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)

April 29, 2005

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LESS POPULAR CROPS KEY TO SOLVING HUNGER, MEETING REPORTS

More research on neglected but nutritious crops can be the solution to hunger. This is according to agriculture and biodiversity experts who met during the International Consultation on the Role of Biodiversity in Achieving the United Nations Millenium Development Goal of Freedom from Hunger and Poverty held in Chennai, India. They also said that a more varied selection of native crops can provide greater dietary diversity. Some examples of these crops are varieties of millet in Asia; quinoa, canihua, and amaranth in South America; and green leafy vegetables in Africa.

This undertaking is believed not only to address the first UN Millenium Development Goal to “reduce by half the number of people who suffer from hunger”, but also two others: to reduce infant mortality and the number of women who die in childbirth.

The meeting was organized by the International Plant Genetic Resources Institute and Global Facilitation Unit for Underutilized Species, both from Rome, with the M.S. Swaminathan Research Foundation from Chennai. Recommendations from the meeting are being finalized to be part of UN’s review on the progress of its Millenium Development Goals in September.

For more news, visit http://www.underutilized-species.org. For information regarding the meeting, see http://www.mssrf.org/events_conferences/content_events/millets/millets.htm.

EU MAY LIFT BANS, ALLOW NEW GM CROP FOR PLANTING

The European Commission (EC) has drafted proposals for the Council of Ministries for five member states to lift their bans on genetically modified organisms (GMOs). These are the GM maize varieties T25 and MON810 in Austria; GM maize Bt176 in Austria, Germany, and Luxembourg; oilseed rape variety MS1xRF1 in France; and Topas 1912 in France and Greece. The proposals are supported by the European Food Safety Authority (EFSA).

The Council will vote on whether to adopt or reject the proposals. If there is no decision made by the required majority in three months, the proposals will be returned to the Commission for adoption. If adopted, the countries concerned will have to lift their bans after at most 20 days from their notification.

In related news, European Union (EU) officials recently announced that their environment experts may vote in June on allowing a new genetically modified (GM) crop to be grown in Europe, a first attempt since 1998. The debate on the crop, 1507 maize, is tentatively scheduled on June 6 and is still pending confirmation.

The EU has recently lifted its six-year ban on GM imports, but there still has been no go-signal to plant any GM crop in Europe since 1998, as EU's 25 member countries are "deeply divided on the issue."

See the full news stories on http://europa.eu.int/rapid/pressReleasesAction.do?reference=MEX/05/0426&format=HTML&aged=0&language=EN&guiLanguage=en. Read the EFSA opinions at http://www.efsa.eu.int/science/gmo/gmo_opinions/catindex_en.html.

IMPROVED VERSION OF GOLDEN RICE UNVEILED

Golden rice 2, a new version of genetically modified (GM) rice by United Kingdom (UK) and US scientists from Syngenta Biotechnology Inc., is estimated to provide 50% more of the recommended daily allowance (RDA) of vitamin A for

children, compared to the first version. This was featured in the April issue of Nature Biotechnology.

Golden rice is a crop engineered to produce beta-carotene, a yellow-orange pigment converted by the body into vitamin A. Golden Rice 2 has more than 20 times the amount of beta-carotene or pro-vitamin A. It also contains a version of phytoene synthase (the first in the beta-carotene pathway) from maize, which was found to produce the most beta-carotene from all the enzymes screened.

Syngenta, as a part of the Humanitarian Project for Golden Rice, plans to donate the strain to other researchers for further study and improvement.

See the full news report on
http://www.nature.com/nbt/press_release/nbt0405.html

NEW TOOL AVAILABLE FOR BIOTECH INFORMATION SHARING

A new tool for the biotechnology industry can enable researchers or companies to access patented technologies for their work. Introduced by CAMBIA, an Australian non-profit biotech research organization, this is the Biological Innovation for Open Society (BIOS).

BIOS is an open source license wherein biotech innovations can be distributed. It applies the same approach in open source licensing in the computer industry. In this manner, a scientist's improvement on a licensed technology can be accessed by the community for commercialization. Scientists can also start on a new project, join an ongoing one, or share information through BioForge (http://www.bioforge.net), where BIOS participants can meet in the Web. However, those who accessed knowledge have to contribute their own improvements back into the licensing pool.

One of the recent technologies made available through BioForge was Trans-Bacter, a new method of gene transfer to plants using other bacterial species aside from the usual *Agrobacterium tumefaciens*. With this, it was discovered that several other bacterial species can transfer genes, not only *Agrobacterium*.

Richard Jefferson, CEO and chief scientist at CAMBIA, believes that "when you start having tens or hundreds of patents necessary to reduce to practice one idea, then it becomes untenable. And basically innovation grinds to a halt." With BIOS, those in the public sector, small biotech companies, and developing countries can now access technologies for their own improvements.

Download the article at http://www.bios.net/daisy/bios/551

RICE BLAST FUNGUS GENOME SEQUENCE REPORTED

Dr. Ralph Dean of the Center for Integrated Fungal Research, North Carolina State University and colleagues recently presented a rough draft of the genome sequence of the rice blast fungus *Magnaporthe grisea*. Their findings are reported in a recent issue of Nature.

M. grisea is the most destructive pathogen of rice worldwide, and is estimated to destroy enough rice yearly to feed 60 million people. Its different forms can also affect a broad range of grass species including wheat, barley, and millet.

The research team found a few genome qualities unique to *M. grisea*, 9.7% of which consists of repeating sequences. So far, their draft shows that M. grisea's genome encodes a large and diverse set of secreted proteins, with an expanded family of G-protein-coupled receptors, several new virulence-associated genes, and large suites of enzymes involved in secondary metabolism. The draft also shows that the genome contains 11,109 genes with protein products of longer than 100 amino acids.

