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)

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NEWS

*** Global ***

POPLAR: FIRST TREE GENOME SEQUENCED

The poplar black cotton wood, Populus trichocarpa, is the latest to join the club of sequenced genomes. Poplar was chosen as model crop for biofuel production as it has an extraordinary growth rate, is amenable to genetic manipulation, and has a relatively compact genome size of 480 million nucleotide units (40 times less than pine). The research, published this week in the scientific journal Science, is the result of a four-year initiative led by the U.S. Department of Energy's Joint Genome Institute (DOE JGI) and Oak Ridge National Laboratory (ORNL), joining the efforts of 34 institutions from around the world.

“Biofuels could provide a major answer to our energy needs” said DOE's Under Secretary for Science Dr. Raymond L. Orbach. “Fine-tuning plants for biofuels production is one of the keys to making biofuels economically viable and cost-effective. This research, employing the latest genomic technologies, is an important step on the road to developing practical, biologically-based substitutes for gasoline and other fossil fuels.”

More information available at: http://www.jgi.doe.gov/News/news_9_14_06.html, http://www.sciencemag.org/cgi/content/full/sci;313/5793/1556a, and http://www.sciencemag.org/cgi/content/short/313/5793/1596.

DEFINE PRECAUTIONARY PRINCIPLE, SAYS UNU-IAS REPORT

The “precautionary principle” states that if an activity, notably in the fields of science and technology, may pose adverse effects on either human health or the environment, precautionary measures should be adopted even if the relationship between cause and effect are not fully established scientifically.

However, what constitutes legitimate precaution versus protectionism in disguise when regulating the global trade in novel biotechnology applications? With biotech foods the focus of a World Trade Organization (WTO) ruling scheduled to be released this month, and a growing number of international trade disputes over biotech crops, it is imperative to adopt a common, better definition of the “precautionary principle”, argues a report by the United Nations University/Institute of Advanced Studies (UNU/IAS). The report calls for a better international agreement on common approaches to risk assessment, and suggests the WTO dispute settlement system is not the “best way in which to resolve disputes in these important areas of policy making”.

“A clearer understanding of the various uses of the precautionary principle or approach will contribute to a more cohesive and harmonious approach to the regulation of biotechnology at the international level and mitigate some of the damage that is threatened by the current state of affairs” says UNU-IAS Director A.H. Zakri.

More information is available at:
http://www.ias.unu.edu/news/details.cfm/articleID/808.
Read the full UNU-IAS “Trading precaution: The Precautionary Principle and the WTO” report at:
http://www.ias.unu.edu/binaries2/Precautionary%20Principle%20and%20WTO.pdf

PLANTS AS COMMERCIAL PHARMA FACTORIES: NOW ONE STEP CLOSER

Scientists at Icon Genetics GmbH, a subsidiary of Bayer Innovation GmbH, and Bayer BioScience NV, a Belgian subsidiary of Bayer CropScience, report on a new technology that can provide large quantities of human monoclonal antibodies from biotech plants. With yields as high as 0.5 grams of antibody per kilogram of plant material, the new process is suitable for the research, industrial scale-up, and rapid manufacture of antibodies for health care use. It is also applicable in situations requiring rapid response such as pandemic events. The expression system is described in the latest issue of the scientific journal Proceedings of the National Academy of Sciences of the USA.

“We are taking the lead in moving plant-made biopharmaceuticals closer to commercial reality,” says Dr. Wolfgang Plischke, member of the Board of Management of Bayer AG.

Read the press release at:
http://www.icongenetics.com/html/news_details.php?id=5942&ityp=2
To read the article (open access) “Rapid high-yield expression of full-size IgG antibodies in plants coinfected with noncompeting viral vectors” visit:
http://www.pnas.org/cgi/reprint/0606631103v1?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=Giritch&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT.

