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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GLOBAL

BT NEEDS HELP TO KILL MOTH

A clean gut means survival for larvae of gypsy moth fed with *Bacillus thuringiensis (Bt),* a widely used organic pesticide. Researchers at the University of Wisconsin-Madison, USA, counter the wide belief that *Bt* activity alone is needed to cause the insects' death. Scientists determined that native bacteria in the moth's gut need to be present for *Bt* to be lethal. "Ultimately, this is a toxin-mediated septicemia (blood poisoning) modulated by the gut community", write the authors. The team published the findings in a recent issue of the Proceedings of the National Academy of Sciences (PNAS).

Results of the research may have implications in managing the deployment of the *Bt* technology. "The work also raises the possibility that the genes encoding the (Bt) toxins could be deployed more effectively in transgenic crops by exploiting the role of insect-borne bacteria that enhance insecticidal activity," writes the researchers in the PNAS report.

Read the complete press release at http://www.news.wisc.edu/12934.html. To read the abstract of the article "Midgut bacteria required for *Bacillus thuringiensis* insecticidal activity" visit: http://www.pnas.org/cgi/content/abstract/0604865103v1?maxtoshow=&HITS=

NSF AWARDS $72.5 M FOR PLANT GENOME RESEARCH

The United States' National Science Foundation (NSF) has given 24 new awards totaling US $72.5 million to support research about the genomes of economically important crop plants such as potato, poplar and corn. Awards were given to 43 institutions in 30 states, including 10 international collaborations.

"These innovative new projects will provide the basic discoveries leading to a greater understanding of how variations in plant genomes manifest as changes in growth and development in a range of environments. New discoveries improve the quality and yield of crops plants", says James Collins, head of the NSF's Biological Sciences Directorate.

Several new projects will extend the knowledge gained from the sequenced genomes of some key crops. Comparative genome tools will enable researchers

to rapidly pinpoint genes for disease resistance in legumes. Such tools will be used to study chickpea, cowpea and pigeonpea through a developing country collaboration with the International Crops Research Institute for the Semi-Arid Tropics in India.

Additional information on research initiatives to be funded by NSF are available at http://www.nsf.gov/bio/pubs/awards/pgr.htm or by emailing Jane Silverthorne at jsilvert@nsf.gov.

UNLOCKING THE SECRETS OF THE OYSTER MUSHROOM GENOME

The oyster mushroom, *Pleurotus ostreatus*, will have the distinction of being the first edible mushroom in the world to be genetically sequenced. The project was chosen from amongst more than 400 entered for the annual competition of the Joint Genome Institute (JGI) of the United States Department of Energy's Science Office.

Why a mushroom? Aside from being rich in vitamins and minerals, the mushrooms are actively involved in recycling carbon in the environment by degrading lignin, a component of wood. The degradation of this lignin is an essential step in the production of biofuels. Mushrooms may also be recruited for the breakdown of man-made contaminants released into the environment.

The article, "Sequencing of the oyster mushroom genome," can be accessed at http://www.basqueresearch.com/berria_irakurri.asp?Gelaxka=1_1&Berri_Kod=1046&hizk=I.

AGORA PROVIDES GLOBAL ACCESS TO AGRIC INFO

The Food and Agriculture Organization (FAO) recently announced the launching of the second phase of the Global Online Research in Agriculture (AGORA) initiative, which will provide more countries with access to leading food and agriculture journals for little or no cost. The public-private partnership between FAO, some of the world's leading science publishers and other key partners including the World Health Organization and Cornell University, was formed in response to the needs of thousands of students, researchers and academics in poorer countries for better access to important agricultural information.

"In less than three years, AGORA has already helped bridge the knowledge gap by providing 850 institutions access to over 900 journals in the areas of agriculture and related subjects," notes Anton Mangstl, Director of FAO's Library and Documentation Systems Division. Through AGORA, public and private

sectors are making an important contribution to the achievement of the United Nations Millenium Development Goals by providing essential information to improve the standards of poor countries.

The news article can be read at http://www.fao.org/newsroom/en/news/2006/1000406/index.html.

BIOTECH RICE FACILITY FOR PHARMA OPENS IN KANSAS

A new bioprocessing facility for plant-made pharmaceuticals will open in Kansas, USA, officials announced recently. The facility, owned by California-based Ventria Bioscience, will process genetically-engineered rice for the extraction of proteins to be incorporated into oral rehydration solutions to address childhood diarrhea. This disease claims 1.9 million lives annually according to the World Health Organization.

“I welcome Ventria Bioscience to Kansas and look forward to their contributions to the health of children worldwide”, declared Kansas Governor Kathleen Sebelius in a statement.

