

BioLines is AfricaBio's 'Biotechnology Headlines' – a quick guide to what is topical. By design, the articles are not exhaustive, but references are given to follow up points of interest. Let us know what you like and dislike about **BioLines** and what you want to see as part of this service. Articles are edited and some shortened to meet space requirements. It is not the intention of this service to infringe on copyright. **BioLines** is issued free of charge and every effort is made to acknowledge the source of information.

CONTENTS:

NEWS FROM AFRICA

- ◆ **EU REGULATIONS HAMPER AGRICULTURAL DEVELOPMENT IN DEVELOPING COUNTRIES (1)**
- ◆ **MAIZE SEED LEAVES GIANT FOOTPRINT IN NEPAL, KENYA AND ZIMBABWE (2)**
- ◆ **NEW DROUGHT-TOLERANT MAIZE VARIETY IN AFRICA (3)**
- ◆ **AFRICAN GOVERNMENTS TO INCREASE COOPERATION ON BIOTECH (4)**
- ◆ **AU AGRIC MINISTERS ENDORSE PAN-AFRICAN SEED, BIOTECH PROGRAMME (5)**
- ◆ **AU AGRICULTURE EXPERTS OUTLINE POSITION ON GMOs (6)**

NEWS FROM OTHER COUNTRIES

- ◆ **BIOMASS: A CLEAN FUEL FOR THE STEEL INDUSTRY? (7)**
- ◆ **WILD RELATIVES MAY HOLD KEY TO DEADLY WHEAT DISEASE (8)**
- ◆ **CONSTRUCTION OF 'DOOMSDAY VAULT' BEGINS (9)**
- ◆ **THE FUTURE OF GMO DETECTION (10)**
- ◆ **GENE DELETOR TECHNOLOGY TO PREVENT GENE FLOW (11)**
- ◆ **PRODUCTION OF BIO-PLASTICS IN PLANTS (12)**
- ◆ **GM CROPS HELP REDUCE GREENHOUSE GASES (13)**
- ◆ **FORMATION OF INTERNATIONAL BIOFUELS FORUM (14)**
- ◆ **NOTICEBOARD (15)**

EU REGULATIONS HAMPER AGRICULTURAL DEVELOPMENT IN DEVELOPING COUNTRIES

<http://www.seedquest.com/News/releases/2007/march/18649.htm>

Different prominent scientists have expressed their concerns that Europe is damaging countries in the developing world by imposing its standards to regulate genetic modified (GM) crops. The current regulatory policy is damaging the prospects of public sector biotech to the point where most of its contributions are stalled. If this is the situation in South Africa and China, where experience in the development of GM crops and biosafety regulations are in place, what then is the hope for other developing nations that desperately need transformation towards a knowledge-based bio-economy.

At a recent public discussion organised by Friends of Europe, Connie Hedegaard, Danish Minister for the Environment, expressed concern that Europe is damaging countries in the developing world by imposing its standards to regulate GM crops. Also per Pinststrup-Andersen, Professor of Food, Nutrition and Public Policy at Cornell University, and a World Food Prize laureate commented: "This Debate is important because what we think and do in Europe affects poor people in developing countries."

As a follow up to this event, the European Action on Global Life Sciences (EAGLES) invited plant researchers from South Africa, China and Brazil to hear their views on how European regulations on GM crops influence legislators in the developing world.

Former head of unit at the European Commission, DG Research and head of unit of biotechnology at the OECD Mark F. Cantley said, "The economic and political disincentives Europe imposes on the use of new technologies for environmentally friendly agriculture makes it impossible for the developing world to develop new improved crops".

In her presentation, Professor Jennifer Thompson of University of Cape Town underlined the reality of this fact: "We are concerned about what we consider the European over-regulation and question whether this may prevent, or severely delay, the approval of plants that are desperately needed by poor Africans".

Even China, according to Professor Chen Zhangliang, President of Beijing Agricultural University, has failed to approve the commercial release of GM rice due to concerns over future exports "even though China only exports 1% of its total rice production".

