

## **CROP BIOTECH UPDATE**

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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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**August 12, 2005**

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### **NEWS**

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#### **SPAIN ANNOUNCES COEXISTENCE DECREE**

After eight years of biotechnology self-regulation, the Spanish government will issue a coexistence decree. The United States Department of Agriculture reports that key representatives of the ministries of agriculture and the environment made this announcement in a press conference. The Royal Decree will be finalized by the end of 2005 and will be operational for corn planting in 2006.

Among the provisions in the Decree are:

- Authorities from the ministries of agriculture and environment, and the autonomous regional governments will work jointly to develop an annual “National Supervision Plan” encompassing all facets of coexistence, paying special attention to organic production, the level of adventitious material resulting from the biotechnology crops grown under the Decree, and to the labeling of biotechnology crops.
- The National ministries of agriculture and the environment will come out with a yearly report that will focus on problems between farmers planting biotechnology and traditional, traditional/organic crops; the biotechnology adventitious levels in traditional, traditional/organic crops; and farmer adherence to the coexistence requirements.
- The ministry of agriculture will organize educational programs and additional recommendations for biotechnology use by local farmers.

The Decree will also set expectations for other stakeholders such as farmers, seed companies, and local associations. For more details, visit

<http://www.fas.usda.gov/gainfiles/200507/146130388.doc>

## EU OKS GM MAIZE FOR FEED

The European Commission granted a 10-year license to Monsanto Co. to export a genetically modified (GM) maize, known as MON 863, for use as animal feed. It is the third GM product approved by the European Union since the end of its six-year moratorium in April 2004. EU health ministers are expected to vote on whether to clear the same maize for human consumption in September 2005.

See the full story in

[http://www.guardian.co.uk/international/story/0,,1545304,00.html#article\\_continue](http://www.guardian.co.uk/international/story/0,,1545304,00.html#article_continue)

## SATELLITE TECH TO DETERMINE IF CROP IS GM OR NON-GM

There is potential for satellite technology to be used to help distinguish between genetically modified (GM) crops and non-GM crops. Anthony Fletcher of Food USA Navigator says that the US Environmental Protection Agency is now working with the National Aeronautics and Space Administration (NASA) to adapt hyperspectral imaging for agricultural use.

Through hyperspectral imaging, data can be obtained on a crop's health status, need for irrigation, pest attacks, weed status, soil nutrients and other previously unquantifiable variables, including gene drift. It uses a special camera to cut one

photograph into 120 color-specific images. Each image shows a unique characteristic not visible to the human eye.

The hyperspectral camera and its applications were developed by the Institute for Technology Development at NASA's Stennis Space Center in Mississippi, USA.

Visit <http://www.ucbiotech.org> for more biotechnology news.

## GROWERS ASSOC DISCUSS BIOTECH WHEAT FUTURE

The US National Association of Wheat Growers, through its President, Sherman Reese, told Monsanto Growers Advisory Council that discussions are being made with other agribusiness groups on the future of growing and selling biotech wheat. It noted that producers need to take a more active role to bring about its introduction inasmuch as they are direct beneficiaries of wheat industry developments as a result of biotechnology.

Noting that the domestic market will be more accepting of the biotech crop than the foreign sector, the wheat growers felt that wheat might risk being an orphan crop and be supplanted domestically by future crops like drought-tolerant corn and soybeans. Nevertheless, they opined that efforts to segregate should focus on non-biotech varieties such as organic wheat for customers who demand them.

More on this development at <http://www.wheatworld.org/blog/blogger.html> or view the news release at <http://www.grainnet.com/info/articles.html?type=bn&ID=27479>

## WORLD FOOD DAY 2005 THEME: INTERCULTURAL DIALOGUE

The Food and Agriculture Organization announced that this year's World Food Day theme is 'Agriculture and intercultural dialogue'. The theme stresses "the contribution of different cultures to world agriculture and argues that sincere intercultural dialogue is a precondition for progress against hunger and environmental degradation."

"Intercultural dialogue between developing countries facing similar food and agriculture problems is an important way of sharing expertise and technologies," FAO said. Hence, South-South cooperation through sharing of expertise and technologies has resulted in "the transfer of many solutions suited to local conditions." World Food Day provides an opportunity at various institutional levels to further dialogue and enhances solidarity on many issues that affect developing countries.

