CropBiotech Update

INTERNATIONAL SERVICE FOR THE ACQUISITION OF AGRI-BIOTECH APPLICATIONS

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).

In This Issue

June 15, 2007

NEWS

Biofuels Supplement (15 Jun 2007 Issue) [Read latest news]

<< Previous Issue | **[Print PDF | Archive | Translations | Subscribe | RSS]**

News

GLOBAL

[Top]

BT CROPS RELATIVELY KIND TO NON-TARGET INSECTS

A recent study suggests that crops modified with insect-resistance are relatively kind to non-target insects. An analysis of 46 field experiments shows that Bt fields contained more invertebrates than fields sprayed with insecticide. But both have fewer insects than fields that were not sprayed with insecticides. Michelle Marvier of Santa Clara University, California and colleagues used a meta-analysis approach to obtain a clearer picture of life in the field. The researchers combined the data from field studies that measured invertebrate populations near Bt crops and the results of field trials submitted to the Environmental Protection Agency as part of the approval process for the engineered crops. The approach may also address other concerns about transgenic crops, such as whether they promote new types of pests, or encourage weeds that have a knock-on effect on butterflies and other insects.

Read the news article at http://www.nature.com/news/2007/070604/full/070604-9.html and the abstract of the paper "A Meta-Analysis of Effects of Bt Cotton and Maize on Nontarget Invertebrates" at http://www.sciencemag.org/cgi/content/abstract/316/5830/1475.

[Top]

GM CANOLA HAS MARKET SAYS STUDY

Can genetically modified (GM) canola find a place in the international market? A report by the Australian Bureau of Agricultural and Resource Economics (ABARE) says that GM canola is finding acceptance in international markets at prices very similar to those of conventional canola. Traditional import markets like Japan, Mexico, China, Pakistan and Bangladesh generally accept GM as they would conventional canola at similar price levels. The exception is the European Union, which presently does not allow imports of the main GM canola varieties. Nevertheless, Canada which accounts for over 70% of canola exports worldwide exports mostly GM canola.

The report adds that market access issues are not the only concern. Other factors to consider include agronomic and environmental benefits, and the costs associated with keeping GM and non-GM separate in the handling and storage process.

Read the full report at http://www.abareconomics.com/corporate/media/releases_2007.html.

[Top]

DOE JOINT GENOME INSTITUTE ANNOUNCES GENOME SEQUENCING TARGETS FOR 2008

The Department of Energy Joint Genome Institute (DOE JGI) has announced the latest Community Sequencing Portfolio (CSP). Among these projects, one of the most ambitious is that of the eucalyptus tree genome, which is geared to the generation of resources for renewable energy. The second largest selected CSP project is the sequencing of foxtail millet (*Setaria italica*), a close relative of several prospective biofuel crops, including switchgrass, napiergrass, and pearl millet. Next in the portfolio is the marine red alga *Porphyra purpurea*, for the

study of carbon fixation.

The CSP will also pursue eight smaller eukaryotic projects in 2008, including the sequencing of the genomes of the fungus *Paxillus involutus, the phytoplankton Phaeocystis,* the leaf-degrading fungus *Agaricus bisporus,* the ciliated protozoa, *Tetrahymena thermophila,* the soybean pathogen *Heterodera glycines, and liverwort. Another project will deal with the genomes of coniferous trees.*

Read the news article at http://www.jgi.doe.gov/News/news_6_8_07.html.

[Top]

PLANTS CAN TELL KIN FROM STRANGERS

It is not only animals, which can tell siblings from strangers; it seems that plants can perform the same trick. Susan Dudley and Amanda File of McMaster University in Canada have shown that plants grown alongside unrelated neighbors are more competitive than those growing with their siblings — investing more energy into growing roots when their neighbors are not of kin. The researchers used a beach-dwelling plant, the Great Lakes sea rocket (*Cakile edentula*) as model plants.

Plants can sense the presence of neighboring plants through changes in water or nutrients available to them or through chemical cues in the soil, and can adjust their own growth accordingly. "That plants have a secret social life is something well known to plant ecologists," says Dudley --- though how the plants recognize siblings is still a mystery.

