

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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In This Week's Issue:

NEWS

Global

- Improved Maize, Wheat Varieties Lower Farmers' Risks
- Evogene, Biogemma Unite for Drought-Tolerant Corn
- Modern Biotech – Integral Supplement to Plant Breeding

Africa

- Media, Civil Society, and NGOs Meet NEPAD on Biotech
- Uganda Begins Improving Agri, Industry for Better Economy
- South Africa Deputy Minister Commends Country's Biosafety Regime

The Americas

- Peru Approves Law for the Promotion of Biotechnology
- DOE to Invest \$250 Million for Biofuel Research
- Mexico Invests In Research and Technology to Boost Agricultural Sector

Asia and the Pacific

- ASEAN Ministers Support Biofuels in Energy Meeting
- Iraq Agricultural System to Get U.S. Help
- NSW Farmers Back GM Crops
- Work Begins on Thailand Biosafety Law
- Indonesia Works On Agarwood

Europe

- Italian Scientists Petition for GMO Research
- EU To Assess Biotech Applications

RESEARCH

- Tobacco Genes Keep Armyworms Out
- Plant Acid Contributes To Blight Resistance, Research Finds

ANNOUNCEMENTS DOCUMENT REMINDERS

NEWS

*** GLOBAL ***

IMPROVED MAIZE, WHEAT VARIETIES LOWER FARMERS' RISKS

Modern maize and wheat varieties not only increase maximum yields in developing countries but add to farmers' incomes by assuring more reliable yields than traditional varieties. "By reducing the fluctuations in maize and wheat grain yields, scientists have played a vital role in making modern crop technology attractive, accessible, and beneficial to farmers and consumers around the globe," says Douglas Gollin, an associate professor of economics in Williams College, Massachusetts, USA.

Gollin analyzed changes in national-level yield stability for wheat and maize across developing countries and related them directly to the diffusion of modern varieties. His study shows that "over the past 40 years, there has actually been a decline in the relative variability of grain yields." This finding, says Gollin, disproves critics' views that farmers are exposed to greater risks due to the variability in yield of modern varieties.

The study on "Impacts of international research on inter-temporal yield stability in wheat and maize: an economic assessment" can be downloaded from <http://www.cimmyt.org/english/docs/impacts/ImpIntlResIntertemp.pdf>. A news feature by John Dixon is available at <http://www.cimmyt.org/english/wps/news/2006/jul/steadyasShedoes.htm>.

EVOGENE, BIOGEMMA UNITE FOR DROUGHT-TOLERANT CORN

Evogene and Biogemma, two biotech companies engaged in crop improvement, have recently announced that they will collaborate on developing commercial corn lines with improved drought tolerance. Both companies have already made progress toward the goal. Evogene's abiotic stress tolerance program has identified a set of novel genes that provide high tolerance to adverse environmental conditions in a number of model crops. Biogemma, on the other hand, has developed different genomic approaches to define what will be the best commercial variety.

For more information, contact Evogene through Chief Executive Officer Ofer Haviv at ofer.haviv@evogene.com , or visit <http://www.evogene.com>; or Biogemma through Chief Executive Officer Michel Debrand at info@biogemma.com, or visit <http://www.biogemma.com>. Read the complete press release at <http://www.evogene.com/press13.htm>.

MODERN BIOTECH – INTEGRAL SUPPLEMENT TO PLANT BREEDING

Traditional and modern biotechnology must go hand in hand to accelerate crop improvement and ensure global food security. The new technology will only complement, but not replace, conventional plant breeding. Prem P. Jauhar makes this assertion in a paper “Modern biotechnology an integral supplement to conventional plant breeding: The prospects and challenges” published in the online version of the journal Crop Science.

A sensible regulation of transgenic crops is essential, adds Jauhar. “When carefully deployed, modern biotechnology will become an integral supplement to conventional plant breeding and its enormous potential should be harnessed to the best advantage of the entire human race,” concludes Jauhar.

Email Prem Jauhar at prem.jauhar@ndsu.edu for additional information.