Critics of GM crops can no longer base their campaigns of disinformation on arguments that biotechnology is simply a tool with which multinational corporations will subjugate unwitting farmers. Rather they should acknowledge that most, if not all innovative research in agricultural biotechnology in the developing countries is done in public research institutions working towards public goods outputs.

The EU's Environmental Council has repeatedly ignored the advice of the EU's expert advisory bodies, such as the European Food Safety Agency (EFSA), on the proven safety of GM crops. The Council repeatedly fails to implement its own laws, favouring instead state censorship rather than offering choice. This departure from rational decision-making is damaging the credibility of the regulatory system on which much of Europe's innovative and industrial capacity relies. Europe's inconsistencies on the regulation of GM crops threaten the efforts of public research to create food security in the developing world.

MAIZE SEED LEAVES GIANT FOOTPRINT IN NEPAL, KENYA AND ZIMBABWE

<http://www.cimmyt.org/english/wps/news/2007/jan/smallSeed.htm>.

Through the seeds that the Technology Adoption through Research Organizations (TATRO) has been producing, farmers in Africa have more reasons to smile. The maize seed, which looks small, proved to be prolific. Small-scale maize farmers of the Regional Agricultural Association Group (RAAG) in Western Kenya now obtain more than 2 tons of maize grain per hectare.

The variety that TATRO grows is called Kakamega Synthetic-I. It is open-pollinated, drought tolerant and matures earlier than other local varieties. Kakamega Synthetic-I was released by the KARI research station in Kakamega, Kenya. Its pedigree can be traced back to the work of CIMMYT and many partners in southern and eastern Africa to develop stress tolerant maize for the region's smallholders. The variety has also been released in Nepal, after small-scale farmers from the mid-hills chose it as one of their favourites in participatory varietal trials.

NEW DROUGHT-TOLERANT MAIZE VARIETY IN AFRICA

<http://www.irinnews.org/report.aspx?reportid=69829>

A drought-tolerant maize seed has been launched recently to help boost food production in African countries. The development of the maize seed is part of a project based at the International Centre for Research in Agroforestry (ICRAF) in Nairobi. According to Wilfred Mwangi, project leader with the International Maize and Wheat Improvement Centre (CIMMYT), the maize project aims to supply the new seeds to farmers in Ethiopia, Kenya, Uganda, Tanzania, Benin, Nigeria, South Africa, Angola, Malawi, Mozambique and Zimbabwe. The first drought-tolerant, open-pollinated hybrid varieties of maize and wheat were introduced into eastern and southern African in 1999.

AFRICAN GOVERNMENTS TO INCREASE COOPERATION ON BIOTECH

afsta@afsta.org

African governments have recognized the importance of regional cooperation to address the possibilities and the range of issues associated with biotechnology and genetic modification. The African Union (AU) resolved to take a common approach to address issues pertaining to modern biotechnology and biosafety.

According to a report of a meeting it convened in Addis Ababa late last year to take a common position on biotechnology, it was noted that biotechnology had a key role to play in developing African agriculture and reducing poverty. The meeting was attended by approximately 50 experts from various African countries and institutions including the Regional Economic Communities (RECs,) research institutions, civil society organizations, farmers associations, universities, the private sector and other stakeholders.

Therefore it was agreed that AU Model Law on biotechnology and biosafety be reviewed to facilitate easier access and utilization of biotechnology. Participants to the meeting also urged the governments to take an active role in capacity building and public awareness creation.

AU AGRIC MINISTERS ENDORSE PAN-AFRICAN SEED, BIOTECH PROGRAMME

Daniel Otunge (d.otunge@cgiar.org)

The third Conference of African Union Ministers of Agriculture held in Libreville, Gabon, recently, endorsed the development of the African Seed and Biotechnology Programme (ASPB) to help streamline the two sectors on the continent. They concurred that improved seeds offer an opportunity to meet the challenge of enhancing agricultural productivity in which lie the pathway towards sustainable food security.

