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 ***

BEES AND BIRDS INCREASE GLOBAL PRODUCTION OF FOOD CROPS

The first global study to estimate crop production that is dependent on animal pollination reveals that pollinators such as bees, birds and bats affect 35 percent of the world's crop production. This increased the outputs of 87 of the leading food crops worldwide, says an international research team led by Alexandra-Maria Klein from the University of Goettingen in Germany and Claire Kremen of the University of California Berkeley which reviewed scientific studies from 200 countries.

Results of the review showed that out of the 115 crops studied, 87 depend to some degree upon animal pollination. This accounts for one-third of crop production globally. Of those crops, 13 are entirely reliant upon animal pollinators, 30 are greatly dependent and 27 are moderately dependent. Staple crops such as wheat, corn and rice were crops that did not rely upon animal pollination.

"The stability of crop yields not only depends on pollination, but also on further ecosystem services," Klein said. "Therefore, we need landscapes carefully managed for a diversity of functionally important groups of organisms that sustain many important ecosystem services such as pollination, pest, pathogen and weed control, and decomposition."

The full paper is available at the Proceedings of the Royal Society B: Biological Sciences. For more information, email Sarah Yang of the University of California at mscyang@berkeley.edu.

PIONEER DEVELOPING DROUGHT-TOLERANT CORN

Pioneer Hi-Bred International, Inc, a subsidiary of Dupont, is focusing its efforts on developing corn hybrids that use water sources more efficiently and thus help farmers maintain yields during periods of water stress. "We want growers to benefit overall by having hybrids that can reduce yield loss during temporary water stress yet maintain maximum yield potential under optimal conditions," said Marc Albertsen, director of agronomic traits and lead evaluation for Pioneer.

The company is using a combination of approaches that include conventional breeding, molecular breeding and transgenic programs. Pioneer adds that it also uses a variety of tools, including gene shuffling which optimizes desired traits by multiplying the effectiveness of beneficial genes. While the enhanced transgenic trait is still being developed, Pioneer has already developed several hybrids with drought tolerance and high-yield potential.

Read Pioneer's press release at
http://pioneer.mediaroom.com/index.php?s=press_releases&item=194

*** AFRICA ***

DUPONT, CIMMYT COLLABORATE ON AFRICAN MAIZE

A public-private partnership between Dupont and the Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT) has been forged to provide research, product development and technical support collaboration on maize for Africa. Initial projects will be on maize nitrogen utilization to increase and stabilize maize yields while future research will focus on drought tolerance, Striga tolerance and protein enhancement.

“Production agriculture improvements are the first steps to solving economic and health problems in Africa,” said Masa Iwanaga, CIMMYT director general. “With the right products for the diverse African growing environments, there is enormous potential to turn the existing situation around.”

For more of the collaborative project, visit
http://pioneer.mediaroom.com/index.php?s=press_releases&item=193

*** THE AMERICAS ***

BIOTECHNOLOGY CAN HELP CANADA, SAYS BSDE REPORT

Biotechnology could help Canada and the world attain sustainable development goals while enhancing Canada’s overall economy. A strong sustainable development-oriented biotechnology sector can reduce humanity’s ecological footprint, diminish toxic substances, support clean air and water goals, and perhaps play a role in mitigating the effects of climate change. This was the gist of a report prepared for the Canadian Biotechnology Advisory Committee (CBAC) by the Biotechnology, Sustainable Development and Canada’s Future Economy (BSDE) Expert Working Party which was commissioned to analyze the role of biotechnology, sustainable development and Canada’s future economy.

The report forwarded the following recommendations that Canada should pursue:

* Take a strategic rather than piecemeal approach to BSDE

* Focus on implementing advanced technologies to seize new bioproduct and biorefinery opportunities

* Recognize the interlocked nature of environment and economy; and move to an integrated sustainable development assessment approach

* Engage citizens and stakeholders in deliberative dialogue with the international community

* Strengthen governance for adaptive management of BSDE

The BSDE technical report is available online at http://www.cbac-cccb.ca.
Contact info@cbac-cccb.ca for individual background research papers.

