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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FAO SAYS INVEST MORE IN AGRIC AND RURAL DEVELOPMENT

The Director-General of the Food and Agriculture Organization (FAO) called for increased investment in agriculture and rural areas of developing countries to improve economic opportunities and reduce hunger where most of the world's poor live.

Speaking at a recent meeting of world leaders at the United Nations, Dr. Jacques Diouf said: "Despite a growing body of evidence that shows most poor and hungry people depend on agriculture for their livelihoods, many developing countries continue to spend far too little on agriculture and rural development. In countries where undernourishment is most widespread, the share of government spending devoted to agriculture falls far short of matching the sector's importance in the economy."

As hunger and malnutrition are both a cause and an effect of poverty, and 70 percent of the poor live in rural areas, he called for direct measures to support improved access to food, especially through income generated by employment in secured, productive and thus competitive agricultural activities.

According to FAO studies, investment in rural areas is also necessary to slow immigration from rural to urban areas. "In fact," said Dr. Diouf, "the legitimate concern about rapid urbanization and the costs this imposes on entire societies may have even worsened the rural handicap by diverting investments from rural to urban areas. When investment in agriculture and rural development is neglected, the rural-urban gap will further widen and the resulting increase in rural to urban migration becomes a self-fulfilling prophecy."

For more information, see the FAO online at www.fao.org, or contact John Riddle, the FAO Information Officer, at john.riddle@fao.org.

IITA TRAINS NIGERIAN POLICY MAKERS ON BIOTECH

About 100 Nigerian top civil servants from the Ministries of Agriculture and Rural Development, Science and Technology, and Environment participated in a biotechnology seminar organized at Abuja, by the International Institute of Tropical Agriculture (IITA), under the auspices of the Nigeria Agriculture and Biotechnology Project (NABP). The seminar aimed at assisting top government officials to make policy decisions on biotechnology. They were also enlightened on the contributions of biotechnology to the socio-economic development of Nigeria especially in health, medicine, agriculture, food security, human nutrition, and environmental protection.

In a message to the participants, Nigeria’s Minister of Environment, Alhaji Bala Mande said food biotechnology offers a viable option for achieving food security. He remarked that despite the potentials of biotechnology, there was still some level of reluctance and hesitation to embrace it, adding that public education was an important strategy to achieve acceptability. He urged Nigerian biotechnology stakeholders to apply the best practices in the course of research and development on environmental considerations, while adhering faithfully to the Nigerian biosafety guidelines.

Dr. Christian Fatokun, IITA Cowpea Breeder, explained that among NABP’s objectives are to build national capacity to conduct research and development for bioengineering of priority crops; develop the capacity of the national biosafety committee to review and approve applications for field testing and commercialization of bioengineered crops; and to develop public awareness and acceptance of the benefits of biotechnology through balanced dissemination of

information on the benefits and possible risks. He said the project supports the Federal Government's policy to initiate appropriate steps to explore the use of biotechnology and ensure that Nigeria becomes a key participant in the international biotechnology enterprise within a decade.

For more information about the IITA workshop on biotechnology, contact IITA Taye Babaleye, Head, Public Affairs, at t.babaleye@cgiar.org.

USDA PUSHES BIOTECH INITIATIVES FOR AFRICA

The United States Department of Agriculture Secretary Ann Veneman announced several initiatives that will be implemented in Africa to strengthen biotechnology research and development. In a keynote address during the 7th Annual AfriCANDO Trade and Investment Symposium held in Miami, Florida, USA, Veneman said a U.S. private and public sector team of cotton experts will travel to West Africa to look into the cotton industry. The team will recommend how best West African cotton industries can become more efficient and competitive. This will serve as a model for cooperation in other parts of Africa.

A second activity will be a follow-up conference later this year in Mali to be hosted by West African countries that attended the Burkina Faso Ministerial. In addition, the US will help West Africa achieve its goal of creating a regional African Center of Excellence for Biotechnology. A variety of technical assistance, training, and cooperative research, exchange, and development programs will be provided to facilitate and accelerate the transfer and adaptation of biotechnology to the region. Guidance on establishing appropriate biotechnology standards and regulatory systems will be provided as well.

For the full transcription of Veneman's talk, visit
http://www.usda.gov/Newsroom/0398.04.html

SYNGENTA RESUMES SALE OF GM SEEDS IN SOUTH AFRICA

After voluntarily halting the sale of genetically modified corn, Syngenta has resumed selling to South African farmers. It stopped selling after Biowatch, an organization against gene-altered crops, appealed a government decision to allow the company to sell seeds. A board of legal and agricultural experts convened by the high court dismissed Biowatch's request for appeal.

Ken Flower, managing director of Syngenta's South African unit, said that the company is back to selling and distributing seeds. The company will comply with the appeal board ruling for "additional monitoring and research" of crops.

