CROPBIOTECH UPDATE

A weekly summary of world developments in agri-biotech for developing countries, produced by the Global Knowledge Center on Crop Biotechnology, International Service for the Acquisition of Agri-biotech Applications SEAsiaCenter (ISAAA)

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In This Week's Issue:

NEWS

PAPER HIGHLIGHTS ROLES OF WHEAT RESEARCH

Scientists from the International Maize and Wheat Improvement Center (CIMMYT) recently published article on the role of wheat research, and how it could translate into enormous gains for developing country farmers. The article, published in the Centenary Review of the Journal of Agricultural Science, is written by CIMMYT wheat physiologist Matthew Reynolds and Nobel Peace Prize Laureate Norman Borlaug; and is part of a series of papers to celebrate 100 years of the journal.

The review traces the history of international wheat breeding, as well as the benefits that publicly-funded collaborative research has had on improving yield potential and stress tolerance of wheat. This has translated to lower food costs for the poor, and has allowed food supplies to meet current rising demands, as well as to keep hectares of natural ecosystems from being converted to farmland. The article also acknowledges the efforts of institutes like the International Center for Agricultural Research in the Dry Areas (ICARDA), which, along with CIMMYT, has played key roles in collecting, conversing, and studying wheat landraces and other possible genetic resources.

Read the press release at: http://www.cimmyt.org/english/wps/news/2006/may/bigBangWheat.htm. View the special issue of the journal at: http://journals.cambridge.org/action/displayIssue?jid=AGS&volumeId=144&issueId=01.

LIBERALIZED TRADE, RESEARCH SHAPE WORLD AGRI, REPORT FINDS

Increased trade liberalization, agricultural research and development, and new and rising demands in developing countries are among the main “Forces Reshaping World Agriculture.” This new esearch paper, by Jeremy Mattson and Won Koo of North Dakota State University, is published as Agribusiness and Applied Economics Report No. 582, and examines these forces in detail.

Key conclusions include the following: 1) to improve competitiveness, countries must increase agricultural productivity, which they can do through research and development; 2) Rising incomes from developing countries, most notably China and India, could result in increased food demand, as well as shifts in demand; 3) per capita consumption of vegetable oils and meat has increased in developing countries, with the latter possibly exerting a significant influence on the demand

for animal feeds such as corn and soybean meal; and 4) because most countries cannot expand their agricultural production land area, they can increase production only by improving their crop yields. The report also takes note of the rising demand for corn for use as a source of biofuels.

Read the complete report at http://www.ag.ndsu.nodak.edu/capts/documents/AGReport582P.pdf.

Africa

KENYAN FARMERS, MPS DEMAND RELEASE OF BT COTTON

Representatives of Kenya's eight million cotton farmers have called on the Kenyan government to speed up the release of Bt cotton, which is currently under contained field trials by the Kenya Agricultural Research Institute (KARI). The farmers said they were frustrated by the slow pace of adoption of biotechnology policy and enactment of biosafety laws. These two documents are currently tabled in government and await approval.

Speaking during a stakeholders' fact-finding mission to the KARI Mwea Bt Cotton trials site, Major (Rtd) Ochwada, Coordinator of the National Cotton Stakeholders Forum (NCSF), urged the government to address factors that are hindering the revival of the cotton sector in the country. The sentiments were echoed by two Members of Parliament (MP) from cotton growing areas in Kenya, Hon. Sammy Weya and Hon. Alfred Nderitu, who also told the participants about their recent tour of South African Bt Cotton farms. The MPs promised the farmers that they were "ready to do anything in our powers to ensure that the biosafety bill is brought to parliament and passed as soon as possible". They said revival of the cotton sector through new technologies would benefit not only the farmers but the whole country.

The fact-finding mission was attended by over 50 farmers, MPs, extension workers, journalists, provincial administration and scientists. For more information, contact Daniel Otunge at dotunge@absfafrica.org.

The Americas

BRAZIL TO SUPPORT TECHNOLOGY INNOVATION

The Brazilian National Bank for Economical and Social Development (BNDES) has announced the creation of the Technology Fund, Funtec, aimed to support projects of technological innovation. The areas to be funded are renewable

energy from biomass; software and semiconductors; biotechnological solutions addressing constraints to the Brazilian agricultural sector; and the production of biotech pharmaceuticals. Funtec has an initial capital of R$ 153 million (equivalent to US$ 68.8 million) and a portfolio of long-term projects of R$ 286 million (US$ 128.8 million). Funtec is intended for research institutions, and will promote the establishment of links with the private sector. Private institutions will not be able to receive support directly.

