

May 13, 2015

GLOBAL

FAO LAUDS G20 EFFORTS TO BUILD SUSTAINABLE FOOD SYSTEMS

The Group of 20 (G20) agricultural ministers signified their commitment to meet global food security and nutrition by building food systems that use natural resources more efficiently, are economically sound and socially more inclusive, and help combat climate change during their meeting in Istanbul. José Graziano da Silva, Director-General of Food and Agriculture Organization of the United Nations (FAO), lauded the commitment of G20, as well as their specific efforts to decrease food loss and waste which includes a new platform for fortifying information sharing in G20 members and developing countries.

During their meeting, the G20 agriculture ministers discussed how to meet the food and nutrition needs of the global population, which is expected to reach 9 billion in 2050. According to FAO estimates, global food supply should be increased by 60% to feed the growing population. The G20 agriculture ministers emphasized the need for sustainable and resilient food systems, which will help expand food supplies and create decent work in rural areas. Furthermore, they noted that sustainable food systems should help address climate change.

Read the press release from FAO.

PG ECONOMICS: GM CROPS CONTINUE TO PROVIDE POSITIVE IMPACTS

Crop biotechnology continues to deliver significant economic and environmental benefits, allowing farmers in developing countries to grow more with fewer resources, according to PG Economics report.

"In 2013, the 18th year of widespread adoption of crops using biotechnology innovations, the technology has continued to provide more productive agriculture, higher incomes to farmers and a better environment for citizens. A majority of these benefits continues to go to farmers and rural communities in developing countries," said Graham Brookes, PG Economics Director and co-author of the report. The other author of the report is Peter Barfoot, also the Director of PG Economics.

The highlights of the report include the following:

GM crops enabled the farmers to grow more without using additional land. Without biotechnology, farmers would have needed 44.7 million acres of more land (equivalent to 11% of arable land in the US) to get the same yield.

Biotechnology helped farmers produce improved yields. With the use of insect resistant crops, 11.7% more corn, 17% more cotton and 10% more soybeans were produced.

GM crops planting practices helped reduce tilling and greenhouse gas emissions equivalent to removing 12.4 million cars off the road.

Download the full report from PG Economics.

AFRICA

KENYAN MAIZE FARMERS EXPRESS SUPPORT FOR GM MAIZE

Farmers from the Cereal Growers Association have expressed their support for the introduction and commercialization of GM maize in Kenya.

Speaking at an event organized by the Open Forum on Agricultural Biotechnology in Kenya, farmers received positive testimonies from stakeholders who had recently toured Brazil GM crop fields. The meeting was attended by 25 farmers and farm managers from various Counties of the Rift Valley and Western Kenya who mainly grow maize and soybeans.

Mr. Mburu, Operations Manager at Gicheha Farms Limited, described the Brazil tour as an eye opening experience. According to Mr. Gicheha, "introducing biotech into Brazil's farming systems has allowed the country to be a net exporter of maize and soya beans to other countries like Canada and United States." By adopting GM crops, Brazil has achieved "higher crop yield, lower production cost, longer planting and harvest windows, better quality produce and reduction of pesticide applications," said Mr. Mburu. "One of the main differences between us and Brazil is the adoption of GM crops, because we have similar climatic conditions," he added.

"From this forum, we realize that what we have been hearing on dangers related to GMOs are false rumors. To support our scientists, we will endeavor to sensitize our groups so that they know the truth about GMOs," said Kibiok Tanui from Nandi County.

For more information on the forum, contact Dr Margaret Karembu, Director of ISAAA AfriCenter and chair of the OFAB Kenya Programming Committee at mkarembu@isaaa.org.

AMERICAS

PLANT BREEDER DEVELOPS RUST-RESISTANT SOYBEAN

University of Illinois geneticist Ram Singh has managed to cross a popular soybean variety, Dwight (*Glycine max*) with a related wild perennial plant that grows like a weed in Australia, producing the first fertile soybean plants that are resistant to soybean rust, soybean cyst nematode, and other soybean pathogens.

According to Singh, there are 26 wild species of *Glycine* perennials that grow in Australia. One species, *Glycine tomentella*, was of particular interest because it has genes for resistance to soybean rust and to soybean cyst nematode, Singh said. Earlier efforts to hybridize it with soybean produced only sterile plants. Singh continued to experiment and eventually developed a hormone treatment that interrupted the process that caused the hybrid seeds to abort. Singh's research has yielded plants that are resistant to soybean rust, soybean cyst nematode or *Phytophthora* root rot.

For more details, read the news release at the University of Illinois website.