*** AFRICA ***

MEDIA, CIVIL SOCIETIES AND NGOS MEET NEPAD ON BIOTECH

The African Union (AU) and the New Partnership for African Development (NEPAD) has been challenged to integrate the media, civil societies, and non-governmental organizations in their quest to involve the public on biotechnology issues. The groups, who were presenting their views to the AU/NEPAD high-level committee on biotechnology consultation forum in Nairobi, noted that Africa has failed in proper utilization of modern technologies due to misinformation from interest groups.

John K. Mutunga the national coordinator of Kenya National Federation of Agricultural Producers (KENFAP) said that African farmers were willing to adopt various upcoming scientific methods to promote better crops production, but were being hindered by lack of information.

In her contribution, the Director of International Service for acquisition of Agri-biotech Applications (ISAAA) Afri-Center Dr. Margaret Karembu advised Africans

to work towards integrating national priorities with global goals. She also cautioned African policy makers against making unrealistic regulatory systems with the intention of blocking the multinationals, noting that the same laws will also be a hindrance to local researchers.

For more information, email Mr. Daniel Otunge of the East and Central Africa Biotechnology Information Center (ECABIC) at dotunge@absf.org.

UGANDA BEGINS IMPROVING AGRI, INDUSTRY FOR BETTER ECONOMY

Uganda's government is now taking steps to improve the country's agriculture and industry sectors. In a statement, President Y.K. Museveni said that the promotion of research and scientific innovation would be one of his priorities in the next five years. In addition to this, Finance Minister Dr. Ezra Suruma announced that a total of 8 billion Ugandan Shillings (~US\$ 4.3 M) will be allocated to research, in recognition of the role of science in transforming economies.

Dr. Suruma also announced that negotiations were underway for a \$30 million loan from the World Bank-funded Millennium Science Initiative to finance industrial research and advanced technical training for students. Agriculture being the mainstay of Uganda's economy, the government underlines the need for substantial research and industrialization efforts for the agricultural sector within the wider Plan for modernization of Agriculture project.

With reports from <http://allafrica.com/stories/200608010077.html> and <http://allafrica.com/stories/200608010075.html>.

SOUTH AFRICA DEPUTY MINISTER COMMENDS COUNTRY'S BIOSAFETY REGIME

The South African government's commitment to public safety is supported by ongoing efforts to enhance the country's capacity to harness the potential of biotechnology to benefit the poor, but without undermining biosafety. This was expounded on by Derek Hanekom, South Africa's deputy science and technology minister, in his column, which appeared recently in Business Day.

Entitled "South Africa: Cautiously Sowing the Seeds of Change," the article takes a look at recent measures by the country to ensure the balance of biotechnology and related research, with the government's responsibility of keeping people and environment safe. Hanekom states that South Africa, as a whole, must recognize that Africa's "orphan crops" are not "points of interest" for multinational

companies, so “if we want to produce improved varieties of crops that have evolved here, we will have to do so ourselves”.

“Africa's food insecurity means developing agriculture is an important objective. Genetic modification technologies -- with potential for pest resistance, drought and herbicide tolerance, as well as improved nutritional characteristics -- must surely be part of the solution?” concluded Hanekom.

Read the complete article at

<http://www.businessday.co.za/articles/topstories.aspx?ID=BD4A243447>.

*** THE AMERICAS ***

PERU APPROVES LAW FOR THE PROMOTION OF BIOTECHNOLOGY

The Peruvian Parliament approved last July the law for the development of modern biotechnology in Peru. Modern biotechnology was declared a national priority, and recognized as a fundamental tool for technological innovation, competitiveness, and for sustainable economic development. The law aims to enhance the productivity of the agricultural, forestry, and fisheries sectors; to boost the industry; and to improve human health and nutrition without compromising the preservation of the environment.

The law will promote scientific research and education in universities in the field of modern biotechnology, and will support the development of private companies for the commercialization of novel biotechnology applications. Also included in the legal document are guidelines for the protection of Intellectual Property Rights (IPR), and for the safeguard of the traditional knowledge and practices of indigenous local communities.