The meeting stressed the need to enhance seed trade and to agree on harmonized rules among Member States, to improve collaboration between regional economic communities, and to enhance the role of the private sector in the seed industry. In discussions regarding funding for the Programme, the Director of the Rural Economy and Agriculture Department of the African Union Commission, Dr. Babagana Ahmadu, reminded the delegates of the Maputo Declaration of 2003, in which the Heads of State and Government pledged to allocate at least 10% of the national budgets to implement the agricultural agenda.

The meeting was attended by ministers from Algeria, Angola, Cameroon, Chad, Egypt, Gabon, Gambia, Guinea, Ivory Coast, Kenya, Lesotho, Liberia, Libya, Malawi, Mozambique, Namibia, Nigeria, Republic of Congo, Senegal, South Africa, Tanzania, Togo, Tunisia, and Zambia.

AU AGRICULTURE EXPERTS OUTLINE POSITION ON GMOs

Daniel Otunge (d.otunge@cgiar.org)

African Agriculture experts meeting during the third Conference of AU ministers of agriculture, Libreville, Gabon, have urged to put in place a biosafety framework in order to harness the potential from biotechnology while minimizing the risks, since their countries are signatory parties to the Cartagena Protocol on Biosafety.

In a paper presented to ministers from 24 countries and to representatives of leading development agencies organizations and institutions, the experts argued that genetic engineering is a tool that could be used to resolve some of the constraints of African agriculture, and should therefore be considered along with other conventional farming practices. However, they underscored the high cost related to biotechnology research and development and encouraged international collaboration and partnership as well as institutional linkages, regional initiatives and innovative approaches to access patented technologies for the benefit of small holder farmers in Africa.

Experts observed that research to develop indigenous African crops can best be done by African research institutions with the support of African governments.

To harness the benefit of GM technology, "it is necessary for Africa to develop facilities for regulatory purposes, to enhance scientific capacity of institutions operating in biotechnology research and development and those conducting risk assessment studies, and establish GMO testing facilities and to streamline regulations for testing GM crops to assess their merit", the experts told the ministers.

BIOMASS: A CLEAN FUEL FOR THE STEEL INDUSTRY?

<http://www.cirad.fr/en/actualite/communiquer.php?id=626>

In order to reduce greenhouse gas emissions of steelmaking, researchers involved with the European Ultra Low CO₂ Steelmaking (ULCOS) project have been replacing fossil fuels with biomass, notably from forest plantations in the tropics. The project also aims to develop more efficient, less polluting processes for converting that biomass into charcoal.

The French Agricultural Research Centre for International Development (CIRAD) is lending its research expertise in the production, supply and sustainable use of woody biomass from eucalyptus as a cleaner fuel source. Brazil and several central countries have been chosen as "candidate" countries to host plantations of the fast-growing eucalyptus. Preliminary tests on carbon flux in Brazilian and Congolese plantations showed that Brazilian plantations have higher carbon sequestration potential than those in Congo. In the conversion of biomass to charcoal, researchers have been concentrating on innovative thermochemical processes such as high-pressure pyrolysis. The results show that high pressure and slow heating help reduce gas emissions in relation to conventional processes under atmospheric pressure.

WILD RELATIVES MAY HOLD KEY TO DEADLY WHEAT DISEASE

<http://ipgri-pa.grinfo.net/index.php?itemid=1680>.

The threat of a new, highly virulent wheat rust strain known as Ug 99 looms over global wheat production. Wheat varieties initially resistant to the pathogen are showing signs of succumbing to wheat rust. The survival of vulnerable wheat varieties may lie in the valuable genetic material of their wild relatives. Bioversity International (formerly, the International Plant Genetic Resources Institute) has been working on a global project to protect important and threatened crop wild relatives by encouraging their *in situ* conservation - in farmers' fields and in the wild - thereby ensuring that they are available to meet agricultural challenges like that posed by Ug 99.

Wild relatives offer a critical source of genes that can provide resistance to a wide range of diseases, pests and environmental stresses. However, over-exploitation, habitat loss and climate change threaten this vital resource. Bioversity and its partners are working to protect crop wild relatives. "Good protection of crop diversity and wild relatives is the best insurance policy we can have," said Emile Frison, Director General of Bioversity International. "You never know what the next problem will be. But whatever it is, agricultural biodiversity is likely to provide the solution."

