

# 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).

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## News

### GLOBAL

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#### FAO: RECORD CEREAL CROP FOR 2007

The prospects for global cereal production this year are generally favorable, according to the United Nations Food and Agriculture Organization (FAO). World cereal production is forecast to increase 4.3 percent to a record 2 082 million tons. However, many countries are in crisis due to significant crop losses and low yield. In many parts of southern Africa

total maize production remains about the same as last year's below-average crop. Prospects are good in eastern Africa, following above-average to bumper first season crops in the region.

Record 2007 main season maize crops are being gathered in South America, where planted area increased in response to strong demand, largely for ethanol production in the United States. A good wheat crop is being harvested in Mexico, while in Bolivia, severe weather has caused extensive losses to agriculture, livestock, and other assets, threatening the food security of rural communities.

The FAO press release is available at <http://www.fao.org/newsroom/en/news/2007/1000533/index.html>.

## LESS EXTENSIVE RISK ASSESSMENT OF GM STACKED EVENTS

GM stacked events are products with more than one transformation event. These have been also referred to as 'stacked products', 'breeding stacks', 'stacked genes' or 'pyramided traits'. Because they are considered as new GMOs by the European Commission, they need regulatory approval, including an assessment of their safety, similar to single events prior to marketing.

Researchers in Belgium however, assert that the risk assessment of these GM stacked events could be less extensive than the assessment of the parental GM events. The researchers proposed and enumerated several criteria for the risk assessment of stacked events that include molecular and comparative analysis data as minimum requirements. Additional analysis may be conducted in order to extrapolate data from the parental GM lines to the GM stacked event.

The researchers recommend that the molecular data should include (1) evidence of the presence and the copy number of the parental inserts in the GM stack, and (2) that the levels of expression of the newly expressed proteins in the GM stack is equal to that of the GM parental lines. In addition, the combined effects of the transgenes and the effects of the potential interactions between the newly expressed proteins should also be assessed.

The opinion paper published by the journal Trends in Food Science and Technology can be accessed by subscribers at <http://dx.doi.org/10.1016/j.tifs.2006.09.002>.

## NEW REPORT CITES BENEFITS OF PESTICIDE USE

A report from the study conducted by researchers at the University of Greenwich in the United Kingdom stated the numerous benefits derived from pesticide use, a view that is in contrast with a number of other publications.

In their study, Jerry Cooper and Hans Dobson provided evidence that pesticides will continue to be a vital tool that will help improve living standards for the people of the world. Among the cited benefits include those categorized as 'primary benefit', for example improved crop/livestock yield and quality, and 'secondary benefits' such as improved nutrition and quality of life. The researchers further categorized these primary and secondary benefits as economic, environmental or social in nature.

The report was supported by CropLife International and can be downloaded at <http://www.croplife.org/library/documents/Crop%20protection/Pesticides%20and%20humanity%20Version%20A24.pdf>. The complete press release can be found at <http://www.croplife.org>.

## AFRICA

### ECOWAS MINISTERS AGREE ON BIOTECH PLAN

An agreement was forged by the Ministers from the Economic Community of West African States (ECOWAS) to use biotechnology to increase food production in their region. This was reached at the third ECOWAS ministerial meeting

on biotechnology and biosafety held in Accra, Ghana. A communiqué issued at the end of the meeting noted that the technology will improve productivity, make the farming sector more competitive and ensure sustainable management of natural resources. However, safety measures at both the national and regional levels were deemed important as part of the implementation process.

A regional and comprehensive plan is envisioned to benefit from biotechnology developments. This will necessitate the assistance of development partners and the collaborative efforts of governments of various countries, said Marcel Nwalozie, from the west and central African Council for Agriculture Research and Development, an umbrella organization that co-ordinates agricultural research for west and central Africa.

Read the full report at  
<http://www.voanews.com/english/2007-03-31-voa16.cfm>.

## AMERICAS

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### APHIS POLICY ON LOW-LEVEL PRESENCE OF GE MATERIAL

The Animal and Plant Health Inspection Service (APHIS) of the United States Department of Agriculture clarified its approach for handling incidents of low-level presence (LLP) of genetically engineered (GE) plant material in commercial seeds and grain. Developers must comply with all APHIS regulations and permit conditions to prevent the release of regulated GE material.

When LLP incidents occur, the agency will initiate an inquiry whenever regulated material is mixed with commercial seeds or grain to evaluate any risk, to determine the circumstances surrounding the release, and to determine whether remedial and/or enforcement actions may be appropriate. If APHIS determines that an incident involving regulated GE plant material could pose a risk to plant health or the environment, the agency will take appropriate remedial steps using its authority under the Plant Protection Act.