UNIV OF GEORGIA TO STUDY 'JUMPING GENES' IN MAIZE

The US-based National Science Foundation has awarded US$4.1M to the University of Georgia (UGA) to identify all the transposable elements (TE's) in maize and to develop an annotated database to assist research in this crop. Transposable elements, popularly called "jumping genes", are sequences of DNA that can move around chromosomes in a cell. They are recognized as important parts of the blueprints of plants and animals.

"Maize is the organism of choice for understanding how TE's contribute to gene and genome evolution", said Susan Wessler, Regents Professor of plant biology at UGA and principal investigator.

All information from the project will be made freely available to the Maize Genome Sequencing Project and to long-term repositories such as the Maize Genome Database.

Additional information on the grant may be obtained from Phil Williams of the University of Georgia at phil@franklin.uga.edu.

IN FOCUS: CONFINEMENT OF GM CROPS DURING FIELD TESTING

The Biotechnology Regulatory Services (BRS) of the Animal and Plant Health Inspection Service (APHIS) under the United States Department of Agriculture (USDA) sponsored a workshop on confinement of genetically engineered crops during field testing. Included in the discussion were measures that would restrict genetically engineered plants and their offspring to the authorized site, and prevent their persistence in the environment following termination of the field trial. Three types of plants were considered in the study of cross pollination and gene flow: 1) wind pollinated crops using corn as a model, 2) self pollinated crops using rice as a model, and 3) insect pollinated crops using safflower as a model.

The workshop discussed biological confinement measures that have been developed to control the flow of transgenes through pollen or seed. Engineered male sterility results in crops that produce no pollen, but this type of containment strategy poses some disadvantages in terms of biosafety and seed production. Maternal inheritance of the transgene engineered via the chloroplast genome is a promising approach for transgene containment, as chloroplasts are never inherited through pollen. Although this technology has been developed for tobacco for the production of biopharmaceuticals and biomaterials, extension of this approach to food crops requires further research. At present, no effective gene containment method is available for all GM crops, and considerable investment and research is needed to develop the technologies that would properly address these issues.

The Workshop presentations can be viewed online at:
http://www.aphis.usda.gov/brs/confine_present.html.

EMBRAPA TO ASSIST MINISTRY OF AGRIC TO MONITOR UNCERTIFIED SEEDS

The Brazilian Agricultural Research Corporation (EMBRAPA) has announced plans to assist the Ministry of Agriculture in monitoring soybean fields to ensure only certified biotech soybean seeds were used for planting. The monitoring system will avail of the use of satellites to register images of plantations every 15 days, able to detect unregistered, illegal soybean fields. Seeds used for planting must have a known origin, be certified, and be registered with the Ministry of Agriculture to be legal.

Ywao Miyamoto, the president of Brazil's Seed Producers Association (Abrasem) explained that uncertified seeds are available at a lesser cost in the black market, and are often purchased by farmers in good faith. However, uncertified seeds sometimes fail to germinate, and on average 75 kilos of illegal seeds per hectare are required instead of 50 kilos per hectare of certified seeds. Certified seeds also have a guarantee of “health, pureness, and germination”. The price of approved seeds also includes royalties to the companies who developed them. One of these, in Brazil, is EMBRAPA. Royalties are required to fund further research aimed at improving agricultural production.

Read the full article at:
http://www.agenciabrasil.gov.br/noticias/2006/10/21/materia.2006-10-21.2990835881/?searchterm=sementes

PETROBRAS INVESTS IN SMALL-SCALE AGRICULTURE

Petrobras, Brazil’s federal energy company, has announced it will invest R$ 200 million (about US$94.7 million) in the state of Rio Grande Do Sul in partnerships with cooperatives of small-scale producers, as part of a program to set up three plants for the production of biofuels: two for biodiesel and one bioethanol. The partnership aims to benefit 80 thousand farmers from 140 cities in the state, who will provide the raw materials (including sunflower, canola, soy and peanut) for the biorefineries.

“This agreement is extremely important for the small-scale producers” said state governor Germano Rigotto. The governor added the initiative will allow the Rio Grande Do Sul state to become self-sufficient in terms of biodiesel requirements, in addition to increasing the income and living standards of farmers.