Readers can access the article at http://www.nature.com/news/2007/070611/full/070611-4.html.

AFRICA

[Top]

ROLE OF INPUTS AND PRODUCTIVITY IN AGRICULTURAL GROWTH IN AFRICA

Agricultural and economic growth in Africa will be fueled by land, agrochemicals, labor quantity, labor quality, tractors, livestock, technology and random factors, all put together, according to Dr. Guy Blaise Nkamleu, of the International Institute of Tropical Agriculture (IITA). Nkamleu looked at why some African countries had experienced rapid economic growth, while others experience economic stagnation and regression under the same conditions. The driving forces affecting African agricultural growth must be explored and acted upon to remedy the situation, he added.

Nkamleu's study provides a quantification of the contribution of different inputs to the agricultural growth, and also highlights the extent to which agricultural growth contributors vary across countries and regions in relation with different country conditions, institutions and politico-historical factors. "These findings have important implications for research and show types and the extent of interventions needed to be put in place in each region/countries for enhancing the agricultural growth of African agriculture", Nkamleu said.

Read the news article at http://www.iita.org/cms/details/news_details.aspx?articleid=1062&zoneid=81.

[Top]

KOFI ANNAN TO ASSUME POST AS CHAIRMAN OF THE BOARD OF AGRA

Former UN Secretary-General Kofi Annan was appointed by the Alliance for a Green Revolution in Africa (AGRA) as its first chairman. While still with the UN, Annan has called for a "new uniquely African Green Revolution" that will feed the continent. As Chairman of the Board of AGRA, Annan will meet with African farmers, entrepreneurs, scientists and political leaders to discuss and promote the work of the Alliance. He will articulate the Alliance's goal to dramatically boost farm productivity and incomes while at the same time safeguarding the environment and advancing equity.

AGRA was established last year with grants from the Bill & Melinda Gates Foundation and the Rockefeller Foundation in response to recent calls by African leaders to focus on Africa's agricultural development. The Alliance is already working with African crop scientists and small-scale farmers to use conventional breeding techniques to develop more productive and resilient varieties of Africa's major food crops, as well as the means to distribute them. It is also supporting program that will increase the number of African agricultural scientists and program to monitor and evaluate its work.

The news article is available at http://www.agra-alliance.org/news/pr061407.html.

[Top]

SCIDEV SPOTLIGHT ON AGRI-BIOTECH IN SUB-SAHARAN AFRICA

A plethora of new policy frameworks, initiatives and programs has recently emerged in Africa promoting agri-biotechnology. African governments and scientists, foreign aid donors, international research centers, philanthropic foundations, and the private sector are all players in this "new green revolution".

SciDev.Net, a network set to provide science and technology information to developing countries, has recently published a "spotlight" to shed light on the current status and future prospects for agri-biotech in sub-Saharan Africa. Included are a review of the history and recent developments in biotechnology politics in the region; facts and figures outlining existing initiatives; and key stakeholders' views on major regulatory proposals.

The site can be accessed at: http://www.scidev.net/dossiers/index.cfm?fuseaction=specifictopics&dossier=6&topic=186&CFID=1968860&CFTOKEN=70213954

AMERICAS

[Top]

BIOFUEL CROPS PROVIDE ENERGY, CURB GREENHOUSE GASES

Not only are biofuel crops used in producing energy, they can also help reduce the levels of greenhouse gases in the atmosphere, according to a study by scientists at the United States Department of Agriculture Agricultural Research Service (ARS). The researchers compared the net production of carbon dioxide and two other greenhouse gases associated with producing biofuels from several different bioenergy crops. They found that switchgrass and hybrid poplar are more effective in curbing greenhouse gases than the current fad corn and soybeans.

Bioenergy crops offset their greenhouse-gas contributions in three key ways: by removing carbon dioxide from the air and storing it in crop roots and soil as organic carbon; by producing co-products like protein for animal feed, which saves on energy to make feed by other means; and by displacement, whereby replacing a fossil fuel with a biobased one "recycles" rather than adds more carbon dioxide to the atmosphere.

