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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PAKISTAN APPROVES BIOSAFETY RULES

Pakistan's Ministry of Environment has approved and put into law the country's biosafety guidelines. The rules apply to the following activities: manufacture, import and storage of microorganisms and gene technological products for research; all work involved in the field trial of genetically manipulated plants, animals (including poultry and marine life), microorganisms and cells; and import, export, sale and purchase of living modified organisms, or substances or cells and products for commercial purposes.

Prime Minister Shaukat Aziz of the Islamic Republic of Pakistan had earlier chaired a meeting on the biosafety guidelines for the agriculture and pharmaceutical sectors where he directed the Food and Agriculture Ministry to adopt biosafety measures in the agriculture sector to grow disease-free crops and boost agricultural production.

The approved biosafety rules follow a three tier safety mechanism system composed of the National Biosafety Committee, Technical Advisory Committee and Institutional Biosafety Committee that control and monitor the whole gamut of activities from the laboratory to the field.

Obtain more details of this approval from Ijaz Ahmad Rao at luckystarpk@yahoo.com.

INDIA APPROVES TWO NEW BT COTTON HYBRIDS

India's Genetic Engineering Approval Committee (GEAC) recently approved two Bt cotton hybrids of Nuziveedu Seeds namely NCS-145 Bunny Bt and NCS-207 Mallika Bt for commercial cultivation in south and central India. New approvals for commercial cultivation of Bt cotton hybrids now number 13 from a possible array of 20 Bt cotton varieties. Last year only four varieties were approved for commercialization.

The region-wise authorized cultivation of Bt cotton in 2005 is as follows:

1. In north India, including Haryana, Punjab and Rajasthan, Bt hybrids like RCH-134 and RCH-317 of Rasi Seed, MRC-6304 and MRC-6301 of Mahyco and Ankur-651 and Ankur-2534 of Ankur Seeds

2. In central India, including Maharashtra, Gujarat, Madhya Pradesh and Chhattisgarh, Bt hybrids like Mech-12 Bt, Mech-162 Bt, Mech-184 Bt and MRC-6301 of Mahyco-Monsanto, RCH-2, RCH-118, RCH-138 and RCH-144 of Rasi Seed, Ankur-651 and Ankur-09 of Ankur Seeds and NCS-145 Bunny Bt and NCS-207 Malika Bt of Nuziveedu Seeds

3. In south India, including Andhra Pradesh, Karnataka and Tamil Nadu, Bt cotton hybrids like RCH-2, RCH-20 and RCH-368 of Rasi Seed, MRC-6322 and MRC-6918 of Mahyco-Monsanto and NCS-145 Bunny Bt and NCS-207 Malika Bt of Nuziveedu Seeds can be cultivated. Mech-162 Bt and Mech-184 Bt of Mahyco-Monsanto can be cultivated in south India with the exception of Andhra Pradesh.

News feed from Bhagirath Choudhary (b.choudhary@cgiar.org) of the International Service for the Acquisition of Agri-biotech Applications India Office with related news from http://www.thehindubusinessline.com/2005/05/25/stories/2005052501641000.htm ; http://www.financialexpress.com/fe_full_story.php?content_id=91664; and http://sify.com/finance/fullstory.php?id=13807788

EXPERTS DEVELOP RICE POLICY STRATEGY FOR WEST AFRICA

Experts in rice policy research in West Africa have developed a common strategy to improve the impact of policy research and institutional arrangements on the competitiveness of the rice sector in the region. Experts from Burkina Faso, Mali, Nigeria, Niger, the Economic Community of West African States, and the Africa Rice Center (WARDA) agreed during a meeting in Cotonou, Benin on the following key elements of the strategy:

- Formation of a rice policy research and advocacy platform at the regional level that can serve as a channel for transmitting policies to promote the rice sector in the region.

- Development and implementation of a common agenda for rice policy research to provide necessary information for national and regional policies.

- Development of multi-country project proposals on rice policy research based on regional research priorities identified by the participants and the joint sourcing of funds to carry out the projects.