See the full report at
http://mywealth.co.za/index.php?fSectionId=568&fArticleId=2235136

ESOF PROVIDES FORUM FOR NON-EU SCIENTISTS

The EU must identify obstacles to global collaboration and address them, urged non-European scientists from Japan, the US, and South Africa, at The first EuroScience Open Forum (ESOF2004), held at Stockholm, Sweden, on August 25-28th 2004. More than 1,800 persons participated (of which 350 were international journalists), in the first pan-European scientific meeting staged to provide an interdisciplinary forum for open dialogue, debate, and discussion on science and technology in society.

Kiyoshi Kurokawa from the Science Council of Japan explained that in an increasingly global world that is experiencing dramatic advances in science and technology, three global issues need to be addressed: population growth; the stress on the environment due to population growth, and the North-South dichotomy.

Presenting the view of the developing world, Khotso Mokhele from South Africa explained that the reality in developing countries is political indifference, or, at best, ambiguity towards science. 'We are counting a lot on the EU to change this state of affairs,' said Mokhele.

Responding to Mokhele's address, an EU official in the audience explained that only 17 million of a 32 million euro fund has so far been used, mainly because the projects presented by developing countries are often not up to the required standards. He also regretted the fact that European scientists are often unaware of this money and of the possibility of including developing countries in their consortium. He therefore called on EU scientists to include scientists from developing countries in their collaborative work.

Read the full article at http://dbs.cordis.lu/fep-cgi/srchidadb?CALLER=NEWS_ERA&ACTION=D&QM_EN_RCN_A=22542. Visit the official website of the ESOF 2004 Conference at http://www.esof2004.org.

ARS LEADS IN ASSESSING TRANSGENICS

The assessment of safety is integral to the regulatory system to ensure the safety of genetically modified organisms. Hence, the Agricultural Research Service (ARS) of the US Department of Agriculture has taken a lead role in biotechnology risk assessment research.

John Radin, ARS national program leader for plant physiology and risk assessment, said that biotechnology risk assessment research is high priority. Several areas of risk assessment that ARS is doing research on are: creating more specific ways to transfer only desired genes, developing new models for doing risk assessments, finding ways to limit spread of transgenes, discovering ways to prevent new allergens from being created, ensuring that nontarget organisms are not put at risk by a GEO, and carrying out long-term monitoring to spot any emerging resistance to transgenic traits.

The ARS is also developing better methods that may serve as models for resistance monitoring in conventional pest controls as well as in transgenic crops. For instance, it is working on identifying genes that may control insect resistance to Bt. Another area is exploring ways to manipulate the DNA of genetically altered plants so that the transgene is deleted or inactivated during the physiological process of pollen production. Still another activity is assessing the potential for new allergens in food, which is integral to the process of reviewing transgenic plants.

For more information about ARS activities related to assessing transgenics, visit http://www.ars.usda.gov/is/AR/archive/sep04/trans0904.htm.

JAMAICA TO DRAFT BIOTECH ROAD MAP

The Scientific Research Council in Jamaica reports that Caribbean experts are preparing to draft a regional road map for the commercialization of biotechnology. The region, however, requires a regulatory framework, testing facilities as well as competence to carry out risk assessments. It also needs focused strategies and developmental plans aimed at commercializing biotechnology-derived products.

In addition, the Caribbean Single Market and Economy (CSME) and the Free Trade Areas of the Americas (FTAA) Agreement are two trade initiatives being formally adopted by member states to facilitate access to wider global markets and the free movement of good, personnel and services. These developments

highlight the need for protocols to guide the use of biotechnology in the Caribbean and to draft a road map for its commercialization.

An e-discussion has been set up to help Jamaica develop its biotech roadmap. For those interested to join this e-discussion, visit http://www.src-jamaica.org/forum or email Audia Barnett of SRC at AudiaB@src-jamaica.org.

GE LINSEED PRODUCES HEALTHIER OMEGA 3 AND 6 FATTY ACIDS

In an article in this month's The Plant Cell, Ernst Heinz at the University of Hamburg (Germany) and colleagues succeeded in producing genetically modified linseed plants that accumulate significant levels of very long chain poly-unsaturated fatty acids (PUFA) in seed.

In the study, DNA coding sequences for the genes for fatty acyl desaturases and elongases from plant and algal organisms that produce very long-chain PUFA were introduced into linseed and tobacco plants, and expression of the proteins directed into the seed with the use of seed-specific gene promoter sequences. In addition to the possibility of providing healthier, more nutritious oils for human consumption, this work will lead to the production of high quality animal feed that could improve the PUFA content of animal products such as meat, eggs, and dairy foods.

