet the household requirements, and also generate a surplus for sale,

generating extra income for the family", said João Marcelo Intini, from the Secretariat of Familiar Agriculture of the Agrarian Ministry of Public Works and the Economy Brazil.

Read more at: http://www.agenciabrasil.gov.br/noticias/2007/01/15/materia.2007-01-15.0514608332/view

USDA SEEKS PUBLIC COMMENT ON DEREGULATION OF GE CORN

The United States Animal and Plant Health Inspection Service (APHIS) is seeking public comments on a petition to deregulate MIR604 corn, which is engineered with resistance to corn rootworm insects. The petition for deregulation was submitted by Syngenta Seeds, Inc. Should it be shown that the GE organism is equivalent to its traditionally bred counterpart, APHIS could grant the petition for deregulation, thus eliminating the prerequisite for regulatory oversight by APHIS. The GE corn is also subject of regulation by the Environmental Protection Agency (EPA) and the U.S. Department of Health and Human Services' Food and Drug Administration (FDA).

Read the full article at http://www.aphis.usda.gov/newsroom/content/2007/01/gecrndreg.shtml. For more information on how to submit comments, visit http://www.regulations.gov.

PINTO BEAN RESISTS VIRAL DISEASES

A new pinto bean named "Quincy" that can resist the attack of the bean common mosaic virus (BCMV) and the bean common mosaic necrosis virus (BCMNV) has been developed by researchers at the United States Agricultural Research Service (ARS) and Washington State University-Prosser. The cultivar harbors two genes, I and bc-22, which confer resistance to the two viruses. However, this pinto bean also has its weak spot – it is susceptible to *Uromyces appendiculatus*, the fungus that causes bean rust disease.

Read the news article at http://www.ars.usda.gov/is/pr/2007/070111.htm.

*** ASIA ***

RP BIOTECH PROJECTS RECEIVE GO-SIGNAL

The Philippines Department of Agriculture (DA) has approved P45 million-worth of applied biotechnology research projects this year for the improvement of rice, coconut, papaya, and abaca. The DA-approved biotechnology projects for 2007 include the development of papaya hybrid varieties with delayed ripening traits, which will be implemented by the University of the Philippines, Los Baños (UPLB) Foundation, and the UPLB Institute of Plant Breeding; improvement of rice hybrid lines to be carried out by the Philippine Rice Research Institute to increase rice production; control and management of the brontispa disease in coconut initiated by the Philippine Coconut Authority (PCA); cloning and mass propagation of high-yield coconuts by the PCA-Albay Research Center; and the development of genetically modified varieties of abaca (Manila hemp) by the Fiber Development Authority (FIDA).

To read more, visit http://www.da.gov.ph.

PHILIPPINES APPROVES 12th STACKED TRAIT PRODUCT

The Philippine Department of Agriculture Bureau of Plant Industry recently approved Pioneer Hi-Bred's Corn DAS 59122 x Corn NK 603 for direct use as food and/or feed. This would make it the 12th approved stacked trait product eligible for release. Other combined trait products that were already approved include Corn MON810 x Corn NK603 and Cotton 531 x Cotton 1445 by Monsanto, and Corn TC 1507 X Corn NK603 by Pioneer Hi-Bred.

Access the summary of approved combined trait products in the Philippines at http://www.fas.usda.gov/gainfiles/200701/146279920.doc.

PAKISTAN SUBMITS BIOSAFETY APPLICATIONS

Pakistan public sector R&D centers have started submitting applications to the National Biosafety Committee (NBC). The NBC is a directorate established in the Ministry of Environment for commercialization and field trial approvals of biotech crops. It is currently considering two applications under the Biosafety Rules 2005.

The National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad, has applied for the commercialization of their Bt Cotton variety “IR-FH-901”. In 1997 NIBGE conducted field trials to check and analyze many safety tests on various Bt cotton varieties, with desirable results against the Bollworms known as “Sundies”.

