

October 08, 2014

Global

Governments Agree on Decisions Regarding Safe Use of LMOs

Governments participating in the United Nations meeting on safe use of living modified organisms (LMOs) have agreed on several actions to move forward the implementation of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity as a tool for the safe transfer, handling, and use of LMOs. One of the highlights in the meeting was a decision inviting governments and other stakeholders to use the Guidance on Risk Assessment of Living Modified Organisms in actual cases of risk assessment and as a tool for capacity-building activities in risk assessment. It was also agreed that an improved version of the Guidance will be available in the 8th meeting of the Parties in 2016.

It was also agreed that the Parties will continue to identify LMOs intended for direct use (food or feed) or for processing that are subject for transboundary movement, by incorporating the information identified in decision BS-III/10 into existing documentation accompanying LMOs.

Socioeconomic considerations were also discussed and it was decided that an expert group will be formed to further develop clarity this issue and come up with proper guidelines on the subject.

Read the press release at <http://www.cbd.int/doc/press/2014/pr-2014-10-03-bscopmop7-en.pdf>.

Africa

Agricultural Innovations Can Help African Farmers Compete, Says Report

A new report released by the African Development Bank (AfDB) and the International Food Policy Research Institute (IFPRI) says that Africa needs to embrace agricultural innovations to be able to compete globally. The report, GM agricultural technologies for Africa: A state of affairs collects current information on the status of biotechnology in Africa with an emphasis on GM crops, and assesses the opportunities offered by and constraints on adoption.

The report also discusses the need to transform African agriculture from low productivity to one that is a high-potential driver of economic development. The authors identified several initiatives that could help overcome obstacles, such as increasing public investments in agricultural biotechnology research and development; improving regulatory frameworks and regulatory capacity; and developing an effective and broad-based communications strategy.

For more information about this publication, visit the IFPRI website at: <http://www.ifpri.org/publication/gm-agricultural-technologies-africa-state-affairs>.

Americas

Maui Mayor: Proposed Moratorium on GM Crops is Impractical

Implementing a moratorium on biotech crops is impractical, says Maui, Hawaii Mayor Alan Arakawa. The proposed moratorium will disallow cultivation and testing of biotech crops until developers complete environmental and public health studies to prove safety. According to Arakawa, if the moratorium is approved in the November 4 election, the measure would be "almost impossible and impractical to be able to administer."

"It's going to require the county to become very invasive in that we're going to have to go to almost every single person's house, (inspect) every tree that's there, be able to identify in our forests, in our pastures, all the potentially infested GMO products and somehow be able to control it," said Arakawa during a panel discussion with mayoral, gubernatorial and county council candidates. Arakawa did not make a formal stance on biotech, but he said that he does not believe that biotech crops are harmful.

Read more at <http://mauinews.com/page/content.detail/id/590420/Arakawa--GMO-initiative-would-be--impractical-.html?nav=10>.

Researchers Disable SDP1 Enzyme to Increase Oil Accumulation in Plant Leaves

A new study by Jillian Fan, John Shanklin, and Changcheng Xu at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory, published in *The Plant Cell*, revealed a method for increasing oil in plant leaves. Using the new method, the scientists grew *Arabidopsis* with leaves that had significantly higher oil content. The key was in the biochemical pathways converting carbon into fatty acids, fatty acids to oil, and breakdown of oil.

Previous attempts at increasing oil in leaves focused on blocking oil breakdown by disabling the enzyme that transports fatty acids to the peroxisome. However, it had negative effects on plant health. The team disabled enzymes to determine their effect in regulating various biochemical conversions. They found that disabling the enzyme SDP1 prevents oil from breaking down into fatty acids, leading to higher oil content.

To learn more about the study, read: <http://www.bnl.gov/newsroom/news.php?a=11668>.

Asia and the Pacific

China Launches Media Campaign on Biotech Crops

China's government launched a media campaign on biotech crops to address misinformation about the technology. According to the Chinese agriculture ministry, they would try to educate the public on biotechnology through television, newspapers, and the Internet.

China has been importing large amounts of biotech soybeans for several years, mainly for feed and for vegetable oil. China takes about a third of the world's soybeans, and snaps up about 65 percent of all imports each year.

"(We will create) a social atmosphere which is beneficial for the healthy development of the genetically modified industry," the agriculture ministry said in a statement.

For more details, read the article at <http://www.scientificamerican.com/article/china-launches-media-campaign-to-back-genetically-modified-crops/>

Europe

Scientists Reveal How Fall Armyworms Survive Plants' Defense

Scientists at Max Planck Institute for Chemical Ecology in Germany revealed how fall armyworms survive plants' defense against pests.

