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)

March 24, 2006

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GLOBAL

GOVERNMENTS ADOPT INTERNATIONAL TRADE RULES FOR GMOS

At the conclusion last week of the third meeting of the 132 Parties to the Cartagena Protocol on Biosafety (MOP3), a landmark decision was reached on detailed documentation requirements for genetically modified organisms in the international trade of agricultural commodities. The Cartagena Protocol on Biosafety is the only international treaty governing the cross-border transport of genetically modified organisms, and is intended to promote the conservation and sustainable use of biodiversity. During the next six years, shipments containing living modified organisms (LMOs) will bear the label “contains LMOs”, followed by a list of the organisms present in the containment and additional relevant information, such as intended use of the LMOs and details of the genetic modification event. Shipments where identification of LMOs is not possible can bear the label “may contain LMOs” during the interim period. After 2012, only the label “contains LMOs” will be acceptable. In addition, MOP3 took decisions on a range of other issues intended to facilitate the implementation of the protocol, including biosafety capacity building initiatives for developing countries, risk analysis and management, training, and the mechanism for disseminating information.

According to the Brazilian Ministry of Foreign Relations, the agreement “represents an important victory, most of all for the developing countries. The new rules reinforce the implementation of the country's extant legislation, as well as favoring the coexistence of agricultural systems that produce LMOs, non-LMOs, and organic crops”.

More information can be found at: http://www.biodiv.org/default.shtml and http://www.radiobras.gov.br/

ECONOMIC IMPACT OF GM CROPS IN DEVELOPING COUNTRIES

Recent economic studies show that institutional factors such as national agricultural research capacity, environmental and food safety regulations, intellectual property rights and agricultural input markets matter at least as much as the technology itself in determining the level and distribution of economic benefits of transgenic crops. This was forwarded by Terri Raney of the Food and Agriculture Organization (FAO) in an article, “Economic impact of transgenic

crops in developing countries", to be published in the journal Current Opinion in Biotechnology.

Raney notes that evidence shows that farmers in developing countries can benefit from transgenic crops citing the experiences of farmers in China, Argentina, South Africa, Mexico, and India. However, where institutional conditions are weak, "ensuring access will remain a formidable challenge".

The full text of the article is available for subscribers at http://www.sciencedirect.com.

WORLD BANK REPORT CALLS FOR DOUBLING IN RURAL IRRIGATION INVESTMENTS

Investment in irrigation programs should double to US$40 billion a year with aims of improving productivity to avoid a potential global food crisis in the next two decades, says a new World Bank Report. Food demands are expected to double by 2030, as global population increases by an additional two billion people. Most of the additional food will be needed in developing countries. The report "Reengaging in Agricultural Water Management: Challenges and Options" was released during the Fourth World Water Forum that concluded on March 22 in Mexico City.

According to Kevin Cleaver, Director Agriculture and Rural Development, World Bank, "about 60% of the extra food to meet the increasing demand will come from irrigated agriculture. At the same time, we face the challenges of increasing farmer incomes, reducing rural poverty and protecting the environment, all from an increasingly constrained water resources base." The report recommends an integrated approach to agricultural water management to ensure farmers have reliable access to water and cost effective means of crop production. Water management policies must also achieve a balance between water demands across a range of sectors in addition to agriculture, and must address environmental risks and benefits.

For more information visit: http://www.worldbank.org/

AFRICA

AGRI BIOTECH NETWORK IN AFRICA LAUNCHED

The Food and Agriculture Organization (FAO) and the African Biotechnology Stakeholders Forum (ABSF) launched an agricultural biotechnology network for

professionals and other stakeholders in Africa. Agricultural Biotechnology Network in Africa (ABNETA) aims to build a knowledge base in plant breeding and biotechnology to facilitate access to reliable information on new technologies to improve agricultural production and reduce hunger.

While launching the network at the Africa Biotechnology Stakeholder's Forum (ABSF) secretariat in Nairobi, Agriculture Minister Kipruto Kirwa of Kenya said ABNETA would provide crucial data needed to inform decision making on matters of self-sufficiency in food production in the continent. The Network provides a common platform and tools to share, learn, discuss and decide agricultural matters on the continent.

