CROP BIOTECH 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)

June 17, 2005

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NEWS

NEW COMMITTEE HEARINGS ON BIOTECH RELEASED

The U.S. Senate Committee on Agriculture, Nutrition and Forestry recently held a hearing on the “Benefits and Future Developments in Agriculture and Food Biotechnology.” Six panelists answered questions on agricultural biotechnology and regulation, and discussed the role of regulatory agencies in the U.S., now working together under a Coordinated Framework for regulating agricultural biotechnology in the country; the use of agricultural biotechnology to help meet the world’s growing food needs; future possibilities for “second generation”

genetically modified (GM) crops; and the need for a science-based approach in regulating the development and deployment of GM crops.

Chairman Saxby Chambliss, a senator from the state of Georgia, recognized that "It is important to institute science-based systems in other countries that do not enjoy the same level of confidence in their government or their regulatory systems." With him on the panel were Chuck Lambert, deputy undersecretary of the United States Department of Agriculture (USDA) Marketing and Regulatory Programs; Jim Greenwood, Chief Executive Officer of the Biotechnology Industry Organization; and Ambassador Kenneth Quinn, President of the World Food Prize Foundation.

Also on the panel were Dr Robert Brackett, Director of the FDA Center for Food Safety and Applied Nutrition, who stressed the Food and Drug Administration's confidence that bioengineered foods are as safe as their conventional counterparts; and Ron Heck, Chairman of the American Soybean Association, who presented statistics on biotech crops in the U.S. and the advantages experienced by farmers so far.

Transcripts from the speeches made at the Senate hearing are available at http://agriculture.senate.gov/Hearings/hearings.cfm?hearingId=1523

REPORTS SHOW BIOTECH SECTOR FAST GROWING IN INDIA

Reports recently released by Biospectrum India show that the biotechnology sector is fast growing in the country. Using business data on exports, company growth, and progress made by biotechnology clusters, the reports detail investments made in the industry, as well as industry earnings for 2004-2005.

The top five biotechnology companies in India are Biocon, an integrated biotech company with interests in discovery, biopharmaceuticals, and enzymes; Serum Institute of India and Panacea Biotec, both vaccines manufacturers; Venkateshwara Hatcheries, a poultry vaccines manufacturer expanding into the human health care market; and Mahyco-Monsanto Biotech. The Top 10 biotech companies in the country accounted for 47% of the total biotech business. According to the report, the approval of a total of 17 Bt cotton hybrids for cultivation has contributed significantly to the growth of the agricultural biotechnology sector.

For more information, read the Biospectrum India Articles at http://www.biospectrumindia.com/content/BSTOP20/10506133.asp, http://www.biospectrumindia.com/content/GuestColumn/10506137.asp, and http://www.biospectrumindia.com/content/BSTOP20/10506131.asp.

MANUAL REVISED FOR NEW INDIA PATENT REGIME

With a new patent regime in place for 2005, and new laws incorporating the provisions for granting product patents in all fields of technology, including chemicals, foods, drugs, and agrochemicals, the Department of Industrial Policy and Promotion (DIPP) of the Government of India amended its Manual for Patents Practice and Procedure (MPPP).

The new revised manual aims to make patent filing easier, as it gives guidelines on protocols and procedures to be followed when examining patent applications in India. It also aims to make industries, R&D organizations, and individual researchers and inventors familiar with the patent regime, thus providing a user-friendly system for obtaining as well as maintaining patents under the existing patent law.

Visit official site of the Controller General of Patent, Designs, and Trade Marks at http://www.ipindia.nic.in.

IRRI-CIMMYT ALLIANCE AGREE ON INITIATIVES

An Alliance formed between the International Rice Research Institute (IRRI) and the International Maize and Wheat Improvement Center (CIMMYT) have agreed on three important new initiatives. These include:

- A joint program for intensive farming systems in Asia

  The program will focus on complete agricultural systems such as rice-rice, rice-wheat, or rice-maize cropping combinations. It will address a range of cross-cutting issues – from diversification beyond rice, wheat and maize, and breeding for specific farming system needs, to the development of resource-conserving technologies.

- A single unified crop information system for rice, wheat, and maize, as well as a new integrated cereal informatics center

  The new unified system will permit new kinds of comparative biology research to be conducted.

- An integrated cereal systems knowledge-sharing portal for extension workers and national programs

  The Alliance's new interactive knowledge bank for rice, wheat, and maize will let extension workers and national programs working on the three

crops share practical information, best practices, and ideas across a common platform.

Contact Duncan Macintosh, spokesperson of IRRI for more information on the Alliance at d.macintosh@cgiar.org.

VIETNAM COLLABORATES WITH U.S. AND INDIA ON BIOTECH

Experts on soybean from different U.S. universities have been giving lectures and exchanging views on the application of gene technology to create high quality soybean varieties in Vietnam. The activity is part of a collaborative program between the Vietnamese Ministry of Agriculture and Rural Development and the U.S. Department of Agriculture. Discussions centered on soybean genomic mapping and applications of molecular markers to breed soybeans resistant to floods and diseases.