In cases in which APHIS determines that remedial action is not necessary to mitigate LLP of regulated GE plant material to protect plant health and the environment, APHIS is not precluded from taking enforcement action against a company or individual for violations of APHIS regulations.

Readers can access the press release at <http://www.aphis.usda.gov/newsroom/content/2007/03/llppolicy.shtml>.

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### FARMERS GET MORE FROM CIMMYT DURUM WHEAT

Here is a piece of good news for durum wheat farmers around the world. The International Wheat and Maize Improvement Center (CIMMYT) has been breeding new durum lines that are disease-resistant and of high quality. The CIMMYT team realized that farmers in developing countries need high quality and marketable grain for them to improve their livelihoods.

Breeding itself is a cyclical process of combination and selection until the breeder is satisfied that all required characteristics have been incorporated into the new wheat plants. The first goal was to develop leaf rust resistance in durum wheat. After the CIMMYT team accomplished this feat, they focused on enhancing the performance of the wheat varieties under drought stress and incorporating resistance to other diseases. Next is making the best possible wheat varieties from all other perspectives – including the yield, color and quality of the gluten in durum wheat grains. The best durum wheat lines in the CIMMYT breeding station will then be sent to national programs for evaluation.

Read more on durum wheat at <http://www.cimmyt.org/english/wps/news/2007/mar/yieldBack.htm>.

## ASIA AND THE PACIFIC

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### INDONESIA AIMS FOR SELF-SUFFICIENCY, ENTERS AGREEMENT WITH IRRI

The Indonesian Agency for Agricultural Research and Development (IAARD), and other agencies of the Indonesian Ministry of Agriculture, signed a three-year agreement with the Philippine-based International Rice Research Institute (IRRI) to help boost rice production in Indonesia. The Southeast Asian nation aims to produce an additional 2 million tons of rice in 2007 and must attain a 5 percent growth in national rice production each year, to achieve self-sufficiency in rice production.

The new agreement between Indonesia and IRRI focuses on three key areas: support for the Indonesian government's Rice Production Increase Program, collaborative research, and human resource development. Support efforts will include 1) the development of improved rice varieties with high yield potential, grain quality, and resistance to pests, 2) the development of a national strategy and framework for hybrid rice, and 3) the development of improved rice varieties that can tolerate submergence, drought, and low-temperature in high-elevation areas.

Read the news release at <http://www.cgiar.org/newsroom/releases/news.asp?idnews=557>.

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### ICRISAT HYBRID PIGEONPEA TO BOOST PRODUCTION OF PULSE CROP

The low productivity of pigeonpea remains a major concern of many countries that consume this pulse crop (legume). A new hybrid pigeonpea technology, developed by the International Crops Research Institute for the Semi-arid Tropics (ICRISAT) and partners offers a hope of starting a pulse crop revolution in India and other developing countries by substantially increasing pigeonpea production.

The new hybrid technology is based on the cytoplasmic male-sterility (CMS) system. Male-sterile plants are those that do not have functional male sex organs. For hybrid production to be successful, it requires a female plant in which no viable pollen grains are borne. A simple way to establish a female line for hybrid seed production is to identify or create a line that is unable to produce viable pollen. This male-sterile line is therefore unable to self-pollinate, and seed formation is dependent upon pollen from the other male fertile line. So far the progress in the mission of enhancing the productivity of pigeonpea has been very encouraging and the team at ICRISAT is confident that the reality of commercial hybrids is just around the corner.

The news article is available at <http://www.icrisat.org/Media/2007/media6.htm>.

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### PHILIPPINES INSTITUTIONALIZES BIOTECH PARTNERSHIP

Responsible use of biotechnology to enhance local initiatives to address issues of food security and poverty – this was

the call by participants to the first Biotechnology Information Organization Network (BIONet) National Congress held in Manila, Philippines. BIONet, a multi-stakeholder partnership with grassroots base, envisions itself in helping to institutionalize and maximize agricultural biotechnology for livelihood, food, nutrition and marketing capability of communities.

During the congress, the Local Government Unit (LGU) Course on Biotechnology was launched by the Department of Agriculture (DA) Biotechnology Program Implementation Unit. This course which aims to educate the local government units headed by chief executives on the benefits of traditional and modern biotechnology, came about from a 2005 Memorandum of Agreement between the DA and the League of Municipal Mayors of the Philippines.

