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

AFRICAN PANEL PUSHES FOR BIOTECH AT GRASSROOTS LEVEL

The African Panel on Biotechnology is advising the African Union, an organization of African states, on how to adopt biotechnology to address grassroots development, particularly one that involves local growers and integrates community customs. “Africans Embrace Biotech Future” by The Council of Biotechnology Information (CBI) presents trailblazing biotechnology initiatives that local farmers and institutions in Kenya, Tanzania, South Africa, and Uganda have made.

CBI quotes Calestous Juma, former executive secretary of the United Nations Convention on Biodiversity and Panel co-chair, as saying that issues facing African agriculture require an aggressive approach. "Africa must take charge of its future and assess the usefulness of all existing technological options for meeting its needs. The challenge is how to make biotechnology relevant to local needs and how to ensure that existing institutions meet this challenge."

See the CBI article online at http://www.whybiotech.com/index.asp?id=5266.

INERA HEAD CALLS FOR BIOSAFETY FRAMEWORK FOR WEST AFRICA

West African governments should work towards having a biosafety framework to harness the use of biotechnology in the region. This was stressed by Hamidou Boly, Director of the Institute of Environment and Agricultural Research (INERA), during an interview with West African journalists in Burkina Faso. He added that the framework would allay fear among people regarding biotechnology.
Boly said that countries within the Sub-Region needed a visionary leader, a strong political commitment, and an adequate regulatory framework to foster technological independence by supporting innovation.

INERA organized the visit for journalists to the Bt cotton trial fields in Fada and Bobo-Dioulasso in the Eastern and Western parts of Burkina Faso.

More on Africa from the Ghana News Service at
http://www.ghananewsagency.com.

NEW APPROACHES NEEDED FOR AGRIC IN DEVELOPING WORLD

Enhancing agricultural productivity in developing countries requires new approaches that provide incentives and funding mechanisms that will translate new innovations in plant science into concrete benefits for poor farmers. This was articulated by Deborah Delmer of the Rockefeller Foundation in “Agriculture in the developing world: Connecting innovations in plant research to downstream applications”, published online by the Proceedings of the National Academy of Sciences of the United States of America.

Delmer analyzes the constraints and opportunities presented by the challenge to translate new discoveries in plant sciences into successes in agriculture for the benefit of the poor. In particular, she notes the lack of systems that promote and reward efforts to “create a strong interface between fundamental and applied research in support of global agriculture.”

View the full paper online at http://www.pnas.org through its open access option. Email Deborah Delmer at ddelmer@rockfound.org.

CAST COMMENTS ON SAFETY OF BIOTECH FOODS

Are transgenic foods safe to eat? Are they beneficial or harmful to the environment? Will they encourage further industrialization of agriculture at the expense of biodiversity? These are some of the questions raised in "Crop Biotechnology and the Future of Food: A Scientific Assessment", released by the Council for Agricultural Science and Technology (CAST). The CAST publication was written in response to public concern about the use of crop biotechnology and its effects on people and the environment.

"Over the last decade, 8.5 million farmers have grown transgenic varieties of crops on more than 1 billion acres of farmland in 17 countries. More than 7 million of these farmers are small-holders in developing countries. The crops have been consumed by humans and animals in most countries, so a prodigious amount of data and observation is available on which to judge their safety and usefulness," said Dr. Bruce Chassy, professor of food microbiology, University of Illinois, and Task Food Chair.

The commentary which discusses hypothetical hazards vis a vis available scientific evidence and experience with transgenic crops is available online at http://www.cast-science.org/cast/src/cast_top.htm. CAST is an international consortium of scientific and professional societies.

SOUTH ASIA HEADING TOWARD AGRIC TRANSFORMATION

Prospects are bright for South Asia to head toward a "new order" of agricultural transformation. However, it is crucial that institutional arrangements and governance must undergo positive change. This was the conclusion of a synopsis on "Agriculture in South Asia Destined for a New Deal", by economics professor Abdul Bayes of Jahangirnagar University, Dhaka.