Read the full article at: http://www.agenciabrasil.gov.br/noticias/2006/10/23/materia.2006-10-23.5249754622/?searchterm=agricultura

* ASIA and PACIFIC *

IRRI CHANGES COPYRIGHT POLICY, OFFERS FREE INFORMATION

The International Rice Research Institute (IRRI) freely opened the doors to its information vault to all parties, adopting an open-source information copyright policy. IRRI’s decision follows the release of the Delhi Declaration on Rice by the Ministerial Roundtable at the International Rice Congress (IRC) held recently in Delhi, wherein the Institute was asked to help achieve the main

objectives of the declaration. These include a plan to establish a comprehensive partnership among the participants that would support regular discussions for strengthening rice research and development efforts.

“We were already preparing to change our copyright policy when the Ministerial Roundtable asked us to host the task force and facilitate the continued exchange of rice research and information in Asia —we’re honored to be asked to play such an important role,” IRRI Director General Robert S. Zeigler said. “Both decisions also fit very well with goal four of IRRI’s new Strategic Plan, Bringing Hope, Improving Lives, to provide equitable access to information and knowledge on rice and help develop the next generation of rice scientists.”

For the complete press release, visit: http://www.irri.org/media/press/press.asp?id=142.

THAI KING FIRST RECIPIENT OF BORLAUG MEDALLION

King Bhumibol Adulyadej of Thailand will receive the Dr. Norman E. Borlaug Medallion, awarded by the World Food Prize Foundation for “exceptional humanitarian service in reducing hunger and poverty”. He will be the first recipient of the award which honors individuals at the highest international level who would not normally be considered for the World Food Prize. The Medallion is named in honor of Nobel Peace Prize Laureate Dr. Norman Borlaug who founded The World Food Prize in 1986.
Ambassador Kenneth M. Quinn, President of the Foundation, said that King Bhumibol “has displayed an unwavering dedication to the well being of his subjects, and a deep concern that they have sufficient food and proper nutrition”. Among his projects are efforts to promote small-scale agriculture, the introduction of new agricultural technologies and the sustainable use of water.

Read the World Food Prize press release at
http://www.worldfoodprize.org/press_room/2006/october/thai-king-borlaug-medallion.htm.

INDIA’S SUPREME COURT OKS FIELD TRIALS FOR GM MUSTARD

It’s a go for field trials of DMH-11, a genetically modified (GM) mustard crop variety, being studied by the Delhi University. This decision came soon after an earlier Supreme Court ruling for government to temporarily ban any approval of GM seed field trials except those that are currently on-going.

India’s Genetic Engineering Approval Committee (GEAC) was denied from granting any approval for field trials of GM seeds meantime that hearings are being held in Court.

For more information, contact Bhagirath Choudhary of the ISAAA South Asia Office at
b.choudhary@isaaa.org.

VIETNAM RELEASES PLANT VARIETY PROTECTION DECREE

The Vietnamese government has issued Decree No. 104/2006/ND-CP, which details provisions and executing guidelines that govern plant variety protection rights. Covered by this decree are complete plants varieties, breeding materials, and harvested materials of plant varieties from agriculture and forestry sectors. The registry application of plant varieties is stipulated under Section 2, Article 164 of the Intellectual Property Rights (IPR) Law.

The National Protection Agency is tasked to establish and save national registration numbers of protected plant varieties. The decree takes effect 5 days from its publication in the National Gazette.

Email Hien Le of Biotech Vietnam at hientttm@yahoo.com for more news on Vietnamese agriculture and biotechnology.

CLIMATE CHANGE TO AFFECT AUSSIE WINE INDUSTRY

CSIRO (Australia's national science agency) and the University of Melbourne have forecasted a decrease in grape quality and crop harvest by Australian grape farmers in the coming years. Following their climate change projections for 2030 and 2050, scientists have predicted that greenhouse gas emissions will cause an increase in temperatures in Australia's wine growing regions by 0.3 to 1.7 degrees Celsius. The rise in temperature will mean shorter growing seasons and earlier harvest dates. Warm temperature grape varieties should be developed to replace the current cool temperature adapted ones. Eventually, the current varieties may have to be relocated in cooler regions in the south or near coastal areas of the continent.

