

COMESA develops regional biosafety policies and guidelines

The Common Market for Eastern and Southern Africa (COMESA), at the request of ministers of agriculture and those of environment of member states, has drafted regional policies and guidelines on biosafety. The guidelines were prepared by the Regional Approach to Biotechnology and Biosafety in Eastern and Southern Africa (RABESA) initiative. The draft guidelines are currently being presented to stakeholders in member states for their input. Speaking at the RABESA national consultative meeting held at Hotel Africana recently, Dr Getachew Belay, the Director of Biotechnology at ACTESA, explained to stakeholders that the guidelines are meant to provide a harmonised framework within which matters of biosafety can be addressed. He pointed out that countries need to be prepared to safely make use of products of modern biotechnology yet member countries are at different stages of policy, regulatory and product development.

ACTESA, the Alliance for Commodity Trade in Eastern and Southern Africa, is a specialised agency of COMESA charged with increasing farmer productivity and income in the



A farmer's garden in western Uganda. COMESA has prepared guidelines for commercial planting of GM crops.

countries with limited resources can benefit from regional cooperation for accessing and building the necessary capacity to implement the CPB.

COMESA region through trade in staple crops. Other partners in the RABESA initiative include the International Service for the Acquisition of Agri-biotech Applications (ISAA), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), and the Program for Biosafety Systems (PBS).

The guidelines presented to stakeholders in Uganda included guidelines for commercial planting of GM crops, guidelines for trade in GMOs, and guidelines for handling GM food aid. The guidelines and policies were drafted by experts from the COMESA region and also benefited from national and regional consultative processes. The final draft will be presented to the region's ministers of agriculture and environment once stakeholder input from all member states has been made.

Participants in the meeting included the

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Biotechnology: Accurate information is crucial

Theresa Sengooba

The development and use of modern biotechnology to produce useful products has been widely adopted in many countries but still faces criticisms from some who question the usefulness and relevance of the technology to small scale farmers such as those in Uganda. Some people still think this technology is only for the rich farmers or is only to benefit multinationals. Such criticisms have led to slow development of the technology in areas where they are badly needed such as Africa. Policymakers and farmers in the continent often receive mixed information from various interest groups, including the media, where sometimes opinions are equated to facts.

The debate on modern biotechnology, especially as regards GMOs in agriculture should not derail efforts to increase productivity of the major crops in the region as food security and livelihoods of hundred of millions is at stake. Instead, focus should be on ensuring that the appropriate technology is developed and availed to end-users in a safe and sustainable manner.

In the East African region, several efforts are underway by government agencies to develop properly identified, safely developed and adequately regulated biotech products that can contribute to agriculture and national development. The communication component of the concerned government departments are probably inadequate hence the frequent misunderstanding of the intention in supporting GMO research and development. There is still great need to educate the public and farmers about biotechnology, in terms of the promise the technology holds in the fight against hunger and poverty and the specific products government research institutions' have decided to start investigating.

Efforts to reach as many stakeholders as possible are most valuable. However all persons who intend to engage in communicating biotechnology should seek information from the concerned scientists or from credible government sources and authorities in the respective countries. In case of East Africa, information can be obtained from the following sources:

- Kenya: National Biosafety Authority - National Council for Science and Technology - www.biosafetykenya.co.ke; Kenya Agricultural Research Institute (KARI), International Service for the Acquisition of agri-biotech Applications (ISAAA), African Biotech Stakeholders' Forum (ABSF) and AHarvest etc
- Uganda: Uganda National Council for Science and Technology- uncst@starcom.co.ug; National Agricultural Research Organisation (NARO); Program for Biosafety Systems (PBS); Science Foundation for Livelihoods and Development (Scifode) etc.
- Tanzania: Tanzania Commission for Science and Technology (COSTECH)- www.costech.or.tz. ■

COP-MOP5 & COP 10 Meetings

Nagoya, Japan

The fifth meeting of the Conference of the Parties serving as the meeting of the Parties to Cartagena Protocol on Biosafety (COP-MOP-5) will be held at Nagoya, Japan 11 to 15 October 2010. This will be followed by the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP-10) that will be held in the same venue from 18 to 29 October 2010. The COP-MOP meeting will specifically address outstanding issues related to liability and redress in the event of environmental damage due to the use of GMOs. Uganda, Kenya, and Tanzania will all send delegates to both meetings. ■