Vietnam News quoted Prof. Henry Nguyen, Director of the American National Centre for Soybean Biotechnology at the University of Missouri at Columbia, and one of the seminar's co-sponsors, as saying that the country's soybean yield could be tripled from the current 1.26 tons per hectare if “new technologies in soybean cultivation, particularly improved seed varieties, are developed and adopted by farmers.

Meanwhile, Vietnam and India reviewed their scientific and technological cooperation and signed a collaborative program for 2005-2007 during the 6th session of the Vietnam-India Joint Committee for Scientific and Technological Cooperation held in New Delhi from May 19-20. They agreed to expand research into agricultural biotechnology for application to farming techniques on drought-stricken land, and hybrid rice.

In the said meeting, Vietnam officials requested assistance from India in the fields of information technology and biotechnology according to the resolution of the 12th meeting of the intergovernmental committee signed in 2004.

For a synthesis of Vietnam news on biotechnology, contact Le Hien of Biotech Vietnam at hienbiotechvn@pmail.vnn.vn.

CHINA JOINS ISAAA BIOTECH INFO NETWORK

China is now part of the growing network of Biotechnology Information Centers (BICs) of the International Service for the Acquisition of Agri-biotech Applications (ISAAA). The China National Center for Biotechnology Development (CNCBD) and ISAAA recently signed a letter of agreement for the establishment of the Chinese Agricultural Biotechnology Information Center to be hosted by CNCBD. It shall, among, others, serve as focal point for the coordination of their collaborative biotechnology communication and information activities in China.

Aside from China, fully operational BICs in Asia exist in Bangladesh, India, Indonesia, Malaysia, the Philippines, and Thailand, while a node in Vietnam is collaborating with ISAAA to translate and distribute information materials. Other BICs and or/information nodes are located in Africa and Latin America.

For more information about the BICs, visit http://www.isaaa.org/kc

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RESEARCH

SMALL MOLECULE ANCIENT AND WELL CONSERVED, RESEARCH FINDS

MicroRNAs (miRNAs) are small RNA molecules which operate by targeting certain DNA sequences, and whose tasks in land plants span the range of developmental control, to patterning. Mutations in individual miRNAs can cause faulty floral development, or even plant death. In “Antiquity of MicroRNAs and Their Targets in Land Plants,” Michael Axtell and David Bartel of the Whitehead Institute for Biomedical Research in Cambridge, Massachusetts look at miRNAs common to a number of land plants, and see how these commonalities may lead to a better understanding of plant evolution. Their findings appear in this month’s Plant Cell Online.

Researchers profiled miRNAs during *Arabidopsis thaliana* development, tracking the molecules through specific organs and tissue types. Their work revealed that tissues in which a given miRNA is highly expressed are unlikely to also show high expression of the corresponding targets.

Using a variety of techniques, including microarray detection of miRNAs, on some plants, researchers also found that some families of miRNA are not only common to most plants, but are actually ancient, and have been conserved through evolution in a wide range of plants with different lifestyles and morphologies. They detected 11 major families in a gymnosperm, 8 in a fern, 3 in a lycopod, and 2 in a moss.

For the complete article, go to http://www.plantcell.org/cgi/reprint/17/6/1658

RESEARCH FINDS PROTEIN CRITICAL FOR LYCOPENE ACCUMULATION

All living organisms respond in various ways to high temperature. Some express a group of conserved polypeptides collectively known as heat shock proteins, or HSPs, to allow organisms to adapt to the temperature change. Inbal Neta-Sharir and colleagues of the Hebrew University of Jerusalem explore the "Dual Role for Tomato Heat Shock Protein 21: Protecting Photosystem II from Oxidative Stress and Promoting Color Changes during Fruit Maturation." Their findings appear in the latest issue of Plant Cell online.

Researchers found that expression of a small HSP (sHSP), HSP21, in tomato is induced by heat treatment in leaves, and under normal growth conditions in developing fruit. Through experiments using transgenic plants expressing high amounts of HSP21, they concluded that HSP21 (1) plays a role in fruit reddening, and (2) is necessary for obtaining maximal lycopene accumulation, since transgenic fruits accumulated carotenoids (lycopene) earlier than controls. HSP21, moreover, protected an internal pathway from oxidative stress, which would otherwise disable plant metabolic activities.

For more information, download the article at
http://www.plantcell.org/cgi/reprint/17/6/1829

PYRAMIDED CROPS FOUND TO ACT BEST ALONE

Work on creating transgenic plants currently focuses on pyramiding genes, or inserting two dissimilar toxin genes into the same plant, with the aim of delaying insect resistance. This advantage for insect resistance management, however, may be compromised if they share toxins with single-gene plants in the same field.

An article in the latest issue of the Proceedings of the National Academy of Sciences tests this hypothesis, and looks at how "Concurrent Use Of Transgenic Plants Expressing A Single And Two *Bacillus thuringiensis* Genes Speeds Insect Adaptation To Pyramided Plants." Written by Jian-Zhou Zhao and colleagues of the Department of Entomology, Cornell University, the research describes greenhouse work done on transgenic broccoli expressing insecticidal Bt genes.