The Center of Excellence in Molecular Biology (CEMB), at the University of the Punjab Lahore, has also submitted an application to NBC for permission to conduct field trials of the Bt cotton varieties “MNH-93” and “CIM 482”, in collaboration with a national and a multinational company.

Read the article written by Ijaz Ahmad Rao at
http://www.pakissan.com/english/advisory/biotechnology/adoption.of.bt.cotton.in.pakistan.shtml

*** EUROPE ***

EU TO LIFT MEASURES AGAINST Bt10 IN US EXPORTS

The European Union Member States agreed to lift the EU requirement for all imports of US corn gluten feed and brewers' grain, and certify the imports as free from the genetically modified organism Bt10. The Bt10 corn was only detected once in May 2005 in a US shipment to the EU and on this occasion it was stopped at the border. The last case of Bt10 detected in the United States was in early November 2005 and Syngenta, the company responsible for developing Bt10, has taken a series of measures to ensure that this GMO is no longer propagated.

Read the press release at
http://europa.eu/rapid/pressReleasesAction.do?reference=MEX/07/0117&format=HTML&aged=0&language=EN&guiLanguage=en.

BIOTECH CORN AREA INCREASING IN SPAIN

A recent report by USDA-FAS Global Agriculture Information Network (GAIN) indicated that the proportion of the total area planted in Spain with biotech corn is increasing. This trend is especially evident in Catalonia and Aragon areas where the corn borer pest is prominent.

The GAIN report stated that corn production in Spain has shrunk in the past year due to persistent drought. However, the proportion of biotech corn over the total corn area has been increasing. In 2006, there is an estimated 53,700 hectares of biotech corn that was planted. This is about 14.8% of the total corn area, a proportion that is higher than last year's 12.8%. All of the biotech corn planted and harvested in Spain is used in the production of feeds.

The complete report can be found at http://www.fas.usda.gov/gainfiles/200701/146279912.pdf.

ANTIBODY VARIANTS PRODUCED FROM PLANT SEEDS

Researchers at the Ghent University in Belgium have demonstrated the possibility of producing human antibody-like proteins from plant seeds. Geert De Jaeger and his colleagues succeeded in producing the novel proteins from seeds of Arabidopsis. The proteins were found to be as effective as human antibodies in protecting animal cells against Hepatitis A virus infection.

The research of De Jaeger's group may have important implications in reducing the production costs of medicines in the future by 10-100 times. Most medicines today are produced using bacteria or animal cells, requiring extra equipments which may not be required if working with plants.

The complete press release is at
http://www.vib.be/NR/rdonlyres/17268A44-2198-459B-A50F-AA4B6E869151/2180/20070100_ENG_VanDroogenbroeck_antilichameninArabid.pdf.

RESEARCH

HERBICIDE TOLERANT MAIZE AND BIODIVERSITY

The effects of continuous planting of herbicide tolerant maize on diversity of plant and invertebrates were examined by a group of researchers in the United Kingdom. M.S. Heard and his colleagues studied eight maize fields that were previously used for Field Scale Evaluations (FSE). They looked for differences in arable biodiversity when the fields were continuously planted with herbicide tolerant maize instead of being rotated with conventional maize or other cereal crops.

The research group gathered data for two cropping seasons. Some of the biodiversity indicators recorded include weed species abundance, seed rain data, within-field invertebrate species abundance, and vegetation cover. The indicators were obtained before the crops were sown, during the season, and after harvest.

In the first year of cropping, Heard and colleagues observed that weed biomass and seed rain were greater in biotech maize but there was no clear pattern in the second year. This observation about the variation in the effects on individual plant species is consistent with earlier studies. They concluded that research on the field used in FSEs provides little evidence for cumulative effects on biodiversity resulting from continuous planting of herbicide maize.