USDA SECRETARY SEES DIFFICULT TALKS ON TRADE BETWEEN US AND EU

Differences in GM crop regulations between the US and European Union will make transatlantic trade deal difficult, according to the US Department of Agriculture Secretary Tom Vilsack. He mentioned this during a media interview at the G20 agriculture ministers meeting held in Istanbul.

"You can't use and create a system of open or free trade if you are creating ways in which countries can develop barriers to products for political or cultural reasons," Vilsack said, pointing out the recent European Commission proposal to give member governments to have control over GM crops. "You ought to give people the choice, then let the market decide," he suggested. He also emphasized that GM crops enable more production under difficult circumstances, expanding the food supply and lowering food prices. Thus, Americans are spending around 10 percent of pay for food.

Read the news article from AgWeb.

CHEMIST CREATES TOOL FOR GENE EDITING

Since 2013, scientists have used the gene editing tool CRISPR/Cas9, to excise a gene, alter its function, or introduce desired mutations. The method employs a bacterially derived protein (Cas9) and a synthetic guide RNA to induce a double-strand break at a specific location in the genome. The CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats of DNA base sequences) method has shown tremendous promise to enable researchers to treat cystic fibrosis and sickle-cell anaemia, create laboratory animals that mimic human disease, and create a strain of wheat resistant to powdery mildew.

Alexander Deiters, chemistry professor at the University of Pittsburgh, together with colleagues at the University of North Carolina at Chapel Hill, have found a lysine residue in Cas9 that can be replaced with a light-activated analog. The approach, developed by Deiters, generates a Cas9 protein that is functionally inactive, so called "caged," until the cage is removed through light exposure, activating the enzyme and thereby activating gene editing.

"This method may allow people to engineer genes in cells or animals with better spatial and temporal control than ever before," says Deiters. "Engineering a light switch into Cas9 provides a more precise editing tool. You can say, 'In this cell, at this time point, is where I want to modify the genome.'"

More details about this research are available at the University of Pittsburgh website.

ASIA AND THE PACIFIC

PHILIPPINE RESEARCH TACKLES INDUCTION OF DISEASE RESISTANCE IN ABACA

The National Abaca Research Center (NARC) in the Visayas State University of the Philippines is looking into abaca's innate resistance to fungal diseases such as Fusarium wilt to bring about disease resistance in the said crop and thus increasing yield.

The study, supported by the Department of Agriculture-Biotechnology Program (DA-Biotech), makes use of the Systemic Acquired Resistance (SAR) Induction method which stimulates the plant's defense systems using various compounds. It also intends to develop a new and effective disease management strategy against the Panama disease and increase the plant's resistance to a broad spectrum of other diseases. Preliminary results have shown a delay on the onset of disease by up to three weeks. With the Philippines as the producer of 80% of abaca fiber in the world market, this research ultimately aims to further strengthen the abaca industry as a major economic pillar.

For more information about this research, please contact the NARC Director Dr. Ruben M. Gapasin (rmgapasin1952@yahoo.com), or Dr. Antonio Alfonso of DA-Biotech (biotechpiu@yahoo.com). DA-Biotech's info brief about this research, and other biotech updates in the Philippines may be found at the website of the Southeast Asian Regional Center for Graduate Study and Research in Agriculture Biotechnology Information Center (SEARCA BIC).

AUSTRALIAN OGTR AUTHORIZES FIELD TRIALS OF BT-HT COTTON

Australia's Office of the Gene Technology Regulator (OGTR) issued a license to Bayer CropScience, allowing the field trials of genetically modified (GM) cotton with insect resistance and herbicide tolerance traits. The field trials were allowed to take place in July 2015 to July 2021 in New South Wales, Queensland, and Western Australia. For the first two years, the maximum planting area allowed is 120 hectares/year and 600 hectares/year for the remaining 4 years. The field trials will be conducted to evaluate the agronomic performance and pest resistance of GM cotton under Australian field conditions.

Read the notification of license decision at the OGTR website.

EUROPE

SCIENTISTS FIND NEW SPECIFIC INSECTICIDE TARGET PROTEIN

Scientists from BASF and the University of Göttingen in Germany have found a new insecticide target protein. The discovery marks the first identification of vanilloid receptors, the TRPV ion channels, as insecticide targets. The scientists focused on the mode of action of the insecticides pymetrozine and pyrifluquinazon and identified a novel TRPV ion channel complex as the target protein of the two chemicals. In insects, two TRPV channels exist, which occur together in certain stretch receptors that are present in joints, for example in the antennae and legs.