ABSF will manage and implement ABNETA through national coordinators who will collect and collate breeding and biotechnology information from both government and private sectors. It will organize meetings, workshops and seminars to enhance the goals of the network.

For more information contact Daniel Otunge on dotunge@absfafrica.org or visit http://www.abneta.org.

FRAMEWORK FOR SUSTAINABLE DEVELOPMENT IN AFRICA

African Heads of State and Governments have endorsed the Comprehensive Africa Agricultural Development Programme (CAADP), a framework which sets the focus and priorities for sustainable agricultural development in the Eastern and Central African (ECA) Region. CAADP will be largely implemented by the Common Market for Eastern and Southern Africa (COMESA), in collaboration with other regional economic organizations, research institutes, and international organizations. CAADP is supported by African and international donors, including USAID, the World Bank and DFID. USAID has programmed approximately US$ 200 million per year for the next five years to CAADP. The initiative is currently active in six countries: Ghana, Kenya, Mali, Mozambique, Uganda and Zambia.

The objectives of CAADP are to: extend the area under sustainable land management and reliable water control systems; improve the productivity of agriculture with particular attention to small-scale farmers, especially women; enhance rural infrastructure and trade related capacities for market access; increase food supply, reduce hunger and improve responses to food emergency crises; and advance agricultural research, technology dissemination and adoption.

COMESA recently held a series of meetings with donors and collaborating partners to discuss CAADP priorities, outline some of the collaborative

mechanisms that will be used in the field implementation of key CAADP activities, and agree on a schedule of implementation of key events.

For more information on CAADP write to Chikakula Miti at: CMiti@comesa.int

FINAL DRAFT FOR MALAWI BIOTECH POLICY

Top government officials from the Ministries of Science and Industry, Agriculture, Trade and Private Sector Development and Environmental Affairs are set to meet in Lilongwe to discuss the final draft of Malawi's Biotechnology Policy. The regulatory framework will cover crosscutting issues such as science, agriculture, trade, safety, environment and human health.

Alick Manda, Chief Scientist at the National Research Council of Malawi, was quoted by Nation Malawi as saying that the draft will eventually be subjected to a national stakeholders' meeting later in April. The draft is expected to either amend or change the 2002 Biosafety Act.

See the full article in
http://www.nationmalawi.com/articles.asp?articleID=15802

ASIA

INDIA DRAFTS AMENDMENTS TO FOOD GUIDELINES

India's Ministry of Health and Family Welfare, New Delhi, India has issued the Draft Notification to amend the Prevention of Food Adulteration Rules 1955 for Labeling of Genetically Modified (GM) Foods. The draft rules, based on the recommendations of the Indian Council for Medical Research, are open for reactions and suggestions from stakeholders.

The amended rules stipulate that any GM food, whether imported or domestically produced, needs to be labeled. The label should indicate that the specific food contains GM material and has been subject to genetic modification. Imported food product that may contain GM material likewise needs clearance for marketing and use from the country of origin.

For more information on the draft rules, contact Bhagirath Choudhary at: b.choudhary@cgiar.org.

BIODIESEL FOR MALAYSIANS

The Prime Minister, Datuk Seri Abdullah Ahmad Badawi launched a made-in Malaysia biodiesel. Called “Envo Diesel”, it consists of five per cent palm oil and 95 per cent diesel. The Government has already issued seven licenses to companies interested in building biodiesel plants.

Malaysia had earlier announced its biodiesel policy guidelines which covers both legislative and industry incentives. The country expects to produce up to 500,000 tons of biodiesel to offset its dependence on fossil fuel.

