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)

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NEWS

VERHEUGEN: BIOTECH DEBATE MUST BE OPEN BUT SCIENCE-BASED

There is a need for an open debate on the benefits of and ethical issues about biotechnology but that it must remain science-based. Günter Verheugen, Vice President of the European Commission for Enterprise and Industry, said in a Biotechnology Policy Day High Level Roundtable in Brussels, Belgium, that the Commission will launch such a debate next year in the context of the mid-term review of the Biotechnology Strategy.

“Biotechnology is of great importance to several of Europe's industrial sectors and will be a key component to increase our competitiveness,” Verheugen stressed. “By keeping Europe at the cutting edge of biotechnology research, we will also contribute to the more general goals of creating more highly-qualified and well paid-jobs, boost economic growth and improve our terms of trade.”

Verheugen said that the new Commission's industrial policy for biotechnology would rely on the relaunched Lisbon Strategy and the Commission's strategy and action plan for Life Sciences and Biotechnology. He noted that the new Commission has developed a clearer and more realistic plan with a stronger focus and greater ownership of the process by Member States.

A full transcription of Verheugen's speech is available online at http://www.cordis.lu.

ARTICLE EXAMINES ARGENTINA'S BIOTECH

In the latest issue of BioEntrepreneur, VeronicaGuerrero examines how“Argentina gets serious about biotech” and how its latest laws and policies favor the growth of biotechnology research in the country.

Argentina was one of the first countries in the world to approve the research and planting of genetically modified crops, and may be the most entrepreneurial of all Latin American nations. Initiatives by the government now aim to use these advantages for the benefit of biotechnology research through increasing tax and investment incentives for biotech startups.

Such initiatives include the launch of the Strategic Plan for the Development of Agricultural Biotechnology, as well as the Law on the Promotion and Development of Biotechnology, which awaits approval in Congress. The new law

will “augment [Minister of Economy, Roberto] Lavagna's crop-science initiative by placing the development of all biotech products at the center of Argentina's development effort,” Guerrero writes, and “will provide seed capital and early-stage funding for young biotechs through the Fund of Economic Stimulus for New Business Enterprises.”

Read the complete article at http://www.nature.com/bioent/bioenews/092005/full/bioent880.html.

REPORT SAYS CANADA MUST TAKE ADVANTAGE OF BIOTECH

Canada must make biotechnology a strategic priority and take advantage of its socio-economic benefits. The Conference Board of Canada, a not-for-profit organization, provides evidence-based analysis in a report “Biotechnology in Canada: A technology platform for growth”. It raises policy questions for industry, the academic community and government.

Biotechnology is a global industry says Trefor Munn-Venn, author of the report, and yet “Canadian biotechnology firms are generally small and undercapitalized, and they struggle to attract the scientific and managerial talent critical to success.” Hence, there is a need for the country to “step up its efforts to realize the benefits of this platform technology, building on our considerable areas of strength.”

A news release on the report is available at http://www.conferenceboard.ca. Subscribers can download the full report from the same website.

WORLD CEREAL OUTPUT DECREASES

The Food and Agriculture Organization (FAO) estimates world cereal production for 2005 at 1984 million tons which is 3.4 per cent less than last year's record output. FAO's publication Food Outlook says that this trend is due to the anticipated decrease in global cereal output, notably of coarse grain crops in 2005 by the developed countries. Weather conditions such as the adverse hot and dry weather in the United States and drought in parts of the European Union contributed to lower yields.

Developing countries, however, were expected to increase production marginally from 2004 yields due to better crops in several Asian countries.

For more information, contact FAO's Pierre Antonios at Pierre.antonios@fao.org or visit http://www.fao.org/newsroom/en/news/2005/107900/index.html

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RESEARCH

GM ALFALFA EXPRESSES VACCINE

Scientists have long worked on edible vaccines which are expressed in food crops. Such a vaccine production method could yield vaccines which do not require refrigeration or strict cold storage, making them stable, and making them ideal for use in developing countries. To date, vaccines for six infectious diseases have been successfully expressed in plants: diarrhea, Norwalk virus, respiratory syncytial virus, rabies, Hepatitis B, and measles.