Read the complete press release at
http://www.csiro.au/csiro/content/standard/ps2ei,,.html

* EUROPE *

EU DEMANDS TESTING OF US RICE IMPORTS

Following the detection of unauthorized GM rice LLRICE 601 in shipments of US long grain rice to the EU, the Standing Committee on the Food Chain and Animal Health endorsed a draft Commission Decision imposing mandatory counter testing for unauthorized GMOs in all imports of US long grain rice. The failure of US authorities to adopt a common sampling and testing protocol for the detection of unauthorized GM rice LLRICE601 in rice imports to the EU prompted the Committee to approve the Decision. Under the draft Decision, all shipments of US long-grain rice will be sampled and tested at the point of entry to the EU by Member State authorities according to the EU testing protocol accepted by the Standing Committee.

Read the press release at
http://europa.eu/rapid/showInformation.do?pageName=middayExpress&guiLanguage=en.

BIOTECH INDUSTRY SUPPORTS EU INITIATIVE ON BIOREFINERIES

The European Association for Bioindustries (EuropaBio) recently announced its support of the initiative taken by the European Commission in conjunction with the Finnish Presidency to promote the development of biorefineries in Europe. Analogous to today's petroleum refineries, biorefineries are a key element of the bio-based economy, one that is not wholly dependent on fossil fuels for energy and industrial raw materials. To develop a knowledge based bio-economy in Europe, EuropaBio will publish a full policy document on biorefineries. The main recommendations proposed include the establishment of a coherent European Policy Agenda for the Knowledge Based Bioeconomy (KBBE), and the promotion and support of innovation in plant science and industrial biotechnology

Read the complete press release at http://www.europabio.org/articles/PR_industrial201006.doc.

GM DEBATE IN THE VATICAN

Three American professors presented this month in the Vatican the benefits of using transgenic crops. Lawrence Kent, Carl Pray, and Greg Taxler told the Vatican that huge economic benefits at the farm level have been gained by using transgenic crops. In addition, the three speakers said that they have not come across any case of negative health effects on humans caused by the technology.

Pope Benedict XVI has not released any formal statement about the topic. The Vatican however, has indicated its awareness that this might help in ending hunger and improving the lives of the poor.

The full article was published by the National Catholic Register and available online at http://ncregister.com/site/article/507/

RESEARCH

GM TOMATO GOOD FOR THE HEART

Plant foods are a good source of flavonoids, important compounds due to their antioxidant properties. As antioxidants, flavonoids may protect against certain diseases such as cancer by inhibiting oxidative and free-radical damage to lipids and nucleic acids. These plant-derived substances also play a role in the prevention of other diseases associated with aging like cardiovascular disease. In a recent article published in the Journal of Nutrition, scientists in Germany and the Netherlands have succeeded in producing transgenic tomato with enriched levels of flavonoids, and tested the health effects of both genetically-modified and wild-type tomatoes on mice.

Researchers tracked changes in general health indicators such as bodyweight and food intake, and in cardiovascular risk indicators that include plasma C-reactive protein (CRP) and cholesterol levels. They found out that mice fed with wild-type tomato and those with transgenic tomato have

higher levels of “good” cholesterol compared with the baseline; however, mice supplied with flavonoid-enriched tomato have significantly reduced levels of CRP – a protein associated with high risk of cardiovascular disease – than those that received wild-type tomato in the diet, indicating lower risk of cardiovascular disease for the group fed with flavonoid-enriched tomato. The results of the study suggest that genetic enhancement of fruits and vegetables may in the future allow an optimization of the human diet and help reduce diseases.

For the abstract of the research, “Transgenic Flavonoid Tomato Intake Reduces C-Reactive Protein in Human C-Reactive Protein Transgenic Mice More Than Wild-Type Tomato”, readers can visit http://jn.nutrition.org/cgi/content/abstract/136/9/2331

DUPLEX SCREEN MESH REDUCE MAIZE POLLEN FLOW

Researchers at the University of Tsukuba in Japan reported that a greenhouse covered with 1-mm duplex fine mesh reduced the outcrossing in maize by more than 75%. This is a result of the study by Shin Wanatabe and colleagues aimed to assess gene flow between maize plants inside the greenhouse and those outside. Under natural conditions, outcrossing in maize is reported to occur at 78% to 98%.

