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), and AgBiotechNet

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UK GOVERNMENT ALLOWS PLANTING OF GM CORN

The United Kingdom has given the go-signal for the planting of genetically modified (GM) corn. Margaret Beckett, Britain's environment secretary, said that the government approved in principle the commercial cultivation of herbicide tolerant corn. The first GM corn crop for cattle feed will be grown in spring 2005.

Beckett stated that the science-based decision took into account “safety, human health and the environment,” and was based on the three-year Farm Scale Evaluations which concluded that biotech corn had less negative impact on the environment than conventional varieties.

London’s Financial Times quoted Prof Julia Goodfellow, chief executive of the Biotechnology and Biological Sciences Research Council, as saying that "GM technology has great potential benefits for both the public and producers. It is right that we assess each application of this technology case-by-case based on the scientific evidence while taking into consideration the understandable concerns regarding the use of this relatively new technology".

In related developments, the British Medical Association (BMA) backed the government's decision to allow the planting of GM corn. David Carter, chairman of the BMA's Board of Science, explained that it was necessary to "move away from the hysteria that has so often been associated with GM foods." The BMA released its report where it reversed its 1999 position for an "open-ended" moratorium on biotech crops. This time it concluded that it agreed with the Royal Society's 2002 findings that the risks to human health from biotech foods are "negligible."

Aside from the UK, only Spain has allowed the growing of GM crops on a commercial scale in Europe.

See the Financial Times at http://news.ft.com/home/uk/. For more of the British Medical Association, visit http://www.bma.org.uk.

KEY ISSUES IN BIOTECH IDENTIFIED IN CHILE FORUM

A number of key issues affecting the development of biotechnology in the developing world were identified during the Global Technology Forum held in Concepcion, Chile. These were: inadequate scientific, technical and research capabilities, the absence of entrepreneurial skills and of public investment in this field, the presence of intellectual property barriers, different biosafety regulations, and difficult market access.

Over 1400 international delegates from 80 countries attended the forum to assess the challenges in the field of biotechnology in developing countries and countries with economies in transition. The meeting opened a dialogue meant to develop proposals, initiatives and solutions for action, such as: the establishment of a multi-stakeholder forum for informed dialogue on biotechnology and its benefits for the developing world, the creation of a network and database on biotechnology activities in developing countries and those with economies in transition, including global market and technology information for partnership facilitation, enhancement of capacity-building activities, and the assessment of intellectual property legislation on biotechnology.

The Global Technology Forum was organized by the United Nations Industrial Development Organization (UNIDO) and the Government of Chile.

For further information, email Cristina Stricker, UNIDO Information Officer, at c.stricker@unido.org. A UNIDO press release is available online at http://www.un.org/News/Press/docs/2004/dev2465.doc.htm.

WORLD HUNGER AND BIOTECHNOLOGY

The Pew Initiative on Food and Biotechnology recently issued a brief entitled "Feeding the World: A Look at Biotechnology and World Hunger," which examined both the potential and limitations of agricultural biotechnology in boosting food production and improving the plight of poor farmers in developing countries. Although the paper does not review all pertinent factors contributing

to the problem of global hunger, it however, discusses extensively several key policy issues. Some of these issues are as follows:

* The idea that world hunger should be solved solely through food redistribution (through aid and assistance programs) partly contradicts the goals of economic development and self-sustainability that are espoused by developing countries. Local food production is still the primary way to address hunger.

* Agricultural biotechnology does not offer solutions to broad systemic problems. The science, however, may provide means for developing crop varieties tailored to the specific needs of a particular region. This could, in turn, play an important role in addressing hunger. Traits such as disease, pest, and drought resistance could help increase food production. Biotechnology may also address critical nutritional deficiencies by enhancing the nutritional value of staple crops in the developing world.

* Biotechnology raises environmental and human health considerations that must be considered during the development and deployment of new genetically modified crops. Such an assessment will require a case-by-case examination of specific crops in specific environments to be able to consider its potential environmental benefits. If risks are identified, the capacity of small farmers and regulators to manage those risks, without training and resources, should also be considered.

