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)

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In This Issue:

GM RICE IN CHINA ASSESSED

Jikun Huang, of the Chinese Academy of Sciences, and colleagues recently studied "Insect-Resistant GM Rice in Farmers' Fields: Assessing Productivity and Health Effects in China" in the journal Science. Their findings show that genetically modified (GM) rice has not only led to relatively higher crop yields and reduced use of pesticides in China, but has also contributed to improved farmer health.

Using farm surveys conducted for work on two of the four GM varieties currently in farm-level pre-production trials, researchers found that GM rice farmers apply pesticide less than once per planting season, compared with 3.7 times for non-GM rice farmers; the mean of insect-resistant GM rice yields (6364 kg/ha) is higher than those of non-GM varieties (6151), although only by 3.5%; and that there were no reports of adverse health effects due to pesticide use from farmers working on sample GM plots.

There were no differences noted between GM and non-GM growers in terms of farm or plot sizes, the share of rice in the households' cropping patterns, or the household head's age or education.

The GM rice varieties used were created to be resistant to rice stem borer and leaf roller by insertion of a Chinese-created Bacillus thuringiensis (Bt) gene; or by introducing a modified cowpea trypsin inhibitor (CpTI) gene into rice.

Download the article at http://www.sciencemag.org/cgi/reprint/308/5722/688

RESEARCH SHOWS GM USE GOOD FOR POLAND

With data gathered from genetically modified oilseed rape, sugar beet, and maize with herbicide tolerance and/or insect resistance traits, Graham Brookes of Brookes West, UK, and Professor Andrzej Aniol of the Plant Breeding and Acclimatization Institute, Poland assess "The farm level impact of using GM agronomic traits in Polish arable crops." Their work on the socio-economic benefits of the abovementioned genetically modified (GM) crops appear in the journal Biotechnologica.

The research shows that GM technology can offer benefits to farms of all sizes, and that small farms in Poland have been the most enthusiastic adopters of it, given the simplicity and low capital costs of GM technology. The technology also carries with it additional intangible benefits, such as increased management flexibility and simplicity, since finding outlets for GM derived crops is likely to be fairly straightforward, especially in the feed sector.

Key findings also include a projected 10-90% increase in crop output for both GM oilseed rape and sugar beet; an increase of €55-116 million in annual added value for production of the three crops; an increase in farm (gross margin) income of between €67 million and €123 million; and a decrease of 38-67% in the volume of herbicides applied.

For more information, contact the author at graham.brookes@brookeswest.co.uk, or download the report at http://www.pgeconomics.co.uk/pdf/Possible_farm_level_impact_GM_crops_Poland.pdf.

PORTUGAL OPENS DOORS TO GM MAIZE

Farmers in Portugal may soon have access to 17 new varieties of genetically engineered maize from different seed providers, as the Portuguese Council of Ministers approved the planting of transgenic maize in the country.

New legislation guarantees that genetically modified varieties will be able to coexist with conventional crops. Current regulation also specifies that the distances from transgenic to conventional fields must be 200 meters, and from transgenic to organic, 300.

With news from http://www.checkbiotech.org, http://www.bbc.co.uk, and http://www.jrc.cec.eu.int.

ICRISAT RELEASES VIRUS-RESISTANT PIGONPEA

Pigeonpea is a major crop in India, and is an important protein supplement in the vegetarian diet. It is, however, also susceptible to a number of diseases, including the pigeonpea sterility mosaic virus (PPSMV), or “green plague.” PPSMV-infected plants no longer produce flowers and pods, leading to losses amounting to about $300 million annually in India and Nepal.

The International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) has recommended the release of pigeonpea variety ICP 7035, a landrace cultivar highly resistant to PPSMV. The release is a joint effort of the research led by ICRISAT and University of Agricultural Sciences, Bangalore, and is supported by the Department for International Development (DFID) of the UK Government.

ICP 7035 has excellent resistance to PPSMV and tolerance to wilt, two major pigeonpea diseases in India. It is also 8.8 % sugar, so that it can be as sweet as garden peas; and has high amounts of anthocyanins, making it a potential antioxidant.

For further information, contact Dr KB Saxena at k.saxena@cgiar.org or Dr P Lavakumar at p.lavakumar@cgiar.org.

CIMMYT INTRODUCES IMPROVED MAIZE IN NW INDIA

A new maize hybrid promising early maturity and more protein could prove beneficial to India’s small farmers, through increased harvests and improved nutritional quality. This hybrid was developed by the Indian Council for

Agricultural Resources (ICAR), with the aid of the International Center for Wheat and Maize Research (CIMMYT).