The experts agreed that local rice would never become competitive unless favorable and consistent policies and effective institutional arrangements relating to rice are developed and implemented across the region.
See the press release from the Africa Rice Center at http://www.warda.org.

CHALLENGES FOR RICE BIOTECH

The application of biotechnology in rice can help produce the estimated 700 million tons of rice required to feed an additional 650 million rice consumers by 2025. The technology, however, must continue to address problems of small rice farming communities, complement rather than replace existing practices, and enrich rather than disrupt the agro-environments for which they are targeted for deployment. So say Edilberto Redona and Lou Franz Mula of the Philippine Rice Research Institute in an article published in the Asian Biotechnology and Development Review.

“Some Imperatives and Challenges for Rice Biotechnology” suggests that Asian governments can play a catalytic role by developing responsive programs and policies to ensure that the benefits of rice biotechnology applications will impact poor farmers and consumers.

See the full article in Volume 7, No. 1 issue of the Asian Biotechnology and Development Review or visit its website at http://www.ris.org.in/abdr.html.

WORKSHOPS TACKLE GENDER DIMENSIONS OF BIOTECH

Agricultural production, traditional knowledge and health are among some potential applications of biotechnology with gender dimensions. Concerns like environment and natural resources management, food safety and security, privacy and access to health care, and ownership and benefit sharing of genetic resources, also have gender dimensions that are related to the effects and uses of biotechnology.

These were major points raised during the two workshops held by the General Advisory Board of the United Nations Commission on Science and Technology for Development entitled "Understanding the Gender Dimensions of Biotechnology Research and Development" in Pretoria, South Africa and Islamabad, Pakistan.

Some of the identified key issues related to gender dimension were cultural relationships, technical assessment, biotechnology policy-making, communication and extension, intellectual property rights, trade and international agreements, access to education, bioethics and health, commercialization of biotechnology by women scientists and entrepreneurs, and agricultural technologies and genetically modified organisms.

The workshops concluded that the gender impact of biotechnology on the lives of women and men does not differ much in many areas; more African and Asian men are inclined to grow certain crops where biotechnology is more applied than those plants grown by women; and health biotechnologies have a distinct impact on the lives of men and women mainly because of biological and sex differences. For more details, see http://gstgateway.wigsat.org/TA/ethics/biotech/html.

STUDY EXPLORES IPR EXPERIENCES OF DEVELOPING COUNTRIES

The most common mechanism in five developing countries (China, Colombia, India, Kenya and Uganda) to protect varieties in the plant breeding industry is hybridization. Other mechanisms include seed laws, contract law, brands and trademarks. This was the finding of a study commissioned by the World Bank on strengthening Intellectual Property Rights (IPR) in the plant breeding industry and its effect on agriculture in developing countries.

The study assessed initial experiences with strengthened IPRs in developing country agriculture. It analyzed the design, management and impacts of various IPR instruments applied to plant breeding in five developing countries. Various issues were covered such as the implementation of IPR regimes, changes in public and private plant breeding, and changes for farmers.

Indicators, according to the study, that are unlikely to wait for a rapid formation and efficient enforcement of the IPR regime types are political realities, limitations in administrative resources, and varied economic incentives in developing countries.

For more details, see http://www.cgn.wageningen-ur.nl/pgr/images/IPR%20in%20breeding%20industry.pdf.

CHINA AND IPGRI LAUNCH CENTER ON AGRO BIODIVERSITY

The International Plant Genetic Resources Institute (IPGRI) and the Chinese Academy of Agricultural Sciences (CAAS) launched the Centre of Excellence in Agrobiodiversity Research and Development (CEARD). IPGRI reports that it will be a focal point for research on agricultural biodiversity particularly on neglected crops, and as a training center for the entire region.

With a branch at Yunnan Agricultural University and a training center for biotechnologies at Huazhong Agricultural University in Hubei, CEARD will work on molecular characterization of buckwheat diversity in China. Improved varieties of buckwheat, an important crop for small farmers in marginal lands and in mountainous regions, are expected to be developed. The Center will also organize a training course on the use of molecular markers for characterization.

See the full article at http://ipgri-pa.grinfo.net/index.php?itemid=860.