In North and South America, fall armyworm (*Spodoptera frugiperda*) cause massive damage in maize fields. Crops like maize attach sugars to chemical defenses known as benzoxazinoids to protect themselves from being poisoned by their own protective agents. When an insect pest attacks the plant, the plant enzyme detaches the sugar to deploy the active toxin. Scientists Daniel Giddings Vassão and colleagues discovered why this strategy does not work against fall armyworms. They found that after the plant detaches the sugar, the insect reattaches the sugar but in opposite stereochemical configuration. Thus, the new configuration prevents the cleaving of the plant enzyme and the sugar, failing to generate the toxin for defense.

The next step of the researchers is to identify the enzymes and genes involved in the detoxification process in the fall armyworm. They will also search for equivalent enzymes in related species.

Read the original article at http://www.mpg.de/8429152/armyworms-maize?filter_order=L&research_topic=.

Research

Scientists to Improve Disease Resistance of Sweet Oranges

Brazilian scientists led by Lisia Attilo studied the genetic transformation of sweet oranges through the use of Salicylic binding-protein 2 (SABP2) to enhance the resistance of sweet oranges to citrus-diseases such as leprosis, citrus canker, and greening disease (HLB). SABP2 is involved in signal transduction pathway which activates systemic resistance and can enhance disease resistance of sweet oranges, thus overexpressing it in this crop can be a tool in enhancing sweet oranges' resistance to diseases.

Results of the study show that the overexpression of SABP2 had resulted to the production of transgenic shoots. This transgenic shoots are then grafted to Carrizo citrange, a sweet orange cultivar to further assess and evaluate its resistance to citrus diseases.

Further details of the study can be read at: <http://www.biomedcentral.com/1753-6561/8/S4/P109>.

PCM DNA Isolation Technique to Increase DNA Yield

Researchers from University of Wisconsin-Madison evaluated the efficacy of a new DNA isolation technique for plant tissues in terms of yield and purity of isolated DNA. The technique is based on MagnaCel paramagnetic cellulose particles (PMC), a method applied on forensic sciences which requires small amount of DNA. A comparative assessment of PCM with two other DNA isolation technique methods, silica column technique (DNeasy Plant Mini Kit) and cetyltrimethylammonium bromide (CTAB) method in terms of yield and purity of isolated DNA was conducted in 25 plant species.

The findings of the assessment show that PCM obtain twice higher DNA yield compared to CTAB and DNeasy and produces consistent DNA purity based on its absorbance ratios of 260:280 and 260:230 nm. These results provide evidence that PCM is more efficient and can be a useful tool in DNA isolation especially under low DNA concentrations.

Read more about this study at: <http://www.bioone.org/doi/pdf/10.3732/apps.1400048>.

Get to Know the BiP Genes from Bread Wheat

The endoplasmic reticulum chaperone binding protein (BiP) is important in protein synthesis, folding assembly, and secretion. To study the role of BiP in seed development of wheat, Capital Normal University's Yueming Yan and Xiaohui Li, and their team, cloned three BiP cDNA sequences in bread wheat (*Triticum aestivum*) and examined its expression.

Analysis showed that BiPs contain three highly conserved domains present in plants, animals, and microorganisms, indicating evolutionary conservation. It was also found that TaBiP (*Triticum aestivum* BiP) gene expression was predominantly localized to seed endosperm. Drought stress also significantly up-regulated the expression of TaBiPs in roots, leaves, and developing grains.

The high conservation of BiP sequences suggests that it plays the same role across species. The expression of TaBiP enzymes in different wheat tissues and under abiotic stress indicates that it is abundant in tissues with high secretory activity and with the high number of cells undergoing division. TaBiP genes are regulated during seed development and early seedling growth, and under various abiotic stresses.

For more on the study, visit: <http://www.biomedcentral.com/1471-2229/14/260>.

Beyond Crop Biotech

International Team Reveals Monarch Butterfly's Genetic Secrets

A team of scientists from around the world has sequenced the genome of the monarch butterfly. The scientists identified a single gene responsible for building muscle tissue that is key to the monarch butterfly's annual mass migration, and another that controls pigmentation. They also shed light on the evolutionary origins of the monarch.

The team sequenced the genomes of 92 monarch specimens from around the world and nine other butterfly species. The gene Collagen IV alpha-1, was identified to have a strong influence on migratory behavior by building muscle tissue and making metabolism more efficient in the migratory monarch populations. They also found that wing color variation was decided by the myosin gene DPOGS206617, which has never before been connected with pigmentation in insects.

For more details about this research, read the following news releases:

<http://www.uchospitals.edu/news/2014/20141002-kronforst.html> and

<http://www.uq.edu.au/news/article/2014/10/monarch-butterflies-built-migration>.