Increased consumption, in particular of the very long chain PUFA such as those found in fish oils, has been linked to a decreased risk of heart disease; protection against inflammatory diseases such as arthritis, irritable bowel syndrome and some cancers; and the promotion of healthy brain and eye development in infants. However, it is recommended that consumption of many types of fish be limited due to depletion of worldwide fish stocks, as well as widespread contamination with pollutants, such as heavy metals and dioxins.
Download the full text of the article, "Biosynthesis of Very-Long-Chain Polyunsaturated Fatty Acids in Transgenic Oilseeds: Constraints on Their Accumulation" at http://www.plantcell.org

DUST IN THE WIND NO MORE

A recent study by Agricultural Research Service (ARS) scientists reports that dust can serve as a fingerprint for the soil from which it originates, providing information on soil type and farming practices used on the field from which it blew.

ARS microbiologist Veronica Acosta-Martinez and soil scientist Ted Zobeck, both at the agency's Cropping System Research Laboratory in Lubbock, Texas, fed different soil samples into their own dust-generating machine, which works by applying kinetic energy by gravity to a dust source sample to generate dust. Samples were taken from agricultural soils with a history of continuous cotton, or cotton rotated with peanut, sorghum, rye, or wheat; and under different water management (irrigated or dryland) and tillage (conservation or conventional) systems.

The dust samples showed activities of ß-glucosidase, alkaline phosphatase, and arylsulfatase, which are related to cellulose degradation and phosphorus and sulfur mineralization in soil, respectively. They were also able to identify the type of tillage and the crop rotation used on the field.

As more information becomes available on dust characteristics, conservationists and land planners will be able to pinpoint areas and practices that are causing most of an area's wind erosion. These techniques may also help to assess the relationship between these biochemical properties of dust and the soil sources, in order to evaluate their potential as biochemical fingerprints of the soil source.

View the full article online at http://jeq.scijournals.org/cgi/content/full/33/5/1653.

INDIA'S NCL WORKING ON PEST-RESISTANT CROPS

The plant molecular biology unit of the biochemical sciences division of the National Chemical Laboratory (NCL) at Pune, India is working on enhancing industrially important crops such as chickpea, cotton, sunflower, tomato, pigeonpea, and okra through identifying proteinase inhibitors (PIs), which could be used to develop pest-resistant varieties of crops.

According to the NCL team, the process involves using the PIs to block the digestive capabilities or reproductive potential of certain agricultural pests. This is achieved by transferring the genes responsible for PI production to plants that do not naturally produce a particular critical PI.

One such pest, the Gram Pod Borer (Helicoverpa armigera), is responsible for destruction of chickpeas. "We found that the Pod Borer disarms the host plant's natural defense mechanism by inactivating PIs, and then feeds on them," scientist Vidya Gupta said.

As the PI found in the host plant was ineffective, "we screened several other plants that were resistant to the particular pest, and then identified PIs from

them". Studies revealed that when these PIs from winged bean, bitter gourd, capsicum, to name few crops, were fed to the Pod Borer, its growth and egg-laying/hatching abilities were dramatically retarded.

Visit the NCL at http://www.ncl-india.org/index.jsp

GREEN ENERGY GETS TAPPED IN SPINACH

Another type of biotechnology is underway at the Massachusetts Institute of Technology, where Shuguang Zhang of the institute's Laboratory of Molecular Self-Assembly has integrated a protein complex, derived from spinach chloroplasts, with organic semiconductors to make a solar cell that can be combined with solid-state electronics: an electronic device that uses spinach to convert light into electrical charge.
Inspired by the light transfer reactions that drive photosynthesis in plants, the device developed by Zhang uses the same process to feed electrons into organic semiconductors aligned on top of a layer of glass.

Zhang's team managed to artificially stabilize the protein complex at the heart of their system - comprised of 14 protein subunits and hundreds of chlorophyll molecules - using synthetic peptides to bind small amounts of water to it, within a sealed unit. The resulting cells are much thinner and lighter than existing solar panels and could eventually be used to make much more efficient panels, says Zhang. Although the prototype device can't rival commercial solar cells made of silicon, it demonstrates a new strategy for making longer-lasting photovoltaic cells.

The system is far from perfect, however. The peptides used keep the protein complex stable only for about three weeks, and the cells convert only 12% of light to electrical charge. But Zhang says efficiency could be boosted dramatically by layering numerous cells on top of one another, as they will still let some light through.

Visit Shuguang Zhang's laboratory online at http://web.mit.edu/lms/www/

DOCUMENT REMINDER: UPDATED POCKET K 10

A revised version of Pocket K No. 10 on "Herbicide Tolerance Technology: Glyphosate and Glufosinate" is now available online at http://www.isaaa.org/kc. It discusses weed control practices, development of glyphosate and glufosinate

herbicide tolerant plants, advantages of herbicide tolerance crops, safety aspects of the technology, and the current status of herbicide tolerance.

Pocket Ks are Pockets of Knowledge, packaged information on crop biotechnology products and related issues. They are produced by the Global Knowledge Center on Crop Biotechnology of the International Service for the Acquisition of Agri-biotech Applications. There are already 15 Pocket Ks which are all available online at http://www.isaaa.org/kc.

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