Antonio Barros de Castro, managing director of BNDES, said the aim of the funds is to search for solutions to great technological problems to remove barriers to the socio-economic development of Brazil. The fund intends to support the pre-commercial stage, where technological solutions have been already identified, but have not been yet transferred to the market.

Read more at: http://www.radiobras.gov.br/

BIOLOGICAL HELP FOR WHEAT PRODUCERS

The Institute of Agricultural Microbiology and Zoology of Argentina, in partnership with the company Nitragin, has released a new biological help for wheat production. The liquid product, derived from the growth-promoting bacterium *Azospirillum brasiliense*, has been available in the market since 2005. The large scale use of this product has confirmed the results obtained during field trials. 11% increase of productivity, equivalent to additional 330 kg/ha, was observed during the last growing season in 249 fields, with a cost/benefit rate of 1 to 6.6.

The product is therefore recommended to complement high production agricultural practices, including the use of high yield wheat varieties.

For more information visit: http://www.inta.gov.ar/info/intainfo/bolactual.htm#art2

PEW RESEARCH SHOWS LEGISLATURES ADDRESS AGRI-BIOTECH

According to a new fact sheet and web database released by the Pew Initiative on Food and Biotechnology (PIFB), state legislatures in the US have significantly addressed issues in agricultural biotechnology in 2005, as they “increasingly attempted to preempt, or disallow, local and county initiatives that were mostly aimed at limiting or prohibiting genetically modified (GM) seeds and crops. “State Legislative Activity Related to Agricultural Biotechnology Continued in 2005” chronicles and catalogues state and federal legislative activity relating to agricultural biotechnology during 2005 and the first half of the 2005-2006 state legislative session

During the 2005 legislative session, 117 pieces of legislation related to agricultural biotechnology were introduced in 33 states and the District of Columbia. Most of these bills were from Hawaii, New York, and Massachusetts. The PIFB found that about 17% of the bills focused on co-existence of different food production systems. Moreover, many state legislators are continuing to introduce legislation in favor of agricultural biotechnology, as bills in support of it comprised close to two-thirds of adopted bills.

The fact sheet can be viewed at http://pewagbiotech.org/resources/factsheets/legislation/factsheet.php, while the database is available at http://pewagbiotech.org/resources/factsheets/legislation. For more information, email Kara Flynn of the Pew Initiative at kflynn@pewagbiotech.org.

US WHEAT GROWERS PROPOSE CHANGES FOR BETTER INDUSTRY

A coalition of U.S. wheat industry organizations recently released a document that outlines the problems facing the country's wheat industry, as well as methods to improve it. According to "Addressing the Competitiveness Crisis in Wheat," problems include flat export growth and domestic consumption; loss of acres to other crops; wheat diseases that impact farmers' profitability; and the lag in genetic improvements to wheat varieties.

To make wheat growing more attractive, the report proposed the continuation of domestic farm policies guided by the principle of commodity neutrality; the adoption of biotechnology traits; the increase in wheat research in both the public and private sectors; a focus on conservation programs as suitable only for environmentally sensitive lands; and a focus on both domestic and export demand expansion.

The paper was jointly authored by the National Association of Wheat Growers, the North American Millers' Association, U.S. Wheat Associates, and the Wheat Export Trade Education Committee. It will be followed up by a meeting of wheat industry representatives later this year.

The wheat competitiveness paper can be accessed at http://www.wheatworld.org/pdf/Wheat%20Competitiveness%20Paper.pdf. Read more at http://pewagbiotech.org/newsroom/summaries/display.php3?NewsID=1012 and http://www.wheatworld.org/html/news.cfm?ID=1007.

Asia

COMMERCIALIZATION OF BIOTECH CROPS DISCUSSED IN MANILA

Developing country representatives from Latin America and Asia converged in Manila, Philippines to learn from the experiences of India and the Philippines on the commercialization of biotechnology crops. India and the Philippines are two of these Asian countries (the other being China) where farmers are already planting transgenic crops, specifically Bt cotton and Bt corn, respectively.

In the training workshop on "Commercialization of Biotech Crops in Asia: From Ideas to Useful Products," experts from the private sector including technology developers, public research and development institutes, and academic institutions shared their pioneering forays into the regulatory and support processes that led to the eventual commercialization of biotech crops. The Bt corn experience in the Philippines, for example, took about 10 years from the time the product was moved from the laboratory to farmers' fields. However, with recent scientific developments, and experiences learned during the process, technology developers are optimistic that the process that would allow the commercialization of biotech crops would be shortened.