IRD WORKS ON RYMV RESISTANCE IN RICE

France’s Institut de Recherche pour le Développement (IRD) is currently working on rice varieties engineered to be resistant to Rice Yellow Mottle Virus (RYMV). RYMV causes considerable yield losses. Prevention measures have been implemented to limit the spread of the disease, but IRD has found that the use of resistant varieties results in the greatest reduction in RYMV damage.

In a recently published paper in The Plant Journal, researchers have found that the Rymv1 gene is the best candidate for resistance to the virus. IRD has already transferred the gene by crossing it into agronomically important varieties, which they have given to various national institutions in the Ivory Coast, Senegal, and Madagascar; and international research institutions such as the African Rice Center (WARDA) for them to use in variety selection programs.

IRD scientists are also studying RYMV strains and the molecular mechanisms of plant resistance or susceptibility on the basis of direct interactions between the rice protein and that of the virus. Another strategy developed by the IRD involves introducing part of the viral genes into the plant genome, with the aim of inducing resistance to RYMV.

Read the complete press release at
http://www.ird.fr/fr/actualites/fiches/2006/fas247.pdf.

FRANCE, ARGENTINA REINFORCE COLLABORATION FOR AGRIC RESEARCH

The National Institute for Agricultural Research (INRA) and the Agricultural Research for Developing Countries (CIRAD) of France have signed an agreement with the National Institute for Agricultural Technology of Argentina (INTA) to tighten links in scientific collaboration for agricultural research.

INRA and INTA are already jointly involved in several studies, which include: the restructuring of familiar agriculture in Argentinean territories; the dynamics of pesticides in the soil of semi-direct agriculture areas; the evaluation of the environmental impacts of genetically modified crops; and the genetic transformation of symbiotic fungi of forest trees. CIRAD and INTA also cooperate within the framework of the ProsPER program in the south (Prospective and Partnership Enterprise-Research), a bilateral and regional cooperation program promoting technological innovation in agriculture.

Read more at: http://www.cirad.fr/en/presse/communique.php?id=210

FUNGUS SWEET TO SUGAR BEETS

Scientists with the Agricultural Research Service in Sidney, USA, are recruiting a fungus, Metarhizium anisopliae, to help in the battle against sugar beet root maggots. The pest, which attacks young sugar beet root, leaving the plant vulnerable to further attack by pests and pathogens, can cause up to 40% in yield losses without the heavy use of chemical sprays. The fungus, report the scientists, is not only a very effective biological control, but also has the ability to adapt to new ecosystems, and its use would greatly diminish the use of chemicals in sugar beet fields. The team is currently investigating an efficient delivery system for the fungus.

Read more at: http://www.ars.usda.gov/is/pr/2006/060919.htm

*** Africa ***

NEW ALLIANCE FOR A GREEN REVOLUTION IN AFRICA

The Rockefeller Foundation and the Bill & Melinda Gates Foundation (BMGF) are forming a new Alliance to improve agricultural productivity and the welfare of small scale farmers in the African continent through research funding and development work. To this aim, two organizations have been created: Alliance for a Green Revolution in Africa (AGRA) and Programs for a Green Revolution in Africa (ProGRA).

AGRA will contribute to poverty alleviation through agricultural development for resource poor farmers, while ProGRA will serve as a supporting organization for redistribution, to improve the productivity and profitability of small-scale farming in Africa. The first major initiative of ProGRA will be a Program for Africa's Seed System (PASS) that will operate in 20 African countries.

"The original Green Revolution was a huge success in many parts of the world," said Judith Rodin, president of the Rockefeller Foundation. "Unfortunately, in Africa, while there are many positive efforts, momentum is going the other way. Over the past 15 years, the number of Africans living on less than a dollar a day has increased by 50 percent. Working with the Bill & Melinda Gates Foundation and with African leaders, farmers and scientists, we're committed to launching an African Green Revolution that will help tens of millions of people who are living on the brink of starvation in sub-Saharan Africa."