Access the complete release at http://www.ventria.com/news/Press%20Release%209-29-06.asp

FUSARIUM MEETS MATCH IN BACILLUS, AND OTHER FUNGAL STORIES

Now here is some good news from the microscopic world. Researchers in the Agricultural Research Service (ARS) Toxicology and Mycotoxin Research Unit at Athens, USA, have found a bacterium that can greatly reduce the colonization of corn by the fungus *Fusarium verticillioides*. This fungus is one of the sources of mycotoxins – known carcinogens, the presence of which lowers the marketability of crops.

ARS microbiologist Charles Bacon and colleagues observed that one microbe that also lives in corn can protect the crop from fungi. *Bacillus mojavensis*, already patented by ARS, greatly reduces the amount of fungus in corn. Unfortunately, the bacillus is killed by fusaric acid, a substance secreted by the fungus when stressed. However, the researchers identified two mutant bacterial strains resistant to fusaric acid, which may provide the biocontrol tools needed for better crop protection.

ARS scientists are also are also taking apart the toxin-making machinery of Fusarium, to determine which genes are employed by the fungus to produce

mycotoxins. To this aim, a team led by David Kendra started compiling the equivalent of “genetic snapshots” of the fungus in 2001. Currently, 80 % of the fungal genes have been identified, and scientists have also discovered a new gene, *FUM20*, plus nine others that may regulate mycotoxin production. This information, argues Kendra, will help to formulate sprays that disrupt the fungus’ toxin synthesis, or the formation of critical spore pigments.

Read more about these projects at: http://www.ars.usda.gov/is/pr/2006/061002.htm and http://www.ars.usda.gov/is/pr/2006/061005.htm

BIOTECH TOMATOES FOR EDIBLE MALARIA VACCINES?

Malaria affects 300–500 million people annually, and over two billion individuals reside in areas where the disease is endemic. A proposal to deliver malarial vaccines using tomatoes, published recently in the journal *Medical Hypothesis*, was forwarded by Kamal Chowdhurya and Omar Bagasra at Chaflin University, South Carolina. Tomatoes with different antigens for malaria would be identified by the different fruit sizes, shapes and colors. By using edible vaccines, the authors hope that the logistical difficulties in immunizing over a million children living in malaria prone areas can be overcome, at a fraction of a cost of a regular vaccination.

“Our hypothesis is to immunize the children/infants by feeding them one variety of tomato at a time, 3–6 weeks apart”, said the researchers. The researchers expect that the low dose of antigens that are administered should be enough to trigger an immune response, protecting the children from the malarial parasite in the future.

Several challenges need to be resolved before tomato can be used to produce these biopharmaceuticals. Among these include the development of tomato lines with consistent high gene expression levels; and conducting studies assessing the risks of out-crossing among the transgenic crop and their close relatives via pollination.

For more details, the complete paper can be accessed online by subscribers at http://dx.doi.org/10.1016/j.mehy.2006.04.079

AFRICA

HARVESTING RAINWATER FOR AGRIC IN AFRICA

Solutions to global water scarcity may lie, not so much in places where this resource is still abundant, but in a region that is relatively dry – the African savannas.

This was one of the key findings of the Comprehensive Assessment of Water Management for Agriculture, a study carried out to examine the current status of water availability worldwide. According to the International Water Management Institute (IWMI) Director General Frank Rijsberman, the African savannas can be made more productive using the limited water supply already at hand, citing the example of Brazilian scientists who accomplished such feat in their country's vast savanna.

If Africa is to feed itself it would have to harvest more rainwater- not in dams, but in pails and buckets. To transform rain-fed agriculture in the African savannas and other semi-arid lands would require investment in low-cost practices such as supplemental irrigation and water harvesting with simple equipment. For the world's poor who live in semi-arid tropics, this transformation should be done soon since "there simply is not enough water to go around," said David Molden, an IWMI scientist who led the research.

Read the complete article at http://www.cgiar.org/monthlystory/october2006.html.

AMERICA

SYNGENTA'S ROOTWORM BIOTECH MAIZE APPROVED IN THE USA

Syngenta announced this week that its maize rootworm trait, Agrisure™ RW, has received registration approval from the US Environmental Protection Agency (EPA). The seeds will be available in US markets for the 2007 growing season, as a single trait and stacked with glyphosate tolerance through elite hybrids from Garst, Golden Harvest and NK.

"The approval of Agrisure RW in this fast-growing biotech market is a major step in our strategy to bring all three of the leading input traits to the corn market," said Jeff Cox, Head of Syngenta Global Corn and Soybeans.