Participants were oriented on the various stages of commercializing crops, such as the discovery or identification of concepts, research, product development, regulatory approval, freedom to operate and licensing, to product stewardship. Training participants from Chile, Peru, and Mexico in Latin America; and China, Indonesia, Malaysia, the Philippines, South Korea, Thailand, and Vietnam in Asia also visited the Institute of Plant Breeding, University of the Philippines, Los Banos to be oriented on public sector research initiatives, particularly the development of papaya ringspot virus-resistant papayas.

The training workshop was co-sponsored by Asia Biobusiness, National Institute of Education of Nanyang Technological University in Singapore, and the International Service for the Acquisition of Agri-Biotech Applications. For more information on the workshop, email Andrew Powell, Chief Executive Officer, Asia Biobusiness Pte Ltd, at andrew.powell@asiabiobusiness.com.

GEAC RESPONDS TO CLAIMS LINKING BT COTTON TO SHEEP MORTALITY

In a recent meeting, India's Genetic Engineering Approval Committee (GEAC) deliberated on the report received from the Center for Sustainable Agriculture (CSA) regarding mortality in sheep flocks after grazing on Bt Cotton fields at Warangal, Andhra Pradesh. According to the CSA report, three random villages surveyed said "animals that fed continuously on Bt cotton for up to a week became listless with erosive lesions in the mouth, nasal discharge, and blackish diarrhea."

However, after reviewing the case and the available data, the GEAC reported that the findings appear to be highly exaggerated, and based more on hearsay than on scientific facts. Nevertheless, it has been recommended that the Department of Biotechnology may sponsor a study to assess the problem at Warangal District with the help of the local Veterinary Hospital.

The Bt cotton released for commercial cultivation has been approved after evaluation of biosafety data, which includes feeding studies. The 90-day animal feed studies conducted at the Industrial Toxicology Research Center, Lucknow; feeding studies conducted at G B Pant University of Agriculture, Pantnagar on lactating cows; and on fish at Avian Research Institute, Izatnagar indicate no toxic effects. Feeding studies on mice show that an intake of 4300 mg Cry1Ac/kg body weight had no ill effects on the mice. Studies on goats also show that in order to have an intake of 4300 mg of Cry1Ac/Kg of body weight, a 15 kg goat should eat 24,339 kg of leaf/50,300 kg of boll rind, which is not feasible.

Read the GEAC 68th Meeting Decision at http://www.envfor.nic.in/divisions/csurv/geac/geac-68.pdf. For more information, contact Bhagirath Choudhary of the ISAAA South Asia Office at b.choudhary@isaaa.org.

MALAYSIA GEARS FOR BETTER BIOTECH

Malaysia aspires to become a regional biotechnology hub, especially in agriculture-based biotechnology via the National Biotechnology Policy, which will

be implemented over three phases up to 2020. Various projects are already in the offing. For instance, Bank Pembangunan Malaysia is aiming to disburse about RM10 billion (USD2.9 billion) in loans next year for infrastructure projects under the Ninth Malaysia Plan (9MP). Its President and Managing Director, Datuk Abdul Rahim Mohd Zin, said that more attention will be given to new growth areas in the high-technology sector, particularly biotechnology and alternative energy sources.

Kumpulan Guthrie Bhd, one of Malaysia's plantation giants, is also studying the possibility of setting up a biodiesel plant either in Malaysia or Indonesia. The Malaysian Government is taking steps to promote the R&D as well as the utilization of alternative fuels in Malaysia, including a RM1.9bil (USD 0.5bil) investment for biodiesel projects this year.

For more information, email Mahaletchumy Arujanan of the Malaysia Biotechnology Information Center (MABIC) at maha@bic.org.my.

Europe

NEW EUROPE AGRI-BIOTECH PROJECTS ANNOUNCED

Two new agricultural biotechnology projects were recently launched in Europe. AGRON-OMICS is a plant research consortium led by scientists at the Flanders Interuniversity Institute for Biotechnology (VIB) and Ghent University. Through the cooperation of a network of major European players in plant biology, scientists will perform experiments to identify and understand the biological processes involved in leaf growth. The European Commission is devoting €12 million to fund the project.

The German Federal Ministry of Education and Research (BMBF) is also engaged in research on plants as key raw material suppliers through the GABI FUTURE (genome analysis of the plant biological system). The project aims to optimize plants through both breeding and genetic engineering methods, and is funded with €50 million for the next three years.

For more information on the projects, visit http://www.agron-omics.eu and http://www.bio-pro.de/en/life/meldungen/02288/index.html.