To this purpose, the following administrative bodies have been created: the Executive National Commission of Biotechnology (CONEBIO); the National Forum of Biotechnology; the Committee on Bioethics; and the Advisory Committee for Biosafety.

Read the law at:

[http://www2.congreso.gob.pe/Sicr/RelatAgenda/proapro.nsf/ProyectosAprobadosPortal/30D7D5DC0876A088052571AA001042A9/\\$FILE/12033.pdf](http://www2.congreso.gob.pe/Sicr/RelatAgenda/proapro.nsf/ProyectosAprobadosPortal/30D7D5DC0876A088052571AA001042A9/$FILE/12033.pdf)

DOE TO INVEST \$250 MILLION FOR BIOFUEL RESEARCH

The U.S. Department of Energy (DOE) has announced that it will invest US\$250 million to establish and run two Bioenergy Research Centers for the development

of biofuels. The centers will conduct systems biology research on microorganisms and plants, with the aim of harnessing and improving on Nature's own ways for producing energy from sunlight.

"This is an important step toward our goal of replacing 30 percent of transportation fuels with biofuels by 2030," said Secretary Samuel Bodman. "The mission of these centers is to accelerate research that leads to breakthroughs in basic science to make biofuels a cost-effective alternative to fossil fuels."

Public and private research institutions are eligible to compete for an award to establish and operate a center. Deadline for submission of proposals is 1 February, 2007. The centers are expected to open in 2008 and will be fully operational by 2009.

Additional details on the funding opportunity and the centers' objectives are available at: <http://www.doe.genomestolife.org/centers>.

MEXICO INVESTS IN RESEARCH AND TECHNOLOGY TO BOOST AGRICULTURAL SECTOR

Francisco Mayorga Castañeda, Secretary for Agriculture, has announced that 2700 million Mexican pesos (US\$246.27 million) have been allocated to address the scientific and technical needs of the agricultural sector. The funds aim to increase food production and improve the competitiveness of the Mexican agricultural sector. Mayorga Castañeda added that the alliance between national research institutions and agricultural producers is essential for the interchange of knowledge and research outcomes, and for the transfer of technology, to boost productivity and competitiveness.

Read more at: <http://www.sagarpa.gob.mx/cgcs/boletines/2006/agosto/B196.htm>

*** ASIA ***

ASEAN MINISTERS SUPPORT BIOFUELS IN ENERGY MEETING

Development of renewable energy sources, such as hydropower, biomass, and biofuels should be strengthened, and power trade cooperation should be promoted amongst members of the Association of Southeast Asian Nations (ASEAN). This assertion was part of the Joint Media Statement of the ASEAN Ministers on Energy Meeting, recently concluded in Vientiane, Lao PDR.

The meeting, themed “Strategizing for Efficient, Competitive and Sustainable ASEAN Energy Future,” saw the member countries’ respective energy ministers exchanging views on the strategic directions and measures for an efficient, competitive, and sustainable energy future in the ASEAN.

The ministers emphasized the need for closer cooperation, as well as exchange of experience in promoting the production and use of biofuels. To do so, they proposed that relevant fiscal incentives be formulated, a regulatory infrastructure drawn up, and funding facilities be identified.

Read the complete press release at <http://www.aseansec.org/18582.htm>.

IRAQ AGRICULTURAL SYSTEM TO GET U.S. HELP

Mike Johanns, Secretary of the United States Department of Agriculture (USDA), and Dr. Salam Zukam Ali Al-Zawba'i, Deputy Prime Minister, signed a joint statement of intent to strengthen and broaden Iraq's agricultural extension system and universities through partnerships between U.S. and Iraqi universities. Under USDA sponsorship, the program is designed to match U.S. land grant colleges and universities with Iraqi agricultural universities to provide training for Iraqi faculty members on managing extension services and a variety of related subjects.

Areas of technical cooperation will include production of wheat, barley, rice, fruits, vegetables, sheep, and goats; animal health initiatives; and water resources management.

