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Prof. J. Opuda-Asibo, Chairman National Biosafety Committee (NBC), at the opening launches the Kawanda green house.

GMO FACILITY LAUNCHED AT KAWANDA

Patience Atuhairwe

Owing to completion of a Biosafety Containment Green house at the National Agricultural Biotechnology Centre, the National Agricultural Research Laboratories Institute, Kawanda, now has the capacity to carry out contained trials of genetically modified (GM) crops.

The centre, nationally famous for its production of improved hybrids, received the green house from the contractor, Victor Construction Ltd, through NARO (National Agricultural Research Organisation)- Uganda's leading Public Agricultural Research Organisation on Friday 22 June 2007 at Kawanda. The facility was officially opened by Prof. J. Opuda-Asibo, the chairman of the National Biosafety Committee.

The director of the research institute, Dr. Mathias Magunda, during the handover ceremony said that the greenhouse is a containment and experimentation facility for GM plants, to check their disease and pest resistance, before they are sent to the field. The research center is now able to move genetically enhanced plants from purely laboratory-based experimentation to confined greenhouse evaluations.

"The green house will improve the production of the biotechnology inputs for future provision of food locally as well internationally, by export. This will also go a long way to improve people's economies and, on the whole, the country's economy," Magunda said.

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POLICIES AND PROTOCOLS ON BIOTECH AND BIOSAFETY

Barbara Zawedde Mugwanya

Legal protection of intellectual property rights and transfer of biotechnology applications to developing countries is a key issue in the development and progress of the industry. Many developed countries favor strengthening intellectual property protection through such agreements as the Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement of the World Trade Organization (WTO), with the view that protection will stimulate technological innovation and promote economic growth. Critics argue that intellectual property rights protection will instead deter innovation and deny developing countries economic growth. For many African countries, the relationship between technological development and legal protection of intellectual property rights remains unclear, making it difficult for them to participate in the handling and transfer of biotechnology.

Most African countries are not sure of whether to follow the more 'permissive' U.S. approach toward GM crop technologies, or the more precautionary EU approach. Their decisions should evolve as they gain a better understanding of the technology, their R&D efforts generate new products and/or processes, and they establish biosafety systems. There is need to establish how legal systems can be designed to benefit low income groups (particularly rural farmers, traditional medicine enterprises, rural women and small-scale informal

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Prof. J. Opuda-Asibo, Chairman NBC, invites Director of Kawanda Dr. M. Magunda to enter the facity looking on is an Engineer of Victor Constructions Ltd.

Exterior of the Containment Greenhouse

L-R Ugandan biotechnologists Geoffrey Arinaitwe and Yona Baguma talking with Mr. Ecuru (UNCST)

A representative of Balton (sub-contractors) talks to Prof. Opuda-Asibo and Andrew Kiggundu of Kawanda

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The USAID-funded (Shs. 320m) facility will add to NARO's capacity to move further in its agricultural biotechnology research and development efforts.

The facility comprises of an anteroom, where laboratory workers change into protective or lab clothing, the preparation room where the plants are cleaned and potted and the growth area where plants will be monitored.

The greenhouse uses computerized, state-of-the-art technology, part of which is an automatic temperature regulation system. It has an automated opening roof and a thermo-screen, both of which regulate the heat to appropriate levels required for the crops' proper growth. This climate control system is connected to misters and irrigators in the growth room, which irrigate or mist the plants automatically according to the weather.

While at the moment the greenhouse will be used to experiment on crop resistance to disease/pests, in future, more research will be carried out on crops that are nutrition enhanced.

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enterprises) in African countries within the context of international/regional policies and trade protocols, including the Convention on Biological Diversity, the TRIPS agreement and African Model Law, to which we are obliged to comply.

Convention of Biological Diversity (CBD)

The CBD is the first global agreement on the conservation and sustainable use of biological diversity that was signed in 1992 by over 150 governments at the Rio "Earth Summit". The CBD is an international legally binding convention whose objectives are the conservation of biodiversity, sustainable utilization of its components and the fair and equitable sharing of benefits arising from the use of genetic resources.

The Convention clearly recognizes the potential benefits as well as the perceived risks of modern biotechnology to the conservation and sustainable utilization of biodiversity. It seeks to ensure the development of appropriate procedures to enhance the safety of biotechnology in reducing all potential threats to biodiversity, taking into account the risks to human health. Article 19(3) provides for biosafety measures for the trans-boundary movement of living modified organisms (LMOs), which is the base for the international biosafety regulatory systems, through the Cartagena Protocol on Biosafety. Uganda ratified the CBD in September 2003 and the national focal point is the Ministry of Lands, Water and Environment.