RESEARCH

RESEARCH TACKLES WILD RICE DOMESTICATION

The domestication of wild species of crops has allowed us access to more food resources, but has also led to lower genetic diversity of currently cultivated crops. Scientists are now turning to the wild counterparts of today's crops, which will allow them to identify important genetic resources that may help in carrying out future crop improvement. One example is rice, which represents the world's most important staple food crop, and feeds over half of the world's human population. Little is known about *Oryza sativa*'s domestication history from its wild ancestors, *Oryza rufipogon and Oryza nivara*, and tracing rice's evolutionary history might aid scientists in understanding and making better rice.

Jason P. Londo and colleagues of Washington University, Missouri; Pingtung University of Science and Technology, Taiwan; and Cheng Kung University, Taiwan document that "Phylogeography of Asian wild rice, *Oryza rufipogon*, reveals multiple independent domestications of cultivated rice, *Oryza sativa*." Their work appears in the latest issue of the Proceedings of the National Academy of Sciences.
Scientists examined DNA sequence variation in three gene regions of wild rice and cultivated rice, and used their data to map the evolution of today's rice varieties, as well as to determine the number of potential domestication events and regions within south and southeast Asia. They found that: 1) *O. rufipogon* originated from India and Indochina; 2) Cultivated rice was domesticated at least twice from different *O. rufipogon* populations, producing today's popular *O. sativa* indica and *O. sativa* japonica; 3) Indica rice was domesticated within a region south of the Himalaya mountain range, while Japonica was domesticated from wild rice in southern China; and 4) an additional domestication event may have occurred for Aus rice in India.

Read the complete article at http://www.pnas.org/cgi/content/full/103/25/9578.

PLANT CALCIUM OXALATE CRYSTALS KEEP INSECTS OUT

Calcium oxalate is an abundant plant material produced in the form of sharp, microscopic crystals, and has been reported in over 200 plant families, including the species Medicago truncatula. These crystals are known irritants for humans, but can they also serve to keep insects at bay?

Kenneth L. Korth and colleagues of the University of Arkansas and Baylor College of Medicine investigate this issue, and report that "Medicago truncatula

mutants demonstrate the role of plant calcium oxalate crystals as an effective defense against chewing insects." Their work appears in the latest issue of Plant Physiology.

The team compared beet armyworm larval feeding preference between wild type and M. truncatula mutants, the latter of which produced lower levels of calcium oxalate crystals. They found that the larva showed a clear preference for tissues from oxalate-defective lines. They also found that: 1) larvae feeding on wild-type plants suffered from significantly reduced growth and increased mortality; 2) larvae feeding on mutant lines began to pupate earlier than larvae reared on wild-type plants; 3) calcium oxalate crystals act as abrasives during feeding; 4) the crystals interfere with the conversion of plant material into insect biomass during digestion, making the crystals both anti-nutrients and feeding deterrents; and 5) the crystals had no negative effects on the pea aphid, a sap-feeding insect.

Scientists suggest that modifying the levels of calcium oxalate in other crop plants could potentially serve as an environmentally friendly means to improve plant defenses. They also suggest that the plant genes responsible for crystal size, shape, and localization be identified, as this could be valuable in developing plants with enhanced levels of resistance to chewing insects.

Subscribers to Plant Physiology can read the complete article at http://www.plantphysiol.org/cgi/content/full/141/1/188.

ANNOUNCEMENTS

FOSSNA TO SUPPORT AFRICAN POST GRADS

The Food Science and Nutrition Network for Africa (FOSNNA) has secured funding to support at least 10 African post graduate students to conduct short term, food science and nutrition-related research in laboratories with the necessary facilities. The signed application form and other relevant attachments should reach the regional FOSNNA Office before August 5th, 2006. Download the application form at http://www.fosnna.org.

BMBF ANNOUNCES FUNDING FOR PROJECTS

The German Federal Ministry of Education and Research (BMBF) has announced the funding guidelines for projects within the initiative "GABI

FUTURE: plants as the basis for life - from genomic analysis to product innovation" that comes within the scope of the framework program "Biotechnology – seize the opportunity and turn it into profit".

The GABI FUTURE (genome analysis of the plant biological system) research and funding initiative aims to optimize plants through both breeding and genetic engineering methods.

Interested parties are invited to submit project proposals in both written and electronic form to the Project Management Organisation Jülich (PtJ). Application deadline is October 13, 2006. For more information, visit http://www.bio-pro.de/en/life/meldungen/02288/index.html.

