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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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:

BOTSWANA DRAFTS GMO REGULATION FRAMEWORK

The first stakeholders' workshop on the drafting of a framework for the regulation of genetically modified organisms (GMO) was recently held in Bostwana. Organized by the Ministry of Agriculture, this is the country's first attempt on setting guidelines on how the importation and restriction of GMO technology in the country should be handled.

Dr Mmasera Manthe -Tsuaneng, the national Biosafety coordinator, emphasized that genetic engineering promises advances in medicine, agriculture and industrial products. She added that this technology has the potential to increase food security, decrease land use, and increase sustainable agricultural yield.

Among the concerns raised during the workshop was the need to carefully review existing laws, and who will be responsible for the funding once the framework has been put in place. Based on the Namibian experience, which was cited by the representatives from the Namibian Biotechnology Alliance (NBA), the government is a co-funder but the large bulk of the funding came from donor agencies.

Botswana is a signatory to the Cartagena Protocol on Biosafety, which deals with the conservation of biological diversity and the equitable sharing of benefits derived from biotechnology.

Read the news release at http://allafrica.com/stories/200404300296.html.

STUDY ON GM FOOD LABELING IN THE PHILIPPINES

It is important to assess the genetically modified (GM) labeling options available in the Philippines. It should consider one that carefully considers the “consumer’s right to know” on one hand, and the cost implication of GM labeling to affected sectors on the other. This was the recommendation of a report released recently by the Bureau of Food and Drugs in the Philippines on the costs implications of GM food labeling in the country.

The study evaluated the impact of GM food labeling in the Philippines from the standpoint of all stakeholders concerned. Focusing on two GM products, soybean and corn, significant portion of the study examined the cost implications of mandatory GM food labeling in the country and its effect to the farmers, traders and manufacturers, the government, and consumers.

Attendant costs of mandatory labeling of GM food products in the Philippines will be borne in raw material segregation and differentiation at the farm level and in manufacturing. The imposition of mandatory labeling laws will imply an additional manufacturing cost by 11% to 12%. With the increase in raw material and manufacturing costs, even the top earning companies in the country will not be able to absorb the increase. What is expected however is that part, if not all of the additional cost will be passed on to the consumers. Regardless of the type of labeling to be adopted, whether voluntary or mandatory, the Philippine government will have to incur regulatory costs in the implementation of a GM labeling policy.

The report was written by Augusto de Leon, Abraham Manalo, and Fe Cielo Guilatco.

For the full report, please contact Abraham Manalo at Abraham_manalo@up.edu.ph.

FIRST EUROPEAN STUDY ON GMO CO-EXISTENCE

The Institute for Research on Agronomic Techniques (IRTA) at Lleida, Catalonia, Spain presented the first European study on genetic modification (GM) co-existence last March. These findings were based on practical results obtained in field trials with maize, which were carried out in 2003 near Invars d’Urgell. In these field tests, the researchers observed the interaction between the Bt-maize

variety “Compa CB” (Bt-176) and the isogenic conventional maize variety “Brasco”.

Results showed that a separation distance of 25 meters between fields with GM and non-GM crops was sufficient to ensure that the transgenic content in the conventional produce remained below the required European Commission (EC) labeling threshold of 0.9% GM content. However, this recommended safety distance was valid only for acreages above one hectare.

In smaller fields, and in areas of GM cultivation directly adjacent to conventional plantings, the EC labeling threshold was exceeded, especially in the main wind direction. This was also observed in strips up to 10 meters wide between fields of GM and non-GM maize. However, this effect was considerably reduced in fields larger than one hectare. The mixing of corn from the field borders with plants further away from the GM plantings – and which the heavy maize pollen did not reach even with strong winds – was responsible for this dilution effect.

The full article was published at the European Biotechnology Science & Industry News, 3(4), (2004), and can be downloaded at http://www.biocom.de/english/ebn-index.htm.

CROP IMPROVEMENT MEETING IN KENYA

Gene transformation experts from the Consultative Group in International Agricultural Research (CGIAR) centers met in Nairobi, Kenya recently to discuss Gene Transfer and Crop Improvement, a sub-program of the World Bank’s Generation Challenge Program that focuses on improving crop varieties in developing countries.