World Food Day is celebrated annually to coincide with the founding of FAO. This year's celebration will be on October 16 at the FAO Headquarters in Rome, Italy.

Additional information on World Food Day at

<http://www.fao.org/newsroom/en/news/2005/105677/index.html>

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## RESEARCH

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### NEW BT TECHNIQUES REVIEWED

In "Sustainable and durable insect pest resistance in transgenic crops," Paul Christou of the John Innes Center in the United Kingdom reviews existing and emerging techniques in introducing the Bt gene into plants. His work appears in the latest issue of the Information Systems for Biotechnology news report.

Current research in agricultural biotechnology has so far been limited to introducing a single gene into plants whose product is already widely used. Although the evolution of insects resistant to Bt has yet to be seen in the field, scientists are still taking precautions to ensure that no such evolution will happen. Stacking or pyramiding of multiple transgenes in one plant is a way by which eventual insect resistance can be managed.

Another method is to introduce fusion proteins – or a new protein with two domains, one containing the Bt toxin, and the other containing a non-toxin. Christou cited a fusion protein comprising a Bt toxin and a lectin polypeptide as an example, where the latter portion could serve as a novel binding domain, allowing the fusion protein to bind to a greater number of insect receptors. Christou found that such a fusion protein conferred plant resistance to a broader spectrum of insect pests such as the striped stemborer, cotton leaf worm, and leafhopper.

For more information, visit

<http://www.isb.vt.edu/news/2005/news05.aug.htm#aug0501>

### STUDY FINDS NO GM CORN IN MEXICO

Two articles, one in the Online Early Edition of the Proceedings of the National Academy of Science, and the other in Nature, report that no genetically modified (GM) corn has been found in Mexico. This is based on the work of Sol Ortiz-Garcia and colleagues, who sampled maize seeds of 870 plants from 125 fields in 18 localities in Oaxaca, Mexico.

The Mexican government imposed a six-year moratorium on GM maize release in 1998, but the GM corn was found in Oaxaca a few years later, according to a previous study published in Nature. To test if this was still true, scientists screened seeds for the two transgenes present in the corn. After tests on 153,000 seeds, they did not detect the transgenes, and concluded that the genes were absent or in very low quantities in native maize. They likewise speculated that the transgenes may have been present in fields as early as the year 2000, but had dropped out of local maize varieties thanks to a farmer education program and a reduction in GM maize imports.

For more information, contact Allison Snow of Ohio State University, at [Snow.1@osu.edu](mailto:Snow.1@osu.edu). You can find more news at <http://www.nature.com> and <http://www.pnas.org>.

## RICE GENOME MAPPED

After working with ten nations on the rice genome, the International Rice Genome Sequencing Project has obtained a finished quality sequence, and has mapped the complete genome of rice (*Oryza sativa* L. ssp. *japonica* cv. Nipponbare). Findings and maps are published in the journal Nature.

Analysis of the sequences, which represent 95% of the 389 million base pair genome, revealed, among others, that there are 37,544 protein-coding genes, 71% of which have homologs in *Arabidopsis*; and 0.38-0.49% of the nuclear genome contains DNA fragments from cell organelles, suggesting repeated and ongoing transfer of DNA from chloroplasts and mitochondria into the nucleus.

The maps and the complete genome sequence will allow rice breeders to increase yield potential and yield stability, through a combination of biotechnology and improved conventional breeding.

Nature subscribers can access the full text of the article at <http://www.nature.com/nature/journal/v436/n7052/full/nature03895.html>. Other readers can view the abstract at <http://www.nature.com/nature/journal/v436/n7052/abs/nature03895.html>.

## FOOD CHANNEL MARKETS AND GM PERCEPTION

Highly negative consumer sentiment towards genetic modification (GM) in Europe seems likely to continue to influence food industry buyers against importing GM food. However, the presence of GM crops in a country does not cause negative perception of non-GM food imported from that country as long as adequate steps are taken to avoid accidental contamination of conventional crops. This was a finding of the study "Impact of genetic modification on country image of imported food products in European markets: Perceptions of channel members" by John G. Knight, Damien W. Mather, and David K. Holdsworth of the University of Otago, New Zealand.