MELBOURNE, AUSTRALIA TO HOST ABIC

The Melbourne Convention Center, Victoria, Australia will be the site of this year's Agricultural Biotechnology International Conference (ABIC), to be held from August 6-9, 2006. Hosted and sponsored by the Victorian State Government and AusBiotech, ABIC will have the theme "Unlocking the Potential of Agricultural Biotechnology," and will address the two most important challenges in agricultural biotechnology: the public perception of what 'biotechnology' means; and the lack of effective commercialization of innovative technologies. For more information, visit the event calendar of MABIC website at http://www.bic.org.my.

CONFERENCE, EXHIBIT ON CROP SCIENCE SLATED FOR JULY

The International Crop-Science Conference & Exhibition will be held on the 27th-28th of July 2006 in Bangkok, Thailand. With the theme "Prospects of Agrochemical and Biotech Industry Post WTO Era," the conference will address future trends and development of the agrochemical and biotechnology industries; the role of generic agrochemicals in the post WTO era; the role of GM crops in agriculture; the promotion of multi-lateral trade; zonal harmonization of registration requirements of agrochemicals; and the scope of specialty chemicals and its synergy in agrochemicals industry. For more information, visit http://www.pmfai.org.

DOCUMENT REMINDERS

CIAT RELEASES NEW DOCUMENTS

The International Center for Tropical Agriculture (CIAT) has released new documents in its Guide Series. Included are “Strategy Paper: A Participatory and Area-based Approach to Rural Agroenterprise Development,” part of the Good Practice series; and “A Market Facilitator's Guide to Participatory Agroenterprise Development,” part of the Enabling Rural Innovation in Africa Series. To download the documents, visit http://www.ciat.cgiar.org/agroempresas/ingles/index.htm.

CIAT has also released the latest issue of Tropical Pastures, which documents recent advances in research on new forage options for Colombia's Eastern Plains area and other tropical regions. Read more at http://www.ciat.cgiar.org/forrajes/last_issue_pastures.htm#last.

FROM THE BICS

SEMINAR FOCUSES ON BIOTECH IN BANGLADESH

Bangladesh’s scientific community, as well as its government, should take the necessary steps to finalize biosafety guidelines and all documents needed for field trials of transgenic crops in order to completely establish their safety. This was stated by Professor Dr. Md. Amirul Islam, Vice Chancellor of Bangladesh Agricultural University (BAU). The Vice Chancellor was chief guest at a recently concluded seminar on “Transgenic Crops Alleviating Hunger and Malnutrition” held at the Bangladesh Institute of Nuclear Agriculture (BINA).

Also a speaker at the seminar was Professor Dr. M. Imdadul Hoque, Country Coordinator of the South Asia Biosafety Program (SABP), who gave an overview of ISAAA and SABP activities, including their impact in Bangladesh. Dr. Craig A. Meisner of Cornell University presented his paper on the development history of papaya ring spot virus (PRSV) resistant transgenic papaya and its potential benefits for developing countries. Professor Dr. A.S. Islam of Dhaka University gave an overview of the status of transgenic crops research in Bangladesh. Prof. Dr. Hans-Joerg Jacobsen of the University of Hannover, Germany presented a paper on the application of biotechnology for the production of pharmaceuticals, including edible vaccines.

About 150 participants comprised of teachers, students, and representatives from the private sector attended the seminar, which was jointly organized by the International Service for the Acquisition of Agri-biotech Applications (ISAAA) and Biotech Bangladesh Limited (BBL). For more information, contact Prof K M Nasiruddin of the Bangladesh Biotechnology Information Center (BdBIC) at k.nasiruddin@isaaa.org. Visit the BdBIC at http://www.bdbic.org.

INDO WORKSHOP TACKLES BIOTECH FOR MEDIA

Third World countries can develop biotech crops with apomictic genes. This is according to Prof. Dr. Wattimena from Bogor Agricultural University, Indonesia, who spoke in a local workshop for media held recently in Bogor. “An Effort to Build Positive Perception toward Application of Biotechnology in Indonesia” was jointly organized by the Indonesian Biotechnology Information Centre (IndoBIC), the Agricultural Biotechnology Support Project II (ABSP II), and the International Service for Acquisition of Ag-biotech Application (ISAAA).

Wattimena added that apomictic plants may herald the “second Green Revolution.” Apomictic plants produce seeds that are genetically identical to the parent plant, so that plants are genetically identical from one generation to the next. This means that desirable characteristics will be passed on stably to offspring, preventing the loss of important genes because of cross pollination. Indonesia is home to apomictic gene resources, such as plants from the families Gramineae (grasses) and Rosaceae (roses).

For more information on the IndoBIC, visit http://indobic.biotrop.org/. You may also contact Nia Dahniar, Dr. Wattimena's assistant, at dahniar2001@yahoo.com.

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

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