The full paper in the journal Annals of Applied Biology can be accessed by subscribers at http://dx.doi.org/10.1111/j.1744-7348.2006.00091.x

ETHANOL CO-PRODUCTS AS FODDER FOR LIVESTOCK

Dried distillers grain (DDG) is a byproduct of the distillation process, and in recent years ethanol plants have become sources of distillers grain. Researchers at the Iowa State University are studying the use of distillers grain from corn as feeds for livestock. Areas of research include feeding distillers grain on the meat quality; using ethanol co-products in forage-based beef systems; and feeding distiller grain to beef cows, fall-calving cows, pigs and poultry.

Research work on the use of ethanol co-products in forage-based beef systems and in integrated pasture and drylot system for feedlot steers showed that DDG-fed cattle was comparable to the control group in terms of carcass weight. On the other hand, distiller grain supplement was found to benefit grazing cows, fall-calving cows or calves, and yearling steers. In another project, researchers observed that increasing the content of dietary fiber in the feed of laying hens can lower manure ammonia emissions by 40 percent per hen without adversely affecting egg production.

For more information on the research projects, read the full article at http://www.ag.iastate.edu/aginfo/news_detail.php?var1=292

BIOSENSOR CHIPS FOR EASY DETECTION OF PLANT MOLECULAR MARKERS

An efficient and inexpensive assay that uses custom-designed biosensor chips to detect unique transgenes in biotech crops was reported by a group of Chinese researchers. The chips can also be used for detecting molecular markers in genomes of model plants such as *Arabidopsis*.

The biosensor chips work by hybridizing labelled PCR fragments with capture probes covalently attached to their surface. A color change from gold to blue or purple on the chip surface indicates the presence of the specific target sequences. The color can be visualized by the unaided human eye, wrote the group of Su-Lan Bai in their paper published by the Plant Journal. The simple detection method makes this technology less expensive than current microarray methods because costly image documentation systems are not required.

The researchers have shown that various transgenes in biotech canola, corn, soybeans, and cotton can be successfully detected by the chips. The conclude that their discovery can help in nucleotide sequence-based identification assays and have wide applications in crop breeding, trait mapping, and other work requiring positive detection of specific sequences.

For the abstract, with links to the full paper, please visit http://dx.doi.org/10.1111/j.1365-313X.2006.02951.x

---
FROM THE BICs

BIOTECHNOLOGY SEMINAR IN INDONESIA FOR STUDENTS

"An effort to build positive perception on biotechnology" was the theme of National Seminar on "Biotechnology for Better Future" which was conducted on 6 January 2007 at SEAMEO BIOTROP, Bogor, Indonesia. The event was organized by the Indonesian Biotechnology Student Forum (IBSF) and supported by the Indonesian Biotechnology Information Centre (IndoBIC) and Monsanto. Participants included students from Indonesian Universities, such as University of Indonesia (UI), Bandung Institute of Technology (ITB), Bogor Agriculture University (IPB), National University (UNAS) and members of institutions related to biotechnology. The National Seminar focused on biotechnology development and its applications and impacts in Indonesia.

Contact Dr. Bambang Purwantara at b.purwantara@biotrop.org or Dewi Suryani at dewisuryani@biotrop.org for more information on the seminar.

ANNOUNCEMENTS

ISAAA/KC WEBSITE HAS A NEW LOOK!

Our website is undergoing dramatic renovations. We are developing the site to make it easier to retrieve information. Some sections may still be incomplete.

Visit the site at: http://www.isaaa.org/ and http://www.isaaa.org/kc/

WORLD BIOTECHNOLOGY CONGRESS IN DISNEY

The Fourth Annual World Congress on Industrial Biotechnology & Bioprocessing will be held at the Walt Disney World Swan and Dolphin Resort in Orlando, Florida from March 21 to 24 2007. This year's theme is "linking biotechnology, chemistry, and agriculture to create new value chains". This event is organized by the Biotechnology Industry Organization (BIO), American Chemical Society (ACS) and the National Agriculture Biotechnology Council (NABC).