For more information visit: http://www.rockfound.org/Agriculture/Announcement/218. Read the complete press release at: http://www.rockfound.org/Library/agra1.pdf

BIOTECH GRAPEVINE READY FOR FIELD TRIALS

Scientists at the Institute for Wine Biotechnology at Stellenbosch University, South Africa, have developed several lines of transgenic grapevine (Vitis vinifera) plants with increased resistance to fungal pathogens. These lines will be tested in the field to determine the stability of the transgene, and to perform ampelographic, viticultural, and vinicultural evaluations. The transgenic plants will be grafted on year-old non-transgenic rootstocks. In order to avoid dispersal of the transgene to the environment, the flowers of the transgenic plants will be bagged to contain the pollen, and the grapevines will be covered by a net to prevent seed dispersal.

For more information about the trial visit: http://www.sun.ac.za/news/NewsItem_Eng.asp?Lang=2&ItemID=10831. To find out more about the research initiatives at the Institute for Wine Biotechnology visit: http://academic.sun.ac.za/wine_biotechnology/research_programmes.htm

BIOETHANOL TO TAKE ROOT IN SOUTH AFRICA

Ethanol Africa plans to construct eight bioethanol factories in South Africa, the first of which will open next year. The company, formed by a group of farmers and agronomists, is already exploring the possibility of building ethanol factories in countries like Angola and Zambia.

“Africans have the potential to become the Arabs of the biofuel industry,” Chief Executive Johan Hoffman says. Bioethanol can help South Africa by providing farm and factory jobs, and ensuring a stable market for maize, sugar, and other commodities. Ethanol Africa said it hoped to source 30% of its maize from small-scale farmers and buy whatever they brought for sale at prices set before the planting season, ensuring a steady income for farmers.

Read the complete news article at http://www.irinnews.org/print.asp?ReportID=55584. Find out more at http://www.ethanol-africa.com/.

*** The Americas ***

CHEVRON GRANTS US$ 25 MILLION TO UC DAVIS FOR BIOFUEL RESEARCH

Chevron and the University of California, Davis have formed a strategic partnership for research aimed at developing transportation fuels from renewable biomass resources, including new energy crops, and agricultural, forest, and municipal waste. The 5-year project will receive up to US$25 million from Chevron for research and development of new energy technologies. Research will focus on four main areas:

• understanding the characteristics of current California biofuel feedstocks;
• developing additional feedstocks optimized for features such as drought tolerance, minimal land requirements, and harvesting technology;
• production of cellulosic biofuels;
• design and construction of a demonstration facility for biochemical and thermochemical production processes.

“We think it's important to pursue research that could accelerate the use of biofuels since we believe they may play an integral role in diversifying the world's energy sources. Developing next-generation processing technology will help

broaden the choice of feedstocks, including cellulosic materials," said Don Paul, vice president and chief technology officer, Chevron Corporation.

Read the complete press release at:
http://www.chevron.com/news/press/2006/2006-09-19.asp

BT COTTON: BRAZILIAN FARMERS TO USE 25% LESS INSECTICIDES

Bt cotton, modified to contain a insecticidal gene of bacterial origin toxic to common lepidopteran pests, results in a reduction in the number of insecticide applications, which translates to a reduction in production costs. "Today, cotton production in Brazil requires about 20 applications of insecticides to control insect pests," says Wilhelmus Uitdewilligen, from the Association of Cotton Producers of Mato Grosso, Brazil. "With transgenic cotton, we estimate a reduction of 25%." Biotech cotton has been approved for commercial planting by the Brazilian Technical Commission for Biosafety (CNTBio).

"With a reduction in costs and a decrease in the use of insecticides, we will improve our competitiveness in the international cotton market," said Uitdewilligen. He also stated that Brazil has a ten-year delay in adopting the technology compared to international competitors like the United States, China, and India, which affects the competitiveness of the Brazilian product.