CONSTRUCTION OF 'DOOMSDAY VAULT' BEGINS

<http://www.croptrust.org/main/arctic.php?itemid=211>.

Construction for the Svalbard International Seed Vault, or the "Doomsday Vault" as the media described it, has begun and is due to be completed in September 2007. The seed vault is an answer to a call from the international community to provide the best possible assurance of safety for the world's crop diversity. The idea for a global gene bank has been around since the 1980s, but it was only with the coming into force of the International Treaty on Plant Genetic Resources, and an agreed international legal framework for conserving and accessing crop diversity, that the seed vault became a practical possibility. The Svalbard International Seed Vault will be the ultimate safety net for the world's most important natural resource.

THE FUTURE OF GMO DETECTION

<http://www.coextra.eu/researchlive/reportage765.html>

The LL601 rice incident last year brought the issue of detection of genetically modified organisms (GMO) in the limelight. The rice is believed to have escaped during field trials in the United States in 2001 and contaminated rice shipment into the European Union.

According to Dr. Holst-Jensen, Norwegian researcher in the Co-Existence and Traceability (Co-Extra) project and expert for GMO detection methods, protein-based screening methods applied in the US have limitations because some events are still unknown. In Europe the use of event-specific detection methods have been promoted for many years, but traditional application of event-specific methods would also fail to detect events like the LL601 rice. Policy makers could make GMO tests and monitoring more reliable by establishing an international register of GMO sequences and testing material, and requiring reference material for detection to be available at all stages of GMO development. Holst-Jensen also described high density micro-array technology, and multiplex screening tools which will be the latest addition in GMO detection methods. Dr. Holst-Jensen expressed his optimism on an approach based on bioinformatics, which may detect even completely unknown GMOs.

GENE DELETOR TECHNOLOGY TO PREVENT GENE FLOW

<http://news.uconn.edu/2007/February/rel07015.html>.

Scientists at the University of Connecticut have developed a tool which could prevent genetically-modified (GM) gene flow into non-biotech crops or weeds. Known as the "GM (genetically-modified)-gene-deletor", the technology could be particularly useful to confine engineered genes by initiating the gene deletion process immediately prior to seed or fruit development. Yi Li and co-workers observed exceptionally high deletion efficiency in the experimental plants, and they expect an enormous potential for the technology to be used in large-scale plantings of agricultural crops, genetically improved trees, and bioenergy/biofuel and pulp generating species.

PRODUCTION OF BIO-PLASTICS IN PLANTS

<http://dx.doi.org/10.1016/j.biotechadv.2006.11.007>

There has been a growing concern on the effect of non-degradable plastic wastes on the environment. Pornpa Suriyamongkol and colleagues in Canada, say that one solution is to use naturally produced plastic compounds, called polyhydroxyalkanoates (PHAs). PHAs have many potential applications in the food industry (in bottles and other food material packaging), and in medicine (in implants, gauzes, and suture filaments).

PHAs has been found to bio-degrade in 3-9 months, and mass production can be done using plants or microorganisms. Suriyamongkol and colleagues believe that the use of plants is considerably less expensive than in bacteria because the former does not need the costly requirements used in growing the microorganisms, such as sterile environment, fermentation equipments, and electricity.

The efficiency of producing PHA in transgenic plants has already been examined by using the model plant *Arabidopsis* and several crop species. The main challenge is how to produce commercially viable levels (greater than 15% dry weight) of PHA in the transgenics. If the desired level is attained, it is hoped that the cost of producing bio-plastics in plants could be lower or equivalent to the cost of producing petroleum-based polymers, which is about \$1/kg.