One such infectious disease is Foot and Mouth Disease, or FMD. FMD is caused by a virus, and can infect domestic animals which produce milk and meat. María J. Dus Santos Instituto de Virología and colleagues from Buenos Aires, Argentina document their first shot at making an edible FMD virus in “Development of transgenic alfalfa plants containing the foot and mouth disease virus structural polyprotein gene P1 and its utilization as an experimental immunogen.” Their work appears in Vaccine.

Through Agrobacterium transfer, researchers introduced the gene for one of the FMD virus' proteins into alfalfa plants. What resulted was transgenic alfalfa producing the virus polyprotein. Researchers then fed the transgenic crop to mice, to induce a weak immune response in mice, prompting them to produce antibodies to the FMD virus. When infected with FMD, none of the mice were infected.

Read the complete article at http://dx.doi.org/10.1016/j.vaccine.2004.11.014. If you are not a ScienceDirect subscriber, you may still read the abstract at the same site.

SOYBEAN GETS PROTEIN LIFT

Soybeans are a highly nutritious, protein-rich food source. However, they have lower amounts of the amino acids methionine and cysteine, both of which are essential to human and animal growth and development.

To supplant this deficiency, genes which express methionine and cyteine-rich proteins may be introduced into soybean. Zhiwu Li, of Kansas State University, and colleagues explore this option as they induce the "High level expression of maize c-zein protein in transgenic soybean (Glycine max.)." Their work appears in the latest issue of Molecular Breeding.

Researchers introduced the maize-derived, c-zein gene into the Jack soybean cultivar. C-zein produces a sulfur-rich protein, which also contains methionine and cysteine. Their techniques yielded three transgenic lines, two of which showed significant cysteine and methionine content upon protein extraction and assaying of the grown plants' seed flour.

These two transgenic lines produced as much as 30% more cysteine, and 18.6% more methionine than the Jack cultivar. The two transgenic cultivars also stably passed the c-zein gene on to subsequent soybean generations.

Subscribers to Molecular Breeding may download the complete article at http://dx.doi.org/10.1007/s11032-004-7658-6 . Other readers may view the abstract at the same site.

PLANT HORMONE RECEPTOR DISCOVERY COULD LEAD TO BETTER CROPS

Plants produce their own hormones as they grow, develop, and respond to environmental stimuli. One of these is gibberelin, which can induce, among others, seed germination, stem elongation, leaf expansion, pollen maturation, and flowering. How gibberelin is made has been well studied and characterized. How it is sensed and transmitted to induce plant growth, however, is still a mystery.

In the latest issue of Nature, Miyako Ueguchi-Tanaka and colleagues find that “GIBBERELLIN INSENSITIVE DWARF1 encodes a soluble receptor for gibberellin.” Since plant breeders often prefer semi-dwarf varieties of cereal crops to double their grain production, and since these varieties are often deficient in gibberellin, such findings can aid scientists in producing higher-yielding crops.

As researchers mapped genes in rice mutants, they found a gene called GID1, whose sequence was similar to genes belonging to a hormone receptor family, and which they surmised would code for gibberellin receptors that would make plant cells sense the presence of the hormone. They also found that underexpression of the gene produced a severe rice dwarf with wide, dark green leaves; while overexpression resulted in long, spindly rice, typical of gibberellin overdosed plants.

Read the supplementary article at http://www.nature.com/nature/journal/v437/n7059/full/437627a.html. Nature subscribers can access the complete journal article at http://www.nature.com/nature/journal/v437/n7059/full/nature04028.html.

ICRISAT EFFORTS YIELD BETTER CHICKPEA

Chickpea is the world's third most important food legume, but is not easily given to hybridization. This is especially important, since hybridization may be able to protect the crop from the various diseases and pests to which it is susceptible.

The first step to better chickpea has been taken by scientists at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), whose efforts have yielded a chickpea hybrid.

Researchers were able to cross a cultivated variety, Cicer arietinum, with the wild species Cicer bijugum, through embryo rescue and tissue culture methods. They hope that this hybrid will improve disease resistance and boost crop yields, and make a hardy plant better protected against harsh weather and pest attacks.

For further information, contact Dr Nalini Mallikarjuna at n.mallikarjuna@cgiar.org. Find out more at http://www.icrisat.org.