* Biotechnology is seen as a means of assuring food security for impoverished populations, while others see this technology, and the complications associated with access to it, as a potential vehicle for capitalist exploitation. Many of these differences are rooted in perspectives that are broader than the biotechnology debate itself and cannot be resolved solely within its confines, but within other broader forums.

The full issue brief can be viewed at http://pewagbiotech.org/resources/issuebriefs/feedtheworld.pdf.

US AND OTHER SECTORS ARE WARY ABOUT NEW BIOTECH RULES

Attendees of the first Meeting of Parties to the Cartagena Protocol on Biosafety (MOP1) in Kuala Lumpur, Malaysia last February agreed that detailed biological information should be provided with each shipment of genetically modified organisms (GMOs). This decision, however, disappointed plant researchers and countries such as the United States, that are major exporters of genetically modified crops.

The main contention pointed out was the protocol's guidelines for labeling shipments of GMOs. The United States and its allies are suggesting to minimize additions to the existing rule so that package markings state that they "may contain" such organisms. US representatives argued that anything more specific than that would hinder shipping. "There are 12 or so varieties of genetically modified maize in commercial use — we have no idea what's in most shipments," says John Pitchford, Office of International Affairs, US Department of Agriculture.

However, delegates from the European Union and Africa, during the MOP1, have successfully argued that exporters should put common and scientific names on

each shipment, and information on the genetic transformation event used to make each variety. This information will be needed by developing countries for their own risk assessments. "We need to be able to check for ourselves," says David Hafashimana, a conservation biologist at Uganda's Ministry of Water, Lands and Environment.

Read the news release at
http://www.nature.com/cgi-taf/DynaPage.taf?file=/nature/journal/v428/n6978/full/428006a_fs.html.

POTENTIALS OF GM SUGAR BEET IN THE UK & GERMANY

“The potential impact of genetically modified (GM) crops on the environment and human health compared with conventional crops is a key topic within the GM debate. In the case of GM herbicide-tolerant sugar beet, results of the Life-Cycle Assessment (LCA) suggest that growing the GM variety would produce fewer emissions that can potentially harm either the environment or human health when compared with the typical herbicide regimes currently being used on sugar beet in the UK and Germany,” states Richard Phipps and Richard Bennett of the School of Agriculture, Policy and Development, University of Reading, United Kingdom. Phipps and Bennett suggested assessing the environmental impacts of new technologies thru the use of an LCA which evaluates the inputs, outputs, and potential environmental impacts of a particular technology. They applied LCA to estimate the environmental burdens associated with growing GM herbicide-tolerant and conventional sugar beet in the UK and Germany.

The manufacture, packaging, and transport of the herbicides and the use of farm machinery for field operations were considered in the analysis of each impact category, which include: the amount of energy used, the effect of carbon dioxide and other gases on global warming, the production of chemicals that could contribute to the depletion of the ozone layer, potential effects on water quality, and the production of sulphur dioxide, which contributes to the production of acid rain.

According to Phipps and Bennett, the LCA showed that the GM production system had lower values than the conventional systems. The results also showed that the use of GM varieties of sugar beet offers positive environmental and human health benefits when compared with conventional production systems.

For more details on the study entitled “Comparing Environmental and Health Burdens of Traditional vs GM Beet, email Richard Phipps at r.h.phipps@reading.ac.uk.

GENOME EDITOR TO REVOLUTIONIZE AGRICULTURE

A gene targeting system based on a naturally occurring process called homologous recombination has been developed to precisely substitute one DNA segment for

another within a cell. Called Genome Editor, it can delete, add or modify any gene with surgical precision in many commercial crops.

According to Phytodyne, an Iowa State University spin-off company, it can be used to modify multiple genes that work together to confer complex traits such as improved nutrition and better oil profiles. It can eliminate unwanted characteristics such as allergens and can improve grain composition to enhance processing qualities.

Dan Voytas, professor of genetics and co-founder of Phytodyne, said that the Genome Editor is more precise and efficient in improving the genetics of plants than the current technology of gene targeting.

See additional details at http://www.iastate.edu/Inside/2004/0227/phyto.shtml

REGULATING GM CROPS TO ASSURE PUBLIC TRUST

A mandatory pre-market approval system that applies established safety standards in procedures that are transparent and allows for public participation with no preconceived notions or biases will best achieve both safe products and consumer trust. This is the view of Gregory Jaffe of the Center for Science in the Public Interest in Washington, DC.