Read the complete press release at http://www.fas.usda.gov/scripts/PressRelease/pressrel_dout.asp?Entry=valid&PrNum=0092-06

NSW FARMERS BACK GM CROPS

Australia's New South Wales (NSW) Farmers' Association has expressed its support for the commercial release of genetically modified (GM) crops. This was declared at the Association's Annual Conference, concluded recently in Sydney.

“Members at [the] Annual Conference believe the benefits of GM crops outweigh the marketing risks and want the ability to adopt the technology,” Angus McLaren, of the NSW Farmers' Association Grains Committee, said, “This is the first time this organization has supported the move for the commercial release of GM crops since the debate started.”

The Association also voted to lobby the Primary Industries Ministerial Council (PIMC) to set adventitious presence levels for all crops, rather than for canola only, as is currently the case. Farmers also want practical, objective and inexpensive “on-farm” GM detection tests, as well as an education program in conjunction with lifting the moratorium.

“Lifting the moratorium will put NSW farmers on a level playing field with some of our biggest international competitors,” Mr. McLaren concluded. At this stage, the GM moratorium is set to expire in 2008.

Read the complete press release at http://www.nswfarmers.org.au/media_centre/news_releases/farmers_say_Yes_to_GM_crops.

WORK BEGINS ON THAILAND BIOSAFETY LAW

Thailand’s Biotechnology Alliance Association (BAA) has organized a meeting for private sector and researchers to discuss the draft of the country’s Biosafety Law. According to BAA President Dr. Sutat Sriwatanapongse, the meeting aimed to obtain comments from concerned stakeholders on the likely effects of the draft Biosafety Law on Thai biotech business. Comments and recommendations will be submitted for consideration to the office of the Ministry of Natural Resources and Environment.

In related news, Setasan Setakarun, president of Thailand’s Soya Oil Production Association, expressed his wish to see “strong support from the Government on biotechnology and genetic engineering for the development of agriculture products.”

“It will be a big mistake for Thailand not to do so since the country will lose its competitiveness in the world market,” Setasan said in a statement to reporters.

With reports from Naewna, as translated by Thailand’s Biotechnology Information Center (<http://www.safetybio.com/>).

INDONESIA WORKS ON AGARWOOD

After work on clones of agarwood-producing trees, Yupi Isnaini of the Southeast Asian Regional Center for Tropical Biology (SEAMEO BIOTROP), Indonesia has isolated three clones of *Aquilaria* trees that produce more resin than conventional clones. Isnaini is also working on obtaining fungal isolates and formulating media concentrations that can speed up production of agarwood resin.

Agarwood refers to the resin-impregnated wood that grows predominantly in the rain forests of Southeast Asia. Agarwood is formed in response to fungal infection and this resin can stop or slow down fungal growth. The resin has been used for centuries in traditional Chinese medicine, and is important to the perfume industry in the Middle East, India, Europe, and Malaysia.

For more information, send an email to yupi@biotrop.org. For more details, contact dewisuryani@biotrop.org, or visit <http://www.indobic.or.id>.

*** EUROPE ***

ITALIAN SCIENTISTS PETITION FOR GMO RESEARCH

Galileo2001, an association of Italian scientists, has submitted a petition to the European Commission (EC) calling for research into genetically modified organisms (GMO) to continue in Italy. GM crops are still under moratorium in the country, despite recent directives in the European Union (EU) that allow field trials to be conducted. Meanwhile, regional governments have been given the task of establishing areas where field trials may be conducted, a measure that overloads the regulatory process.

The petition is addressed to several EU commissioners, as well as José Manuel Barroso, President of the European Commission. It calls for the leaders to intervene, "Adopting the appropriate measures, in order to allow Italian GMO researchers to resume their work within the EU rules and in collaboration with the other EU researchers."

For more information, contact Professor Bruno Mezzetti of the Università Politecnica delle Marche, at b.mezzetti@univpm.it. Find out more about the association at <http://www.galileo2001.it/>.