Syngenta also recently announced the first registrations in Europe and Asia of its new fungicide, Revus, for the control of late blight in potatoes and tomatoes, and of downy mildew in vines and vegetable crops.

Read the full press releases at:
http://www.syngenta.com/en/media/press/2006/10-04.htm
http://www.syngenta.com/en/media/press/2006/10-03.htm

BRAZIL STARTS EXCHANGE OF CERTIFIED BIOTECH SEEDS

The Brazilian National Supply Company (CONAB) will exchange this month illegal, uncertified soybean seeds for certified grains in the state of Rio Grande do Sul. Carlos Manoel Farias from CONAB stated that the success of the operation will depend on the participation of farmers to the scheme. Only after the exchange of the first 33,606 tons of seeds initially acquired, CONAB will be able to buy the remaining seeds from the total of 80000 tons that the Federal Government has committed to the exchange program, estimated to cost R$ 60 million (approx. US$ 27.8 million).

Farias has informed that certified seeds are available to farmers in 36 warehouses. The exchange program will take place until November 10, and each farmer will be able to acquire up to 5000 kg of seeds.

With reports from: http://www.agenciabrasil.gov.br/noticias/2006/10/03/materia.2006-10-03.7200579640/?searchterm=conab

EMBRAPA PRODUCES ENVIRONMENTALLY FRIENDLY TOMATO

The Brazilian Agricultural Research Corporation (EMBRAPA) reports on a new production method for tomatoes that results in fruits with no detectable traces of agro-chemicals. Tomatoes, together with potatoes, strawberries and papayas, are the crops most affected by contamination from pesticides.

The new technology, explains José Ronaldo Macedo, leader of the group that conducted the research, comprises: measures to prevent soil erosion; integrated pest management practices, including an initial land survey to determine existing pests populations to prescribe the right type and amount of pesticides; and drip irrigation systems to optimize the use of water. The new technology reduces by 60% the use of pesticides, and by 40% the use of fertilizers, says Macedo. However, as currently the scale of production is small, the new technology is also more expensive.

With reports from http://www.agenciabrasil.gov.br/noticias/2006/10/04/materia.2006-10-04.8750871804/?searchterm=agricultura

ASIA

INDIA MOOTS FIRST POLICY FOR FARMERS

The National Commission on Farmers headed by MS Swaminathan has handed over its final report and revised draft National Policy for Farmers to Union Agriculture Minister Sharad Pawar on 4th Oct 2006 in New Delhi. A detailed blue print for implementing this policy was also submitted in the form of final report "Serving farmers and saving farming: towards faster and more inclusive growth of farmers' welfare".

The policy document calls for: enabling farmers to earn a minimum net income; not divert prime farmland for non-agricultural purposes like Special Economic Zones (SEZs), lower interest rates for loans; establishment of a national bank for farmers; setting up an Indian trade organization to procure food grains at market price; and promotes conservation farming in the heartland of the green revolution.



For further details visit: Revised Draft National Policy for Farmers at http://krishakayog.gov.in/revdraft.pdf ; the Commission's final report at http://krishakayog.gov.in/5threp1.pdf or contact: b.choudhary@isaaa.org

INDIA, 2007-08 TO BE YEAR OF "MORE CROP PER DROP OF WATER"

MS Swaminathan presented this week the report "More Crop and Income Per Drop of Water" to the Union Water Resources Minister Saifuddin Soz. Recommending that the year 2007-08 be declared as the "Year of more crop and

income per drop of water", Swaminathan suggested various measures to enhance agricultural production and farmers' income. These include:

- Adoption of System of Rice Intensification technologies (SRI), which require fewer seeds, less nursery area, and save water and labor while enhancing yield
- Introduction of Micro Irrigation technology, such as drip and sprinkler irrigation
- Adoption of crop diversification schemes, to include with high value crops with reduced water requirements
- Introduction of a weather based crop insurance protection
- Adequate support to farmers for marketing and to access to market information.

Swaminathan also recommended the formation of Water Users Associations and additional measures to improve the management of ground water resources.

For more information visit: http://pib.nic.in/release/release.asp?relid=21113, or contact Bhagirath Choudhary at: b.choudhary@isaaa.org

INDIA EXPERIENCING COTTON BOOM

India is set to become the world's second largest cotton producer. It might yet displace the United States and come next to China as the largest cotton producer. "A quiet revolution in the country's cotton sector" is happening says Vikas Dhoot of the Indian Express, as cotton production in 2006-07 is estimated by the Cotton Advisory Board to be between 265-275 lakh bales.