The news release is available at http://www.ars.usda.gov/is/pr/2007/070608.htm.

[Top]

DUPONT UNVEILS NEW SEED RESEARCH CENTER IN BRAZIL

DuPont has announced the opening of its newest seed research center, which will be fully operational by 2008, in Porto Nacional, Brazil. The research center will focus on winter nursery capabilities for corn and soybean breeding; drought tolerance and heat stress research; as well as local product development efforts. "We're confident the opportunities in agriculture will continue to grow in Brazil, including the expansion in soybean production, the transition from low technology to high technology corn production and new biotechnology traits," said Dean Oestreich, DuPont vice president and general manager and Pioneer Hi-Bred president.

Read the press release at http://www.pioneer.com/web/site/portal/menuitem.b9068631264de102a3869fd2d10093a0/.

[Top]

U of M TO STUDY CORN FOR DUAL PURPOSE USE

Researchers at the University of Minnesota and the US Department of Agriculture- Agricultural Research Service are set to study whether corn can be bred for dual-purpose use as a grain and biomass. The study will use DNA markers to create genetic information that can help develop new corn varieties that produce both high grain yields and stover that can easily be converted to fuel.

The U of M project is one of 11 bio-based fuels research efforts that have received funding from the US Departments of Agriculture and Energy.

See related article at http://ww.seedquest.com/news or contact Dr. Rex Bernardo, Professor of agronomy of the University of Minnesota, at berna022@umn.edu.

[Top]

NEW TECHNIQUE TO PROFILE GM CROPS

A new technique developed by scientists from the Institute of Industrial Fermentation in Madrid, Spain, analyzes the potential changes in the composition of amino acids in transgenic crops. It has the potential to improve the nutritional and safety profiling of the crops, and to show how transgenic organisms may match or differ from their conventional counterparts.

“Analysis of chiral amino acids in conventional and transgenic maize” published in the journal Analytical Chemistry, focuses on the chemical structure of the amino acids and measures the presence of “L” or “D” forms of the amino acids which affect nutritional quality and digestibility. In addition, the technique can also be used “as an additional indicator for assessing the existence (or not) of unexpected modifications in other metabolic pathways linked to the amino acids profile within a GMO”.

A short article about the research is available at http://www.foodnavigator.com/news/ng.asp?

n=77249-gm-nutrition-amino-acids.

ASIA AND THE PACIFIC

[Top]

JAPANESE RESEARCHERS DEVELOP RICE-BASED VACCINE FOR CHOLERA

Scientists at the University of Tokyo have developed a genetically modified strain of rice that expresses a vaccine for cholera. The Japanese researchers created the rice-based cholera vaccine by inserting the genetic material from the cholera bacterium into the genome of the rice plant. The researchers used two types of rice plants to generate the vaccine: Kitaake, which produces normal rice, and Hosetsu, which produces dwarf-type rice.

Cholera is a bacterial disease that affects the intestinal tract. It is caused by the bacterium *Vibrio cholerae* and is transmitted to humans through contaminated food and water. The advantages of a rice-based vaccine against cholera are the safety in administering the vaccine, and the lower cost of production. It represents an improvement on most traditional plant-based oral vaccines because the rice can be stored at room temperature for at least a year and a half and can remain effective. In addition, purification of the vaccine antigen from rice seed is not necessary, resulting in reduced costs. Rice also has greater protein content than some of the starch-based edible vaccines currently under experimentation for a variety of infectious diseases.

Read the article at http://www.technologyreview.com/Biotech/18876/.

[Top]

GM WHEAT APPROVED FOR LIMITED RELEASE IN AUSTRALIA

Australia's Gene Technology Regulator approved an application from the Victorian Department of Primary Industries for the limited and controlled release of genetically modified wheat lines containing introduced genes for drought tolerance. The license was issued after extensive consultation on the Risk Assessment and Risk Management Plan with various public and private sectors. A trial at two sites in Victoria will be implemented during the May 2007 to March 2008 growing season.