DOCUMENT REMINDERS

ABIC PROCEEDINGS MADE AVAILABLE

The 2004 Agricultural Biotechnology International Conference, held in Cologne, Germany, was the first conference in Europe to unite science, politics, and industry in a joint effort to enhance efficiently the profile of Biotechnology in the continent.

There were nine mini-conferences under the ABIC umbrella, all with their own workshops and keynote speakers. The topics discussed included Public Round Table: The Role and Importance of Ethics for AgBiotechnology in Europe; Controlling Expression in Transgenes; Research in Biosafety, Co-existence of Transgenic and Non-Transgenic Crops; Biotechnology and Food Security for the

Resource-Poor; Role and Importance of Ethics for Agricultural Biotechnology in Europe; and New Traits [on] the Horizon.

The first draft of the proceedings of last year's ABIC are now available at http://www.botanischergarten.ch/ABIC/Report-ABIC-2004-CitNames.pdf.

ARS DOCUMENTS AVAILABLE IN SPANISH

Scientists from the Agricultural Research Service (ARS) of the United States Department of Agriculture (USDA) have compiled over 100 abstracts from publications related to environmentally friendly ways to grow top quality potatoes, sugar beets, and other important crops. These abstracts are now available in Spanish to meet the needs of Spanish-speaking farm owners, managers, and workers wherever they may be in the world. These abstracts are available online at http://www.nwisrl.ars.usda.gov/publist.shtml.

UPDATES FROM THE BIOTECHNOLOGY INFORMATION CENTERS

JOURNALISTS-SCIENTISTS INTERACT AT DHAKA

The Bangladesh Biotechnology Information Center (BdBIC) in Dhaka held a "Journalists-Scientists Discussion Meeting on Communication of Biotech Issues" at Bangladesh Institute of Nuclear Agriculture at Mymensingh. It was co-organized with the Bangladesh Association for Biotechnology (BABT). Chief Guest Md Amirul Islam, Vice Chancellor of the Bangladesh Agricultural University in Mymensingh, stressed the need for closer interaction between journalists and scientists. He announced that the University will arrange seminar discussions and laboratory visits for journalists so that they are updated about research initiatives. Email BBIC director Khondoker Nasiruddin at k.nasiruddin@isaaa.org.

PHILIPPINE MEDIA LEARN BIOTECH THE FUN WAY

Some 34 media practitioners from print and radio groups converged in Los Banos, Laguna, Philippines for a two-day workshop on “Understanding and having fun with biotechnology.” Organized and facilitated by the SEARCA Biotechnology Information Center in Los Banos, in tandem with the International Service for the Acquisition of Agri-biotech Applications SEACenter, the participants had an interactive updating on biotechnology through games, expert sharing sessions, laboratory exercise on isolating the DNA, and greenhouse tour of research activities related to biotech. A board game K-Quest was developed especially for the group which simulates the regulatory process that a biotech crop undergoes from the laboratory to farmers' fields in the Philippines. Co-sponsors were the Agricultural Biotechnology Support Project II, and the Philippine Science Journalists Association Inc. More details regarding the workshop may be obtained by emailing Sonny Tababa, SEARCA-BIC administrator, at spt@searca.bic.org.

ANNOUNCEMENTS

INTERNATIONAL RICE GENETICS SYMPOSIUM

The EDSA Shangri-la Manila is the site of the 5th International Rice Genetics Symposium on November 19-23, 2005. The Symposium, held every 5 years, explores developments in rice genetics and their applications. The 3rd International Symposium on Rice Functional Genomics will also be held under the auspices of the International Rice Functional Genomics Consortium.

INTERNATIONAL PLANT BIOTECH SYMPO IN AFRICA

“Recent advancement in plant biotechnology research and its potential applications to plant protection in East Africa” is the theme of the International Plant Biotechnology Symposium to be held October 23-27, 2005 at Dar-es-Salaam, Tanzania.

The forum will be used to establish the East African Plant Molecular Biologists Network (EAPMBNet). The network will bring together scientists in the field of plant molecular biology and biotechnology in the East African Region for collaborative benefits. For additional details visit http://www.africancrops.net.

Do not hesitate to tell other colleagues/contacts about this mail list. If they wish to join, they should send an e-mail message to knowledge.center@isaaa.org leaving the subject blank and entering the one-line text message as follows: SUBSCRIBE Crop Biotech Network

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