For additional information on BIONet, email Sonny Tababa of the SEARCA Biotechnology Information Center at [spt@agri.searca.org](mailto:spt@agri.searca.org).

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### EUROPEAN FARMERS BENEFITING FROM BT MAIZE CROPS SAYS STUDY

Farmers in Europe are benefiting from planting genetically modified insect resistant (Bt) maize through higher income, improved grain quality and environmental gains associated with lower insecticide use. This is the conclusion of "The benefits of adopting genetically modified, insect resistant (Bt) maize in the EU: first results from 1998-2006 plantings" by Graham Brookes, director of PG Economics in the United Kingdom and author of the study.

Key findings of the study include:

- Higher yields: In maize growing regions affected by European Corn Borer (ECB) and Maize Stem Borer (MSB), the main impact of growing Bt maize has been higher yields compared to conventional non-GM maize. Average yield benefits are +10% and sometimes higher.
- Higher income: In 2006, users of Bt earned additional income levels of between €65 and €141/ha. This is equal to an improvement in profitability of +12 to +21%.
- Better grain quality: In certain regions, Bt maize delivered important improvements in grain quality through significant reductions in the levels of mycotoxins found in the grain.
- Less pesticide use: Where farmers previously used insecticides to control ECB and MSB, adoption of Bt technology delivered environmental gains from less insecticide use and reduced use of fuel.

Read the full report at <http://www.pgeconomics.co.uk/pdf/Benefitsmaize.pdf> or email the author at [graham.brookes@btinternet.com](mailto:graham.brookes@btinternet.com).

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### INCREASE IN GM CORN PLANTATIONS IN FRANCE FUELED BY BORER EPIDEMIC

The tenfold increase in the acreage of GM corn plantations in France from 2005 to 2006 has been attributed to the thriving populations of the European corn borer pest in the southwest and central part of the country. The area of GM corn in France increased from 500 to 5,200 hectares between 2005 and 2006.

France's Association Generale de Producteurs de Mais (AGPM) mentioned that there has been an increase in the geographic reach of the pests across the country. The AGPM says that use of Monsanto's Bt-Maize MON810 made a significant difference in yield, with Bt corn averaging at about 3.5q/ha more than the conventional varieties.

The press release can be found at <http://www.foodproductiondaily.com/news/ng.asp?n=75383-mon-corn-borer-gm>.

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### THREE GM OILSEED RAPE AUTHORIZED FOR IMPORT AND USE AS ANIMAL FEEDS

The European Commission recently authorized the import and use as animal feed of three oilseed rapes Ms8, Rf3 and Ms8xRf3, genetically modified for tolerance to the herbicide glufosinate-ammonium. The authorization does not cover cultivation and food use of the oilseed rapes. Products containing Ms8, Rf3 or Ms8xRf3 will need to be clearly labeled as containing genetically modified oilseed rape. Bayer, the company that developed the oilseed rapes, will have to undertake measures to prevent any damage to health and the environment in the event of accidental spillage.

Read the press release at [http://europa.eu/rapid/pressReleasesAction.do?](http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/416&format=HTML&aged=0&language=EN)

[reference=IP/07/416&format=HTML&aged=0&language=EN](http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/416&format=HTML&aged=0&language=EN)

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## Research

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### FIELD SCALE GENE FLOW IN FODDER MAIZE ANALYZED

Results from Farm Scale Evaluation (FSE) trials in the UK indicated that the rates of pollen-mediated gene flow from herbicide-tolerant (HT) to conventional maize decreased rapidly with increasing distance from the GM source. The experiment conducted by researchers in the Central Science Laboratory and the Winfrith Technology Centre utilized the largest number of sites (55) and samples (1,055) that was analyzed in a single study to date.

The researchers reported that the maximum level of gene flow detected was 60% in samples taken 0-2 m from the HT crop. Gene flow was also detected in samples taken 200 m away from the GM source. The researchers used RT-PCR of the herbicide tolerance gene *pat* to detect gene flow from the Liberty Link maize line T25.

The data was also used to construct statistical models to help confirm assumptions made in risk assessments concerning gene flow in the FSEs. In addition, the results help validate whether the separation distances for maize issued by the Supply Chain Initiative on Modified Agricultural Crops (SCIMAC) are effective. SCIMAC is a formal UK grouping of industry organizations representing farmers, plant breeders, and seed trade and biotechnology companies.

The paper published in Transgenic Research can be accessed by journal subscribers at <http://www.springerlink.com/content/w1627886480r1xr8/>.