EU TO ASSESS BIOTECH APPLICATIONS

The European Commission (EC) will carry out a comprehensive assessment and cost benefit analysis of the consequences, opportunities, and challenges that applications of modern biotechnology have for Europe. Up for discussion are economic, social, and environmental aspects, results of which will contribute to the midterm review of the life science and biotechnology strategy in 2006-2007.

By addressing the perceived challenges of the technology, the Commission looks forward to greater cooperation in decision making among its Member states that will lead to wider consensus among them.

As a guide, the European Union (EU) Directorate General Environment has released “EU policy on biotechnology” which provides the EU strategic context, regulatory framework, regulatory challenges, overview of genetically modified organisms in the EU, and the research and development efforts in support of biotechnology. Download this publication from

http://ec.europa.eu/environment/biotechnology/pdf/eu_policy_biotechnology.pdf

RESEARCH

TOBACCO GENES KEEP ARMYWORMS OUT

The tobacco precursor protein *TobpreproHypSys-A* is expressed when tobacco plants are wounded by herbivores. Can this protein function also in protecting tobacco from insect attack? Feng Ren and Ying-Tang Lu of Wuhan University, China, investigate how “Overexpression of tobacco hydroxyproline-rich glycopeptide systemin precursor A gene in transgenic tobacco enhances resistance against *Helicoverpa armigera* larvae.” Their work appears in the latest issue of the Journal of Plant Science.

The team over-expressed the precursor protein in transgenic tobacco, and measured levels of known plant defense molecules- proteinase inhibitors (PI) and polyphenol oxidases (PPO)-, in both transgenic and wild-type tobacco plants. Feeding trials with armyworm larvae were also conducted. The researchers found that: 1) larvae feeding on transgenic tobacco with the *TobpreproHypSys-A* gene grew slowly, and were smaller than those fed on wild-type tobacco; 2) the damage to leaves of wild-type plants by larvae was more severe than that to leaves of transgenic plants; 3) PIs were expressed in higher amounts in transgenic plants; and 4) PPO activity was 40 times higher in transgenic tobacco than it was in wild-type plants.

These results show that over-expression of *TobpreproHypSys-A* results in the accumulation of PIs and PPOs, which, in turn, enhances plant resistance to armyworm larvae. *TobpreproHypSys-A* is therefore an important gene for signaling defense against herbivore attack.

Subscribers to the journal can visit

<http://dx.doi.org/10.1016/j.plantsci.2006.04.001> to read the complete article.

PLANT ACID CONTRIBUTES TO BLIGHT RESISTANCE, RESEARCH FINDS

Phytophthora blight is an important soil-borne fungal disease that affects pepper plants all over the world, and can wipe out pepper harvests. However, one Mexican accession, *Capsicum annuum* L. cv. 'Serrano Criollo de Morelos 334' (SCM), shows a high level of resistance against the blight. What is the basis of this resistance?

In a recent issue of Physiological and Molecular Plant Pathology, Motoko Ueedaa and colleagues from the National Institute of Vegetable and Tea Science (NIVTS), and Mie University, Japan, investigate the "Contribution of jasmonic acid to resistance against Phytophthora blight in *Capsicum annuum* cv. SCM334." Salicylic acid (SA) and jasmonic acid (JA) are plant hormones that contribute to plant defense responses to stresses such as wounding, ozone exposure, and insect or microbial attack.

To find out the extent of JA's participation in blight resistance, scientists grew the SCM cultivar along with a susceptible cultivar, California Wonder (CW). They then measured SA and JA levels, as well as gene expression patterns, during infestation with Phytophthora blight. Researchers found that JA levels increased in SCM immediately after infection with the pathogen; but, as time passed, JA levels decreased, and SA levels increased, accompanied by hypersensitive-response (HR). HS is a complex, early plant defense response that causes cell death at the site of pathogen penetration to restrict the spread of infection. The researchers note that these patterns indicate that JA-mediated defense is crucial in the resistance of pepper plants to Phytophthora blight; they also note that the early appearance of JA, and SA's later accumulation, suggest that both hormones play a separate role in pepper's defense response.

