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), and AgBiotechNet

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In This Issue:

FAO EXPERTS RECOMMEND GUIDELINES FOR DEPLOYING GM CROPS

An expert consultation organized by the Food and Agriculture Organization (FAO) recommended that any responsible deployment of genetically modified (GM) crops needs to comprise the whole technology development process. Specifically, this includes pre-release risk assessment, biosafety considerations, and post release monitoring. Other recommendations forwarded include:

* The need for environmental goals to encompass the maintenance and protection of basic natural resources such as soil, water, and biodiversity.

* Inclusion of potential hazards associated with GM cropping in the context of impacts associated with all agricultural practices.

* Involvement of stakeholders like environmental organizations, farmer groups, and community organizations in this process.

FAO said that it will facilitate the process along with other national and international institutions. The consultation was an attempt to provide clear preliminary guidelines on the most accurate and scientifically sound approach to monitoring the environmental effects of existing GM crops.

For more details regarding the experts consultation visit:
http://www.fao.org/newsroom/en/news/2005/89259/index.html

CHINA RELEASES RICE GENOME ANALYSIS

Scientists led by Gane Ka-Shu Wong from the Beijing Institute of Genomics reported a “much improved, near complete genome analysis of the indica and japonica subspecies of Oryza sativa” in an article published in PLoS Biology. They used the combined DNA sequence data from the two subspecies to facilitate the sequence assembly. This resulted in an almost 1,000-fold increase in contiguity for the two genome sequences relative to the existing sequence data.
In their article “The genomes of Oryza sativa: a history of duplications,” Wong and colleagues mentioned that they used their improved genome sequence to investigate the evolutionary history of rice. They noted that there is evidence in the rice DNA sequences for a whole-genome duplication event just before the grasses diverged from other flowering plants, about 55–70 million years ago. This genome duplication may have played a role in the origin of the grasses, which then spread rapidly across the world.

The individual gene duplications provide a continuous source of raw material for gene genesis. The challenge is thus to use the rice sequence to develop improved strains of rice and other important food crops.

The article is available online at http://www.plosbiology.org. Contact Gane Ka-Shu Wong at gksw@genomics.org.cn

DECREASING NUMBER OF GM CROPS GOING THROUGH U.S. REGULATORY REVIEW

The number of biotechnology crops that passed through the regulatory review process in the United States has decreased sharply. Products that the government reviewed from 2000-2004 involved engineered crops with similar genes that were commercialized in the 1990s. This was the gist of a report by Gregory Jaffe, director of the biotechnology program of the Center for Science in the Public Interest in Washington, DC.

Jaffe used the Food and Drug Administration and the Animal and Health Inspection Service of the US Department of Agriculture information about genetically modified crops that have passed mandatory or voluntary regulatory hurdles prior to commercialization. Data also revealed that it took twice the time to receive a regulatory clearance.

The report recommends that the federal government:

* Assess and explain why companies and others are marketing fewer new GM crops and why government is taking longer to release regulatory clearance.

* Streamline current public investment in GE research on crops and traits that are not being pursued by industry and that will benefit farmers, the environment, and also consumers.

* Facilitate regulatory reviews of those products developed by the public sector.

See the full report at: http://cspinet.org/new/pdf/withering_on_the_vine.pdf

UK EXPERIENCES IN ENVIRONMENTAL RISK EVALUATION

Generalized information about environmental risks from genetically modified organisms is worthless and has no place in regulation. Regulatory systems rely on scientific advice on risks to humans, livestock, and the environment. This was stressed by Dr. Brian Johnson, senior advisor on biotechnology to the British statutory conservation agencies, and head of the Biotechnology Advisory Unit at English Nature, the government's advisors on nature conservation, in his talk on "Assessing Environmental Risks: UK Experiences" presented in Los Banos, Laguna, Philippines. He emphasized the need for a strong dialogue among stakeholders based on science.

Johnson said that his work on the United Kingdom Farm Scale Evaluations, considered the largest ecological experiment in the world, proved the necessity of conducting agro-ecological research to understand impacts on all novel crop systems. "The UK experience shows that each crop has different characteristics and carried different potential risks. Risks from GM crops are sometimes different

from conventional crops but not necessarily higher." In this scenario, Johnson, recommended case-by-case assessments as always necessary for all novel crops, not necessarily limited to GM crops alone.

The biotech advisor's visit to the Philippines was made possible through efforts of the Philippine National Academy of Science and Technology, SEARCA-Biotechnology Information Center, and the International Service for the Acquisition of Agri-biotech Applications.

Contact Dr. Johnson at brian.johnson@english-nature.org.uk.