See the notification of decision at http://www.ogtr.gov.au.

[Top]

NEW GENERATION OF SCIENTISTS ENCOURAGED TO HELP DEVELOPING COUNTRIES

Young scientists are often sheltered in advanced research institutes and are increasingly isolated from people from poorer nations who could benefit from their work. The three-week "Rice: Research to Production" course, held last month at the International Rice Research Institute (IRRI) in the Philippines, will encourage some of the world's best and brightest young scientists to consider careers helping developing nations. During the course, participants learned first the rudiments of rice cultivation. Then, they were shown the latest in rice research, and given hands-on experience in such areas as rice breeding and fertilizer management.

Sponsored by the National Science Foundation (NSF) of the United States, the United Kingdom's Gatsby Foundation, and IRRI, the new course attracted 26 participants from 12 nations, with half coming from the U.S. and European

Union and half coming from rice-growing countries in Asia and Africa. The new program also seeks to reverse the one-way traffic of recent decades that saw thousands of young scientists from the developing world studying and taking jobs in the developed world.

IRRI has already confirmed plans to run the same course next year. Read the press release at http://www.irri.org/media/press/press.asp?id=154.

[Top]

INDONESIA TURNS TO HYBRID VARIETIES FOR SELF-SUFFICIENCY IN RICE PRODUCTION

"Indonesia should be able to achieve self-sufficiency in rice production in the next year." This was stated by Jusuf Kalla, Vice President of Indonesia, after signing last week in China a collaboration agreement between PT. Penta Prima Pusaka, Sichuan Guohao Seed Industry, Indonesia, and the Rice Research Institute of Department of Agriculture, Chengdu, Sichuan, China, to build an Integrated Hybrid Centre in Indonesia. The Centre will count with the technical support of Chinese experts, and is expected to produce the qualified rice seed required by farmers in 2008.

"Hybrid seed varieties such as Bernas and Bernas Rokan will meet the target of increasing rice production by 2 million tons in 2007, and by 5% a year in the following years", said Anton Apriyantono, Indonesian Minister of Agriculture. According to trial experiments, production could reach 10 tons of rice per hectare.

In a related development, Apriyantono announced the release of 14 superior hybrid rice seed varieties this year, with improved yields and higher tolerance to abiotic stresses. The new varieties are the result of a two-year collaboration between the Rice Research Institute of Thailand and the government of Indonesia.

For more information visit:
http://www.kompas.co.id/kompas-cetak/0706/11/ekonomi/3591333.htm and http://www.tempointeraktif.com/hg/ekbis/2007/06/12/brk,20070612-101820,id.html, or contact the Indonesian Biotechnology Information Center (INDOBIC) at indobic@biotrop.org

---

[Top]

"COMMUNITY OF PRACTICES" CONCEPT FOR RICE PRODUCTION IN THE MEKONG REGION

The Rice Gene Discovery Unit, a specialized lab jointly set up by BIOTEC and Kasetsart University, has launched the project "Community of Practices" Concept (CoP) applied to Rice Production in the Mekong Region. This project aims to promote the implementation of marker aided selection (MAS) into the current rice breeding program in the Mekong region, particularly Thailand, Laos, Cambodia, and Myanmar through comprehensive hands-on training program and sharing of genomic information.

Six researchers from Cambodia (Cambodian Agricultural Research and Development Institute, CARDI), Laos (National Agricultural and Forestry Institute, NAFRI) and Myanmar (Department of Agricultural Research, DAR), as well as two Thai researchers from Ubon Ratchathani University, will perform the MAS breeding on their own rice varieties in Thailand for 2 weeks. Emphasis will be on drought, salinity and grain quality improvement. The project, funded by Generation Challenge Programme, was designed to address the limitation of short-term workshops as well as the limitation of research facilities in these countries.