More GM trials approved in Uganda

Kampala, Uganda

The National Biosafety Committee of Uganda has approved additional field trials of GM crops in Uganda. Trials were approved for drought tolerant maize (under the WEMA project), Cassava brown streak disease resistant cassava (under the ViRCA project), and for Xanthomonous wilt resistant banana, and containment trails for virus resistant sweet potato. ■



Biofortified banana under confined field testing at NARL

Biotech can improve agric productivity

By Peter Wamboga-Mugirya

SOROTI—A training workshop on biotechnology and its communication for a diversity of agricultural development stakeholders in Uganda's eastern Teso Sub-region recently ended in Soroti, with participants noting that the technology can offer several opportunities of improving agricultural productivity in Uganda. The training workshop, among others, explored the application of modern agro-techniques

Foundation International (AHBFI). They were given technical backstopping by the National Agricultural Research Organisation (NARO), its area-based National Semi-Arid Resources Research Institute (NaSARRI) and the Program for Biosafety Systems (PBS).

Thematic papers and discussions were made on the status of biotech research and development in Uganda and in the world at large in which



Second phase of GM cotton under confined testing at Serere

to revive the sub-region's 'near-dead' cotton industry using *Bacillus thuringiensis* (Bt) and herbicide tolerant (HT) cotton GM technologies.

The training—the first of the kind—for farmers, agricultural extension staff, district NAADS and production coordinators and district leaders took place on September 30, 2010 in Soroti town. Participants were drawn from Amuria, Kumi, Kaberamaido, Serere, Ngora, Katakwi and Soroti districts. It was jointly organized by Uganda's science policy advocates—the Science Foundation for Livelihoods and Development (Scifode) and the Kenya-based Africa Harvest Biotechnology

participants learnt current biotech-based research work to counter biotic and abiotic stress (pests, diseases and climate-induced stresses). The other presentations were on Confined Field Trials (CFT) of Bt and HT (Round-Up Ready) Research work presented by NaSARRI's Director, Dr. Thomas Emeetai Areke; Biosafety Regulations and guidelines in agrobiotechnology by AHBFI's Ken Mburu and Effective Communication of Biotechnology Julia Kagunda also from the Nairobi-based AHBFIs.

The well-attended training was opened by Dr Areke who told participants that the one-year trial of the Bt and Ht [RR] cotton by NaSARRI in which he was

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Principal Investigator (PI), has helped build capacity of his staff to develop and grow genetically-modified (GM) cotton in a confined environment. “That first season also offered scientists, policy-makers and farmers opportunity to interact with GM crops in the field. The experience we all have now, is immense. First of all, we registered no harm from those GM crops. Bt technology worked effectively against bollworm pests and HT cotton withstood Round-Up Ready [glyphosate] sprays, while weeds were wiped out,” Areke said—making a vivid recollection of the first season trials that ended 2009 at NaSARRI and the Mubuku Government Prison Farm, in Kasese District.

Dr. Areke also assured the participants—most of them from cotton-growing backgrounds—that the experience gained last year enables him and his CFT team headed by Mr Pius Elobu [also from NaSARRI]—to undertake another trial with stacked genes (both

Bt and herbicide tolerance) that NaSARRI planted at the end of September 2010. The active audience filed a multitude of questions against what they had earlier freely mentioned as their expectations from the training workshop.

Farmers and agricultural officers who attending said it was very useful as it enlightened them on the theory behind the biotechnology and the potential it holds to improve livelihoods in Uganda.

The Vice-Chairperson of Soroti District, Mr. Daniel Ediau Ewadu, who officiated at the training, said that biotechnology is a positive step in boosting agricultural production to meet the food requirements of the country’s growing population and he was happy to note that scientists are working hard to improve crops that are dear to the needs of the farmers in the Teso region. ■



a : Mr. Ewadu, The Vice-Chairperson Soroti District makes remarks during the workshop

b: Agricultural and extension officers at the workshop

c: Farmers at the training workshop

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Commissioner for Crop Protection - Mr. Bulegeya Komayombi, the Chairperson of the National Bioafety Committee – Prof. Opuda Asibo, the Director of Research at the National Crops Resources Research Institute (NaCRRI) – Dr. Ogwang, journalists, and representatives from various government and non-governmental organisations.