LITTLE AWARENESS ABOUT GM FOODS AMONG U.S. PUBLIC

A national survey reveals that the American public is generally unaware of genetically modified (GM) foods and the extent of its prevalence in their lives. Few knew that the products are readily available in supermarkets, and that people have already been consuming them. These were the findings of the report "Americans and GM Food: Knowledge, Opinion and Interest" commissioned by the Food Policy Institute.

The study, which was conducted by the Rutgers-Cook College, also revealed that Americans generally said they were interested in the technology but did not have enough information for informed decision making.

"People seem to have a great number of misconceptions about the technology," said William Hallman, the study's lead author. "As a result, they seem to be willing to believe just about anything they hear about GM foods."

Download the full report at http://www.foodpolicyinstitute.org/docs/reports/NationalStudy2004.pdf or see the press release from Rutgers University at http://www.cooknjaes.rutgers.edu/news/release.asp?n=297

R&D FOR GERMANY DRIFTING ABROAD, STUDY FINDS

About half of all German companies that invest in research and development abroad have been reducing their research capacities at home. This is according to a survey of 1,554 companies conducted by the DIHK, the umbrella organization for the German chambers of commerce.

"Germany's appeal as a place to conduct research is fading," Ludwig Georg Braun, president of the DIHK, said, while commenting on the survey, "And it will fade further if the government fails to react."

Asked why they were investing in research outside their home base, 66 per cent of companies with more than 1,000 employees said the investments were intended to support their production capacities abroad. Nearly one in five German companies also said they would move R&D jobs abroad during the next three years.
Nearly half of German companies active abroad had R&D investments made within the core 15 member states of the European Union. Another third of German R&D facilities was in central and eastern Europe, where low wages was the primary motivation for the investments there. Twenty-eight per cent of German companies with a foreign R&D presence were in Asia and in North America.

Business leaders have been particularly critical of a German bill that sets some of the strictest limitations in Europe on the growing of genetically modified crops, and of plans by the European Commission to raise safety standards for the chemicals industry.

Read the news article at http://news.ft.com/cms/s/b573a7ca-747e-11d9-a769-00000e2511c8.html.

MAB LEADS TO NEW MILLET HYBRID

With the help of marker assisted breeding (MAB), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the Haryana Agricultural University (HAU) have developed a new pearl millet hybrid resistant to downy mildew (DM). The hybrid, designated HHB 67-2, is the first ever product of marker-assisted breeding in pearl millet to be released for cultivation in India.

DM is caused by invasion of the fungus Sclerospora graminicola. Infection of millet at early stages of development can result in stunted growth of the plant, or even death. Infection at later stages results in failure of grain formation. In years of severe DM attack, up to 30% of the pearl millet harvest can be lost.

To develop the new hybrid HHB 67-2, parental lines of the original hybrid were improved for downy mildew resistance through marker-assisted as well as conventional backcross breeding programs. The gene for downy mildew resistance was added to the male parent, H 77/833-2, through marker-assisted breeding using ICRISAT elite parent ICMP 451 as the resistance gene donor;

while the gene for DM resistance was added to the female parent, 843A/B, from ICRISAT line ICML 22, through conventional backcross breeding.

For further information, contact Dr CT Hash at c.hash@cgiar.org

PROTEIN INTERACTION TRIGGERS TLCV REPLICATION

Dr. Luke A. Selth, of Commonwealth Scientific and Industrial Research Organization (CSIRO) Australia, and colleagues have found that "A NAC Domain Protein Interacts with Tomato leaf curl virus Replication Accessory Protein and Enhances Viral Replication." Their findings are published online in Plant Cell. Tomato Leaf Curl or Leaf Roll is a disease which causes tomato plants to grow slowly, and for tomato fruits, if ever they are produced, to be small, dry, and unfit for the market. The causative agent is the Tomato Leaf Curl Virus (TLCV), which is dependent on host factors for multiplication, and which does so by hijacking host cell processes. Replication enhancer (REn) proteins are produced during an infection, dramatically increasing the accumulation of viral DNA species by a hitherto unknown mechanism.

Selth's study presents evidence that the tomato itself contains a protein, called SINAC1, which enhances TLCV infection through binding with REn. When TLCV starts infecting a plant, they found, it produces REn, which, in turn, induces SINAC1 expression; and all of which result in a substantial increase in viral DNA accumulation. Through in-vitro experiments, researchers not only identified SINAC1, but found that in acts as a transcriptional activator in uninfected yeast cells.