In-depth interviews were conducted with key distributors in the European food sector to find out what they consider important in determining the reputation of exporting countries, and to ascertain whether GM impacts on such reputations. The authors noted that producer countries should be cautious when considering commercial GM release in any crop situation where a conventional or organic version of that crop is currently exported to European markets. Commercial release of GM farm animals for meat or milk production as well as GM crops for pasture and animal feed seem likely to produce an unfavorable reaction. GM applications in non-food areas seem unlikely to impact on perceptions of country-of-origin image in relation to food products.

Contact John Knight for details of this study at [jknight@business.otago.ac.nz](mailto:jknight@business.otago.ac.nz).

## REPORT RECOMMENDS MORE RESEARCH INTO FOOD, AGRI

In a recent report, the American Academy for Microbiology (AAM) recommends "Research Opportunities in Food and Agriculture Microbiology." The AAM is the honorific leadership group of the American Society for Microbiology, and its report is the result of an AAM colloquium of 19 scientists, who met to examine the future of food and agricultural microbiology.

Among others, the report recommends that multidisciplinary research be undertaken to capitalize on advances in different disciplines, such as genomics, nanotechnology, and computational biology. Part of their recommended research agenda include developing a more sophisticated understanding of the nature, specificity and adaptation of microorganisms to food environments, hosts, and host responses to both pathogenic and beneficial microbes; and developing microbial technologies that can be applied in agricultural contexts for reduction of inputs, bioremediation of pollution, conversion of biomass, and converting wastes to fuel.

The report also suggests that barriers to research be surmounted through coordinating development and standardizing the use of diagnostic tests across agricultural production, food processing, and public health systems to provide a foundation for integrated surveillance systems; providing, through integrated educational initiatives, scientifically trained professionals who will serve the food and agricultural communities; and facilitating the implementation of systems approaches, long-term projects, and multidisciplinary research in food and agricultural microbiology.

Download a PDF file of the report at

<http://www.asm.org/ASM/files/ccLibraryFiles/FILENAME/000000001684/AgriFoodMicrobiology.pdf>.

### CRY PROTEIN IN INDIAN BT COTTON HYBRIDS STUDIED (corrected version of last issue's email edition)

Dr. K.R. Kranthi and colleagues of the Central Institute for Cotton Research (CICR) document their four year in depth study of Bt cotton in India in "Temporal and intra-plant variability of Cry1Ac expression in Bt-cotton and its influence on the survival of the cotton bollworm, *Helicoverpa armigera* (Hübner) (Noctuidae: Lepidoptera)." The article appears in the latest issue of the Indian journal Current Science.

By quantifying the Cry1Ac content and activity of leaves and fruiting parts taken from eight Bt cotton hybrids, scientists found that at least 1.9 micrograms of Cry1Ac should be available per gram of tissue in order for *H. armigera* to be made susceptible to the toxin. They also found that 1) Cry1Ac expression was variable among hybrids; 2) expression of the gene declined progressively over crop growth and went below critical levels when plants turned 100-115 days old; and 3) Cry1Ac expression was variable among different plant parts, with leaves expressing the highest amounts of the toxin, and ovary and boll rind the lowest.

Dr. Akhilesh Prasad Singh, India's Minister of State for Agriculture, said in response that the government is evolving resistant management strategies for Bt cotton technology to increase the crop's effective life span from 11-12 years to 30-40 years, with the hope that it will continuously yield bumper cotton production and ensure environmental sustainability.

Read the press release at <http://pib.nic.in/release/release.asp?relid=10674> or download the article from <http://www.ias.ac.in/currsci/jul252005/291.pdf>. You may also contact Bhagirath Choudhary of ISAAA South Asia at [b.choudhary@cgiar.org](mailto:b.choudhary@cgiar.org).