The workshop coordinator, Dr. Marc Ghilain, head of the Molecular Biology Laboratory Crop Improvement and Genetic Resources Department at the International Potato Centre in Lima, Peru, said that the sub-program would enable more breeders to readily move valuable traits into targeted crops using various breeding techniques.

Dr. Ghilain added that the objective of the challenge program is to bring together people in the CGIAR centres and public sectors to share resources, ideas and information on their projects to reduce duplication of efforts and wastage of scarce resources. He said that the main aim of the program is to make poor countries food secure through another Green Revolution.

According to Dr. Robert Zeigler, the Director of the Generation Challenge Program, the programs’ activities will cost about US$12.5 million annually. The funding will largely come from the World Bank and the European Union, with some coming from the CGIAR.

The Challenge program has five components, namely: genetic diversity of global genetic resources; comparative genomics for gene discovery; gene transfer and crop improvement; genomic and crop information systems; and capacity building. The program incorporates a technology transfer plan to ensure that the products of its research would be made available to farmers and breeders.

The program brings together three sets of partners. The CGIAR centers that keep vast amounts of plant diversity in trust for humanity and have expertise in molecular research and global breeding programs; the National Agricultural Research Systems of developing countries that bring expertise in the assessment and breeding of plants under specific conditions, with the participation of farmers; and the Advanced Research Institutes to develop novel techniques and strategies to decode genetic diversity./ Kenya Biotechnology Information Center (KBIC)

USAID INVESTS ON BIOTECH IN NIGERIA

The United States Agency for International Development (USAID) was reported to invest over N400 million for the development of biotechnology in Nigeria. The federal government of Nigeria, the International Institute for Tropical Agriculture (IITA), and USAID signed an agreement that stipulates that such funds will be provided, within a span of three years, to establish a Foundation for Nigeria that will maximize the potential of biotechnology to improve the country's agriculture.

Professor Turner Isoun, representative of the federal government of Nigeria, stated that biotechnology will soon be the "scale" by which the development of countries will be measured against. Isoun foresees that any country that does not take advantage of biotechnology now will experience a technological set back in the future.

The agreement was signed during an international workshop that was organized by the National Biotechnology Development Agency, the Tuskegee University, IITA, and USAID.

Read the news release at http://allafrica.com/stories/200405040182.html.

MAKING GM FOODS PUBLICLY ACCEPTABLE

Making agricultural biotechnology publicly acceptable is complex and involves more than just communicating their benefits. So says Gene Rowe of the Institute of Food Research in Norwich, United Kingdom.

In a paper entitled "How can genetically modified foods be made publicly acceptable?", Rowe said that the general public in different countries are not identical in their support of, or opposition to, GM foods and crops. For example, the European public is less enthusiastic about the contribution of technology to daily life than the North American public who has a relatively greater confidence in the benefits of agri-biotech.

People's perception of "risk" also vary and is complicated by the perceptual multidimensionality of the concept according to Rowe. For example, if perceptions of the risks related to any potential hazard or technology are sufficiently high, no amount of benefits are liable to make it acceptable.

People might also judge a technology to be risky if they or scientists know little about it.

Rowe added that technology advocates need to consider the issue of trust. “Information on benefits and risks must come from a source, and if that source is distrusted it matters little how full or persuasive their information is.

See the full article in Trends in Biotechnology (Vol. 22, No. 3, March 2004). The journal is available online at http://www.sciencedirect.com.

GENETIC ENRICHMENT OF NUTRITIONAL QUALITY

An integrated approach to genetics and molecular breeding is likely to make a food-based approach to nutrition even more effective in the future. This was one of the strategies discussed by M.S. Swaminathan in his article “Nutrition security and natural resources scarcity in Asia” published in the 42nd issue of Quarterly Journal of International Agriculture.