Read more at:
http://www.biotec.or.th/biotechnology-en/newsdetail.asp?id=2508

EUROPE

[Top]

REVISED BIOTECH PATENT LAW GETS GREEN LIGHT IN SWITZERLAND

The Swiss parliament recently voted in favor of a revised patent law, which will provide more protection to biotechnology discoveries such as genetic sequences. A proposal from the government stating that a patent of a genetic sequence should not be restricted to one particular purpose was approved, despite arguments that this would lead to a monopolistic research situation created by patent-holders. Justice Minister Christoph Blocher, however, said that the new Swiss law would prevent monopolies from taking root. In the issue of biopiracy, the legislation states a series of exceptions, where organisms may not be patented. These include cloning human beings and using human embryos for non-medical purposes. Patenting plant varieties and animal species is also not permitted.

Read the news article at http://www.swissinfo.org/eng/science_technology/detail/New_biotech_patent_law_gets_green_light.html?siteSect=511&sid=7917118&cKey=1181641348000.

[Top]

SWISS RESEARCH PROGRAM ON BENEFITS AND RISKS OF GM PLANTS LAUNCHED

A research program comprising of 27 scientific projects that will investigate aspects of biology, economics, law and ethics in respect to genetically modified plants was recently launched by the Swiss National Science Foundation (SNF). The program will run until 2011, and is the consequence of a referendum that placed a five-year moratorium on the cultivation of genetically modified organisms (GMOs) until further research delivers new insights into the safety and coexistence of GM crops. Several projects will focus on the safety and coexistence of GM and non-GM crops under Swiss topographical conditions, and address the question of whether GM plants and Swiss agricultural and environmental goals are compatible. The research program also will assess current legal and administrative frameworks for GMOs, as well as deliver monitoring standards suitable to Swiss agriculture.

Read the news article at http://www.gmo-compass.org/eng/news/messages/200706.docu.html#125.

Research

[Top]

CONTAINMENT OF GM COTTON IN AUSTRALIA

A series of experiments indicated that there is a higher rate of gene flow between GM and conventional cotton in northern Australia than in other regions of the country. This is due to higher pollinator numbers in the northern tropical region, said researchers from the CSIRO Plant Industry and the Cotton Seed Distributors Ltd. Cotton is primarily an inbreeding plant, but cross-pollination can occur due to insect activity.

The researchers reported the effectiveness of buffer zones and isolation distances in reducing the potential flow of transgenes in pollen to nearby cotton crops. Their experiment looked at several insect and herbicide resistant cotton varieties in government and commercial farms. They concluded that gene flow observed in cotton is almost consistent

with all other pollen dispersal studies in plants - there is a high rate of gene flow over short distances and it becomes stochastic over long distances.

The paper published in the journal Agriculture, Ecosystems and Environment can be accessed by subscribers at http://dx.doi.org/10.1016/j.agee.2006.11.019.

[Top]

VIRUS-RESISTANT GM COMMON BEAN FROM RNAI

RNA interference (RNAi) was used to obtain a common bean line resistant to bean golden mosaic virus (BGMV), the virus responsible for golden mosaic disease in the crop. The research, conducted in Brazil, reports that 93% of the plants from the transgenic resistant line were free of symptoms upon high pressure inoculation.

BGMV is a major constraint in bean production that causes yield losses between 40 to 100%. The virus is transmitted by the whitefly *Bemisia tabaci*. The RNAi approach uses an RNA interference construct to silence the sequence region of the AC1 viral gene, producing resistant common bean. Compared to the non-transgenic control with 100% golden mosaic incidence after 38 days of inoculation, the transgenic line has only 7.8% disease incidence.

For details the complete paper published in Molecular Plant-Microbe Interactions can be accessed by subscribers at http://dx.doi.org/10.1094/MPMI -20-6-0717.

[Top]

GENOMICS FOR STUDYING LEGUME SEED DEVELOPMENT

Genomics now makes it possible to begin to understand what genes are required to make a legume seed and its development, said Brandon Le and colleagues at the University of California. The group outlines how their laboratories are using functional genomics to identify genes that program legume seed development in a paper published in the journal Plant Physiology.