Mr. Okasai Opolot, the Director of Crop Resources at the Ministry of Agriculture, representing the Minister of Agriculture, noted that countries with limited resources can benefit from regional cooperation for accessing and building the necessary capacity to implement the Cartagena Protocol on Biosafety's provision that enables countries to enter into regional or bilateral agreements to manage transboundary movement of GMOs. "If we are to meet the challenges of the 21st Century it is essential that we improve public engagement in the science and increase the influence of scientific evidence on public policy", he added, during the workshop that recommended that Uganda should proceed with biosafety policy harmonization programmes, taking into consideration countries sovereignty and specific needs and levels of biotechnology development.

The recommendations made by stakeholders will be incorporated into the draft guidelines that will be presented the council of ministers for endorsement in 2011. ■ **Compiled by PBS & G. Gumisiriza**



Dr. Michael Waithaka, ASARECA



Participants at the consultative workshop



Group photo of participants at the workshop. Dr Ogwang from NaCRRI (3rd R), Mr Okasai Opolot from MAAIF (6th R)

Ambitious GM Rice Project Enters Next Phase



Rice field in eastern Uganda. Scientists want to double yields of rice using modern biotechnology.

Scidev.net, July 1, 2010

An international consortium aiming to re-engineer rice to increase yields by 50 per cent is about to move into the second phase of its decades-long project. The project aims to genetically modify rice to use a more efficient method of photosynthesis - the process by which plants convert carbon dioxide into carbohydrates needed for growth.

Rice has a type of photosynthesis called C3. But some plants, including maize and sorghum, have evolved to use a type called C4. The C4 crops are anatomically different from C3s and are better at concentrating carbon dioxide around a particular enzyme - RuBisCO - which is crucial in photosynthesis.

If the scientists are successful in creating rice that follows the C4 pathway the crop could produce 50 per cent more grain, and would require less water and fertiliser.

The C4 plants work best in hot climates, so could be important as global warming increases. "As temperatures rise, C4 plants will photosynthesise better than C3s," said Richard Leegood, a plant biologist from the UK-based University of Sheffield, which is leading an international team of researchers, coordinated by the International Rice Research Institute (IRRI) in the Philippines.

The project received US\$11.1 million of funding over three years from the Bill and Melinda Gates

Foundation in October 2008. Most of this money has gone to IRRI, said Leegood, where researchers are doing the mammoth task of screening plants to try to identify the genes that control photosynthesis.

The project is a long-term venture - Leegood says that it will be at least 20 years before the modified rice is available. "Many genes need to be manipulated, then engineered traits need to be transferred into commercial varieties."

Since C3 photosynthesis evolved naturally into the C4 type in other plants more than 60 times through history, Leegood hopes that the public will accept this GM rice. "It is not an unnatural process; it's something that plants do ordinarily."

Lewis Ziska, a plant physiologist at the US Department of Agriculture said: "This kind of innovative work is crucial if we are going to meet the demands of an expanding population".. Although there are many other issues that cause food insecurity, Leegood said that this solution could tackle those limitations that are "inherent" in the production of such crops. The Sheffield work forms part of its Project Sunshine, a programme that investigates how the power of the sun can be harnessed to meet the world's increasing food and energy needs. ■

Source: Scidev.net

Africa's Green Revolution 'needs indigenous tech approach'

Scidev.net 9 July 2010

Africa's Green Revolution should be built around the needs of its people, says report

Seeding a Green Revolution for Africa will require developing innovation systems that match each country and science and technology approaches that are relevant to local agriculture, according to a UN report.

"There has been a tendency to focus on applying international models of agricultural development without questioning their applicability to local circumstances," says the 'Technology and Innovation Report 2010: Enhancing Food Security in Africa through Science, Technology and Innovation' released by the UN Conference on Trade and Development (UNCTAD).

