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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DOCUMENT REMINDER: FRENCH VERSION OF POCKET K #6

The French version of Pocket Knowledge (K) 6, which discusses the Bt Insect Resistance Technology is now available at http://www.isaaa.org/kc/Publications/pdfs/pocketks/Pocket K6 (French).pdf, together with the English version. This publication discusses the safety aspects of Bt technology, the advantages of Bt crops, and insect resistance management (IRM).

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CROPBIOTECH SUBSCRIBERS E-SURVEY

Our latest data show that the CropBiotech Update is already reaching subscribers in 189 countries. To have a better profile of our valued subscribers and to better serve you, we are currently conducting a subscribers survey. We would like to express our gratitude for those who have already responded. And, for those of you who haven't answered the survey yet, we encourage you to do so. To view the online form, please follow this link: http://www.isaaa.org/kc/profile/subscription.asp.

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In This Issue:

* EU Lifts Ban on GM Food
* FAO: Biotech Can Meet the Needs of the Poor
* BBSRC Reviews Future of UK Crop Science
* CropLife Asia: Thailand to Benefit from Agric Developments
* Barriers in Marketing GM Horticultural Crops
* GM Cotton, Model for Biosafety Applications in Vietnam
* Low Cost Options for Tissue Culture
* UC Develops High-Protein Maize
* Announcement: French Version of Pocket K # 6

EU LIFTS BAN ON GM FOOD

The European Union (EU) lifted a five-year ban on genetically modified (GM) food. The EU's executive commission approved an application by Swiss company Syngenta to import a strain of sweet corn known as Bt-11 that has been genetically modified to resist corn borer. AFP news service quotes EU health commissioner David Byrne as saying that the sweet corn has undergone “the most rigorous pre-marketing assessment in the world” by EU food safety scientists.

Syngenta was given approval to import GM tinned sweet corn into Europe for 10 years provided the cans are clearly labeled as containing GM products. The EU is currently studying another 33 applications for the marketing or cultivation of GM food in Europe. A moratorium on approving new GM products was imposed in 1999 due to public concern about their environmental impact and safety as food.

See related article at http://news.bbc.co.uk/2/low/europe/3727827.stm.

FAO: BIOTECH CAN MEET THE NEEDS OF THE POOR

According to a report from the Food and Agricultural Organization (FAO) entitled “The State of Food and Agriculture (SOFA) 2004, bioengineered food crops have a potential to alleviate world hunger but these potentials remain largely untapped. Supporters of biotechnology believe that the science is essential for addressing food insecurity and malnutrition in developing countries; offers the possibility of reducing the use of toxic agricultural pesticides; and improve the efficiency of fertilizer and other soil amendments, as backed up by thorough and adequate scientific assessments of its environmental and health impacts.

SOFA 2004 also noted that poor farmers and consumers in developing countries can benefit greatly from biotechnology, however it was observed that as the biotech sector develops "there is clear evidence that the problems of the poor are being neglected." The report also suggested some lines of action that individual countries and the international community can take to make biotechnology a more potent tool against world hunger, and be more advantageous to the poor in developing countries.

Included also in the report are some questions that need to be addressed such as:

* How can more farmers in more countries gain access to the technologies that are emerging from the Gene Revolution?

* Which biotech research priorities could most directly benefit the poor?

* Who will develop innovations for the majority of developing countries that have limitations in attracting large private-sector investments, and lack the scientific capacity to develop their own innovations?

* How can the development and international movement of safe transgenic organisms be facilitated?

* How can the sharing of intellectual property for the public good be promoted?

* How can countries have adequate environmental- and human-health risk assessment regimes for the assessment of new biotechnologies?

Read the FAO press release at http://www.fao.org/newsroom/en/focus/2004/41655/index.html. The SOFA 2004 is also downloadable at http://www.fao.org/docrep/006/Y5160E/Y5160E00.HTM.

BBSRC REVIEWS FUTURE OF UK CROP SCIENCE

An independent review panel commissioned by the Biotechnology and Biological Sciences Research Council (BBSRC), the United Kingdom's largest funding agency for plant science, recommended that the UK should have a stronger national focus on research underpinning “public good” plant breeding. It concluded that “there will be significant needs for novel crop science research that is central of BBSRC's mission and high-level strategic priorities in the promotion of sustainable agricultural systems, integrative biology, crop bioscience for industry and the health organism. Progress will depend not only on national investment but also on international coherence and cooperation.”

The review panel also recommended that the BBSRC:

* Develop a research strategy to exploit genomic information in crops and in models for both non-GM and GM approaches to improving crop performance.

* Ensure the efficient collection and curation of genomic information, together with maintenance of germplasm, for major groups of crop plants.

* Focus investment in functional genomics in the context of identifying important crop traits in wheat, brassica, legumes, and forage.

* Support genome sequencing and gene functional analysis of pests and pathogens and ensure that this is developed within a population genetic and epidemiological framework to promote durable pest and disease control.

The panel highlighted a number of new challenges faced by UK agriculture caused by climate change, international competition, the threat of new pests and diseases and changing food demands from the public.

For more information, visit http://www.bbsrc.ac.uk/news/reports/crop_sci_review12_05_04.html which has a link to the full report.

CROPLIFE ASIA: THAILAND TO BENEFIT FROM AGRIC DEVELOPMENTS

Recent positive developments from the European Union (EU) and the Food and Agriculture Organization (FAO) with regards agricultural biotechnology augur well for Thailand and similar Asian countries. This was stressed by George Fuller, executive director of CropLife Asia, an association of private sector companies engaged in crop science.

