

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).

In This Issue

April 12, 2007

NEWS

Global

[Gene Controlling Rice Grain Size and Weight Identified](#)
[Chloroplast Transformation for Improved Biosafety of Biotech Crops](#)
[Transgenic Plants for Smallpox Vaccine Production](#)
[FAO Says New Trade Rules to Benefit Some Developing Countries](#)
[Technical Challenges for Crop Research](#)

Africa

[Malawi: Small Farmers Benefit from Cassava Project](#)

The Americas

[New Energy Crops Analyzed for Biofuel Greenhouse Gas Releases](#)
[USDA Dedicates New Cereal Crops Laboratory](#)
[EMBRAPA Develops New Soybean Varieties](#)

Asia and the Pacific

[Swaminathan Nominated to Indian Parliament](#)

Europe

[French Farmers to Grow More Biotech Corn](#)
[EC Proposes Strategy on Life Sciences and Biotech](#)
[Biotech for Tastier, Healthier Apricots](#)

RESEARCH

[Intragenic Vectors for Gene Transfer without Foreign DNA](#)
[Bt Cry3a Potato Not Harmful to Beneficial Beetles](#)
[Are GM and Conventionally Bred Wheat Really Different?](#)

[ANNOUNCEMENTS](#) | [DOCUMENT REMINDERS](#) | [FROM THE BICS](#)

[Biofuels Supplement \(12 April 2006 Issue\)](#) [[Read latest news](#)]

<< [Previous Issue](#) |

[[Print PDF](#) | [Archive](#) | [Translations](#) | [Subscribe](#) | [RSS](#)]

News

GLOBAL

[[Top](#)]

GENE CONTROLLING RICE GRAIN SIZE AND WEIGHT IDENTIFIED

A team of scientists led by Prof. Hongxuan of the National Key Laboratory of Plant Molecular Genetics, Shanghai Institute of Plant Physiology and Ecology, China, have successfully cloned a gene, *GW2*, which controls the size and weight of rice grains. Rice plants that lack a functional copy of *GW2* produce bigger rice grains with more cells and wider spikelet hulls, which results in an increase in yield. *GW2* acts by restricting the rate at which cells divide during the formation of the grain. As grain size is a critical agronomic quality, *GW2* could therefore be an important tool for improving production. The research is reported in the latest issue of *Nature Genetics*.

More information available at: <http://english.cas.ac.cn/eng2003/news/detailnewsb.asp?InfoNo=26498>

Read the abstract of the article: "A QTL for rice grain width and weight encodes a previously unknown RING-type E3 ubiquitin ligase" at: <http://www.nature.com/ng/journal/vaop/ncurrent/abs/ng2014.html>

CHLOROPLAST TRANSFORMATION FOR IMPROVED BIOSAFETY OF BIOTECH CROPS

The inheritance of the chloroplasts (the organelles responsible for photosynthesis) in most plants is maternal, as these organelles are not carried by the pollen grains (which produce the sperm cells). The manipulation of the chloroplast genome for crop improvement is therefore considered a very valuable tool for improving the containment of the transgene, and enhancing in this way the biosafety of transgenic plants.

A team of researches led by Ralph Bock from the Max-Planck Institute for Molecular Plant Physiology in Germany have recently evaluated the strictness of maternal inheritance, by measuring the rates at which chloroplasts are transmitted through the pollen. The team reports a low level of paternal inheritance (only 39 seeds were identified with chloroplasts derived from the father plant among over 2 million seeds examined). The results indicate that plastid transformation is a good tool for preventing gene flow. However, in cases where transmission of the transgene through the pollen must be totally prevented, the team recommends adopting additional containment strategies to eliminate the risk of outcrossing. The research is published in the latest issue of PNAS.