Swaminathan, World Food prize winner and head of an Indian foundation in his name, noted the following scope for the genetic enhancement of nutritional quality:

* Quality protein maize – refers to enhanced levels of the two “essential” amino acids, lysine and tryptophan, in the endosperm protein. New varieties developed at the International Maize and Wheat Research Centre in Mexico look and taste like normal maize but the nutritive value of their protein is nearly equivalent to a cow’s milk.

* Beta-carotenoid rich rice – popularly known as “golden rice”, it contains genes that produce high levels of beta-carotene and related compounds, which is converted in the human body as vitamin A.

* Iron enrichment – rice fortified with iron is being developed where the iron content increased two fold in the modified crop.

* Designer potato – possibilities for modifying the amino acid content in potato, a very important non-cereal food crop, has implications for improving child and adult nutrition since mash potato can be fed to young children.

Swaminathan said that integration of conventional breeding with advanced techniques will help enhance the nutritive value of staples. “By integrating pre-breeding in laboratories with participatory breeding in farmer’s fields, it will be possible to breed location specific varieties and maintain genetic diversity in crop fields,” he concluded.

PUBLIC CONCERN ABOUT BIOTECH

While there are no adequate controls over the processes, motivations, and outcomes of the development and applications of biotechnology and gene

technology, there are possible concerns that can be addressed to achieve public confidence. These concerns, according to Craig Cormick , manager of public awareness for the Australian government agency Biotechnology Australia, are:

* Information – a level of understanding of the technology and what it can and cannot do- which has to be provided by a credible source

* Regulation – a level of confidence that effective regulation exists to protect humanity and the environment

* Consultation – a feeling that the public has some input to the development of the technology

* Consumer choice – the ability to accept or reject each application of the technology

* Consumer benefit – a clear individual and societal benefit from each application.

Cormick noted that very few applications of biotechnology meet all the five criteria well and if any, are not able to fulfill them well. “Public policy and communications strategies should be based on a sound understanding of what drives current public concern and what needs to be addressed to alleviate those concerns,” Cormick concluded.

The full article entitled “Perceptions of risk relating to biotechnology in Australia” is available in Vol. 5, No. 2, 2003 issue of the International Journal of Biotechnology. Email Craig Cormick at Craig.Cormick@biotechnology.gov.au.

UC DAVIS - HOME TO PIPRA

By July of this year, the University of California (UC) Davis will house an initiative called the Public Intellectual Property Resource for Agriculture (PIPRA), which is a collection of about 20 universities and philanthropic groups that aims to overcome the legal barriers that slow down the development of biotech crops - particularly those involving the patenting and licensing of genes.

Formed in 2003 by the leading academics in the United States, PIPRA aims to assist developing countries and farmers to address legal issues and constraints, pertaining to biotech crops, that have emerged over the past two decades. The PIPRA advisory board is composed by: Gurdev Khush, respected scientist and rice-breeder; Kent Bradford, director of the Seed Biotechnology Center, UC Davis; and Martina Newell-McGloughlin, director of the UC systemwide biotech program.

For more information about PIPRA, see their website at http://www.pipra.org/.

U.S. RESEARCHERS DEVELOP ENHANCED CORN

Researchers at the University of California, Riverside reported the development of a technology that doubles the protein and oil content of corn while reducing its carbohydrate content.

University of California's Ricardo Duran explained that Daniel R. Gallie and colleagues introduced a gene that enabled the production of cytokinin in developing flowers. Flowers in the corn ear develop in pairs but one from each pair aborts before pollination can occur. Because of the role that the plant hormone, cytokinin, plays in preventing organ death, the authors reasoned that cytokinin might rescue those flowers, which were destined to abort.

Flower abortion was prevented and the kernels produced from pairs of flowers fused into a single normal-sized kernel that contained two embryos and a smaller endosperm. "Because it is the embryo that contains the majority of protein and oil, the presence of two embryos doubles their content in corn grain. The reduction in the size of the endosperm in the kernel, the tissue that contains most of the carbohydrate, means that the nutritional value of the grain has been improved considerably," Gallie explained.

The full article is available in the June issue of the Plant Journal. For more information contact Ricardo Duran at ricardo.duran@ucr.edu.