For further information visit http://www.bio.org/worldcongress/

4TH BIOASIA IN INDIA IS ABOUT BIO-BUSINESS

BioAsia 2007 - The Global Bio Business Forum, facilitating innovative partnerships to explore the latest in biotechnology and bioscience, is the 4th edition of BioAsia events. It will be held at the Hyderabad International Convention Center, Hyderabad, India from February 15 to 17, 2007. This event is organized by the Federation of Asian Biotech Associations, the Government of Andhra Pradesh, the University of Hyderabad and supported by the European Federation of Biotechnology and Technology Vision Group LLC.

Visit the official website at http://www.bioasia2007.org/index.htm

USE OF MOLECULAR TOOLS IN STUDYING HOST-PATHOGEN INTERACTIONS

The Atomic Energy Commission of Syria (AECS) has organized a theoretical and practical course that focuses on "The Use of Molecular Tools in Studying Host-Pathogen Interactions". The course is to be held on 2-12 April 2007 in Damascus, Syria. For more information and for applications contact Azza Kashlan, Director, Relations and Training Department, Atomic Energy Commission of Syria, P.O. Box 6091, Damascus, Syria (phone: 963 (11) 213-2580; fax: 963 (11) 611-2289; e-mail: atomic@aec.org.sy).

DOCUMENT REMINDERS

FIRST ISSUE OF *"BIOTECH ECHO"* NOW OUT: BBA, ISAAA'S NEWSLETTER

The Burkina Biotech Association (BBA) is a non-for-profit organization created by Burkina Faso scientists, with the objective to provide a forum for specialists in the field to voice their opinions and concerns. The creation of BBA, according to BBA's Director Professor Alasane Séré, is the expression of the refusal by African scientists to be outdistanced by the great scientific revolution of the 21st century, which he qualifies as "the most fantastic scientific and technological adventure of this century".

Biotech Echo, a joint BBA and ISAAA project, will be published on a monthly basis in French.

Access the January issue of Biotech Echo in:
http://www.isaaa.org/kc/cbtnews/pubs/newsletters/biotechecho/Biotech%20Echo-2007-01.pdf

ONLINE RESOURCE: PIPRA AGRICULTURAL IP DATABASE

The beta version of the Public Intellectual Property Resource for Agriculture (PIPRA) agricultural intellectual property (IP) database is now available online. The public can access a large volume of patents and patent applications from 39 different countries, as well as monitor and advertise the status information of PIPRA member institutions' agricultural biotechnology intellectual properties. The database can be accessed at http://pipra.m-cam.com.

AFRICAN PLANT INFO DATABASE

Information on hundreds of useful plants of tropical Africa can be obtained through PROTAbase, an online database by the international not-for profit foundation Plant Resources of Tropical Africa (PROTA). The database contains information on approximately 7,000 useful plants of tropical Africa. The resource aims to help provide information to decision-makers in government, private sector, research, education and rural development, and end-users in the region.

The database is accessible at http://database.prota.org/search.htm.

USDA FLAVONOID DATABASE

The updated database of the US Department of Agriculture now provides analytical values on 26 flavonoids in more than 300 foods. Flavonoids are plant metabolites that are known to have antioxidant activities. The resource can be valuable to researchers evaluating associations between dietary flavonoid intake and risk factors for various chronic diseases. To date, many studies have provided evidence suggesting an association between consumption of diets high in flavonoids and reduced risk of cancer and heart disease.

Read the complete press release at http://www.ars.usda.gov/is/pr/2007/070110.htm. The updated database can be accessed at http://www.ars.usda.gov/nutrientdata/flavonoid.

EMBRAPA'S KIT OF SUSTAINABLE USE OF BRAZILIAN BIOMASS

EMBRAPA has published a set of six brochures on the main types of biomass of Brazil, entitled *"A Embrapa nos Biomas Brasileiros".* The publication presents a synthesis of the integrated activities of EMBRAPA for the sustainable use of natural resources taking into account the peculiarities of each region, and it aims to raise interest among stakeholders in the technical tools available for this purpose.

The kit can be obtained from: http://www.embrapa.br/