RESEARCH POINTS TO ONE GENE REGULATING BLOOM FRAGRANCE

A combination of floral scent and color is important to plant reproduction, since a plant's attractiveness to certain insects can attract potential pollinators, ensuring the survival and spread of a plant species. The path to flower fragrance in petunias, for instance, is strewn with benzenoids.

Although the biosynthesis of benzenoids is well characterized, the enzymes and regulation mechanisms involved are less well understood. In a recent paper,

Julian Verdonk of the University of Amsterdam and colleagues explore how ODORANT1 Regulates Fragrance Biosynthesis in Petunia Flowers. Their work appears in the latest issue of Plant Cell Online.

Petunia flowers are fragrant only in the evening and at night, and through measurements of odorants, as well as studies on the genes expressed during odorant synthesis, scientists were able to point to a single gene as candidate for the regulation of volatile benzenoids in the plant. The gene, ODORANT1 (ODO1), encodes a putative protein of 294 amino acids. Work on the gene shows that expression increases during benzenoid production, while silencing it leads to diminished production of benzenoids. This indicates the ODO1 gene product is a key regulator in odorant synthesis in petunias.

Download the complete article at http://www.plantcell.org/cgi/reprint/17/5/1612

RESEARCH TRACKS TRANSGENES IN SOIL

Robert Gulden, of the Department of Plant Agriculture at the University of Guelph, and colleagues report on "Tracking Plant Transgenes in Soil," and ask "Where Do They Go?" Their research proposes an alternative, high throughput method for transgene detection in soil, which has hitherto been plagued by low DNA yields and co-extracted acid contaminants.

Using a 96-well plate, as well as glass beads, researchers showed that they could extract DNA from cells in soil samples, as based on physical and chemical cell wall disruption. The polymerase chain reaction (PCR) followed, using primers that would amplify a recombinant gene and an adjacent chloroplast transit peptide (CTP) gene. Their methods, the researchers found, could be used for large numbers of samples, and address issues such as the persistence and spatial distribution of plant DNA or the influence of cropping systems on the DNA cycle in the soil.

The article, "Tracking Plant Transgenes In Soil – Where Do They Go?" appears in the latest Information Systems for Biotechnology News Report, which may be accessed through http://www.isb.vt.edu/news/2005/news05.may.html#may0504.

'FUSION GENE' TO SUSTAIN PEST RESISTANCE IN GM CROPS

Plants with the *Bacillus thuringiensis* (Bt) gene may now have broader insect resistance after a team of scientists from Uganda, Spain, and the United Kingdom produced the BtRB fusion protein and tested this on rice and corn.

BTRB is a combination of the ?-endotoxin Cry1Ac with the galactose-binding domain of the nontoxic ricin B-chain (RB). This enables the Bt toxin with additional binding domains. Rice and corn which were inserted with the BtRB protein were observed to be more toxic to a wider range of insects, than those which contained only the Bt gene.

The use of Bt in plants such as potatoes, cotton, and corn has already been practiced for many years. Most microbiological insecticides also contain Bt. However, there are concerns that insects could evolve resistance to Bt, prompting scientists to create and test the BtRB.

See the details of the research at http://www.pnas.org/cgi/reprint/0502871102v1

CBT NEWS FEATURE: THE INTERNATIONAL POTATO CENTER (CIP)

The International Potato Center (CIP), known for the acronym of its Spanish name Centro Internacional de la Papa, is one of the 15 Future Harvest Centers of the Consultative Group on International Agricultural Research (CGIAR). It was founded in 1971 through an agreement between the Peruvian government and the North Carolina State University, USA. Since then, it has become recognized as a leader in root and tuber research and development.

CIP aims to lessen poverty and attain constant food security for developing countries, by conducting scientific research and related activities on potato, sweetpotato, and other root and tuber crops; and by managing natural resources in the Andes and other mountain areas.

CIP's vision is "preserving the core, stimulating progress," which was realized in 2003. This vision has seven priorities that are in line with eight of the United Nations Millennium Development Goals. In summary, these are: reducing poverty and hunger; improving human health; developing sustainable rural and urban systems; and improving availability of new technologies.