Subscribers to the journal can download the complete article through <http://dx.doi.org/10.1016/j.pmpp.2005.12.002>

ANNOUNCEMENTS

CONFERENCE TO BE HELD IN MALAYSIA

The Asia Pacific Conference on Plant Tissue Culture and Agribiotechnology 2007 will be held in Malaysia from January 28 to February 1, 2007, under the auspices of the Asia Pacific Association of Plant Tissue Culture and Agribiotechnology and the Academy of Sciences Malaysia. The conference aims to promote research in all aspects of basic and applied biotechnology, especially in the areas of plant tissue culture and agricultural biotechnology. Aside from invited lectures and

scientific sessions, other highlights of the Conference will be an Orchid Symposium, a Business Forum, and a Trade Exhibition. Deadline for abstracts is October 31, 2006. For more information, visit the conference website at <http://www.aimst.edu.my/apacpa2007>.

SYMPOSIUM ON SSA SLATED

The “2nd Networking Symposium on innovations in Agricultural Advisory Services” will be held in Hotel Africana, Kampala, Uganda on September 24-27, 2006. This symposium is part of the effort to foster and enhance experience and lesson-sharing on agricultural advisory services (AAS) in the Sub-Saharan African (SSA) region. The Symposium will bring together 140 participants from 19 African countries implementing innovative approaches and experiences in agricultural extension delivery. Each country will be expected to prepare and present a paper on the country’s experiences with innovative approaches to AAS. Authors are requested to send their full papers by August 30, 2006 by e-mail to ssanaas2004@yahoo.co.uk, with a copy to ckiisa@naads.or.ug. For more information, visit <http://www.naads.or.ug/news.php?id=75>.

BRAZIL BIOSAFETY WORKSHOP SCHEDULED FOR 2007

A workshop on “Biosafety of GM Crops and the Evolution of Regulatory Frameworks: Issues and Challenges” will be held September 24-28, 2007 in Belo Horizonte, Minas Gerais, Brazil. Download the registration form from http://www.anbio.org.br/eventos/icg_form.doc. Send completed forms to secretaria@anbio.org.br or l.oda@uol.com.br. For more information, visit <http://www.funed.mg.gov.br>.

BELGIUM TO HOST CONFERENCE

“Agricultural Advisory and Innovation Conference in Brussels - in the framework of EU Common Agricultural Policy” will be held on October 2-3, 2006 in Brussels, Belgium. The conference will be of particular interest for persons in charge of the development of European agricultural advisory services. For more information, contact Ms. Kirsten Lund at kil@landscentret.dk and/or Mr. Knud Tybirk at knt@landscentret.dk; or visit <http://international.landbrug.cursum.net/client/CursumClientViewer.aspx?CAID=223240&ChangedCourse=true>.

DOCUMENT REMINDERS

NEW POCKET K ON BIOINFORMATICS RELEASED

Pocket K No. 23, Bioinformatics for Plant Biotechnology, is the newest Pocket K in the popular series, and is currently available online at the ISAAA KC Website. This Pocket K discusses the science of bioinformatics, and how it can improve crop biotechnology.

Pocket Ks are Pockets of Knowledge, packages of information on crop biotechnology products and related issues. They are available in 12 languages. Pocket Ks are produced by the Global Knowledge Center on Crop Biotechnology (KC) of the International Service for the Acquisition of Agri-biotech Applications (ISAAA). Twenty-two other topics are available at <http://www.isaaa.org/kc>

IITA REPORT AVAILABLE ONLINE

The International Institute of Tropical Agriculture (IITA) has released "The Impact of IITA-Led Biological Control of Major Pests in Sub-Saharan African Agriculture: A Synthesis of Milestones and Empirical Results." Download the complete report at http://www.iita.org/info/impact/impact_major-pest.pdf

TANZANIA AWARENESS LIST NOW OUT

Tanzania Online has released its Monthly Current Awareness List, which includes articles on poverty reduction and human development in Tanzania, and the development of the country's agriculture. All documents are available online at: <http://www.tzonline.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:
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