For more information, email Mahaletchumy Arujanan of the Malaysian Biotechnology Information Centre (MABIC) at maha@bic.org.my or visit the MABIC website at http://www.bic.org.my

EUROPE

CALL FOR MORE BALANCED APPROACH TO REGULATE NEW FARMING PRACTICES

Society could be losing out on the environmental benefits of new agricultural technologies because regulators are only looking for the potential damage, according to a report produced by the Advisory Committee on releases to the Environment (ACRE). The report, entitled “Managing the Footprint of Agriculture: Towards a Comparative Assessment of Risks and Benefits for Novel Agricultural Systems” was drawn in response to requests by the United Kingdom Secretary of State for Environment, Food and Rural Affairs and the Agriculture and Environment Biotechnology Commission, to assess the wider implications of the Farm-Scale Evaluations (FSEs) of genetically modified herbicide tolerant crops.

While the report strongly endorses the need to ensure that new crops and farming practice will not damage biodiversity, it argues that the current regulatory system is flawed because it doesn't weigh possible damages against the potential benefits for the environment. Professor Chris Pollock, Chair of ACRE said: "We need to ensure that society does not lose out on the potential benefits of new technologies because we are looking too narrowly at the problems”.

ACRE is an independent advisory committee composed of leading scientists. The Committee's main function is to give statutory advice to Ministers in the UK and devolved administrations on the risks to human health and the environment from the release and marketing of genetically modified organisms (GMOs).

To read the full report visit:
http://www.defra.gov.uk/environment/acre/fsewiderissues/index.htm

NEW GE LAW APPROVED BY GERMAN BUNDESRAT

The German Bundesrat (one of the five permanent constitutional organs of Germany) has approved the draft of a New Genetic Engineering Law with a large majority, and with the support of the majority of political parties. Dr. Peter Paziorek, Parliamentary Undersecretary of State in Ministry for Nutrition, Agriculture and Consumer Protection, said that German politicians set a clear signal to stand together when it comes to avoiding financial damage to their country. The European Commission had threatened to file a case with the European Court of Justice against Germany if the country failed to enact a national Genetic Engineering Law based on the guidelines of the European Community. The law is yet to be ratified by the Upper House of Parliament.

The third law to modify the Genetic Engineering Law concerns mainly regulations that will determine its form and procedures, such required documentation, evaluation and monitoring measures, and public participation. Paziorek announced that the legislation will be further modified to include requests from the Upper House of Parliament and the outcomes of multi-stake holder discussion forums. The law aims to provide a legislative solution to balance human health and environmental concerns with the requirement and benefits derived from innovation. The Bundesrat had previously rejected several drafts of the legislation due to disagreements between the Federal Government and the German States, in particular with regards to issues of coexistence of GM and conventional crops and of liability regulations.

For more information (in German) visit: http://www.bmelv.de/cln_045/nn_751688/DE/12-Presse/Pressemitteilungen/2006/041-Gentechnikgesetz.html__nnn=true, and http://www.bio-pro.de/en/index.html

GRAPE GENOME SEQUENCED BY ITALIAN TEAM

A team of researchers at the Italian Istituto Agrario di San Michele, in collaboration with Myriads Genetics Inc., have elucidated the genetic code of the 19 chromosomes of grape, of the Pinot noir cultivar, the first fruit crop and the second food crop after rice to have its genome sequenced. The initiative took six years and was funded by the government of the Trento Province, Italy. The information obtained will be publicly available to the scientific community for grape quality and agronomic improvement initiatives once the final stages of the project are completed (scheduled in the next few months). Meanwhile, the researchers welcome requests of information on specific genes.

For more information (in Italian) visit: http://www.ismaa.it/#

RESEARCH

LACK OF AGREEMENT ON TOLERANCE AND TRACEABILITY OF GMOS THREATENS GLOBAL TRADE

At present, genetically modified (GM) crops are cultivated in 21 countries, and it is estimated that initiatives to develop novel biotech crops are underway in at least 63 countries, with increasing involvement of developing countries. Adventitious presence (AP) of GM materials in non-GM crops is considered an inevitable consequence of the production of biotech grains, and may be result of cross-pollination, seeding errors, and/or commingling during harvest, storage and processing. The AP of GM material in conventional crops is at the centre of a heated international debate, due to the potential adverse effects on biodiversity of GM “escapes”. The Third Meeting of the Parties (MOP-3) to the Cartagena Protocol on Biosafety, which concluded last week in Brazil, resulted in the adoption of international documentation requirements for living modified organisms (LMOs) in the international trade of agricultural commodities.