The paper may be accessed online at
http://www.plantcell.org/cgi/reprint/17/1/311

CBT NEWS FEATURE: DR. INGO POTRYKUS

World-renowned scientist Ingo Potrykus is known for his invention of the beta-carotene-enriched "golden rice." Golden rice was produced using gene-transfer technologies, and could help overcome vitamin A deficiencies in parts of the world where rice is a staple of the diet. Beta carotene is converted to vitamin A after human consumption. Golden rice is believed to be an excellent example of how genetic engineering of plants can be of direct benefit to the consumer, especially the poor in developing countries.

Born in Hirschberg, Germany, Dr. Potrykus studied Zoology, Botany, Genetics, Biochemistry, Philiosophy, and Physical Education at Universities in Cologne and Erlangen. In 1968, he obtained his PhD in Plant Genetics at the Max-Planck-Institute for Plant Breeding Research in Cologne, Germany.

Before joining the Swiss Federal Institute of Technology's Institute of Plant Sciences, where he was a professor from 1987 and 1999, Dr. Potrykus worked as an Assistant Professor for the Institute of Plant Physiology at the University of Hohenheim,Germany from 1974-1976. He was also a research leader at the Max-Planck Institute for Plant Genetics (Germany) from 1974-1976, and established plant genetic-engineering programs at the Friedrich Miescher Institute in Basel, Switzerland. Currently, he is a professor emeritus of plant sciences with the Swiss Federal Institute of Technology at Zurich.

Dr. Potrykus has also applied genetic engineering technology to other food crops, such as wheat, sorghum, and cassava. He has also worked in the areas of plant disease and pest resistance, improved food quality, and increased yield.

Among many honors he received were the Kumho Science International Award in Plant Molecular Biology and Biotechnology (2000), the American Society of Plant Biologists' Leadership in Science Public Service Award, the Crop Science of America President's Award, and the European Culture Award in Science. He has also received an honorary doctorate from Sweden's University of Agricultural Sciences.

Potrykus is a member of Academia Europaea, the World Technology Network, and the Swiss Academy of Technical Sciences. He has authored over 300 publications in refereed journals and obtained 30 international patents.

Since his retirement in 1999, Dr. Potrykus has devoted his energy to guiding Golden Rice towards subsistence farmers across the many hurdles of a GMO-crop. He has also established collaboration with 14 rice institutions in India, China, Vietnam, Bangladesh, Indonesia, and Philippines.

http://nutrition.tufts.edu/pdf/conferences/agri_biotech/cvpotrykus.pdf
http://www.verw.ethz.ch/cgi-win/whoShow.exe/ws7?ID=683&lang=engl

DOCUMENT REMINDER: SPANISH VERSION OF GLOBAL STATUS REPORT AVAILABLE

The executive summary of the Global Status of Commercialized Biotech/GM Crops: 2004 published by the International Service for the Acquisition of Agri-biotech Applications is now available in Spanish (Argentina). It discusses, among

others, the global area of biotech crops since its planting in 1996, distribution of biotech crops in industrial and developing countries, distribution of biotech crops by country, the global value of biotech crops, and future prospects. Visit http://www.isaaa.org/kc to download this summary.

ANNOUNCEMENTS

ICABR DEADLINE FOR PAPERS EXTENDED

Due to requests from the public, the deadline for paper proposals for the 9th ICABR International Conference on Agricultural Biotechnology: Ten Years After has been extended to February 5, 2005.

Conference organizers note that they can still provide a notice of acceptance by February 16, 2005. The conference itself will be held in Ravello, Italy from July 6 - 10, 2005.

The call for papers is posted at the following web address: http://www.economia.uniroma2.it/conferenze/icabr2005/call_for_paper.asp

NORDIC SEMINAR ON GM SET

The Swedish Ministry of Agriculture, Food, and Consumer Affairs, in cooperation with the Nordic Council of Ministers, presents GMO Food and Safety: State of Play in the Nordic and Baltic Countries, a Nordic seminar about the use of Genetically Modified Food (GMO) in the food chain. The seminar will be held in Stockholm, Sweden, from March 10-11, 2005.

The seminar will give an up-to-date view of how different stakeholders perceive the safety aspects of GM-derived food in the Nordic and Baltic countries. The speakers represent food producers, NGOs, authorities, legislators, and scientists.

Members of ministries and national agencies, trade and industry, academia, consumer organizations, and other NGOs in the Nordic and Baltic countries are invited to attend.

The deadline for registration is on March 1, 2005. For more information, contact Ms Christina Isaksson at christina.isaksson-eldh@agriculture.ministry.se, or Dr. David Carlander at david.carlander@slv.se.

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