Dhoot quotes 2006 figures from the US Cotton Market Monthly Economic Letter showing that India has shown an increasing percentage share of world cotton production. With the estimated production for November 2006-07, India is expected to displace the US.

Textile Ministry officials led by Minister Shankar Singh Vaghela attributed the boom to the fact that 60 percent of farmers with irrigation were using Bt cotton seeds. States like Gujarat, Punjab, Tamil Nadu had 50 percent increase in yields due to better productivity.

Dhoot's article can be accessed at
http://www.indianexpress.com/story/13925.html

SCIENTISTS RECRUIT WEEVILS FOR HELP AGAINST FOREST WEED

A plant introduced as an ornamental shrub has now become one of the biggest weed problems in New Zealand forestry. Buddleia (*Buddleja davidii*), a woody species with attractive purple flowers, is an aggressive weed that has the capacity to out-compete young trees, making it a serious problem to forest owners.

Ensis Forest Biosecurity and Protection (FBP) researchers in Rotorua identified a leaf-eating Chinese weevil *Cleopus japonicus* ten years ago as a natural enemy of buddleia. Cleopus was released last month into Rotorua's Whakarewarewa Forest after a long and rigorous process to screen the insect's diet to ensure it does not have an appetite for native or beneficial species. Effective biocontrol practices would mean cost-savings to the forest industry, and a decrease in the amount of chemical herbicides required to control buddleia.

For more information, read the complete media release at http://www.ensisjv.com/NewsEventsandPublications/MediaReleases/tabid/140/Default.aspx?Module460_selectById=1427

EUROPE

CLOSER COLLAB BETWEEN EFSA, MEMBERS STATES

The European Food Safety Authority (EFSA) Advisory Forum members signed this week a 'Declaration of Intent' confirming their commitment to strengthen scientific co-operation and information exchange on risk assessment between EFSA and Member States of European Union.

Members discussed possible opportunities to strengthen collaboration including: identifying more formalized channels of communications; sharing data on specific dossiers; setting up ad hoc liaison groups on forthcoming risk assessments; encouraging exchange of information between scientific staff of EFSA and scientific panels at national level; and sharing draft opinions under embargo on issues of particular importance.

Catherine Geslain-Lanéelle, Executive Director of EFSA, welcomed this initiative: "I am pleased that members of the Advisory Forum have signed up to meet this new challenge. One of the key objectives in establishing EFSA was to achieve greater coherence in risk assessment in the EU. EFSA aims to deliver the best science at the right time and in the most appropriate manner. This can only be achieved through effective pooling and leverage at European level of our collective resources and expertise in risk assessment and risk communications."

Read the full press release at http://www.efsa.europa.eu/en/press_room/press_release/adisory_forum_decl_intent.html

A SIMPLER CAP FOR EUROPE

Experts from Europe gathered this week for a two-day conference in Brussels aimed at simplifying the Common Agricultural Policy (CAP). “Our objective is to eliminate excessive bureaucracy in the Common Agricultural Policy,” said Enterprise and Industry Commissioner Günter Verheugen, one of the keynote speakers in the conference. Simplification efforts focus on both technical and policy aspects. The European Commission is planning in December to draft a proposal for a single Common Market Organisation (CMO) to replace the 21 CMOs that currently cover the different agricultural markets. This move will increase transparency, improve the quality of legal texts and reduce costs for national administrations and companies.

Access the press release at http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/1296&format=HTML&aged=0&language=EN&guiLanguage=en.

RESEARCH

SPIDER VENOM TOXIN – A NEW LINE OF DEFENSE FOR PLANTS?

Spider venoms are a complex blend of toxins that have evolved specifically to kill insects. One such toxin from the venom of the Australian funnel web spider (*Hadronyche versuta*), Hvt, kills preys by blocking the flow of calcium in the cells of invertebrates impairing important cellular functions. This small, stable peptide works with amazing specificity: it affects only certain classes of insects, many of which are known agricultural pests. Scientists at the National Institute for Biotechnology and Genetic Engineering (NIBGE) in Pakistan are now studying the potential of the spider toxin in protecting plants from insect attack.

In an article published in a recent issue of Transgenic Research, the researchers reported that the purified toxin fusion from engineered *E. coli* immobilized and killed the larvae of two herbivorous insect pests, cotton bollworm and the Egyptian armyworm, when applied externally. Transgenic expression of Hvt in tobacco plants also protects the plants from caterpillars, killing all the larvae within 48 hours. The effects of the toxin were sufficiently rapid to prevent significant damage to the leaves.

The researchers plan to introduce the gene into cotton to determine the suitability of spider venom-derived toxins for agricultural application. However, since the issues on biosafety need to be addressed, it will take some time before these toxins find a new host in plants.