For more information visit: http://www.cib.org.br/midia.php?ID=17760

*** Asia ***

IRAN-IRAQ COOPERATE FOR AGRICULTURE

Jihad Mohammad-Reza Eskandari, the Iranian minister of Agriculture, and Yuarib Nadhim al-Abudi, minister of Agriculture for Iraq, have signed a memorandum of understanding on cooperation between their agriculture sectors. The two sides have agreed to exchange expertise in various agriculture and veterinary fields, with the aim of raising the productivity and nutritional qualities of important crops, such as wheat, barley, rice, and maize, and of improving animal species. Iran and Iraq will also cooperate for a multifaceted management campaign for the control of agricultural pests.

"Cooperation between Iran and Iraq in the field of agriculture can contribute to improving the lives of people of both sides," said Eskandari.

With reports from: http://www.irna.ir/en/news/view/menu-237/0609046672153609.htm

AFGHANISTAN PRODUCES QUALITY POTATO THROUGH CIP PROJECT

A project has just been completed in Afghanistan to enable the country to produce quality potato seed for resource-poor farmers by developing in-country seed production programs. Potato is the third most important food crop in the country, but is beset by an inadequate agricultural system to assure quality seed. The Peru-based Centro Internacional de la Papa (CIP), in collaboration with the International Center for Agriculture Research in the Dry Areas (ICARDA), and with USAID-RAMP (Rebuilding Agricultural Markets Program) enabled over 3,000 tons of potato seed to be produced.

CIP reports that a sustainable seed system was created where CIP-trained farmers were given quality potato seed to plant. They were provided support services such as improved location-specific technologies and storage facilities. Radio programs on potato production and marketing produced with ICARDA, Afghanistan were broadcast to more than 50 local radio stations. Over 20,000 farmers, extension workers, village elders, and staff of other agencies benefited from the project activities.

Efforts are being done to increase potato production to 54,000 tons by 2009 and to eventually turn over the program to the Ministry of Agriculture, Animal Husbandry, and Food.

For more information on the CIP program, visit
http://www.cipotato.org/news_more.asp?cod=27

*** Europe ***

EFSA PANEL REPORTS TO EC ON GM RICE ISSUE

Consumption of imported long grain rice containing trace levels of LLRICE601 is not likely to pose any imminent safety concern to humans or animals. This is according to a statement by the European Food Safety Association's (EFSA) GMO (Genetically Modified Organisms) Panel, which evaluated the available scientific data on LLRICE601. According to the Statement, the Panel believes that there is insufficient data available to provide a full risk assessment in accordance with EFSA's GM guidance.

EFSA was asked by the European Commission (EC) to provide scientific support concerning the safety of LLRICE601, which had been inadvertently released in the United States (US) and exported to the European Union (EU).

EFSA is presently reviewing an application for LLRICE62, a similar GM rice variety produced by Bayer Crop Science. The full text of the Statement is available on the EFSA website at

http://www.efsa.europa.eu/en/science/gmo/statements0.html. Read the complete press release at http://www.efsa.europa.eu/en/press_room/press_release/llrice601.html.

SPAIN APPROVES ELEVEN NEW BIOTECH VARIETIES

Eleven new transgenic maize varieties, all containing the MON 810 event, have been approved in Spain this month, bringing to 45 the total number of biotech varieties that can be planted commercially in the country. This approval represents the normalization of Bt maize in the country, as farmers are now able to chose from a wide range of cultivars for those most adapted to their needs.

The approval was welcomed by Esteban Andrés, secretary general of the General Association of Maize Producers. “In times where the margin of profitability are the lowest, biotechnology is the only technology that can make the cultivation of maize in areas infested with stem borers a viable option,” said Andrés in a declaration to the Antama Foundation, a not-for-profit organization committed to share information on the potential benefits of biotechnology to agriculture.

More information (in Spanish) available at: http://www.antama.net/imgNews/13-09-06.htm

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RESEARCH

BT CORN – A SOLUTION TO MYCOTOXIN CONTAMINATION

Mycotoxin contamination is a serious concern in maize production, as two of the most important mycotoxins, fumonisins and aflatoxins, are associated with various diseases in humans and animals. In addition, high levels of mycotoxins result in lower market gains due to livestock losses and higher corn rejection for food and feeds, resulting in huge annual losses to the sector worldwide.