Le and colleagues are optimistic that information from genomics shall permit novel approaches to breed and engineer legume seeds with new agronomic traits. Together with other developments in the techniques such as laser capture microdissection (LCM) technology and RNA profiling, comparative genomics can facilitate the discovery of genes essential for seed and embryo development, including those important for specific legume traits.

The paper can be accessed by journal subscribers at http://www.plantphysiol.org/cgi/doi/10.1104/pp.107.100362.

Announcements

[Top]

SEMINAR ON “FUTURE OF AGRICULTURE: THE BIOTECHNOLOGY ERA”

The University of Jember, Indonesia, will hold a national seminar on “Future of Agriculture: The Biotechnology Era” on 20 June 2007. The theme is ‘Analysis of Indonesian agriculture future in biotechnology era and biotechnology

studies based on society and ecological dimension'. Topics will include studies for future agriculture development based on social-economy aspect; agricultural biotechnology development and implementation for increased agricultural production; biotechnology to develop bioactive compounds and natural resources; and biosafety and food safety analysis on genetically modified products.

For more information, please visit http://www.unej.ac.id/fakultas/mipa/utama.htm.

[Top]

Document Reminders

BOOK FOR BIOTECH JOURNALISTS IN E-COPY

"Genes are Gems: Reporting Agri-Biotechnology: A Sourcebook for Journalists" is now available for downloading from the website of the International Service for the Acquisition of Agri-biotech Applications (ISAAA). Published by ISAAA and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the book captures the knowledge and wisdom gained from media workshops and distills the practical advice and guidelines for science communicators and journalists.

Lead author Dr. Rex Navarro of ICRISAT says that the sourcebook gives background information on agri-biotechnology, perspectives of genetically modified crops, general communication principles, science communication and science journalism guidelines, among others. Download the book at http://www.isaaa.org/kc.

EU-27 ANNUAL BIOTECHNOLOGY REPORT 2007

The EU-27 Annual Biotechnology Report for 2007 is now available on the web. The report is published by the United States Department of Agriculture Foreign Agricultural Service. It highlights the status of approvals of GM crops in the European Union, marketing issues, labeling of GM products, and coexistence.

To read more, visit http://www.fas.usda.gov/gainfiles/200706/146291311.pdf

FROM THE BICS

PUNJABI JOURNALISTS BRIEFED ON AGRIC BIOTECH

The Chandigarh Press Club, the Punjab State Council for Science and Technology, Ministry of Environment and Forest and the International Service for the Acquisition of Agri-biotech Applications (ISAAA) jointly organized a Media Workshop on Agricultural Biotechnology in Punjabi and English in Chandigarh on 7th June 2007.

The event, the second of a series of media workshops in local languages, was entirely supported by the Ministry of Environment and Forest of India under the GEF-World Bank biosafety capacity building project. More than 75 journalists and reporters from print and electronic media attended the program. Resource persons included Dr SR Rao form Department of Biotechnology, Dr BS Dhillon and Dr R G Saini from the Punjab Agriculture University (PAU), Dr Guriender Randhawa from the National Bureau of Plant Genetic Resources (NBPGR), Dr. N S Tiwana and Dr J K Arora from the Punjab State Council for Science and Technology, Dr. Gurdial Singh and Dr. Palwinder Singh Aulukh from the Dept of Agriculture, Govt of Punjab, Mr. Balwant Takshak from the Chandigarh Press Club, and Bhagirath Choudhary from ISAAA.

For more information contact Dr JK Arora at jkarora20@rediffmail.com. Read more about this event at http://cities.expressindia.com/fullstory.php?newsid=240061 and http://www.tribuneindia.com/2007/20070608/main7.htm

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

To stop receiving this newsletter, please send an e-mail message to knowledge.center@isaaa.org and write, "unsubscribe newsletter" in the subject box.

Please visit CropBiotech Net web pages (http://www.isaaa.org/kc) to view previous issues of this newsletter and see other available resources for download.