The two insecticides only act selectively on these stretch receptors because they activate an ion channel complex formed by the two TRPV channels. By activating this TRPV channel complex, the insecticides overstimulate the stretch receptors, disturbing insect locomotion and feeding. Substances with this mode of action are effective against many plant-sucking pests, particularly whiteflies and aphids.

Knowing the exact target of pymetrozine and pyrifluquinazon will help the industry to provide better advice on spray programs to farmers. Dr. Vincent Salgado, a biologist at BASF Crop Protection said, "For instance, we would not want to treat fields with these two substances one after the other. The more you attack one particular site, the faster insects will become resistant. The findings help us to use insecticides more wisely and more sustainably."

For more details, read the news release at the University of Göttingen website.

Research

PLANT GENE REQUIRED DURING HIGH TEMPERATURES IDENTIFIED

Climate change causes several abiotic stresses in crops affecting their productivity. In a study led by researchers from Monash University, they discovered the gene responsible for plant growth during warmer temperatures.

By analyzing the growth responses of *Arabidopsis thaliana* population at different temperatures, the gene ICARUS1 has been identified as the one responsible for the plant growth of *A. thaliana* at increasing temperatures. *A. thaliana* lacking this gene inhibited their growth during high temperatures and resume their growth once the temperature goes down and gets cooler.

ICARUS1 is not only found in *A. thaliana*, but in other plants as well. The discovery of this gene will help scientists in developing plants that can tolerate increasing temperatures.

Details of their study can be read at Monash University's website.

Beyond Crop Biotech

TRANSGENIC BEEF CATTLE WITH HIGH BENEFICIAL FATTY ACID DEVELOPED

One of the beneficial fatty acids in human health is omega-3 polyunsaturated fatty acids (n-3 PUFAs) due to its ability to provide protection against several diseases. The contents of n-3 PUFAs in livestock is very low, hence, researchers from Northwest A&F University and National Beef Cattle Improvement Centre, China developed transgenic beef cattle to produce meat containing higher content of n-3 PUFAs.

The n-3 PUFAs is a result of the conversion of n-6 PUFAs by *fat1* gene from *Caenorhabditis elegans*. By using this concept, the researchers were able to successfully produce transgenic beef cattle rich in n-3 PUFAs by creating a plasmid with codon optimized *C. elegans fat1* gene through somatic cell nuclear transfer.

Read the full details of their study at Biotechnology Letters.

PCC DEVELOPS NEW TECHNIQUE FOR SCREENING CARABAO BULL FERTILITY

A research study at the Philippine Carabao Center (PCC) is exploring the protein phospholipase C zeta (PLC ζ) to develop a potentially more efficient technique in determining the fertility of carabao sperm for artificial insemination (AI). The protein, which is usually

found in mice, has been identified through recent advances in animal fertilization technology as the major factor that causes egg fertilization and development of embryos in mammals.

The research aims to improve carabao breeding efficiency and is geared towards developing a more reliable technique in determining the fertility of carabao sperm for AI. It is targeted to be completed by 2016, and is supported by the Department of Agriculture-Biotechnology Program (DA- Biotech). It is also in line with PCC and DA's goal of improving livestock productivity and attaining food security.

For more information about this research, contact Dr. Eufrocina P. Atabay of PCC (bingay2003@yahoo.com), or Dr. Antonio Alfonso of DA-Biotech (biotechpiu@yahoo.com). DA-Biotech's info brief about this research and other biotech updates in the Philippines may be found at the website of the Southeast Asian Regional Center for Graduate Study and Research in Agriculture Biotechnology Information Center (SEARCA BIC).

Announcements

PLANT BREEDING FOR DROUGHT TOLERANCE ONLINE COURSE

Colorado State University will offer a one-credit, graduate-level online course in Plant Breeding for Drought Tolerance from August 24 to December 18, 2015. This distance course is targeted to graduate students in the plant sciences, as well as to professionals in the public and private sectors interested in increasing their knowledge in this area.

Information on the course content, format, and cost is available at the course website. For questions, contact the Program Assistant, Kierra Jewell (Kierra.Jewell@ColoState.edu). Applications will be accepted through August 1, 2015 or until the class is full for 25 students.

BIO INTERNATIONAL CONVENTION

What: BIO International Convention

When: June 15-18, 2015

Where: Philadelphia, USA

For more information, visit the conference website.

DOCUMENT REMINDERS

IFIC RELEASES NEW VIDEO ON FOOD BIOTECH FACTS

The International Food Information Council Foundation (IFIC) released a new video that provides science-based information on food biotechnology, featuring expert interviews and survey findings.

Watch the video at IFIC website or Youtube.