Damage inflicted to crops by insect pests increases susceptibility to infection by fungal pathogens because wounds encourage colonization by fungal spores. Bt maize is modified with a gene toxic to common lepidopteran pests. Does the increased protection against insect pests also reduce the incidence of mycotoxins in the biotech crop? Felicia Wu, of the University of Pittsburgh, USA, compares mycotoxins levels in Bt and conventional maize in an article published in the latest issue of Information Systems for Biotechnology News Report, and reports the presence of significantly lower levels of mycotoxin concentrations in biotech maize.

The economic benefits of mycotoxin reduction would likely be more prominent in developed countries such as the United States, argues Wu, whereas in areas such as Latin America, northern China, and sub-Saharan Africa, where corn is a staple food, the health impacts would far outweigh the market gains.

The complete article “Mycotoxin Reduction in Bt Corn: Potential Economic, Health, and Regulatory Impacts” can be read at http://www.isb.vt.edu/news/2006/sep06.pdf

RESEARCH TRACKS, CONTROLS FRUIT VITAMIN C LEVELS

Vitamin C decreases the incidence of several important human disorders. It is an antioxidant as well; in L-ascorbic acid (L-AA) form, the vitamin improves the post-harvest properties of fruits. If Vitamin C levels could be increased in fruit species, both consumers and plants thus stand to benefit.

Mark W. Davey and colleagues take the first step in gaining “Genetic Control of Fruit Vitamin C Contents” as they identify three quantitative trait loci (QTL) in apple, which they found are linked to L-AA content of fruit flesh. The researchers, who hail from the Catholic University of Leuven, Belgium, report their findings in a recent issue of Plant Physiology.

Scientists analyzed the progeny derived from a cross between apple cultivars Telamon and Braeburn. They examined linkage maps of the apple parents, and after further analysis, found that: 1) Both parents had QTLs in the same location, which contributed to L-AA content; 2) One QTL in the Telamon parent co-localized with a QTL associated with flesh browning, confirming that L-AA levels are associated with fruit susceptibility to post-harvest browning; and 3) the QTLs identified are associated with molecular markers, which will facilitate the transfer of QTLs to other fruit varieties through marker assisted selection.

Subscribers to the journal can read the complete article at http://www.plantphysiol.org/cgi/reprint/142/1/343. Other readers can take a look at the abstract at http://www.plantphysiol.org/cgi/content/abstract/142/1/343.

NEW GENE ANALYSIS SYSTEM INTRODUCED FOR RICE

Rice is one of the world’s most important food crops, and is thus the focus of many research projects around the world. However, it is difficult to isolate viable rice protoplasts from leaves or suspension-cultured cells – a main requirement for rapid gene functional analysis and biochemical manipulations, both of which are important tools to understand and improve crops.

In the latest issue of Molecular Plant Pathology, Songbiao Chen and colleagues report that they have developed “A highly efficient transient protoplast system for analyzing defence gene expression and protein–protein interactions in rice.”

They describe a significantly improved method to isolate a large number of protoplasts from stem and sheath tissues of both young and mature rice plants, as well as a transient expression assay system using these protoplasts for functional analysis of rice defense genes.

Through their work, scientists were able to establish gene expression analysis protocols for rice defense-related genes, using the green fluorescent protein (GFP) and luciferase as reporter genes. The approach, the researchers write, may be applied to other plants from which sufficient protoplasts cannot be isolated from leaves or suspension-cultured cells.

Subscribers to Molecular Plant Pathology can read the complete article through http://dx.doi.org/10.1111/j.1364-3703.2006.00346.x or http://www.blackwell-synergy.com/doi/full/10.1111/j.1364-3703.2006.00346.x. Other readers can access the abstract through http://www.blackwell-synergy.com/doi/abs/10.1111/j.1364-3703.2006.00346.x.