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ANNOUNCEMENTS  
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INTERNATIONAL CONGRESS ON FUNGAL BIOTECHNOLOGY

An International Congress on Fungal Biotechnology will be held this year, from December 1<sup>st</sup>-5<sup>th</sup>, at Amity University in India. Sponsored by the Amity Institute of Herbal and Microbial Studies, the congress will discuss such themes as industrial enzymes; antibiotics and toxins; food, feed, and beverages; and viticulture and arboriculture, among others. For more information, visit <http://www.amity.edu/aihms>.

AGRIC BIOTECH INTERNATIONAL CONFERENCE

"Unlocking the potential of agricultural biotechnology" is the theme of the Agricultural Biotechnology International Conference (ABIC) 2006 to be held at the Melbourne Convention Centre, Melbourne, Australia from August 6-9, 2006. Conference details are available at <http://www.abic2006.org>.

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DOCUMENT REMINDERS  
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SITE COMPILES AGRI-BIOTECH TITLES

The Eureka Bioscience Database has a section devoted to listing books on agricultural biotechnology. Such books may be recommended to local libraries, or used by professors or scientists for instructional or research purposes. Paying subscribers can browse chapters online, print them, or create custom books. For more, visit <http://www.eureka.com/categories.php?catid=2&category=AGRICULTURAL%20BIOTECHNOLOGY>.

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CBT NEWS FEATURE  
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Taking Root Beyond The Sea  
Agricultural History of the People of French Polynesia

Beyond the New World was an ocean that stretched for miles and miles, out of all human sight and sense, into the kingdom of the stars. To young explorers unlearned in geography and astronomy, the earth was a flat disk, and nothing

stirred beyond the waters – nothing, until ships dared to sail into the unknown and map the then ominous, endless Pacific.

With the Age of Enlightenment came the Age of Exploration, and as explorers such as Louis de Bougainville, James Cook, George Vancouver, and La Pérouse sailed past storms and winds, they found numerous islands and (sometimes) welcome shores. They named their find Polynesia, and as they conquered it, so did the country change. Families fought over the Tahitian throne. Missionaries made their home amidst the trees and mountains. France kept its hold upon its colony.

French Polynesia is composed of five major island groups: the Society Islands (including Tahiti and Moorea), volcanic and heavily etched with valleys; the Marquesas; the Austral Islands, volcanic and forested, with areas of dry grassland; the Tuamotu Archipelago; and the Gambier Islands. Most of French Polynesia is composed of coral reefs or sleeping mountains, embedded in wide, flat atolls that dip gradually into the sea.

Despite their location, studies show that the Marquesas had already been settled in by as early as 300 AD, and part of the Society Islands had already been inhabited by 800 AD. These early settlers subsisted on basic agriculture before the Europeans came. By the time modernity reached them, new crops had taken root, and more were being exported. Interested in the new colony, a group of Chinese fled the poverty of southern China and arrived in Tahiti in 1856, to find work in the cotton and coffee plantations of the Marquesas.

With the Old World still gaping at the wonders of the new, quite a number of Polynesian food crops became attractive to Europeans. The Breadfruit tree soon became a favorite of the colonists, who then organized an expedition to collect cuttings and transplant them in the British West Indies. The uru, as it was known to the natives, was typical of the pre-European Polynesian diet. A single tree could produce fruit three times a year for about fifty years – a significant advantage for an archipelago so dramatically isolated from the rest of humanity. Village healers also used its latex to plaster fractures, sprains, and rheumatism. Breadfruit gum was used to capture birds, and the tree's wood hollowed into small single canoes.

Today's Polynesia is a haven for tourists, where travelers are greeted by sandy shores dappled with swaying coconut trees. However, it is only in the last hundred years that Polynesians planted coconut. There were more breadfruit trees than coconuts when the colonists came, but coconut soon became the country's principal crop. Agriculture has been relegated to outlying villages, where most work is on root crops, fruit, coconut cultivation, and coffee and vanilla growing. In the more urban areas, tourism has replaced agriculture as the main source of income, as Polynesians take to their shores, the way European explorers once did.

Through the centuries of journeys, tribal wars, and even nuclear testing, the islands are islands all the same: in the middle of an ocean vast with storms and discoveries, in the company of stars in a sky as endless as the universe.

For more information, visit

<http://www.iexplore.com/dmap/French+Polynesia/History> and  
<http://www.tahiti1.com/en/identity/agriculture.htm>.

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