Biotechnology is considered a critical tool that will help India, Bangladesh, and Pakistan improve food production and reduce the burden of agriculture on the environment through better resource management. Among the recommendations to achieve the transformation relates to poverty, malnutrition, and biotechnology.

These include:

* Move from political rhetoric to action.

* Reform policies and create a favorable business environment.

* Take policy measures to increase the supply of nutrient-rich, high-value crops.

* Consider the introduction of biotechnology as a complete package where effective regulatory mechanisms, safety precautions, public awareness, and partnership between the various stakeholders are involved.

An online copy of the article is available at http://www.ifpri.org/pubs/books/oc47/oc47ch03.pdf.

EUROPABIO: 1507 MAIZE ASSESSED AS SAFE

Biotech 1507 maize, a crop genetically modified with the Bt trait to make it resistant to certain insect pests such as *Ostrinia nubilalis* (European corn borer) and *Sesamia calamistis* (pink stalk borer), meets all the latest European Union regulatory requirements. EuropaBio, the association of bioindustries in Europe, gave this statement and related background information on this crop which is jointly developed by Pioneer Hi-Bred International, Inc. and Mycogen Seeds.

EuropaBio said that 1507 maize has been judged by the European Food Safety Authority to be as safe as conventional maize. In particular, it noted some of the following attributes:

* The Cry1F protein provides the maize plant with built-in resistance to protect the plant from target insect pests and reduces the need for spraying

* The Cry1F and PAT proteins expressed in 1507 maize are not toxic or allergenic to humans and animals

* The PAT protein conferring tolerance to glufosinate-ammonium herbicide was used as the selectable genetic marker

* 1507 maize poses no concerns with hybridization with wild populations in the EU

* 1507 maize is substantially and nutritionally equivalent to, and at least as safe as conventional maize.

For the full EuropaBio backgrounder on Biotech 1507 maize, visit http://www.europabio.org/articles/EuropaBio%20Background%20Briefing1507_Update%20October%202005%20Final.doc

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RESEARCH

GROUND BEETLES USED TO GAUGE BT EFFECTS

Ground beetles are well spread through most agricultural fields. They are generalist predators, and, as such, can be used to show any unintended impacts of pesticide use. With the release of Bt corn possessing Coleopteran-specific toxins, scientists may be able to use the insects in showing if the crop has effects on non-target arthropods.

Miriam D. Lopez and colleagues explore the "Utility of Ground Beetle Species in Field Tests of Potential Non-Target Effects of Bt Crops." They aim, among others, to determine which ground beetle species are consistently present in a corn field, specifically in Iowa corn; and test such species for differences in abundance which might be caused by transgenic corn or traditional pest management practices.

Researchers trapped the beetles and tallied their numbers in fields of Bt corn and conventional corn fields treated with insecticides. They found that *Harpalus pensylvanicus* DeGeer is the most abundant. The same species was not affected by Bt corn use, but increased in numbers in insecticide treated plots.

Read more at
http://titania.esa.catchword.org/vl=9780304/cl=28/nw=1/rpsv/cw/esa/0046225x/v34n5/s35/p1317

PAPERS EVALUATE MON 863 IN FIELD

Bt corn MON 863 is designed to replace the broad spectrum, soil based insecticides which are used to control rootworm, but which were also found to reduce larval populations of non-target arthropods. MON 863 expresses the Cry3B1 protein lethal to corn rootworm (*Coleoptera*) and was also recently evaluated in the field.

In "Field Evaluation of the Impact of Corn Rootworm (Coleoptera: Chrysomelidae)-Protected Corn on Ground Dwelling Invertebrates" and "Field Evaluation of the Impact of Corn Rootworm (Coleoptera: Chrysomelidae)-Protected By Corn on Foliage Dwelling Arthropods," Muhammad Batti and colleagues take a look at the animals that make up the microcosm of a corn field. Their findings appear in the latest issue of Environmental Entomology.