According to ICAR plant breeder Raman Babu, this new hybrid can help those living in northwestern India, where most are dependent on maize for food. It is a cross between CIMMYT's quality protein maize developed in the 1980s and Vivek Hybrid-9, a popular hybrid grown in nine Indian states.

CIMMYT contributed the donor lines, methodology, molecular markers, and technical guidance while Babu performed the research.

See the full news report on
http://www.cimmyt.org/english/wps/news/2005/apr/qpmIndia.htm
For inquiries, contact Raman Babu (rbabu_icar@rediffmail.com) or Ganesan Srinivasan (g.srinivasan@cgiar.org).

BIOTECH CORPORATION CREATED FOR MALAYSIA

Datuk Seri Abdullah Ahmad Badawi, Prime Minister of Malaysia, recently announced the creation of the Malaysian Biotechnology Corporation (MBC), geared to develop the country's biotechnology sector.

The corporation's thrusts include the aim to add value to the agriculture sector; capitalize on Malaysia's biodiversity to commercialize discoveries in natural products and bio-generics; establish a network of biotechnology centers of excellence at existing institutions around the country; give enough incentives and financial backing to encourage the private sector and academe to get involved; and build international recognition for Malaysian biotechnology.

Specific government initiatives in biotechnology will include government grants for biotechnology research and development, a fund for training biotechnology professionals, and ten-year tax-free status for biotechnology companies in Malaysia. The MBC will be chaired by the Prime Minister.

For more information, log on to http://bic.org.my.

NEW RICE AND CORN VARIETIES ON PHILIPPINE MARKET

The National Seed Industry Council (NSIC) of the Philippines has recently approved the release of 8 new rice and 16 new corn varieties for commercial

planting in the country. This is reported by Dr. Sosimo Ma Pablico in The Philippine Agriculture Magazine.

Of the 8 new rice varieties, three are hybrids and five are inbreds. The Philippine Rice Research Institute (PhilRice) was responsible for four of the new inbreds, while the University of the Philippines Los Baños (UPLB) bred one glutinous rice variety. Private companies bred the hybrids. Of the 16 new varieties of corn, a good number are hybrids, and some are of the glutinous white or of the yellow variety.

Farmers are invited to send their feedback and experiences on growing the new varieties to spablico@yahoo.com.

'POTATO PARK' TO PROTECT NATIVE KNOWLEDGE ON POTATO

The Centro Internacional de la Papa (CIP) or International Potato Center has signed an agreement with local farmers from Cusco, Peru to start a 'potato park' to house CIP's germplasm collection, which includes domesticated and wild potato varieties. This agreement is the first of its kind to be signed by Peru and the Consultative Group on International Agricultural Research (CGIAR).

The document intends to preserve Peruvian farmers' local knowledge on cultivating more than 2,000 varieties of native potatoes. These practices are selected and domesticated ancient technologies from as far back as the pre-Inca times.

The Association for Nature and Sustainable Development stands for the six rural communities comprising the park. According to Alejandro Argumedo, its associate director, "Biological diversity is best rooted in its natural environment and managed by indigenous peoples who know it best." He sees the concept of the park fit to be followed by other indigenous communities.

For more information, visit http://www.cipotato.org/news_more.asp?cod=4

MORE BT COTTON VARIETIES APPROVED

India's Genetic Engineering Approval Committee (GEAC) has approved more Bt cotton hybrids for renewed planting, as well as new varieties for first-time cultivation in the country. The Mahyco Company's varieties MECH 162 and MECH 184 have been renewed for planting in the Central and Southern Zones;

MRC 6918 and MRC 6322 have been newly approved for the Southern Zone; while MECH 12 and MRC 6301 have been approved for the Central Zone. Rasi's RCH 144 and RCH 118 may be planted in the Central Zone, and RCH 20 and RCH 368 are allowed for the Southern Zone. Ankur's Ankur 615 and Ankur 09 are also newly approved for planting in Central Zone. Renewal of the approval period for the MECH varieties will last for only two years as per existing guidelines.

A few of the hybrids, however, did not pass approval for planting in other regions of India. Mahyco's MECH 162 and MECH 184 will be discontinued for Andhra Pradesh (AP), and MECH 12 will not longer be planted in the Southern Zone. Farmers in AP will have the choice of 6 Bt cotton hybrids to grow, compared with only 3 in previous years. GEAC also deferred its decision on commercial cultivation of new varieties Bunny Bt and Mallika Bt, and has asked developer Nuziveedu Seeds for DNA fingerprinting records. The decision on both varieties may again be discussed in the next GEAC meeting, scheduled for the 8th of June.