More information is available at

<http://www.mpg.de/bilderBerichteDokumente/dokumentation/pressemitteilungen/2007/pressemitteilung200704111/index.html>

Read the abstract of the scientific abstract at

<http://www.pnas.org/cgi/content/abstract/0700008104v1?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=1&author1=ruf&andorexacttitle=and&andorexacttitleabs=and&andorexactfulltext=and&searchid=1&FIRSTINDEX=0&sortspec=relevance&resourcetype=HWCIT>

TRANSGENIC PLANTS FOR SMALLPOX VACCINE PRODUCTION

A team of scientists from the Biotechnology Foundation Laboratories, Thomas Jefferson University, Philadelphia, USA, have reported the successful production of a smallpox vaccine in transgenic tobacco plants, shown to protect mice and minipigs against infection. Smallpox, caused by the Variola virus, is a highly contagious disease unique to humans that can be lethal. These results indicate the feasibility of producing safe and inexpensive subunit vaccines by using plant production systems. Advantages of vaccine production in plants include reduced production costs; large production scale; product safety; and the possibility of oral administration.

The abstract of the article "Smallpox subunit vaccine produced in *planta* confers protection in mice" published this week in PNAS can be viewed at

<http://www.pnas.org/cgi/content/abstract/0701451104v1?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=Koprowski&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT>

FAO SAYS NEW TRADE RULES TO BENEFIT SOME DEVELOPING COUNTRIES

The Food and Agriculture Organization (FAO) in its latest Annual Report on the State of Agricultural Commodity Markets 2006 says that multilateral agricultural trade policy report will stimulate trade and economic growth but that they should be compatible with the first Millennium Development Goal. It noted however, that poorer countries such

as those in sub-Saharan Africa will not gain as much as more advanced exporting countries from these trade rules due to economic structures, competitiveness, and capacity to respond to new market incentives.

The report focuses on market access issues and the measures needed to ensure that trade policy reform contributes effectively to reducing poverty and food insecurity. An agreement has to be reached among countries that will lead to a less distorted agricultural trading environment and one which recognizes food security and development needs, and the priorities of developing countries.

See FAO's release at <http://www.fao.org/newsroom/en/news/2007/1000536/index.html>

[Top]

TECHNICAL CHALLENGES FOR CROP RESEARCH

Why has crop research not benefited many of the poor farmers in the developing world? What are the challenges to targeting relevant and appropriate crop research to serve those farmers? What tools can be used, or are being used, to reach this goal? These are some questions that Mauricio Bellon, Director of the Diversity for Livelihoods Program of Bioversity International, answers in a review examining the technical challenges and tools available to target poor farmers in marginal areas.

Bellon notes that bringing farmers directly into crop research is a most useful strategy. It allows farmers to identify problems, ensure that research is relevant and appropriate for their communities and cropping systems. "Developing and carrying out crop research that benefits poor farmers in marginal areas of the developing world is complex and difficult," says Bellon. "It requires not only strong technical and scientific skills but also a commitment to creating research that is targeted, relevant and appropriate for these farmers, their families and their communities."

Additional details available at <http://news.bioversityinternational.org/index.php?itemid=1758> and http://www.cgiar.org/enews/march2007/story_14.html.

AFRICA

[Top]

MALAWI: SMALL FARMERS BENEFIT FROM CASSAVA PROJECT

A project to produce high-yielding cassava for processing into industrial starch is raising the income of small scale farmers of the Masinda Club Factory, while also benefiting farmers from neighboring villages from their sales of raw cassava roots for processing. Farmers were trained, among other things, in cassava production, processing, factory management, and environmental sanitation.

Established in 2003 with an initial capacity to produce four tons of industrial starch monthly, the factory now produces 20 tons, and it has facilitated an increase of about 38.42% in cassava production after two years of operations. Following the example of the Masinda Club Factory, several companies are establishing similar cassava treatment factories in the country.

The initiative, a public- public partnership, is lead by the International Institute of Tropical Agriculture (IITA) in collaboration with the Southern African Root Crops Research Network (IITA/SARRNET), with funding from USAID.

Read more at: http://www.iita.org/cms/details/news_feature_details.aspx?articleid=986&zoneid=342

AMERICAS

[Top]

NEW ENERGY CROPS ANALYZED FOR BIOFUEL GREENHOUSE GAS RELEASES

Cellulosic biomass, such as switchgrass, alfalfa, reed canary grass and hybrid poplar, proposed as “future dedicated energy crops” can reduce greenhouse gas emissions. This was the result of analysis done by researchers from the Colorado State University, Natural Resource Ecology Laboratory and the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) for their capacity to reduce greenhouse gas (GHG) emissions.