ANNOUNCEMENTS

HEWLETT/IATRC CAPACITY BUILDING PROGRAM IN AGRICULTURAL TRADE POLICY

The International Agricultural Trade Research Consortium (IATRC) has received a grant from the William and Flora Hewlett Foundation to sponsor participation of a select group of developing country researchers in two IATRC meetings per year. The purpose of the three-year program is to provide researchers in government and academia, who are concerned with agricultural trade and policy, an opportunity to increase their analytical capacity and broaden their research networks.

For more information, eligibility criteria, and details on how to apply, visit http://www.iatrcweb.org/CapBuildProgram/capacity.htm, or contact Linda M. Young (1-406-994-5604 or lmyoung@montana.edu).

INDIA KNOWLEDGE CHAMBER TO HOLD AGRI SUMMIT

The Associated Chambers of Commerce and Industry of India (ASSOCHAM) have organized a Summit on Green Revolution II: Knowledge Agriculture. This will be held in November 2006 in New Delhi, India. The summit is being organized in partnership with the Indian Council for Agricultural Research, Government of India. The focus of the summit is on Knowledge Agriculture and its role in the resurgence of rural India. For more information, visit http://www.assocham.org/.

MEETING ON PLANT TEMPERATURE STRESS FOR 2007

"Temperature Stress in Plants" will take place January 21-26, 2007 in Ventura, California. The program will cover the physiology, biochemistry, and genetics/genomics of plant responses to high and low temperatures. In addition to model species, important issues regarding agronomic, horticultural and ornamental species will be addressed. In order to be considered for an oral presentation, submit abstracts November 1, 2006. For more information, visit http://www.grc.uri.edu/programs/2007/tempstrs.htm.

ROCKEFELLER MEETING ANNOUNCED

The third general meeting of The Rockefeller Foundation program on "Biotechnology, Breeding, and Seed Systems for African Crops" will be held during 26-29 March, 2007 in Maputo, Mozambique, and will be co-hosted by The Rockefeller Foundation and the Instituto de Investigação Agrária de Moçambique (IIAM). The Rockefeller Foundation grantees working on the genetic improvement and seed systems of African crops, plus many other individuals, who are interested in this work, are invited to attend. For more information, visit http://www.africancrops.net/rockefeller/icv3/.

DOCUMENT REMINDERS

GLOBAL EFFORT FOR ONLINE FREE TEXTBOOKS

The Wikiversity initiative, a brainchild of Rick Watson at the University of Georgia in Athens, aims to provide 1000 free university textbooks to students of developing countries who cannot afford traditional textbooks, which are expensive and quickly out of date. Wikiversity will pool the knowledge of university teachers and students around the globe, but contrary to Wikipedia, the free online encyclopedia, only one expert editor will be in charge of approving contributions, thus guaranteeing the quality of the information.

Even if the project is still in its infancy, more than 100 people in 20 countries, including Uganda, Indonesia, India, and Ethiopia, are involved in the initiative. Some contributors have also signaled the need for specific textbooks in agriculture, public health, and wireless communication. Lots of people and enthusiasm are needed for success, says Watson.

Visit the Wikiversity website at:
http://en.wikiversity.org/wiki/Wikiversity:Main_Page
With reports from: http://www.nature.com/news/2006/060911/full/060911-13.html

THE GDN/BLDS DOCUMENT DELIVERY SERVICE

Development Network and the British Library of Development Studies (BLDS) have teamed up to form the GDN/BLDS Document Delivery service to meet the information needs of research institutes in the South. The GDN/BLDS Document Delivery Service allows searching and requesting documents from the BLDS online catalogue, comprising over 1000 journals, 4000 serials, and over 80,000 monographs concerned specifically with development. BLDS holds Europe's largest research collection on economic and social change in developing countries, with extensive coverage of Southern publications, particularly from Africa and South and East Asia. Requests will be received by a librarian and posted free of charge only to research institutes in developing and transition countries.

Read more at: http://www.gdnet.org/middle.php?oid=26

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While we are still developing this site, feel free to e-mail (knowledge.center@isaaa.org) us for your views and comments on any crop biotechnology product and related issues.