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### IN VITRO BREEDING OF BRASSICA FOR METAL PHYTOEXTRACTION

Research on the use of several plant species for metal phytoextraction had been initiated in the past. Metal phytoextraction is the uptake of heavy metals, such as cadmium and lead, from contaminated soils to the aboveground parts of plants. The contaminants are then removed from the site by harvesting the plants.

Indian mustard, *Brassica juncea*, is among the plant species recognized to have potential for phytoextraction. Researchers in Switzerland recently have shown that *in vitro* breeding and somaclonal variation can be used to improve the potential of the plant species to extract and accumulate toxic metals. The researchers generated somaclonal variants of the Indian mustard from metal-tolerant callus cells.

The new phenotypes were found to have improved tolerance to cadmium, zinc and lead under hydroponic conditions. These plants were able to extract cadmium and lead by up to six and four times higher than the control plants, respectively. The researchers concluded that the clones could be used to further assess metal accumulation and extraction properties in contaminated soils under real field conditions for phytoremediation purpose.

The abstract in Plant Cell Reports, with links to the full paper for journal subscribers, is at <http://www.springerlink.com/content/p0p370n036253r80/>.

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## GENETIC USE RESTRICTION TECHNOLOGIES REVIEWED

The interest in technologies to impede transgene movement is being driven by interest in using transgenic crops to produce pharmaceutical and industrial products. In a review paper, Melissa Hills and colleagues in Canada discussed some of the genetic restriction technologies (GURTs) that could be used to restrict the spread of transgenes. To date, no GURT has been applied commercially or have been tested in the field yet.

The review to be published in Trends in Plant Science focused on varietal GURTS (VGURTs). These are mechanisms that impede transgene movement, either by rendering the plant unable to develop properly, or produce functional pollen or seed, or by preventing the transmission of the transgene so that there is reduced frequency in subsequent generations.

Among the VGURTs reviewed are those that can help reduce seed admixture, render seeds sterile, effect male sterility, and use the mechanism of maternal inheritance. The researchers concluded that several paradoxical issues are associated with GURTs. Among these include the preference of regulatory agencies to use streamlined transgenic constructs, which might preclude the use of additional genes. Also a concern is whether the public will perceive the product with an additional gene more acceptable.

The review paper can be accessed by journal subscribers at <http://dx.doi.org/10.1016/j.tplants.2007.02.002>.

## Announcements

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### World Neem Conference 2007

The World Neem Conference will be held in Coimbatore, India on 21-24 November, 2007. The conference is sponsored by the Neem Foundation. For more details contact the Neem Foundation at [office@neemfoundation.org](mailto:office@neemfoundation.org) or visit <http://www.neemfoundation.org/neem2006.htm>.

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### Conference on Upland Agriculture in Southeast Asia

The International Conference on Integrating Conservation in Upland Agriculture in SEA will be held in Chiang Mai, Thailand on 24-26 October, 2007. More details about the conference are available at <http://www.worldagroforestrycentre.org/Events/default.asp?EventID=177> or contact J.C. Fernandez of the World Agroforestry Centre at [j.fernandez@cgiar.org](mailto:j.fernandez@cgiar.org).

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## Document Reminders

### DBT LAUNCHES TWO NEW WEBSITES ON GMOS

The Department of Biotechnology (DBT) of the Government of India has recently launched two web portals on genetically modified organisms (GMOs).

The website on Indian biosafety rules and regulations can be accessed at <http://dbtbiosafety.nic.in>. The other website is the Indian GMO Research Information System (IGMORIS), a database on activities involving the use of GMOs and products in India. It is available at <http://igmoris.nic.in/>.

For more information contact: Dr. K.K. Tripathi, Advisor, DBT at [kkt@dbt.nic.in](mailto:kkt@dbt.nic.in).

### BOOKS ON PERUVIAN POTATOES

The Cultural Center of the Catholic University and the International Potato Center (CIP) recently launched two books that contribute to the study of the Peruvian potato, one strictly scientific, the other anthropological. Originally published in Spanish, the English translation of the book "The Potatoes of South America: Peru offers a description of almost 100 wild species of Peruvian potatoes. The "Catalogue of Native Potatoes Varieties of Huancavelica, Peru", in Spanish, focuses on 144 potato varieties native to the Huancavelica region, in the Central Andes of Peru. For more information, visit [http://www.cipotato.org/pressroom/press\\_releases\\_detail.asp?cod=34](http://www.cipotato.org/pressroom/press_releases_detail.asp?cod=34).

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