The Cartagena Protocol on Biosafety

In 2000 in Montreal, Canada, the Conference of the Parties to the CBD adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety. The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. The Cartagena Protocol on Biosafety entered into force on 11 September 2003. It recognizes that GMOs are inherently different from other naturally occurring organisms and need to be regulated as such.

The Biosafety Protocol is legally binding in the international legal system and in the legal systems of 140 countries that have ratified, approved, accepted or acceded to it, including Uganda. Identifying that GMOs may have biodiversity, human health and socio-economic impact that should be risk assessed, the Biosafety Protocol operates the 'Precautionary Principle' in decision-making (i.e. in the absence of scientific certainty, a party should err on the side of caution and could restrict or ban the import of GMOs on account of their potential adverse effects) and further establishes it in international law. It also establishes the principle of prior informed consent with regard to the import of GMOs and preserves the right of a country to reject applications for the import of GMOs.

Trade-Related Aspects of Intellectual Property Rights (TRIPS)

The WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), negotiated in the 1986-1994 Uruguay Round, introduced intellectual property rules into the multilateral trading system for the first time. The agreement says patent protection must be available for inventions for at least 20 years. Patent protection must be available for both products and processes, in almost all fields of technology. Governments can refuse to issue a patent for an invention if its commercial exploitation is prohibited for reasons of public order or morality.

They can also exclude diagnostic, therapeutic and surgical methods, plants and animals (other than microorganisms), and biological processes for the production of plants or animals (other than microbiological processes). Plant varieties, however, must be protectable by patents or by a special system (such as the breeder's rights provided in the conventions of UPOV — the International Union for the Protection of New Varieties of Plants). Uganda has been a WTO member since January 1995 and implementation of this Agreement is a responsibility of the Ministry of Trade and Industry.

Sanitary and Phytosanitary (SPS) Measures & Technical Barriers to Trade (TBT) Agreements

SPS is a World Trade Organization (WTO) agreement on food safety and animal and plant health standards. Countries may set their own standards, but regulations must be based on science and applied only to the extent necessary to protect human, animal or plant life or health.

The Technical Barriers to Trade (TBT) Agreement governs technical regulations and standards, including packaging and labeling requirements. It requires members to ensure that their national regulations do not unnecessarily restrict international trade.

Three international standard settings/bodies are specifically recognized by SPS Agreement: Codex Alimentarius, a voluntary 'food code', International Plant Protection Convention (IPPC) and Office of International Epizootics (OIE). Uganda is a member to all.

European Union regulations and directives

The European Union's regulations and directives are the most stringent in the world today and include a series of legislative measures and decision making procedures concerned with handling GMOs from laboratory to field trials which include:

- Principles for environmental risk assessment
- Mandatory post-market monitoring requirements, including any longterm effects arising from the interaction with other GMOs and the environment.
- Mandatory information for the public.
- A requirement for member states to ensure labeling and traceability at all stages of marketing.
- Commercial approvals for the release of GMOs to be limited to a maximum of ten years

The Regulation (1830/2003/EC) requires the labeling of all foods produced from GMOs except when genetically modified material is below a threshold of 0.9%. With regard to traceability, GMOs must be traceable throughout the entire production and distribution process. This is one of the most contested directives. Since Europe is considered the major market of Uganda's crop exports, its regulations influence government policy decisions.

African Model Law

The Model Law is biosafety rules drafted by a number of African biosafety experts, specifically to protect Africa's biodiversity, environment and the health of its people from the risks posed by GMOs. At the AU Summit held in Maputo in July 2003, the Executive Council urged member states to use the African Model Law on Safety in Biotechnology for drafting national legal instruments on biosafety while taking into account differing national circumstances, so as to create a harmonized Africa-wide system for regulating the movement of genetically modified organisms (GMOs). It is an attempt to develop a mechanism of cooperation to maximize the uniformity of implementation of national biosafety laws.

Although Model Law is strongly influenced by the Cartagena Protocol on Biosafety, it contains numerous provisions inconsistent with the Protocol; for instance, the Model Law includes human pharmaceutical products that had been excluded from the Protocol. Also there is no provision for different levels of potential risks.

The regional trading blocks such as the Common Market for Eastern and Southern Africa (COMESA) are also exploring the possibilities of establishing regional decision making mechanisms and policy for biotechnology and biosafety. COMESA has set in motion a number of activities aimed at pursuing regional collaboration in biotechnology and biosafety such as the Regional Approach to Biotechnology and Biosafety Policy in Eastern and Southern Africa (RABESA initiative).