The complete article “Spider venom toxin protects plants from insect attack” can be viewed at http://dx.doi.org/10.1007/s11248-006-0007-2. The abstract is available at http://www.springerlink.com/content/67114104784q55n3/?p=fb961b74b3394b1ebd160af2d0422a96&pi=7.

ARTICLE REVIEWS DNA DETECTION IN GM FOODS

Karl-Heinz Engela and colleagues from research institutions in Germany review methods and challenges of “Quantification of DNA from genetically modified organisms in composite and processed foods” in a recent issue of Trends in Food Science and Technology. Legislation in the European Union requires certain thresholds for the presence of materials derived from genetically modified organisms (GMO). Testing for GM presence is therefore important to meet trade requirements for certain countries.

Researchers report that: 1) Differences in particle sizes of components of food products can lead to over and underestimation of GMO contents; 2) Qualitative assays demonstrated that longer target sequences become increasingly susceptible to degradation, resulting in false negative results when analyzing samples of processed foods or feeds; 3) New methods of quantification, such as ligation-dependent probe amplification (LPA) and microarray technology, should be used so that the effects of food composition and processing can be ruled out; and 4) Quantitative screening assays can be used in combination with synthetic quantification standards to gain important information about the compositions of samples.

Subscribers to the journal can read the complete article at http://dx.doi.org/10.1016/j.tifs.2006.04.008.

ANNOUNCEMENTS

SURVEY: E-AGRICULTURE FOR SUSTAINABLE DEVELOPMENT

The Food and Agriculture Organization (FAO) is conducting a world-wide survey to determine the role and impact of Information and Communication Technologies (ICT) in agriculture, for the promotion of sustainable development. Results from survey will help better to define the role that digital technologies can

have in improving information exchange and communication related to agriculture.

The survey may be completed in English, Spanish or French at: http://www.fao.org/rdd/eagsurvey/index_eag.asp?lang=en&ref=

INTERNATIONAL CONFERENCE ON GRAINS POST-HARVEST TECH SLATED

The Indian Society of Agricultural Biochemists (ISAB) and C. S. Azad University of Agriculture and Technology, Kanpur are jointly organizing an International Conference on Post-Harvest Technology and Value Addition in Cereals, Pulses and Oilseeds (ICPHT-2006) during November 27-30, 2006 in Kanpur, India.

The event aims to improve the post-harvest operations in crops and develop food products with better nutritional quality.

For detail information contact Dr P.S. Kendurkar at pskendurkar@yahoo.co.in. Visit the conference homepage at: http://csauk.ac.in/post-harvest-technology-confrence.html

AUSTRALIA HOSTS WOOD CONFERENCE

The International Academy of Wood Science (IAWS) 2006 Conference, “Wood Science and Technology in 2100”, will be held in Melbourne 13-16 November. The conference will cover topics such as the effects of wood production on climate and vice-versa, energy from wood, new commercial plantation species for wood production, genetic selection for wood quality improvement, and chemical manufacture and storage in trees.

Read more at: http://www.csiro.au/csiro/content/standard/ps2ce,,.html and http://www.ensisjv.com/NewsEventsandPublications/EventsandSponsorship/IAWSAccommodationandVenue/tabid/163/Default.aspx

E-LEARNING MASTER IN BIOSAFETY IN PLANT BIOTECHNOLOGY

The Università Politecnica delle Marche, Italy, is offering a 12-month E-learning master in Biosafety in Plant Biotechnology based on a combination of distance-learning and on-campus training sessions. The course is distinctively interdisciplinary with students and faculty from natural and social sciences, and it

leads to an accredited diploma. The program is supported by the United Nations Industrial Development Organization (UNIDO). Deadline for submission of applications is 31 October 2006.

For further details visit: http://193.205.134.131/Entra/Engine/RAServePG.php/P/3374110800/M/3276110807 or contact Prof. Bruno Mezzetti at b.mezzetti@univpm.it.

ILRI RECRUITING A BIOSCIENCES RESEARCH SUPPORT SCIENTIST

The Africa-based, globally networked International Livestock Research Institute (ILRI) is seeking to recruit a Biosciences Research Support Scientist to facilitate capacity building through strategic planning, technical coordination, implementation and monitoring of research projects within the Biosciences eastern and central Africa (BecA), a new center for excellence in modern biology in Africa hosted by ILRI. The position will be based in Nairobi, Kenya.

For further details and requirements write to recruit-ilri@cgiar.org (quoting Ref: BRSS/T4/10/2006) or visit http://www.biosciencesafrica.org and http://www.ilri.org.

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

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