"When the new African Agricultural Revolution is eventually implemented, it is likely to be built on Africa's own indigenous technology and knowledge requirements and the nutrition and food security needs of its people," says the report. Asia's Green Revolution swept across the continent in the 1960s, leading to high-yielding grain varieties, but Africa is yet to see the same and all eyes are focused on how to bring about a similar advance in Africa.

Some agricultural research and technology can be imported and adapted, some developed from scratch, and still some brought in by cooperation between developing countries with assistance from third-country donors. But the challenge is to find, promote and disseminate innovation relevant to African agriculture. "Our understanding of how new ideas, knowledge and technologies are introduced into agricultural practice remains incomplete,"

the report said. "You can take different types of technology — medium, low and high tech — and different mixes of technology but adapted to Africa's different conditions, different ecology zones and crops," said Michael Lim, an economist in UNCTAD's technology and logistics division, but added that this is "quite challenging".

UNCTAD recommends strengthening the 'innovation systems' — a wide range of interconnecting issues, from providing financial incentives and ensuring technology transfer to promoting education — for agriculture in each country in Africa. "This means enhancing links between knowledge research institutes to make sure any innovation they come up with is diffused to the farmer," said Lim. "Farmers need to be able to absorb knowledge to use technologies effectively, and they often come up with their own solutions."

UNCTAD cites the example of the Framework for African Agricultural Productivity developed by the Forum for Agricultural Research in Africa which advocates involving farmers as active players in improving agricultural productivity by increasing yields but also by having a say in shaping policy. Apart from outlining the challenges, the report also mentions success stories. These include biological control of the cassava mealybug, which was supported in Zambia by the improvement of agricultural supply chains and the development of markets. The result was that cassava production grew rapidly — at times overtaking maize, the country's other staple crop. The report was released on 19 May. ■

Source: Scidev.net

GM soybean is currently the most cultivated GM crop in world.

All photos by H. Oloka

What is Agricultural Biotechnology?

1. What is biotechnology?

Biotechnology is the use and modification of living things to make useful products to benefit mankind and the environment

2. What is agricultural plant biotechnology?

Agricultural biotechnology involves techniques and processes such as tissue and cell culture, plant genetic modification, molecular breeding and marker assisted selection

3. What is tissue culture?

This is the cultivation of plant tissues or organs on specially formulated nutrient media. Tissue culture is used to produce disease-free, high quality planting material and in rapid production of uniform plants

4. What is genetic modification (GM) technology?

This is the process whereby genes are moved into living organisms using modern biotechnology methods to give them useful and desired characteristics

5. What is a Genetically Modified Organisms (GMO)?

A GMO is any living organism that has had a gene or genes inserted into or modified in it by modern biotechnology techniques. GM food and products are derived from GMOs

6. What is molecular breeding or marker assisted selection?

This is a process where a morphological or biochemical characteristic is used for indirect

selection of a trait of interest in plant breeding

7. What is the difference between a conventionally bred crop and a GM crop?

Differences are varied but the major distinction is that conventional breeding relies on cross pollination systems to improve crops while GM technologies involve using precise modern tools to transfer the gene of interest into a desirable plant. Conventional breeding thus depends on the possibility of crosses within a species or with closely related sexually compatible species. GM techniques can however transfer traits from an unrelated species to the specie of interest.

8. What are hybrids?

These are varieties of crops that have been bred by crossing two or more varieties (sometimes called lines) to produce farmers' seeds. A hybrid can be bred conventionally (just like hybrids currently grown in Uganda) or can have a gene inserted/modified in it through modern biotechnology, in which case it would be a GM crop. Most hybrid seeds have to be obtained each season because they lose vigour after one season of planting.

9. Do we have GM crops grown commercially in Uganda, Kenya, or Tanzania?

No. Currently researchers in these three East African States are testing various GM crops in confinement. Such crops will reach farmers only once proven useful, safe to eat and safe for the environment.

10. Are GM crops being cultivated anywhere in the world

Yes. As of 2009, 25 countries in the world cultivated GM crops in over 134 million hectares. Over 14 million farmers cultivated GM crops. The major GM crops grown are cotton, soybean, maize, and oilseed rape (canola). ■

Compiled by PBS

More FAQs to come in the next edition



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