In a paper entitled “Regulating transgenic crops: a comparative analysis of different regulatory processes” published in Transgenic Research (13: 2004), Jaffe enumerated the other major components of regulatory systems that are necessary to ensure safe products and engender public trust:

* Use of outside scientists for expert scientific advice
* Independent agency decisions
* Post-approval activities
* Enforcement authority and resources

Jaffe concluded that “the key to reaping the long-term benefits of agricultural biotechnology is a strong, but not stifling, regulatory system that independently reviews and approves each product for human and environmental safety before it is commercialized.”

Email Gregory Jaffe at gjaffe@cspinet.org.

ENHANCED COWPEA THROUGH BIOTECH IN AFRICA

By introducing improved seed production system and marker-assisted selection, genetically modified (GM) cowpea may yet help Africa in the long term. This was the recommendation of a three-day international workshop on cowpea production and utilization in Accra, Ghana which was attended by over 40 scientists from Africa, Europe, United States of America and Australia.

Participants of the workshop which was hosted by the African Agricultural Technology Foundation (AATF) and the Network for the Genetic Improvement of Cowpea for Africa, agreed to generate, gain access to and deploy technologies

and new mechanisms that would support the production and distribution of high quality cowpea seed, development of cowpea varieties resistant to pest infestation and damage, and dissemination of better storage and processing technologies.

AATF is expected to negotiate intellectual property to access existing technologies and seeds of GM cowpea. It is also responsible for ensuring seed production and availability, provide technology liability protection, and ensure social acceptability of the GM cowpea varieties.

More information on AATF can be viewed online at http://www.aftechfound.org.

MIDDLE EAST SETS UP BIOTECH CENTER

A new environmental and biotechnology research center along the Israeli-Jordanian border is set to be built this year. Seed money will be provided by the Bridging the Rift Foundation, a New York-based organization, while the Stanford and Cornell Universities will assist as academic partners.

Stanford geneticist Marcus W. Feldman said that the center is located in an “extremely interesting environment" – between the Dead Sea, the most saline body of water on earth, and one of the hottest deserts in the world.

An important component of the center will be the Library of Life, a databank project of all living organisms in the Dead Sea region. The library will assemble information on living systems, from microbes to plants to animals, using digital images and global positioning data.

Visit the US partner universities at
http://www.stanford.edu and http://www.cornell.edu.

NEW METHODS FOR IMPROVING SORGHUM

Sorghum is one of the most important grain crop in the world next to wheat, maize, rice, and barley. However, it has trailed behind other cereals in terms of development via genetic transformation. Sorghum transformation has been hampered by tissue culture limitations, such as low regeneration frequencies and accumulation of phenolic pigments, says Tawanda Zidenga of the Plant Biotechnology Center at the Ohio State University.

Zidenga mentioned that, at present, marker-assisted selection and genetic transformation are seen as potential methods that can improve sorghum as a food crop, and as an industrial crop. Genetic improvement of sorghum can also help farmers in semi-arid areas where sorghum is a key food crop.

In the paper entitled “DNA-based Methods in Sorghum Diversity Studies and Improvement,” the author mentioned that, in the past, studies have been devoted to assessing patterns of sorghum genetic variation based on morphology or pedigree. However, it was observed that inherited traits are difficult to trace via morphology alone. Thus, DNA-based methods have been employed in studies of sorghum genetic diversity and in genetic improvement of the crop.

Molecular markers are identifiable DNA sequences found at specific locations of the genome, usually found near the sequence of desired genes, and are transmitted by the standard laws of inheritance from one generation to the next. In contrast to morphological markers, which are based on visible traits and biochemical markers which are based on proteins produced by the genes, molecular markers are based on DNA sequence variations which are linked to useful traits.

For more information, email Tawanda Zidenga at zidenga.1@osu.edu.

CEC REPORTS ON GM CORN IN MEXICO

Assessing biodiversity impacts is a complex issue. "Recent genetic studies of landraces in Oaxaca, Mexico have shown that gene flow between maize populations is quantitatively important but that management of seed by farmers maintains strong agromorphological differentiation between maize populations," said Julien Berthaud and Paul Gepts of the University of California, Davis.

