CROP BIOTECH 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)

February 18, 2005

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INTERNATIONAL EFFORTS FARE POORLY IN SOLVING WORLD HUNGER

Global efforts to reduce hunger and poverty by international organizations have not been successful. On a scale of ten, efforts were rated three, so says the Global Governance Initiative Annual Report 2005 released by the International Food Policy Research Institute. Efforts to diminish poverty earned a rating of four.

The report says that if current trends continue, there will still be about 600 million hungry people in 2015, far short of the target of 400 million set by heads of State of the World Food Summit in 1996. To reach that goal, efforts need to be accelerated more than 12 times or “this scenario will not materialize.”

Of several recommendations forwarded, the report said that governments should reform agriculture. It noted that “agriculture has a tremendously important role to play in meeting these goals. Investments to enhance agricultural productivity and

access to markets would not only increase income for small-scale farmers, but also reduce the cost of food for poor consumers."

The Global Governance Initiative, which issued the report, was created by the World Economic Forum. The Initiative provides an annual assessment of the level of effort being made towards achieving the world's goals by governments, international organizations, the private sector, and civil society organizations.

See the full report online at: http://www.ifpri.org or contact Michael Rubinstein at m.rubinstein@cgiar.org for additional information.

S & T OPTIONS FOR AFRICAN AGRICULTURE

Improving agricultural productivity and food security in Africa involves numerous challenges. The Amsterdam-based InterAgency Council released a report entitled "Realizing the Promise and Potential of African Agriculture" which recommended responses to these challenges.

Among five strategic themes, which include building impact-oriented research, knowledge and development institutions, and creating and retaining a new generation of agricultural scientists, is a focus on science and technology options that can make a difference. The report suggested, among others, the need to:

* Adopt a market-led productivity improvement strategy

* Adopt a production ecological approach with a primary focus on identified continental priority farming systems

* Pursue a strategy of integrated sustainable intensification, and

* Bridge the genetic divide

The report said that a substantial amount of additional investment is needed to respond to the specific needs of African farmers so that they benefit from both classical plant breeding and genetic modification. A regional rather than a national approach was suggested to exploit biotechnology. It called for a strengthening of capacity in biotechnology, particularly through public-private partnerships. Life sciences should focus, the report added, on traits such as drought tolerance and resistance to a wide variety of pests and diseases. Concomitant to all these is the need strengthen research capabilities and regulatory procedures, as well as ensure that biosafety aspects are adequately addressed.

IAC was created by the world's science academies to mobilize the best scientists and engineers worldwide to provide high quality advice to international bodies - such as the United Nations and the World Bank - as well as to other institutions.

See the full report online at:
http://www.interacademycouncil.net/report.asp?id=6959.

BIOASIA GIVES BIRTH TO FABA, ACCORDS

The recent BioAsia 2005 summit in Hyderabad, India concluded with ten Asian countries coming together to form one community tasked to promote biotechnology in the region. The Federation of Asian Biotech Associations (FABA) includes India, Pakistan, Malaysia, Sri Lanka, Singapore, Thailand, the Philippines, Israel, Iran, and Saudi Arabia. Its headquarters will be located in Hyderabad, and M.K. Bhan, secretary of India's department of biotechnology, and B.P. Acharya, a former secretary of biotechnology in the Andhra Pradesh state government, will serve as its patrons. Founding president Answar Nasim, head of Pakistan's National Commission on Biotechnology, hopes that FABA will encourage greater investment in the biotechnology sector.

BioAsia likewise allowed government leaders to express their support for expanding research and development. Andhra Pradesh Chief Minister Y S Rajashekara Reddy, for instance, announced that the government of India would provide another 1,000 acres of land for bio-entrepreneurship in the state. This land would encourage growth of the Biotech Cluster in India's Genome Valley, where a Biotech Park is currently being built.

The summit also saw the signing of 25 memoranda of understanding (MoU) and 42 Business to Business (B2B) meetings in its three-day duration. Over 300 delegates, 40 sponsors and exhibitors, 50 B2B delegates from 31 countries, and 300 students from various universities attended, coming from countries such Canada, Germany, Iran, Italy, Malaysia, Pakistan, Saudi Arabia, Singapore, Sri Lanka, Sweden, Thailand, and USA.

See the article at http://www.hindustantimes.com/. Visit the BioAsia conference website at http://www.bioasia2005.org.