Researchers used a split plot design, with MON 863 and conventional corn on the main plots, and insecticide regimens as subplots. They then sampled the

invertebrates and arthropods by trapping them, then tallying their numbers. They were able to collect a good number of generalist predators, such as spiders, ground beetles, ants, centipedes, and earthworms; and foliage dwellers such as ladybird beetles, damsel bugs, minute pirate bugs, flower flies, green lacewings, and spiders.

Researchers found that the Bt corn had no adverse impacts on the abundance of the animals collected, but insecticide applications decreased the populations of ladybird beetles, green lacewings, and damsel bugs, while increasing populations of the corn leaf aphid.

Read the complete articles at
http://titania.esa.catchword.org/vl=9780304/cl=28/nw=1/rpsv/cw/esa/0046225x/v34n5/s36/p1325 and
http://titania.esa.catchword.org/vl=9780304/cl=28/nw=1/rpsv/cw/esa/0046225x/v34n5/s37/p1336

USDA IDENTIFIES RICE LINES THAT RESIST STRAIGHTHEAD DISEASE

Scientists from the Agricultural Research Service of the United States Department of Agriculture have identified rice breeding lines that resist straighthead disease.

Research geneticist Wengui Yan and colleagues analyzed the U.S. Department of Agriculture (USDA) Rice Core Collection and were able to identify germplasm accessions that are very resistant to straighthead, a plant disease that causes the entire rice head to remain upright at maturity with sterile florets and reduced grain yield.

For more information, view the ARS release at http://www.ars.usda.gov/is/pr.

ANNOUNCEMENT: MEDITERRANEAN BIOTECH CONGRESS

Hammamet, Tunisia is the site for the 1st Mediterranean Congress on Biotechnology on March 25-29, 2006. Visit http://www.fmcb.africa-web.org/ for details of the Congress or email Samir Bejar of the Centre de Biotechnologie de Sfax in Tunisia, at samir.bejar@cbs.rnrt.tn or Marco Bazzicalupo of the Dipartimento di Biologia Animale e Genetica in Firenze, Italy at marco.bazzicalupo@unifi.it.

CBT NEWS FEATURE

TIED TO THE LAND IN THE DARKNESS: Agriculture in Medieval England

When the Roman Empire left the shores of Britannia, it also left an island that would be invaded by a variety of tribes and conquerors. When the dust settled, England found itself in the Middle Ages, ruled by a king, in a time when knowledge was confined to the clergy, and when the whole of Europe was constantly embroiled in wars as it struggled to make a living and create a surplus.

Agriculture was again the order of the day - but this time, it became an important business, well enough for landowners to gain power and hold dominion, and well enough for the widening gap between the nobility and peasantry to create dissent in the lower classes. There was disunity as much as richness, harvests as well as shortage, good health in the midst of plagues. Medieval England was dark with sickness and the politics of ownership, but the time was ripe for literature and art to flourish.

In the meantime, there was food to be had, and England's agricultural system depended on the country's manors to give it. A manor was usually formed around old Roman villas, or assembled by tribes after they decided to settle down. It consisted of arable land, meadow land, waste land, and a village. The larger manors had a mill, blacksmiths, ovens to bake bread, fishponds, an orchard, a wine or oil press, vegetable gardens, and an apiary to keep bees to produce honey.

A lord reigned supreme over a manor, and collected rents from tenants lower than he. For an economy based solely on agriculture, life was a pleasure for the nobles, but one driven by desperation for the tenants, who worked on the land, but received much less in compensation.

Life revolved around tilling the land and making the most out of what it could bring. For most of Medieval England, agriculture dictated what dates were important on one's calendar. New Year, for instance, began on Lady Day, March 25, which marked the first plowing of a fallow field. Since there was little or no fertilizer besides manure, land was allowed to remain fallow every few years, where it would be planted with peas or beans. Medieval peasants did not fully comprehend how their land remained fertile even after they had sown it with legumes, but their efforts, based on years of trial and error, worked to bring nitrogen back into the soil.