Berthaud and Gepts' viewpoints are contained in a draft report on "Maize and Biodiversity: The Effects of Transgenic Maize in Mexico released by the Secretariat of the Commission for Environmental Cooperation (CEC) for public comment.

The CEC report was initiated in 2002 in response to a call by several sectors to investigate the claim that genetically modified material had been found among traditional Mexican varieties of maize despite a moratorium on its planting. The CEC Secretariat appointed an international advisory group to come up with the report and provide advice to the governments of Canada, Mexico and the United States. The advisory group will present its recommendations to the three governments in June.

See the draft report at http://www.cec.org/maize/resources/chapters.cfm?varlan=english. Email inquiries at info@ccemtl.org.

ICAR IDENTIFIES GM PROGRAM

The Indian Council of Agricultural Research (ICAR) has identified transgenic projects worth Rs 250 crore or $55 M involving 14 crops. Proposals are being sought by the government's Planning Commission.

Mangla Rai, Chairman of the Indian Council for Agricultural Research, identified these research areas: Genetically modified (GM) cotton for bollworm and virus resistance and GM brassica for aphid and drought resistance; GM tomatoes with delayed ripening, virus resistance and fruit borer resistance; GM brinjal with fruit borer resistance; and virus resistance for GM soybean, potato, banana and papaya. Other crops include GM banana with fungal resistance, GM rice with resistance to stem borer and fungal pathogens, GM sorghum and corn with stem borer resistance, and GM pigeon pea and chick pea with pod borer resistance.

View the ICAR website at http://www.icar.org.

ANNOUNCEMENTS

NEW CROP BIOTECH BRIEF

Matim Qaim and Alain de Janvry's study entitled "Cheaper GM Seeds Could Boost Adoption, Farm Benefits and Company Profits: The Case of Bt Cotton in Argentina," is the latest CB (Crop Biotech) Brief from the Global Knowledge Center on Crop Biotechnology of the International Service for the Acquisition of Agri-biotech Applications (ISAAA-KC). Downloadable at http://www.isaaa.org/kc, Qaim and de Janvry analyzes the adoption and impact of Bt cotton in Argentina in lieu of the monopoly pricing.

EXEC SUMMARY OF ISAAA BRIEFS 30 IN CHINESE

The Chinese version of the Executive Summary of ISAAA Briefs 30, written by Dr. Clive James, Chair, ISAAA Board of Directors, is now available online at http://www.isaaa.org/kc. This publication is also available in English, Portuguese, Arabic and Italian. French, German, Hindi, Indonesian, Italian, Japanese, Spanish, Spanish-Argentinian, and Thai translations of the press release are also downloadable from the same site.

INTERNATIONAL CONFERENCES

Redbio 2004

Redbio 2004 is the 5th Latin American and Caribbean meeting on Agricultural Biotechnology. This event will be held on June 21 to 25, 2004 at Punta Cana, Dominican Republic. Sponsored by the regional cooperation network on plant biotechnology (RED/FAO), topics that will be discussed include: nutrition genomics, molecular farming, agricultural competitiveness, public perception and regulatory framework. Crop-specific workshops and a massive BioShow trade fair will also take place. Working languages will be English and Spanish. For more information, email redbio2004@redbio.org. The website address is www.redbio.org.

Gender and Forestry Symposium

The Worldwide Symposium on Gender and Forestry will take place at the University of Dar-Es-Aalaam in Arusha, Tansania on August 1 to 10, 2004. This event is being organized by the gender and forestry working groups of the international union of forest research organizations and ENVIROCARE. Strategies on how to improve community access to forest resources while encouraging sustainable forestry management are the highlights of the event. For more information, email Prof. Ruth Meena at envirocare_2002@yahoo.com

Brisbane Crop Science Conference

The 4th International Crop Science Congress (4ICSC) in conjunction with the 5th Asian Crop Science Conference (5ACSC) and the 12th Australian Agronomy Conference (12AAC) will be held in Brisbane, Australia on 26 September – 1 October 2004. Submission of poster papers for presentation has been extended until April 16, 2004. For further inquiries visit http://www.regional.org.au/au/cs/author/faq.htm.

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