Its Research and Development Program includes improving potato technologies, practicing integrated pest management, controlling viruses of sweet potato, conserving biodiversity, managing mountain agro-ecosystems, using genetic resources to improve crops, analyzing commodities and their impacts and leading a global initiative in researching on potato late blight disease.

The center's headquarters is in La Molina, with experimental stations in Huancayo and San Ramon in Peru, and in Quito, Ecuador. It also has offices in four regions: East and Southeast Asia and the Pacific (ESEAP), Latin America and the Caribbean (LAC), Southwest and Central Asia (SWCA), and Sub-Saharan Africa (SSA); and liaison offices in five foreign countries: Ecuador, Uganda, China, Vietnam, and the Philippines.

CIP also belongs to the partnerships CONDESAN (Consortium for Sustainable Development of the Andean Ecoregion), GILB (Global Initiative on Late Blight), Global Mountain Program, Papa Andina, PRAPACE (Regional Potato and Sweet Potato Improvement Network in Eastern and Central Africa), UPWARD (Users' Perspectives with Agricultural Research and Development), and VITAA (Vitamin A for Africa).

An international team of scientists from 25 countries work for the CIP, along with nationally-recruited staff. The center's Director General is Dr. Pamela Anderson.

For more information, visit http://www.cipotato.org

DOCUMENT REMINDERS

NEW POCKET K AVAILABLE

Pocket K No. 20 on Microbial Fermentation is now available online at http://www.isaaa.org/kc. It discusses the process of cultivating microbes on a large scale to produce biofertilizers to assist plant growth; and biopesticides to control weeds, pests, and diseases. In particular, it gives details on biofertilizers, bioinsecticides, and bioherbicides.

Pocket Ks are Pockets of Knowledge, packages of 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. Nineteen other topics are all available at http://www.isaaa.org/kc

MAP OF IRRIGATED AREAS AVAILABLE

The third edition of the Global Map of Irrigated Areas, by the Food and Agriculture Organization (FAO) and the Johann Wolfgang Goethe University of Frankfurt am Main, Germany, has been released online.

Developed in 1999, the map first showed the amount of area equipped for irrigation in a few continents, and was afterwards improved by including more agricultural land areas. The present map is based on inventories of sub-national irrigation statistics for the whole world during the period 1995 - 2000.

The complete documentation of the Global Map of Irrigated Areas is available at: http://www.fao.org/ag/agl/aglw/aquastat/irrigationmap/index.stm

FACT SHEET ON BT COTTON IN INDIA

A fact sheet on Bt cotton in India has been released, listing all approved varieties for the Central, Northern, and Southern Zones for the year. All approved hybrids are from Mahyco (MECH, MRC), Rasi (RCH), and Ankur seed companies in India.

The fact sheet can be found at http://www.isaaa.org/kc. For more information, contact Bhagirath Choudhary (b.choudhary@cgiar.org) of the International Service for the Acquisition of Agri-biotech Applications India Office.

ANNOUNCEMENTS

The University of Kentucky and the University of Tennessee will be hosting the National Agricultural Biotechnology Council's 17th annual meeting on "Agricultural Biotechnology: Beyond Food and Energy to Health and the Environment" at the Renaissance Hotel in Nashville, Tennessee on June 27-29, 2005. Details of the meeting can be viewed at http://www.outreach.tennessee.edu/ppd/nabc .

CONFERENCE ON ADVANCES IN AGRIC & MEDICAL BIOTECH

Monash University Malaysia, with the support of the Ministry of Science, Technology and Innovation, and Ministry of Agriculture and Agro-based Industry are organizing an international conference to be held at Sunway Pyramid Convention Centre, Bandar Sunway, Malaysia. This conference will be done in collaboration with the Malaysia Biotechnology Center, and the Malaysia Research and Development Institute.

The latest developments in agricultural and medical biotechnology will be tackled, and will encourage professional interaction among scientists and representatives of agricultural and medical industries.

For details, please visit the conference website at http://www.artsci.monash.edu.my/conference

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