Using life cycle analysis and the DAYCENT Biogeochemistry model, they found that cellulosic biomass feedstocks (switchgrass and hybrid poplar) can reduce GHG emissions by about 115%. Non-cellulosic biomass (corn ethanol and soybean biodiesel) could do the same by only 40%. Reed canary grass can reduce GHG emissions by 85%. Although GHG-emitting fossil-fuel-inputs are inevitable in biofuel production, bioenergy crops have the ability to offset this by absorbing CO₂ greenhouse gases while they are grown in plantations.

See the summary article and other news on biofuels in this week’s Biofuels Supplement of the Crop Biotech Update at <http://www.isaaa.org/kc/cropbiotechupdate/news/2007/04/12.html>

[Top]

USDA DEDICATES NEW CEREAL CROPS LAB

The United States Department of Agriculture (USDA) has recently dedicated a new laboratory to conduct more in-depth research in barley, oats and other cereal crops. The new facility for the USDA-Agricultural Research Service (USDA-ARS) Cereal Crops Research Unit (CRRU) will be located on the University of Wisconsin-Madison campus and will house 35 employees that include 7 senior ARS scientists and their staff.

During the dedication ceremonies, ARS associate administrator Antoinette Betschart said that “the laboratory is the country’s only public research facility for evaluating malting barley cultivars based on their quality and usefulness”.

The CRRU aims to do more research to better understand the biochemical processes controlling the conversion of starch into sugars, a crucial trait for malting barleys; to identify health-promoting compounds from oats and barleys; and find ways to prevent serious disease attacks on cereal crops like Fusarium head blight on barley, or rice blast.

For more information, visit <http://www.ars.usda.gov/is/pr/2007/070405.2.htm>

[Top]

EMBRAPA DEVELOPS NEW SOYBEAN VARIETIES

EMBRAPA, the Brazilian Agricultural Research Corporation presented this week in the event “Dia de campo” two new transgenic soybean varieties, Gisele RR and Juliana RR, and two new conventional varieties, Graciosa and Princesa. The new lines were developed by the research team Convênio Cerrados, and will be available in the market next year. Graciosa has very high tolerance to attack by nematodes.

José Américo Rodrigues, president of the Brazilian Association of Seed and Seedling Producers (Abrasem) highlighted the importance of the use of certified seeds to ensure high production yields, and to reduce

phytosanitary and biosafety risks.

More information in

http://www.embrapa.br/noticias/banco_de_noticias/2007/abril/foldernoticia.2007-04-09.3971798158/noticia.2007-04-11.3923153115/mostra_noticia

ASIA AND THE PACIFIC

[Top]

SWAMINATHAN NOMINATED TO INDIAN PARLIAMENT

President A.P.J. Abdul Kalam has nominated Dr. M.S. Swaminathan, India's best-known agricultural scientist to the Rajya Sabha. The Rajya Sabha, meaning the "Council of States" is the upper house of the Parliament of India. Membership is limited to 250 members, 12 of whom are chosen by the President of India for their expertise in specific fields of art, literature, science, and social services.

Dr. Swaminathan, has been a recipient of various awards, including the World Food prize in 1987, the Tyler-Honda prize in 1991 and the United Nations Environment Programme (UNEP) Sasakawa award in 1994. He has been Director General of the Indian Council of Agricultural Research and the International Rice Research Institute.

Additional information may be obtained from <http://www.hindu.com/2007/04/11/stories/2007041107401200.htm> and http://timesofindia.indiatimes.com/NEWS/India/Swaminathan_Vatsyayan_nominated_to_RS/articleshow/1889269.cms.

EUROPE

[Top]

FRENCH FARMERS TO GROW MORE BIOTECH CORN

Farmers in France are expected to increase their planting of biotech corn from 5,200 hectares in 2006 to 30,000-50,000 in 2007. This was the highlight of a report from the United States Department of Agriculture Foreign Agricultural Service Global Agriculture Information Network.

The farmers' positive response to the crop was attributed to the higher yield and lower mycotoxin content of biotech corn over conventional corn experienced in 2006. In addition, the Ministry of Agriculture adopted coexistence rules for the crops which require 50-meter buffer zones for commercial biotech plots and disclosure by biotech producers to their neighbors for the existence of biotech crops.