ICRISAT STARTS CONTAINED FIELD TRIALS FOR CHICKPEA

Conventional chickpea is subject to a few pests, including the legume pod borer (*Helicoverpa armigera*). Damage due to the insect is estimated to cost $0.5 million in the chickpea growing areas of the world, with large acreages in India and Bangladesh.

In response to this problem, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has genetically modified chickpea to be resistant to the borer, and has recently launched contained field trials for the crop at ICRISAT-Patancheru.

The transgenic chickpea contains Bt genes for resistance to *Helicoverpa*. The material will undergo stringent lab and field tests over the next two years, and only after these tests and other clearances will the material be transferred for farmers' field trials.

This transgenic chickpea crop is the third for which contained field trials have been launched. Transgenic groundnut resistant to the Indian Peanut Clump Virus has been undergoing contained field trials since 2002, while transgenic pigeonpea has been through similar trials since 2003.

For more of ICRISAT see http://www.icrisat.org.

PLANT CHANNELS CHANGE WITH AGE, RESEARCH SAYS

Plant cells have their own means of communicating, transporting nutrients, and managing traffic amongst important macromolecules. These tasks are carried out by plasmodesmata, or PD, the intercellular channels that span plasma membranes and cell walls between adjacent plant cells. PD transport can be passive, where molecules smaller than channel size can move from one plant cell to the next; or active, where PD's move molecules larger than channel size. Thus, with their vital role in maintaining plant cell health, scientists have been researching how plasmodesmata develop, and how robust they are through plant development.

In the latest issue of the Proceedings of the National Academy of Science, Shoko Ueki and Vitaly Citovsky of the State University of New York show that "Control improves with age: Intercellular transport in plant embryos and adults." Their work, along with other researchers' in the same journal, provides important insights into PD transport, such as the relationship of PD selectivity to plant age. Traffic of macromolecules between plant cells, researchers found, is most

promiscuous in young, undifferentiated tissues, and becomes much more restricted as tissues mature.

Access the article at http://www.pnas.org/cgi/content/full/102/6/1817

STUDIES ON WHEAT PROTEINS DOCUMENTED

Marcia Wood of the Agricultural Research Service (ARS) documents the latest ARS research on wheat proteins, as scientists try to discover more about how they are affected by heat, soil nutrients, and other environmental conditions in which the plant is grown, all of which might produce better flours.

The work of ARS plant physiologist William J. Hurkman and colleagues, for instance, is carried out on wheat kernel proteins. The researchers separate individual proteins from each other, then study each protein and compare their profiles with those posted in online databases. Their efforts have led them to identify over 200 wheat kernel proteins, and group them into tasks they likely perform, ranging from storing carbohydrates to protecting the kernel against insects.

Read more at www.ars.usda.gov/is/AR/archive/jan05/wheat0105.pdf

NEW TECHNIQUE UNVEILED FOR GENE EXPRESSION STUDIES

However which way scientists study plant gene expression, their activities will most likely involve fixing and dehydrating plant tissue, embedding it in plastic or resin, and slicing it into thin sections. These thin sections can then be attached to a slide and labeled with a probe to track molecules, and can be viewed using a variety of techniques in microscopy.

However, scientists at the Agricultural Research Service's (ARS) ARS's U.S. Plant, Soil, and Nutrition Laboratory at Cornell have developed a technique that can allow researchers access to immediate data when studying gene expression, without having to go through the slide making process.

Led by Leon V. Kochian, the research team's technique involves using large plant tissues in gene expression studies, instead of the thin sections of old. In their new method, a piece of a target gene's DNA is copied and then labeled with a fluorescent compound detectable by a laser scanning confocal microscope. This labeled DNA then binds to a target gene's mRNA molecule, so that once sought out and detected, the labeled DNA can give researchers an idea where

the gene is being expressed. A confocal microscope also works with whole specimens, and does not require them to be thinly sectioned - thus eliminating the fixing, dehydrating, and embedding steps scientists have hitherto used.

Read more at www.ars.usda.gov/is/AR/archive/jan05/plant0105.pdf.

SYNGENTA DONATES INFO ON PLANT DISEASE GENOME

Agribusiness company Syngenta has made available for public use important genetic information on *Phytophthora infestans*, as well as most of its genomic sequence. *P. infestans* causes Potato Late Blight, one of the most devastating plant diseases affecting potato and tomato. Syngenta worked with the Syngenta Phytophthora Consortium, an international panel of academic institutions, to analyze and develop a partial genomic sequence.