Using statistical tests on interactions between broccoli plants transformed to express different Cry toxins (Cry1Ac, Cry1C, or both), and a synthetic population

of the diamondback moth (*Plutella xylostella*), researchers found that after 24–26 generations of selection in the greenhouse, the concurrent use of one- and two-gene plants resulted in control failure of both types of Bt plants. On the other hand, few insects survived when exposed to pyramided transgenic plants alone.

Researchers proposed that registration of pyramided transgenic plants be conducted alongside registration or de-registration of single-gene Bt plants, since keeping the two together could provide insects means by which they could be resistant to both genes in pyramided transgenic plants.

The complete article can be found at http://www.pnas.org/cgi/reprint/102/24/8426

RESEARCH FINDS PESTICIDES IN FARMERS' BLOOD

The Center for Science and Environment (CSE), a New Delhi-based research organization, recently conducted studies on detecting the levels of pesticide residues in blood samples taken from Punjab farmers. Their work, Analysis of Pesticide Residues in Blood Samples from Villages of Punjab, appears in the electronic journal Down to Earth.

Professor H.B. Mathur and colleagues measured the amounts of residues of 13 pesticides in 20 randomly selected blood samples from four villages — Mahi Nangal, Jajjal, and Balloh in Bhatinda district, and Dher in the district of Ropar. Tests showed that pesticide residue levels were very high, even for pesticides which should be easily degradable, as per industry standards. These included detected levels of organochlorine pesticides, which researchers found to be 15-605 times higher than those found in blood samples of a US population tested by the US Centers for Disease Control and Prevention in 2003; lindane, at 605 times; and DDT, at 188.

Read more at http://www.downtoearth.org.in/ and http://www.cseindia.org/aboutus/press_releases/press-index.htm.

CBT NEWS FEATURE

The Center for International Forestry Research (CIFOR)

The Center for International Forestry Research, CIFOR, is another future harvest center of the Consultative Group on International Agricultural Research (CGIAR),

and is committed to conserving forests and improving the livelihoods of people in the tropics. Operating through research partnerships out of its headquarters in Bogor, Indonesia, CIFOR works as a “Center without Walls,” as it employs a holistic, inter-disciplinary approach to solving general or widespread problems.

CIFOR's mission is to contribute to the sustained well-being of people in developing countries, particularly in the tropics. It aims to improve the scientific basis that underpins balanced management of forests and forest lands; develop policies and technologies for sustainable use and management of forest goods and services; and assist partner governments in improving their capacity for research, while supporting the optimal use of forests and forestlands

CIFOR's research helps local communities and small farmers gain their rightful share of forest resources, while increasing the production and value of forest products. Research is currently focused on seven eco-regions: the tropical moist forests in central-west Africa and the Congo; the drier forests of eastern-southern Africa; the rainforest-dry forest continuum in southern India; the tropical moist forests in insular Southeast Asia; the uplands of mainland Southeast Asia; the tropical moist forests of the western Amazon; and the mixed forest systems of Central America.

So far, CIFOR’s research has contributed significantly to influencing policy dialogues regarding issues in global forestry; informing the broader international forestry community; collaborating in research with the government and academe; building research capacity in developing countries; encouraging forest policy reform; protecting existing forests and improving poor peoples’ livelihoods; and developing criteria and indicators for sustainable management of forests.

CIFOR has regional offices in Brazil, Cameroon, and Zimbabwe. It works in over 30 countries worldwide, and has links with more than 300 researchers in 50 international, regional, and national organizations.

http://www.cifor.cgiar.org

ANNOUNCEMENTS

MALAYSIAN CONFERENCE ON AGRICULTURAL AND MEDICAL BIOTECH

Monash University Malaysia is organizing a biotechnology conference on agricultural and medical biotechnology on September 29-30, 2005 at the Sunway

Pyramid Convention Centre, Bandar Sunway, Malaysia. The conference will be held with the support of the Ministry of Science, Technology and Innovation (MOSTI), Ministry of Agriculture and Agro-based Industries, and in collaboration with the Malaysian Agricultural Research and Development Institute (MARDI), as well as the Malaysian Biotechnology Information Centre (MABIC).

For details, please visit the official conference website at: http://www.artsci.monash.edu.my/conference/

For more information contact Ms Adeline Yong at: 603-56360600 ext.3510 or e-mail adeline.yong@artsci.monash.edu.my.

IARI TO HOLD COURSE ON BT RESISTANCE MANAGEMENT

The Indian Agricultural Research Institute (IARI) will hold an international training course on "*Bacillus thuringiensis* (Bt) Resistance Management in Insects" from Oct 12-21, 2005 at IARI, New Delhi. The course aims to impart training on various aspects of Bt resistance management, with an emphasis on Bt cotton.

A fee of $1,500 will cover the course, excluding lodging and travel cost. For more information, visit http://www.iari.res.in/mainnews/brochure_int_coursemod.html, or email the course director at gtgujar@iari.res.in or gtgujar@yahoo.com.