What challenges do we face in terms of availability of GMO detection methods, validation and implementation? In the review: “Adventitious presence of GMOs: scientific overview for Canadian grains” researchers from the Canadian Grain Commission examine these issues. According to the authors, the main challenges for dealing with the AP of GM materials in non GM crops include:

* Variation in the tolerance and traceability requirements among different countries

* Lack of internationally validated and harmonized assay kits for the detection of GM material for many commercialized biotech crops

* Lack of specific protocols, DNA sequence information and certified reference materials, often considered confidential proprietary information for crops developed by the private sector

* Absence of international consensus on sampling methods

* Technical constrains and difficulties in the interpretation of units to be compared

* Inability to differentiate between crops with stacked genes and mixtures of different GMOs

The authors also identify a case study where testing procedures to detect the presence StarLink TM corn, which had been approved in the US but not in Canada, had minimal impacts on the Canadian grain industry. The factors that

made this possible were: the existence of effective regulations and validated detection protocols; effective monitoring; industry willingness to comply; and effective cooperation between the relevant authorities involved.

Subscribers to the Canadian Journal of Botany can read the article “Adventitious presence of GMOs: scientific overview for Canadian grains” at: http://pubs.nrc-cnrc.gc.ca/aic-journals/jan06.html#agronomy

IMPORTANT SECRETION PROTEIN FOR RICE DISEASE IDENTIFIED

Blast disease, caused by the pathogen *Magnaporthe grisea*, is one of the most devastating ailments of rice, and is estimated to destroy enough rice crops to feed 60 million people annually. The pathogen's high virulence is related to its remarkable ability to overcome plant defense mechanisms. In 2002, the whole genome of *M. grisea* was deciphered and made publicly available, as part of an international research effort to control rice blast. The presence of large numbers of genes encoding secreted proteins in the genome of *M. grisea* suggested that these may be important for pathogenicity. Proteins are processed for secretion by the Golgi body, a system of stacks of membrane sacs with vesicles pinching off from the edges of the sacs.

Researchers at the School of Biosciences, University of Exeter, UK, decided to investigate the functioning of the Golgi body and the protein secretory pathways in *M. grisea* to understand how the pathogen colonizes the plant without eliciting the host's defense responses. Their report: “A P-type ATPase required for rice blast disease and induction of host resistance” appears in the latest issue of the journal Nature.

The authors first identified a gene, MgAPT2, encoding a P-type ATPase with high similarity to enzymes required in yeast for efficient Golgi functioning. In order to investigate the role of MgAPT2 in the establishment of disease, the authors generated a *M. grisea* line lacking this gene, and demonstrated that mutant fungi were significantly affected in their ability to cause disease. Further, they show that neither the growth of the fungal hyphae, or the ability of the pathogen to penetrate the plant surface were impaired, but that MgAPT2 is required for the secretion of proteins during plant infection. MgAPT2 is also involved in generating a hypersensitive response (an early defense response that causes cell death to restrict the growth of a pathogen) in incompatible reactions. This discovery represents an important breakthrough in rice blast research.

Subscribers to Nature may read the full article at:
http://www.nature.com/nature/journal/v440/n7083/pdf/

SELECTION OF POTATO LINES RESISTANT TO MULTIPLE PATHOGENS

Potatoes rank number four in the list of world food crops (after rice, wheat and maize), and are grown worldwide. Potatoes are however affected by numerous diseases, which threaten potato crop production, in particular by small-scale, resource-poor farmers in developing countries who lack access to chemical controls and certified disease-free seeds. Classical breeding for resistance to pathogens involves the identification of resistance genes, often harboured by wild relatives of cultivated species. These genes are introgressed into cultivars by crossing the “donor parent”, which carries the resistance gene, to the “recipient parent” to be improved. The resulting progeny is then repeatedly backcrossed to the “recipient parent” to remove unwanted genes carried by the “donor parent”. Knowledge of the genetic position of the desirable traits and of closely linked DNA-based markers allows the targeting of specific genes for introgression, and provides a fast track to increase genetic gain in crop breeding programs. This technique is known as marker assisted selection.