Read the complete article at
http://www.nature.com/nature/journal/v434/n7036/full/nature03449.html

PROTEIN COILS GUIDE CAMV, RESEARCH SAYS

"A coiled-coil interaction mediates cauliflower mosaic virus cell-to-cell movement," Livia Stavolone of the Friedrich Miescher Institute, Switzerland and colleagues report in the latest issue of the Proceedings of the National Academy of Sciences (PNAS) online.

The Cauliflower Mosaic Virus (CaMV) uses various proteins in invading plant cells. The Virion Associated Protein (VAP) mediates virus transmission by aphids, and contributes to the spread of an infection within a plant host. The movement protein (MP), on the other hand, is thought to associate with the VAP and contribute to infection as well.

Through studies on the proteins involved, as well as investigations made on the interactions between these proteins, researchers found that one end of MP interacts with VAP. MP's end is a coiled-coil of amino acids, which, through their conformation, interact with another coiled-coil at the end of VAP. Together, the VAP-MP pair move to plant plasmodesmata and contribute to the spread of CaMV infection in the host.

Previous research has shown that, in both plant and animal systems, coiled-coil domains do facilitate interactions between distinct proteins. Knowing how CaMV travels from vector to host can be thus be important in finding ways to disable it and prevent it from spreading to healthy plants.

Download the article at http://www.pnas.org/cgi/reprint/102/17/6219

CBT NEWS FEATURE: THE INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, apolitical, international organization geared towards science-based agricultural development. It is one of the Future Harvest Centers of the Consultative Group on International Agricultural Research (CGIAR), with headquarters in Patancheru, Andhra Pradesh, India; and centers in Mali, Zimbabwe, and Nairobi. It was established in 1972.

With a mission to help apply science in developing countries to increase crop production and food security, reduce poverty, and protect the environment, ICRISAT's focus is on the developing semi-arid tropics (SATs) in Asia, Latin America, and Africa. These are places having erratic rainfall, low soil fertility, and extreme poverty, which all hinder their agricultural development. Their agenda is anchored on the theme “Science with a Human Face” research that will answer human needs regarding poverty, hunger, and environmental degradation.

Its vision and strategy are founded on the acronym WEHAB, which stands for Water, Energy, Health, Agriculture, and Biodiversity. Water is the primary concern on its agenda for SATs, and ICRISAT's research addresses this main concern on two fronts: using natural resource management and plant breeding and biotechnology.

ICRISAT also conserves the seeds of 113,000 crop lines that are diet staples in poor countries. Among these are sorghum, millet, groundnut, chickpea, and pigeonpea, which are bred for higher productivity and resistance to pests, diseases, and other stresses. It also formulates policies, infrastructural development, and most importantly, develops human potential.

Excelling in strategic research for development on global issues and on international exchanges of knowledge, technologies, and skills, ICRISAT works with government, nongovernment, and private sector organizations. Its partnerships are with development investors, collaborative research projects, research networks, and CGIAR system-wide programs. Some of the research networks include the Cereal and Legumes Asia Network, Latin America

Commission of Sorghum Researchers (CLAIS) Network, and Drought Management Network. Meanwhile, the institute takes part in CGIAR's system-wide programs Desert Margins Program (DMP) and Rice-Wheat Consortium for the Indo-Gangetic Plains (RWC) Collaborative Projects. It has also signed a Memorandum of Understanding (MoU) with private companies such as Genome Valley, Sun Microsystems, Inc., and Nandan Biomatrix, Ltd.

ICRISAT places a particular emphasis on Sub-Saharan Africa. In line with this, it is part of the New Partnerships for African Development (NEPAD), which aims to bring about sustainable development in Africa. It also belongs to networks such as the Sorghum and Millet Improvement Network (SMINET), West and Central Africa Sorghum Research Network (ROCARS), West and Central Africa Millet Research Network (ROCAFREMI), and others.

In its more than 30 years of establishment, ICRISAT has had many achievements, most notably being a two-time recipient of the King Baudouin Award. Given every two years, this is the highest of CGIAR's awards, which recognizes the most outstanding scientific work by the 16 CGIAR research centers. In 1996, the award was given to ICRISAT for developing a downy-mildew-resistant and yield-increasing pearl millet; and in 1998, for its improvement of pigeonpea.

The institute is composed of about 900 staff headed by Director-General Dr. William Dar, a Filipino scientist. Its latest undertaking is an agri-science park as its technology commercialization arm. This park is located in the ICRISAT premises in India.

For more information, see http://www.icrisat.org. Details on ICRISAT's agri-science park can also be read at http://www.agri-sciencepark-at-icrisat.org

DOCUMENT REMINDERS

NEW POCKET K AVAILABLE

Pocket K No. 19 on Molecular Breeding and Marker Assisted Selection is now available online at http://www.isaaa.org/kc. It discusses the techniques behind marker assisted selection (MAS), how MAS can lead to new crop varieties, and the various methods used by scientists involved in MAS.

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. Eighteen other topics are all available at http://www.isaaa.org/kc.

IFPRI RELEASES NEW DATASETS

The International Food Policy Research Institute (IFPRI) has released new datasets for Kenya, Nicaragua, and Uganda. These datasets may be requested through http://www.ifpri.org/data/kenya01.htm, http://www.ifpri.org/data/nicaragua01.htm, and http://www.ifpri.org/data/uganda03.htm, respectively.

IFPRI datasets are meant to inform and educate policy makers and researchers on the various local issues and concerns, especially those involving socio-economics, in countries of interest. For more information, visit http://www.ifpri.org.

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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While we are still developing this site, feel free to e-mail (knowledge.center@isaaa.org) us for your views and comments on any crop biotechnology product and related issues.

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