Syngenta also plans to make available genomic data for three other important pathogens this year.

See Syngenta's press release at:
http://www.syngenta.com/en/media/article.aspx?article_id=482 .

ROUNDUP READY CORN APPROVED FOR PLANTING IN THE PHILIPPINES

The Philippines Bureau of Plant Industry, an agency under the Department of Agriculture, has given the commercial approval to Roundup Ready corn. Technology developer Monsanto Company says that this biotech corn variety is expected to reduce the use of herbicides and improve yields and quality of grain. The latest technology was approved after a four year process supervised by the National Biosafety Committee of the Philippines.

Monsanto also reports that the insect-protected corn variety YieldGard, the first biotech crop to be approved in the Philippines, was planted on 54,000 hectares or 133,000 acres in 2004.

See the Monsanto release at http://www.monsanto.com.

DOCUMENT REMINDER: GLOBAL STATUS REPORT UPDATED

The 1996 to 2004 summary of the Global Status Report of Commercialized Biotech/GM Crops, authored by Dr. Clive James, is now available online at http://www.isaaa.org/kc. It provides an overview of the global area, distribution (by country, crop and trait), adoption rate, and global value of biotech crops in the market. You can also download the executive summary of the ISAAA Briefs 32: Preview: Global Status of Commercialized Biotech/GM Crops: 2004, available in different languages: Arabic, Chinese, English, Portuguese (Brazil), Spanish (Argentina), Thai, and Vietnamese at http://www.isaaa.org/kc.

ANNOUNCEMENT: TRAINING ON PLANT TISSUE CULTURE

An international training course on plant tissue culture and transformation techniques will be held at the Agricultural Genetic Engineering Research Institute (AGERI) in Giza, Egypt on April 2-13, 2005. It is sponsored by AGERI, Academy of Scientific Research and Technology (Egypt), and the Centre for Science and Technology of the Non-aligned and other Developing Countries (India). The training course is open to participants from developing countries. For more information, contact Prof. Arun P. Kulshreshtha, Director, Centre for Science & Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre), Core 6A, 2nd Floor, India Habitat Centre, Lodhi Road, New Delhi – 110003, India. His email address is apknam@gmail.com.

CBT NEWS FEATURE: LUIS HERRERA-ESTRELLA

Mexican scientist Luis Herrera-Estrella is an accomplished researcher and leader in the field of plant molecular biology. While working as a PhD student, he published the first report on the genetic manipulation of plant cells. He also pioneered the development of dominant selectable markers and the use of reporter genes for plant systems, which later became the two most important tools to develop gene transfer systems for economically important crops.

He has also shown that tropical crops can be modified through biotechnology to tolerate aluminum and acid soils, significantly increasing productivity. Currently, Dr. Herrera-Estrella is the head of the Plant Genetic Engineering Department, and Director of the Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV) at Irapuato, Mexico. He established and organized this Department at the Irapuato Unit of CINVESTAV, which UNESCO later designated as their Center for Education and Training in

Biotechnology for Latin America. He also created the Plant Genome Unit at CINVESTAV.

Dr. Herrera-Estrella graduated with a B.Sc. degree in biochemical engineering from the Mexican National Polytechnic Institute and later pursued a masters at the IPN's Centro de Investigación y de Estudios Avanzados. He received his PhD in plant molecular biology from the State University of Ghent, Belgium, where he also conducted postgraduate research.

Among the many honors he has received are the 1984 Minoru and Ethel Tsutsui Distinguished Graduate Research Award in Science from the New York Academy of Sciences, the 1987 Javed Husain Award from the UNESCO, the 1989 Scientific Research Prize in Natural Sciences from the Mexican National Academy of Sciences, the 1994 Award in Biology from the Third World Academy of Sciences, the 1998 RedBio Medal from the Latin American Biotechnology Network, the 2000 WIPO Medal from the World Intellectual Property Organization; and the 2002 National Award in Science, the highest recognition given to scientists by the Mexican government. In 2003, he was elected to the Mexican Academy of Sciences and to the US National Academy of Sciences as a Foreign Associate.

http://www.ucmexus.ucr.edu/index.php?content=cmcest/herrera-estrella.html
http://www.hhmi.org/research/scholars/herr.html

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