Recombinant Viral Vector Expressing hBD4 Inhibits Bacterial Infection in Burn Wounds

Burn patients can be affected by infection, hypovolemic shock, hypothermia, and respiratory failure. First aid is critical for the prevention of these severe complications. However, secondary bacterial infection is hard to control in burn patients, and *Pseudomonas aeruginosa* is one of the top pathogens tormenting burn wounds.

To prevent complications in burn patients, researchers led by Man-Seong Park from Korea University, assessed the in vitro and in vivo inhibitory values of human β -defensin 4 (hBD4), a known member of antimicrobial peptides found in human cells. The recombinant Newcastle disease virus (rNDV-hBD4) was used as the vector for hBD4 in burn wounds. HBD4 effectively inhibited growth of *Pseudomonas* in culture media and healed severely burned skin in mice with burn wounds. Results suggest that application of hBD4 may protect burn patients from secondary Pseudomonas infection and provide a therapeutic burn wound treatment.

Learn more about the study here: <http://www.biomedcentral.com/1471-2229/14/260>.

Announcements

BIO Europe 2014

What: 20th Annual BIO-Europe

When: November 3-5, 2014

Where: Frankfurt, Germany

Conference website: <http://www.bio.org/events/conferences/bio-europe>

Document Reminders

Straight from the Scientists: Biotech Experts' Perspectives and Experiences in Informing the Public

In the eyes of the public, academics and scientists are at the topmost level of the credibility ladder, being the most reliable and trusted sources of information on biotechnology. To know how academics and scientists play their role in biotech communication, a study was conducted by ISAAA. The results of the study are published in the August issue of Philippine Journal of Crop Science (<http://www.cssp.org.ph/pjcs-issue/volume-39-no-2>). The highlights of the study is also packaged in a new ISAAA publication titled Straight from the Scientists: Biotech Experts' Perspectives and Experiences in Informing the Public. This new monograph is the latest addition to ISAAA's Biotech Communication Series.

Get a copy of the monograph for free at
<http://www.isaaa.org/resources/publications/scicommstudy/download/default.asp>

From The BICs

Scientists and Policymakers Urge Students to Engage on Agri Research

Uganda Biosciences Information Centre (UBIC) and partners organized an awards ceremony for the second annual National Biotechnology Essay Writing Contest on October 2, 2014. The theme of the essay contest was "Agricultural biotechnology and its 2nd implications on the environment". Through this contest, UBIC hopes to encourage students to explore ideas on application of biotechnology in everyday life and its possible impacts on the environment.

The contest received a total 176 essays from 26 secondary schools and post-secondary educational institutions. The contest winners were: Patrick Kasiita from Bukinda Seminary in Kabale district and Owen Singura from Kyambogo University. Each of the winners received a brand new laptop and an internship program at the National Research Institute.

Speaking at the event, Dr. Evelyn Lutalo from the National Environment Management Authority pointed out that it is necessary to strengthen our regulatory systems and capacities to oversee the use of this technology. Dr. Barbara Zawedde, Coordinator of UBIC, encouraged the students to work towards joining the research teams using advanced techniques to improve agricultural outputs. The representative of the Director General - National Agricultural Research Organization (NARO) - Dr. Yona Baguma emphasized the importance of nurturing the next generation of scientists and innovators to drive national transformation. His message was echoed by the Director of Animal Resources in the Ministry of Agriculture- Dr. Nicholas Kauta, who urged the development of a critical mass of skilled scientists who can enhance Uganda's ability to innovate and integrate modern technologies for improved agricultural productivity.

The keynote address was delivered by Hon. Charles Bakkabulindi- Uganda's Minister of State for Education and Sports. Hon. Bakkabulindi, who had earlier in the day toured laboratories and facilities where genetically engineered crops are being developed, congratulated the winners and encouraged the students to continue searching for knowledge

and seizing opportunities like this for grooming them into competent scientists and innovators.

For more details about biotech in Uganda, contact Anita Tibasaaga of UBIC at atibasaaga@gmail.com.

Thai BIC Organizes Two Biotech Communication Workshops

A workshop on training communicators in crop biotechnology for scientists and researchers, and another similar workshop for biosafety regulators were held at Rama Gardens Hotel, Bangkok last September 24-25, 2014. The two events were organized by Biotechnology and Biosafety Information Center (BBIC) in Thailand. Drs. Supat Attathom of BBIC and Darunee Edwards of FoSTAT gave an overview of crop biotechnology and food safety issues of biotech products, respectively. Dr. Mariechel Navarro of ISAAA introduced the concepts and techniques of science communication.

For more details about the workshops, email BBIC at safetybio@yahoo.com.