Researchers at the Max-Planck Institute for Plant Breeding Research have developed potato lines that harbor multiple resistance genes by marker assisted selection, described in the report “Marker-assisted combination of major genes for pathogen resistance”. The article is published in the Online First section of the journal Theoretical Applied Genetics. The lines generated are resistant to four important potato pathogens: the Potato Virus Y, the soilborne fungus *Synchytrium endobioticum* (responsible for potato wart), and the root cyst nematodes *Globodera rostochiensis* and *Globodera pallida*. The selected plants can be used as sources of multiple resistance, and they are available from the IPK (Institut für Pflanzengenetik und Kulturpflanzenforschung) potato germplasm bank maintained at 18190 Groß-Lüsewitz, Germany.

Subscribers to Theoretical and Applied Genetics may access the PDF file of the article “Marker-assisted combination of major genes for pathogen resistance” at: http://www.springerlink.com/media/99a0hcptrm6rtg4vkyvm/contributions/x/4/5/4/x45451t272267m25.pdf

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DOCUMENT REMINDER

ONLINE TOMATO DATABASE

Researchers now have access to data they can use to develop new theories and information about tomato genetics. Already available online is the Tomato Expression Database (TED), a Cornell University website funded by the

Agricultural Research Service (ARS) of the US Department of Agriculture and the National Science Foundation.

According to the ARS, the TED website provides large-scale tomato gene expression data generated from "microarrays" - collections of microscopic DNA samples on glass chips that allow scientists to assess thousands of genes in an organism. The site is maintained by ARS in collaboration with Cornell, the University of Florida, and Virginia Tech University's Virginia Bioinformatics Institute.

View the database at http://ted.bti.cornell.edu.

ANNOUNCEMENTS

SEMINAR ON DISCLOSURE REQUIREMENTS IN PATENT APPLICATIONS

A seminar to discuss disclosure requirements in patent applications has been slated for March 28, as a side event of the 8th Conference of the Parties to the Convention on Biological Diversity, Curitiba, Brazil. The event, “Disclosure requirements in patent applications: a tool against misappropriation or an obstacle to innovation?”, aims to: review disclosure proposals presented in different discussion groups; identify the gaps in the international governance of this area; explore the concerns of various interest groups regarding misappropriation of genetic recourses; establish whether disclosure requirements are a potential obstacle to innovation in the biotechnological field.

Incorporation of disclosure requirements would entail amendments to some of the fundamental International Intellectual Property Law instruments such as the Trade Related Intellectual Property Rights Treaty (TRIPS) under the World Trade Organisation (WTO), and the Patent Cooperation Treaty (PCT) under the World Intellectual Property Organization (WIPO) to incorporate the objectives of the Convention on Biological Diversity (CBD).

The seminar is organized by the International Centre for Trade and Sustainable Development (ICTSD), an independent non-profit and non-governmental organization established to contribute to a better understanding of development and environment concerns in the context of international trade.

For more information visit: http://www.ictsd.org/dlogue/2006-03-28/2006-03-28-desc.htm

BIOTECH CONFERENCE IN INDIA SLATED FOR JUNE

Bangalore Bio 2006 will take place on 7-9 June, in Bangalore India. The international conference will address key issues on biotech landscape, current trends in innovation, scientific discoveries in biotechnology, sustenance, Governance Issues and the future of the Indian biotechnology industry in the global arena. Keeping in view the potential of biotech application in Indian agriculture, the Bangalore Bio 2006 will give special thrust to agri-biotechnology, highlighting current challenges and future opportunities. Topics for discussion include: transgenic crops and agri-biotechnology; functional foods and plant pharmaceuticals; biofuels; biofertilizers and biopesticides; and IPR, safety and regulatory issues.

Fore more information visit: http://www.bangalorebio.in

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