Fuller was referring to the European Union (EU) Commission's recent approval of a new genetically modified (GM) corn product which lifts an earlier moratorium on GM food. "The Commission's decision to approve this biotech sweet corn is a welcome move and a positive signal for Europe," said Dr Fuller. (See related article in this newsletter).

Another recent development was the FAO report that stated "Biotechnology holds great promise for agriculture in developing countries, but so far only farmers in a few developing countries are reaping these benefits." It noted that biotechnology can provide farmers with disease-free planting materials and develop crops that resist pests, diseases and drought. In countries in Asia where biotech crops have been introduced, small-scale farmers have gained economically and realized significant environmental benefits." (See related article in this newsletter).

Fuller said that "Given Thailand's strong commitment as a leader in agriculture research in Asia, the benefits of biotechnology are particularly relevant and important for Thai farmers as well as for price and health conscious consumers all over the world." He added that Thailand has been fostering development in agricultural technology so that farmers can also benefit from opportunities that their counterparts are already reaping in other parts of the world.

Visit http://www.croplifeasia.org for their full press release.

BARRIERS IN MARKETING GM HORTICULTURAL CROPS

"High costs for research, development and regulatory approval combined with the small acreages planted and the diversity of varieties, will limit the potential for profitable applications of biotechnology to many fruits and vegetables, tree fruits and nuts, and nursery crops," says Julian M. Alston, Professor, Department of Agricultural and Resource Economics, University of California (UC) Davis, and Associate Director, Science and Technology Policy, UC Agricultural Issues Center.

Alston added that these high costs are also accompanied by market barriers, apart from future political decisions that may discourage food manufacturers and retailers from adopting biotech products that have high consumer demands, and are deemed profitable for growers.

At present, he observed that successful genetically modified (GM) crop varieties emphasized "input traits" which are related to reducing the use of chemical pesticides. On the other hand, horticultural biotechnology include an enormous diversity of fruit and vegetable crops, and other plant species (ornamentals, flowers and recreational turfgrass) which may have advantages in terms of potential market acceptance due to their being non-food products.

The author concludes that the government may facilitate a faster rate of development and adoption of horticultural biotechnology products in terms of reforming property-rights institutions to increase efficiency and reduce research and development (R&D) costs. The government could, likewise, reduce some barriers to adoption, especially market acceptance of biotech food products, by providing consumers information about their food safety and environmental implications.

Read the research article entitled “Horticultural biotechnology faces significant economic and market barriers” at http://californiaagriculture.ucop.edu/0402AMJ/pdfs/barriers.pdf.

GM COTTON, MODEL FOR BIOSAFETY APPLICATIONS IN VIETNAM

At a recent workshop on biosafety held in Ho Chi Minh City, Vietnam, genetically modified (GM) cotton was chosen to become a model crop for the biosafety applications of GM crops in the country. The workshop, which was held last April 2004 aimed to identify issues and assess solutions on the research and application of GM crops, particularly on its effect on targeted and non-targeted insects, weeds, and the soil environment. The control of disease-resistance traits was also a major concern.

The participants, likewise, exchanged ideas such as: how to effectively share and exchange information on GM cotton with other countries; new scientific methods that could ensure the environmental safety of GM products; and the conceptualization of a policy and national research program for biotechnology and biosafety.

This workshop is said to be a prelude to the eventual commercialization of GM crops that is set to occur in the next two years. At present, GM cotton in Vietnam is said to have a yield of 3 to 4 tons/ha as compared to conventional cotton which averages about 1.2 tons/ha./ Vietnam Net (http://www.vnn.vn) and Countryside Today.

LOW COST OPTIONS FOR TISSUE CULTURE

There are options to reduce costs in establishing and operating tissue culture facilities in developing countries without compromising the quality of the micropropagules and plants. This can be achieved by improving process efficiency and better use of resources. Reduction in the costs of putting up tissue culture facilities can also be done. Careful planning of a facility can reduce expenses in its construction and day to day operations. These are some general points raised in a publication made available online by the Food and Agriculture Organization entitled “Low options for tissue culture technology in developing countries.”

Other aspects to consider are the proper choice of media and containers that reduce the cost of micropropagation. Production cost can be lowered by replacing expensive imported vessels with reusable glass jars and lids, and using alternatives to gelling agents, use of household sucrose, and some medium components. Bulk buying of media and storage as deep frozen stocks can also reduce labor costs.

The FAO publication is based on the proceedings of a technical meeting organized by the joint FAO/International Atomic Energy Agency Division of Nuclear Techniques in Food and Agriculture held in Vienna, Austria. See the full report at http://www-pub.iaea.org/MTCD/publications/PDF/te_1384_web.pdf (1061 KB) or contact S.M.Jain@iaea.org for more information or to request a hard copy.

UC DEVELOPS HIGH-PROTEIN MAIZE

A low-sugar, high-protein maize was recently developed by Daniel Gallie, Professor of Plant Biochemistry and Molecular Biology, and colleagues at the University of California (UC), Riverside, California, United States. This newly developed maize variety is said to have the potential to address the problems on malnutrition, and specifically address the sufficiency in protein-deficient diets in Africa and South Africa.

According to Gallie, this new maize variety contains half the usual amount of carbohydrates, but doubles the fat and protein content. Together with his colleagues, he genetically engineered the corn plants in such a way that both florets survive and are pollinated. In normal circumstances, only one floret remains to be pollinated. Gallie observed that the resulting corn kernels contained two embryos and a smaller, squashed endosperm. He added that this trait might be bred into other strains of corn.

If this maize variety can be grown commercially, it is said to find a market among consumers who prefer low-carbohydrate diets, and among farmers who want high-energy corn for their farm animals.

Email Daniel Gallie at daniel.gallie@ucr.edu. The news release from Nature is available at http://www.nature.com/nsu/040510/040510-1.html.

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