See the full report at

<http://www.fas.usda.gov/gainfiles/200703/146280665.pdf>.

[Top]

EC PROPOSES STRATEGY ON LIFE SCIENCES AND BIOTECH

The European Commission (EC) affirms its stand that the life sciences and biotechnology are making a significant contribution to the "sustainability and competitiveness of European industry and the quality of life of Europe's inhabitants". In a communication on biotechnology in response to the Mid-Term Policy Review of the EU's Life Science and Biotechnology Strategy, it noted that different sectors need to:

- Promote research and market development for life sciences and biotechnology applications and the Knowledge Based Bio-Economy
- Foster competitiveness, knowledge transfer and innovation from the science base to industry
- Encourage debate on the benefits and risk of life sciences and biotechnology
- Ensure a sustainable contribution of modern biotechnology to agriculture
- Improve the implementation of the legislation and its impact on competitiveness

See the full press release at <http://www.europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/130&format=HTML&aged=0&language=EN&guiLanguage=en>

In a related development, EuropaBio, the European Union Association of bioindustries, called on Member States to implement the revised strategy. It noted that some countries have still not accepted biotech products and are denying farmers' right to try the technology through crop bans.

EuropaBio's release is available at http://www.europabio.org/articles/PR_MTR110407.doc

[Top]

BIOTECH FOR TASTIER, HEALTHIER APRICOTS

Apricots, engineered for improved taste and aroma are currently being developed by scientists from the Institute for Molecular Biology of Valencia, Spain. Apricots owe their fragrance to a volatile substance known as S-linalool, and a research team lead by Luis Antonio Cañas successfully introduced an enzyme that increases the levels of this compound in the fruit, improving its organoleptic properties. The team is also developing biotech apricot varieties that flower earlier to reduce the time required for fruit production. This technique has successfully been applied to citrus trees, explained Cañas, achieving fruit production after only one year, instead of the 6-10 years required for fruiting in conventional varieties. Apricots with increased resistance to diseases are also in the pipeline.

More information is available in <http://www.fundacion-antama.org/imgNews/01-04-07.htm>

Research

[Top]

INTRAGENIC VECTORS FOR GENE TRANSFER WITHOUT FOREIGN DNA

Intragenic vectors are the functional equivalents of vector components used in genetic engineering. These are referred to as intragenic because they come from the genome of a specific crop species (or related species to which it can be hybridized). Unlike 'foreign' DNA, their use for transferring genes between plants of the same species are expected not to raise similar ethical concerns in the GM debate as transfer of genes from unrelated species.

Elite cultivars can be further improved with this vector system and by using tools of molecular biology and plant transformation, says Anthony Conner and his group in New Zealand and the Netherlands. By using intragenic vectors, linkage drag is avoided and the resulting plants may also be considered non-transgenic.

Conner and his group reviewed the progress toward the development and use of intragenic vectors and the implications of their use for the genetic improvement of crops. Intragenic vectors have been assembled by replacing the *Agrobacterium* T-DNA by plant-derived transfer DNA (P-DNA), or by constructing plant derived T-DNA regions by adjoining two or more fragments from the same species.

The paper published by the journal *Euphytica* can be accessed by subscribers at <http://www.springerlink.com/content/98314q74w8338t48/>.

[Top]

BT CRY3A POTATO NOT HARMFUL TO BENEFICIAL BEETLES

Ladybird and carabid beetles were not affected by *Bacillus thuringiensis* d-endotoxin Cry3A (*Bt* Cry3A) in transgenic potato, despite the species belonging to the targeted insect group. The study by researchers in the UK have determined that beetles exposed to the endotoxin did not differ to those that were not exposed in terms of survival, overall body mass, and reproductive fitness.

The ladybird beetles, which are facultative herbivores, were fed with floral tissues of NewLeaf® potato expressing *Bt* Cry3A. The levels of the transgene product in the potato tissues were determined to be up to 0.14% of the total soluble protein, within the range of accumulation in transgenic crops.

The research has also determined that the consumption of *Bt* Cry3A potato fed prey by carabid beetles presents no detrimental effect on the predator species. It was concluded that the potential impact of Cry3A exposure on long-term fitness of such beetles will be minimal, and that the *Bt* Cry3A potato presents a low risk to coleopteran insects other than the targeted chrysomelid larvae.