GM CROPS HELP REDUCE GREENHOUSE GASES

Rachel Melcer, St. Louis Post-Dispatch, 03/09/2007,

<http://www.stltoday.com/stltoday/business/stories.nsf/0/326F900FC0428B8386257299001149DF?OpenDocument>

The global use of GM crops, which allows farmers to plant using less herbicide and without tilling the soil, is significantly reducing greenhouse gas emissions. In 2005, a study by Graham Brookes and Peter Barfoot showed the impact in reduced carbon dioxide emissions was the equivalent of removing nearly 4 million average family cars from the road, said. The study was commissioned by Monsanto Co. of Creve Coeur, the world's leading provider of biotech crops, and published in the peer-reviewed journal AgBioForum.

GM soybeans, maize, cotton and canola were planted on 215 million acres by 8.5 million farmers in 2005, the study said. These crops ward off certain pests and withstand applications of glyphosate herbicide, a weed killer that is less environmentally damaging than other chemicals.

The biggest environmental benefit of these crops, according to the study, comes when they are used to enable no-till farming. Growers who use that technique don't plough the ground; they plant through the organic material left from a prior crop. Ploughing allows naturally occurring carbon dioxide to escape into the air, contributing to greenhouse gas build-up.

Farmers in North and South America rapidly have adopted no-till farming in conjunction with GM crops, the study found. In 2005, this practice left in the ground 2.9 million kilograms of soil carbon that would have been released through ploughing - an amount equal to the emissions of 3.6 million cars.

"No-till farming is nothing new. Farmers have been trying (it) for many years," Brookes said. But the approach doesn't work well with conventional crops, leading many growers to abandon it.

Further carbon dioxide savings come from reduced use of fossil-fuel-burning farm vehicles. The reduction includes the use of plough equipment, as well as vehicles used to spray pesticides needed on conventional crops.

Since their introduction in 1996, GM crops have saved farmers 441 million gallons of fuel, which led to a 4.6 billion kilogram reduction in carbon dioxide emissions, the study said.

Vic Miller, chairman of the U.S. Grains Council, to which Monsanto and other biotech seed companies belong, said he's impressed with the results. He's been using GM crops on his 3,600-acre Iowa corn and soybean farm since 1996. "It's put more money on my bottom line, year after year. And it's allowed me to reduce chemical and pesticide use in my operation," he said. "I'm one of the first environmentalists, because I have to live there. I drink the water and walk on the soil, and I don't appreciate having to use products that have the skull and crossbones on them."

FORMATION OF INTERNATIONAL BIOFUELS FORUM

<http://www.un.org/radio/news/RS/nnF/nnFRItems.asp?id=8487&title=March%202%20-%20International%20Biofuels%20Forum%20Announced%20at%20UN%20News%20Conference>

The United Nations (UN) recently announced the launch of the International Biofuels Forum, a project aimed at promoting the sustained use and production of biofuels on an international scale. Initiated by Brazil, the European Union, the United States, India and China, the project is expected to "help countries with agricultural potential to become major suppliers of alternative fuels". The forum, according to the UN, would contribute toward the creation of an "alternative fuels market" which will bring economic, social and environmental benefits for both developed and developing countries. The forum will also have regular meetings, to "help set industry standards, and eventually work toward the commodisation of biofuels".

NOTICEBOARD

15 – 18 March 2007- The sixth Cold Spring Harbour Laboratory winter conference this year will focus on Plant Genomes. The conference, to be held in New York, USA, will review progress in genome analysis of major plant groups and determine the similarities and differences in the genome structure, composition and function in major groups of experimental and crop plants. More information on this event at <http://meetings.cshl.edu/meetings/plants07.shtml>.

15 – 16 April, 2007 - As part of the project Sustainable Introduction of GM Crops into European Agriculture (SIGMEA), the workshop "Legal approaches to Co-Existence" will be held in Sheffield, United Kingdom. The aim of the workshop is to present the alternative approaches adopted by various Member States of the European Union to address the issues that arise from the co-existence of crops GM crops with conventional and organic farming. The workshop will also tackle the issue of liability and redress for economic losses which may be

caused to non-GM farmers, and the specific problem of GM crops and cross-border related liability issues. For further information about the workshop, contact Ruth Digby (email: lwp05rad@sheffield.ac.uk ; phone: (0)114 222 6713).