Find out more from http://www.indianexpress.com/full_story.php?content_id=69708, http://www.thehindubusinessline.com/2005/05/04/stories/2005050402380100.htm, http://stlouis.bizjournals.com/stlouis/stories/2005/05/02/daily24.html, and http://www.financialexpress.com/fe_full_story.php?content_id=89912. The story is also available in Hindi at http://www.hindustantimes.com/news/2031_1348480,0065000600000008.htm

RNA FAMILIES IN RICE CHARACTERIZED, IDENTIFIED

MicroRNAs (miRNAs) are small, non-coding RNA molecules that regulate gene expression. The genes which code for these represent 1% of the expressed genome in complex organisms such as worms, flies, and humans. Identifying an entire set of miRNAs, as well as their target genes in an organism, is important for researchers who want to understand how genes are regulated, and how they may be silenced.

In “Cloning and Characterization of MicroRNAs from Rice,” a research article that appears in the latest issue of Plant Cell Online, Ramanjulu Sunkar of the University of California, Riverside and colleagues used computational methods to predict families of miRNAs in rice; and sequencing methods to identify new families unique to the crop.

Using rice genome sequence data, and comparing this data to miRNAs found in Arabidopsis, researchers predicted that 20 families of miRNAs exist in rice. With further experimentation, they also found new families of the molecule which are

not conserved in Arabidopsis, suggesting that these may have evolved after the divergence of monocots (represented by rice) and dicots (represented by Arabidopsis). Researchers were also able to predict the genes which the miRNAs regulate.

Download the complete article at http://www.plantcell.org/cgi/reprint/17/5/1397

CBT NEWS FEATURE: INTERNATIONAL CENTER FOR TROPICAL AGRICULTURE (CIAT)

"Solutions that cross frontiers" embodied in genetically improved crops, natural resource management using environmentally sound methods, and other practices for problem-solving and decision-making; transcending natural boundaries and surmounting barriers for the development of human welfare. These characterize the International Center for Tropical Agriculture (CIAT).

CIAT is based in Colombia, with outposts in a dozen other developing countries. It is part of the Consultative Group on International Agricultural Research (CGIAR). It is composed of 800 staff of which 120 are from different countries, headed by Director General Joachim Voss.

The center is focused on reducing hunger and poverty while preserving natural resources in developing countries, specifically the tropics, where poverty, malnutrition, and environmental degradation seem to prevail. CIAT believes that with worldwide support, these problems can be solved.

Three intermediate destinations are set forth to be reached: competitive agriculture, healthy agroecosystems, and rural innovations. Rural families improve their lives as they work towards these goals. They increase their food supplies and contribute to extra income for their economies, creating jobs and making room for growth.

CIAT's expertise is on five areas: agrobiodiversity and genetics, ecology and management of pests and diseases, soil ecology and improvement, analysis of spatial information, and socioeconomic analysis. It is with its research on these areas that "solutions that cross frontiers" are formulated.

Among its partners are other international centers, national research institutes, universities, non-government organizations, the private sector, and rural communities from different parts of the globe. With these institutions, CIAT conducts training, conferences, specialized information and documentation services, and other communication programs.

The center, although in tropical America, also focuses on Asia and Africa. It works on key crops such as beans, cassava, forages, rice, and tropical fruits.

CIAT regularly produces publications, which can be in print, videos, CD-ROMs, and in text and database files. It also houses the Agronatura Science Park, where scientists worldwide can exchange and share ideas and technology, "inducing globalization of research."

For more information, visit http://www.ciat.cgiar.org

DOCUMENT REMINDER:

ISAAA Briefs 33 Now Available

The 33rd ISAAA Briefs is now available for upload at http://www.isaaa.org/kc. "Towards Optimizing the Benefits of Clonal Forestry to Small-scale Farmers in East Africa" documents the Tree Biotechnology Project (TBP) Workshop, which was held in Nairobi, Kenya in January of this year. The information presented at the workshop and published in the briefs may aid readers in understanding the collaborative structure of TBP, which may serve as a model for similar South-South partnerships in technology transfer.

The document is edited by Catherine Ngamau, Benson Kanyi, James Epila-Otara, Patrick Mwangingo, and Samuel Wakhusama, and is published with financial support from the Gatsby Charitable Foundation (UK).

ANNOUNCEMENT: BIOSAFETY CONGRESS TO BE HELD IN BRAZIL

The 4th Biosafety Congress and Latin American Symposium on Transgenic Products will be held from Sept. 26-29, 2005 in Porto Alegre, Brazil. Talks will focus on biosafety, co-existence, dealing with biomedical waste, and working with genetically modified foods and organisms, among others.

For more information, visit http://www.anbio.org.br.

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