The capacity to make informed decisions about GMOs requires adequate funding, human resources and scientific infrastructure, lacking in many African countries including Uganda. Therefore, sharing capacity, information and resources is very important in biotechnology application. A regional approach could reduce duplication, improve transparency and offer cost effective options to countries unable to sustain costly biosafety procedures. However, these regional/international agreements should not override or conflict with national priorities.

MEDIA CAPACITY ENHANCED

Media professionals and extension workers on a field visit with Dr. Yona Baguma of NARO.

Agricultural biotechnology has the most immediate relevancy to Uganda, and efforts to increase understanding of its theory and practice should have strategic focus of stakeholders. Media professionals attending a biotechnology workshop in Mbarara, Western Uganda, said that communication of development issues is a major challenge, further complicated by difficulties of translating abstract and seemingly unrealistic scientific concepts.

During the workshop, attended by media professionals and extension workers from 11 districts, various journalists said they were overwhelmed by technical and scientific information which is hard to assimilate and even harder to communicate. Community radio audiences are mostly rural folk, engaging in subsistence agriculture and basic trade. With high levels of illiteracy in rural areas, journalists must break down complex information into its simplest forms. According to the journalists and radio presenters, biotechnology presents huge communication challenges, despite its importance.

Several journalists expressed a high level of support for agricultural biotechnology and could identify with its potential advantages in crop applications like pest and drought resistance, fortification with nutrients and decreased use of pesticides.

"Uganda is heavily dependent on agriculture and we should be finding creative ways to enhance production while preserving biodiversity," said Togo Kasoro, a radio journalist. "However, I think there is a tendency for stakeholders to over-sell the potential of biotechnology', he added.

Kasoro was heavily skeptical about the perceived benefits of biotechnology, especially in terms of food safety. "Maybe the adverse effects of eating GM foods will only be evident after decades", he argued.

Biosafety was determined as another key concept, with several media professionals stating that they can only be comfortable communicating about biotechnology if they can be sure its applications are safe.

"I wouldn't want to tell the people in my community to eat GM foods in case something happened and the food turned out to be dangerous", said Otushabire Tibyangye, a print journalist. Environmental impact studies were high on the media professionals' wish-list, with most journalists requesting up-to-date information and access to experts who can provide credible information stripped of scientific jargon.

This media workshop was the second of several targeting information gateways like journalists and extension workers who interact with key publics like consumers and farmers. Organized by Program for Biosafety systems (PBS) a USAID-funded project and the Uganda National Council for Science and Technology, its key objective was to build capacity to communicate biotechnology and its applications amongst the media.

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Biotech News

KENYA: NBC approves field trails on genetically engineered cotton variety

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NAIROBI -- The field trials on a new genetically engineered cotton variety meant to be pest-resistant and higher yielding than traditional types has been approved by the National Biosafety Committee (NBC).

The National Biosafety Committee (NBC) in conjunction with the Kenya Agricultural Research Institute (Kari) have recommended the introduction of Bollgard II, an enhanced earlier type called Bollgard I that was tested between 2003 and 2005.However, the introduction of new cotton seed, known as Bollgard II, marks major progress in the introduction of genetically modified (GM) crops in an industry that has been dogged by low production and pest infestation.The new variety offered by the US-based agriculture technology firm Monsanto is expected to save farmers up to 32 percent in production costs, as it removes the need for pesticides required for conventional cotton farming. Further, a Kenyan scientist, Dr Charles Waturu assured that NBC has approved testing of Bollgard II as the variety is toxic to key pests including the Africa bollworm, the most important pest of cotton in Kenya.

The chemicals are identical to those that have been used for decades in commercial anti-bollworm sprays, but that to released by the plants themselves are more effective. The expression of Bt-toxins in cotton plants greatly reduces the need for application of broad-spectrum insecticides, minimising the negative effect of the insecticides on the natural enemies of cotton pests.The main objective of the Bt-cotton project is to establish the efficacy of the Bollgard I and Bollgard II genes on lepidopteran worm pests of cotton, as per Dr Waturu. Further, the trials also aim to look at the impact of the modified plants on non-harmful, beneficial species of plants and insects, that environmentalists fear could be negatively affected.

The scientist added the research would examine the risk of the Bt-cotton inter crossing with commercial cotton varieties as the research into genetically modified (GM) options was spurred by the high costs of traditional cotton growing that had led to poorer farming practices. Since 1998, research into various crops such as maize, cotton and sweet potato has been conducted in the country, but a biosafety draft Bill read in Parliament in 2005 has yet to be made into law.