18 April 2007 - The Biosafety Institute for Genetically Modified Agricultural Products (BIGMAP) at Iowa State University (ISU) has organized its 4th annual symposium to be held in Ames, Iowa. This year's symposium is themed "Understanding the Risks and Benefits of Genetically Modified Agricultural Products." BIGMAP was established to provide public assessment and communication of the risks and benefits of the products of agricultural biotechnology. More info at <http://www.ucs.iastate.edu/mnet/bigmap/home.html>.

15 – 17 May 2007 - The EPOBIO, an international project funded through the European Union's Sixth Framework Programme (FP6) will be holding a workshop, "Products from Plants – from crops and forests to zero-waste biorefineries" in Athens, Greece. The workshop will focus on the development of second and third generation biorefineries using zero-waste feedstocks, producing multiple products from a crop and providing new opportunities for biochemicals and biomaterials. The workshop will also report the outputs of the EPOBIO project, specifically the optimization of industrial crop platforms for biofuels, biochemicals and biomaterials through the use of advanced biorefineries. For more information, visit <http://www.epobio.net/workshop0705.htm>.

31 May – 3 June 2007 - Iowa State University's Annual Plant Sciences Institute Symposium will focus on Epistasis and Gene Interaction. The "Symposium on Epistasis: Predicting Phenotypes and Evolutionary Trajectories" will be held on 31 May to 3 June, 2007 in Ames, Iowa. Along with epistatic interactions, various topics in plant genetics, molecular biology and biochemistry will be discussed. For more information about the symposium please contact the symposium office at pbmb@iastate.edu (Phone: 1-515-294-7978) or visit <http://www.bb.iastate.edu/~gfst/phomepg.html>.

17 – 21 June 2007 - The Asia Pacific Conference on Plant Tissue Culture and Agribiotechnology (APaCPA 2007) is scheduled to be held in Kuala Lumpur, Malaysia under the auspices of the Asia Pacific Association of Plant Tissue Culture and Agribiotechnology and the Academy of Sciences Malaysia. The scope of the conference extends to various areas in biotechnology, including: plant cell & tissue culture, agribiotechnology, aquaculture & animal biotechnology, biotechnology in horticulture & forestry, pharmaceuticals & health-care products, bioinformatics & systems biology, and biosafety, bioethics & biotechnology policies. Further information is available at: <http://www.aimst.edu.my/apacpa2007/index.htm>.

14 – 23 August, 2007 - The Institute of Plant Biotechnology for Developing Countries is organizing a two-week course in modern breeding techniques. The summer course will be held in Ghent, Belgium. Major topics in the field of breeding will be covered, including the latest techniques in breeding using molecular data as a tool, and the use of different kinds of markers in breeding programs. A section will also deal with the commercial aspects of "elite transgenic events" and their specific breeding strategies. For more information, visit: http://www.ipbo.ugent.be/activities/education/brochure_summer_course_2007.doc.

19 – 21 September 2007 - The conference "New approaches to plant breeding of orphan crops in Africa" will be held on September 19-21, 2007 in Bern, Switzerland. Orphan crops, also referred as neglected or lost crops, are crops of high economic value in developing countries particularly in Africa. These crops include cereal crops (such as millet and tef), legumes (cow pea, grass pea and bambara groundnut), and root crops (cassava and sweet potato). Topics to be discussed include techniques that could be implemented in a scheme of orphan crops improvement, and future prospects and feasibility of modern biotechnology in African agriculture. For more information, visit: <http://www.botany.unibe.ch/deve/orphancrops/index.htm>.

CRAWFORD FUND DEREK TRIBE AWARD, 2007 - Nominations are now being accepted for Australia's Crawford Fund Derek Tribe Award. The award is made biennially to a citizen of a developing country in recognition of his/her distinguished contributions to the application

of research in agriculture or natural resource management in a developing country or countries. The winner will attend a seminar, deliver a public address, and undertake a visit of about two weeks to agricultural centres in Australia with the intention of enhancing networking and linkages between the recipient's home institution and country with similar bodies and individuals in Australia. More information at <http://www.crawfordfund.org/events/pdfs/DTAward2007Final.pdf>.