The paper to be published by the journal *Transgenic Research* can be accessed by subscribers at <http://www.springerlink.com/content/08251h6271515775/>.

[Top]

ARE GM AND CONVENTIONALLY BRED WHEAT REALLY DIFFERENT?

It is possible to produce transgenic wheat lines that are substantially equivalent to non-GM wheat at the level of analysis provided by modern "omics" technologies, says researchers at Rothamsted Research in the UK. Their research provides information that will help assure consumers that transgenic crops are not inherently unsafe.

The determination of substantial equivalence requires comparisons of composition and performance of the transgenics with conventionally bred crops, under both field and greenhouse conditions. The group of Peter Shewry has demonstrated that in wheat, transgenic varieties can be substantially equivalent on several levels: functional properties, metabolomics, proteomics, transcriptomics, and genomics.

Shewry and colleagues developed several transgenic lines of wheat that have additional genes encoding high molecular weight (HMW) subunits called 1Ax1 and 1Dx5. These HMW are positively correlated with improved grain quality and were those compared with conventional counterparts.

Subscribers to the journal *Trends in Food Science and Technology* can access the article by visiting <http://dx.doi.org/10.1016/j.tifs.2006.12.010>.

Announcements

[Top]

GLOBAL BIOTECH STATUS EXECUTIVE SUMMARY AVAILABLE IN RUSSIAN

The Executive Summary of the "Global Status of Commercialized Biotech/GM Crops: 2006", published as Briefs 35 by the International Service for the Acquisition of Agri-biotech Applications (ISAAA) is now available online in Russian. The review by Dr. Clive James, ISAAA chair, which analyzes, among others, the global situation in terms of biotech crop area, is also available in 17 other languages.

Download the executive summaries at <http://www.isaaa.org/resources/publications/briefs/35/executivesummary/pdf/Brief%2035%20-%20Executive%20Summary%20-%20Russian.pdf>

[Top]

Document Reminders

KIT PORTAL ON RURAL INNOVATION SYSTEMS

The Royal Tropical Institute (KIT) in Amsterdam recently launched an information portal on Rural Innovation Systems. The portal provides access to free, full-text electronic documents on the Rural Innovation Systems (RIS) approach, both as an analytical concept and a development tool. It is also a unique entry point for all other Internet sources on the topic, including newsletters, discussion groups, websites, bibliographic databases, and directories of organizations and projects.

Access the site at: <http://portals.kit.nl/smartsite.shtml?id=7587>

PMN LAUNCHES AGRIC WEB SEARCH

The Plant Management Network (PMN) and its University Partners have launched a new search engine to promote the use of their online Extension publications and other agricultural information. PMN covers the range of plant science disciplines, including agronomy, crop science, ecology, and weed science. It is aimed for crop consultants, growers, extension educators, researchers, instructors, and students from around the globe. Partner universities and research institutes also receive unlimited institutional access to all PMN subscription content, including four peer-reviewed journals and many other electronic resources.

Visit the site at: <http://www.plantmanagementnetwork.org/>

FROM THE BICS

BANGLADESH SCIENCE AND AGRICULTURE MINISTERS CALL FOR BIOTECH ADOPTION

Government officials in Bangladesh led by Mr Tapan Chowdhury, Advisor (Minister), Ministry of Science, Information and Communication Technology, and Dr C S Karim, Advisor (Minister), Ministry of Agriculture called on the adoption of biotechnology during a conference in Dhaka on "Promotion of Biotechnology in Bangladesh: National and International Perspectives".

Partnerships among various public and private sectors were deemed important to make biotechnology a profitable venture to address the country's requirements in agriculture, industry, and medicine.

Email Dr. K M Nasiruddin of the Bangladesh Biotechnology Information Center at nasirbiotech@yahoo.com for more information on the conference.



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

To stop receiving this newsletter, please send an e-mail message to knowledge.center@isaaa.org and write, "unsubscribe newsletter" in the subject box.

Please visit CropBiotech Net web pages (<http://www.isaaa.org/kc>) to view previous issues of this newsletter and see other available resources for download.

Copyright © 2007 ISAAA
[Editorial Policy](#)