To determine the outcrossing rate, the researchers used yellow, black and white colored varieties. The colored varieties were designated as pollen donors. The presence of colored kernels on ears of white maize indicated cross pollination.

The complete article was published by the journal Plant Biotechnology and can be found at http://www.jstage.jst.go.jp/article/plantbiotechnology/23/4/387/_pdf

ONION LEAF LECTIN WREAKS HAVOC TO APHIDS

Lectins are mostly toxic carbohydrate-bound proteins, which can clump together (agglutinate) red blood cells in higher animals. In insects, lectins target the thin chitin layer covering the gut. In a recent article published in Crop Science, Munshi Azad Hossain and colleagues from the Indian Institute of Technology report that “Transgenic Expression of Onion Leaf Lectin Gene in Indian Mustard Offers Protection against Aphid Colonization” Aphids and other sap-sucking insect pests are resistant to Bt toxins.

Genes of three lectins with low or no toxicity towards higher animals were obtained from snowdrop, garlic, and onion. By expressing the three lectin genes and a fusion lectin gene from garlic and onion in E. coli, the researchers found that the onion lectin and the fusion lectin have higher toxicity towards aphids than lectins from snowdrop and garlic. Transgenic expression of these lectins in Indian mustard confirmed their protective action against aphids on engineered plants.

For the complete article, readers can access: http://crop.scijournals.org/cgi/content/full/46/5/2022

ANNOUNCEMENTS

FRENCH VERSION OF VIDEO OF BT COTTON IN INDIA AVAILABLE

A French version of “The Story of Bt Cotton in India” (“L'histoire du coton Bt en Inde”), a video documenting the process that it took for India’s first genetically modified crop, Bt cotton, to be approved for commercialization, is now available and will be distributed to interested stakeholders in Francophone Africa. It captures the experiences of farmers and various stakeholders, particularly on how the technology has changed their lives and the challenges and opportunities they still face. The video is a joint production of the International Service for the Acquisition of Agri-biotech Applications (ISAAA) and the South Asia Biosafety Program. For more information on the video series of ISAAA, email knowledge.center@isaaa.org.

BIODIESEL WORKSHOP TO COVER BASICS AND BIODIESEL PRODUCTION

The University of Georgia at Athens will host the Southeastern Biodiesel Workshop on November 27 to 29, which will cover all aspects of biodiesel - from the economics of biodiesel to its production at the University of Georgia’s biorefinery. The workshop aims to provide practical information on the biodiesel industry. Early registration must be received by Nov. 1.

For more information, visit: http://www.uga.edu/news/artman/publish/061023_Biodiesel.shtml and http://www.SoutheastBiodiesel.org

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DOCUMENT REMINDERS

USDA ECONOMICS, STATISTICS AND MARKET INFORMATION SYSTEM

The USDA Economics, Statistics and Market Information System (ESMIS) provides fast and free access to nearly 2500 USDA economic reports and datasets. The initiative is a collaborative project between Albert R. Mann Library at Cornell University and several agencies of the U.S. Department of Agriculture.

The system contains nearly 2500 reports and datasets. These materials cover U.S. and international agriculture and related topics. Available titles include both current and historical data. Visit the site at: http://usda.mannlib.cornell.edu/MannUsda/homepage.do

HOMOLOGUE: CIAT’S NEW COMPUTER PROGRAM TO PREDICT “WHERE WILL THIS CROP GROW?”

Homologue™ was created by CIAT experts to aid agricultural technicians and researchers establishing areas around the world where crops are likely to grow well. The program requires basic inputs such as longitude, latitude, and, optionally, and soil characteristics.

“Homologue allows us to find different sites where a variety or crop will respond well," sated William Díaz, of CIAT. “It also produces a map of probabilities where good results can be expected. This is useful for making decisions on introducing new species, conserving germplasm banks, or conducting participatory research in sites with similar conditions.”

Read more at: http://www.ciat.cgiar.org/newsroom/release_22.htm

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