Medieval agriculture prospered in its own way, thanks to three major innovations. The first was the mould board plow, which allowed six or more oxen to plow the land. The second was the horse collar, which fully utilized the animal's strength and allowed it to plow faster than oxen, if the latter were not available.

The third was the three-field system. In such a system, a given area of land was rotated amongst crops, or allowed to remain fallow in order not to deplete the soil's nutrients. Spring crops such as barley, oats, peas, and vetches had their own strips, and were sown by broadcast method, or together, in a mixture called a dredge.

Peasants took care to sow just the right amount of seed. If too few were planted, weeds could grow easily and choke the crops. On the other hand, if too much was planted, the plants would not grow properly, and they would choke themselves. As a rule, barley was sown at four bushels to the acre, while oats, peas, and beans were sown at three.

While plowing and sowing occupied April, May was a time for defending the newly sown seeds from birds. The lord's doves were usually the greatest pests - but they were off limits and could not be killed. With a dove's murder came a heavy prison penalty, and the bird, inasmuch as it caused considerable damage to agricultural crops, became a despised symbol of a lord's dominion.

May was also the time for cultivating cash crops. Peasants planted flax, hemp, and dyeplants such as madder (to produce red), woad (blue), dyer's greenwood (green), and weld (yellow). Also included were spices and herbs such as fennel, celery, mint, parsley, chamomile, catmint, summer savoury, mustard, coriander, and the opium poppy.

Come June were a number of agriculture-related activities. There was haymaking, which united the peasants as they made sure that their animals would survive through the winter. There was lamb shearing, to get wool for the garment trade. Fields were also fertilized by allowing beasts to pasture their, so that their dung would immediately land where needed.

July was a rather dark, desolate month, what with the weeding that had to be done. Weeds such as thistles, dock, charlock, corn cockle, and dead nettle thrived. There were also corn marigolds, associated with barley; and corn flower, which grew near rye.

July was also the lowest point of a manor's food supply. All year round, there would be game, ducks, pheasants, geese, hens, and partridge. There would be fish, beef, and mutton from the manor's animals; and cabbage, carrots, onions, peas, turnips, and beans from the garden. There was some bread, butter, cheese, wine, and ale, as well as some fruits from the larder.

Medieval crop yields, however, were very low, and come July, the grain was all but spent. As a result, peasants foraged or poached royal game for food - or, according to some studies, deliberately baked ergot-infected rye into bread. Ergot is a hallucinogenic mold, and it may have been used to ease many a peasant's hunger pangs.

Harvesting began in August, starting with wheat and rye, which were winter crops; and then barley and oats, the spring grains. By September, peas, beans, and vetches were collected from the field. At this point, the manor would be busy processing the grain, which had to be completed by September 29th, or Michaelmas, the start of the new financial year.

In October, wheat and rye were sown as winter crops, while the woods sounded with foraging pigs, which were driven there to partake of falling beechnuts and acorns. By this time, the winter winds were already blowing in, and by November, the manor was ready with its stores of cured meat, blood for black pudding, and grain to meet the coming frost.

Yields were low, and corruption and greed ran rampant through the glades and rolling heals. Wheat would yield 250-300 liters of grain per acre (meager in comparison with modern agriculture's 1,500 liters or more), oat gave 360-400, and peas 300-340. Barley brought in 700-720, and was used to make both bread and ale.

And so the year went, as the snow fell upon the land, and as the woods sang with traveling lords and outlaws alike. Medieval England's hardships gave birth to a new generation of songs, a new breed of minstrels, whose poetry and verses roused many a broken spirit - and whose tales would form the tapestry of a Renaissance waiting to emerge from the shadows.

Read more about agriculture in Medieval England at http://www.hyw.com/books/history/Agricult.htm, http://www.adbio.com/science/agri-history.htm, and http://www.witheridge-historical-archive.com/medieval-year.htm.

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