

### **Biotechnology to Improve Paper Strength**

The Consortium for Plant Biotechnology Research (CPBR) has given the grant to initiate work at select research centers to explore possibilities of increasing the fiber length in trees, for stronger paper and structural wood products. Such modifications of wood properties can also improve the ability to pulp the wood and decrease the need for use of expensive and environmentally hazardous chemicals.

The study would identify ways to modify growth and wood properties in trees through genetic modification of gibberellic acid metabolism — one of the main hormones controlling plant development. The researchers have already isolated a major gene in the gibberellic acid metabolic pathway and demonstrated the effectiveness of this approach to control tree size. Altering the wood's economic properties such as the fibers and tree height can increase not only the availability of the product but its market value.

According to the CPBR, world demand for pulp and paper products is expected to increase by 50 per cent in the next 15 years. Nearly all of this increased demand will be met through the use of plantation-grown trees. Improving growth and quality factors of these trees will be instrumental in meeting the demand while at the same time preserving natural forests for environmental and biological diversity.

This and other projects funded by CPBR, will generate economic development through new jobs and value-added crops. The research will also support environmental preservation by encouraging the use of renewable resources. The CPBR is a national, non-profit organization

matching US research universities with companies interested in developing improved products and processes. The research project is innovative and has the potential for contributing towards the commercial, economic and environmental development.

### **Technology Licence may Boost Crop Research**

Commonwealth Scientific and Industrial Research Organization (CSIRO) has entered into a licence agreement with Bayer CropScience over the application of its DNA-delivered RNAi (RNAi) gene silencing technology in certain major crops. The deal is the first licence of CSIRO's patented RNAi technology to a leading agri-biotechnology company. Under the agreement Bayer CropScience acquired a worldwide license to develop, market and sell selected crop plant varieties incorporating the RNAi technology. This collaboration demonstrates CSIRO's commitment to build on its position at the forefront of the RNAi field and to work with partners to commercialise its applications. Using RNAi, CSIRO Plant Industry researchers first demonstrated gene silencing in an organism in 1995. The RNAi technology is a breakthrough technology with potential for application across a number of fields including development of novel traits in plants as well as animals.

RNAi can be used to introduce disease resistance, enhance nutritional qualities and control flowering by removing unwanted gene functions. CSIRO has already applied RNAi to make healthier cottonseed oils for cooking and margarine by 'switching off' genes in cottonseed that would otherwise produce the cholesterol raising trans fatty acids usually made as a by-product of cottonseed processing.

### **Syngenta to Reap Sales Growth Rewards**

Syngenta has announced that it would abandon development of one of its genetically modified crops because of delays in approval. Syngenta and rival Monsanto have withdrawn "Event 77", a jointly developed herbicide-tolerant GM sugar beet planned for the European market. The variety, which was the subject of the UK's field trials on GM crops, is now considered commercially out of date.

Still the company is expecting major gains on account of higher crop prices, a benign subsidy environment and a rebound in Latin America, where sales rose 70 per cent year-on-year. Syngenta reported a 15 per cent rise in sales to \$2.3bn, helped by the weak US dollar. Crop protection sales were up 7 per cent in constant currency terms, boosted by a strong conclusion to the season in Latin America and a good start in Europe, Africa and the Middle East, as well as strong demand for insecticides. Seed sales were up 11 per cent. On the performance of the company, Syngenta expected earnings per share to grow 30 per cent, before restructuring and impairment charges, in 2004, significantly ahead of its previous “high-teens” target. The increased optimism was prompted by a strong rebound in all sectors of the agrochemical market after five years of downturn in the industry, as well as synergies from the merger of AstraZeneca’s agrochemical operations with those of Novartis three years ago. Syngenta’s decision to raise earnings came as US chemicals company DuPont reported a rise in first-quarter earnings yesterday, partly on the back of a rebound in agrochemicals demand.

### **ENGL Extends to New Member States in EU**

A number of national enforcement laboratories from the accession countries became part, of the European Network of Genetically Modified Organisms’ Laboratories (ENGL) recently. The 24 laboratories, which previously had the status of observers, have joined the network, coordinated by the European Commission’s Joint Research Centre (JRC), aimed at managing the detection, identification and quantification of genetically modified organisms (GMOs) in food and feed in Europe. Under the new EU regulations on GM food and feed, the JRC has been given the role of managing the detection methods and their validation. This means that all applications for GM food or feed must go through the JRC, which will test the product, making sure the detection methods are accurate and effective.

EU legislation requires a case-by-case assessment of all GM food or feed applications based on scientific evidence. Only products meeting these stringent requirements will be able to be sold in an enlarged EU. Providing a harmonised GMO detection system across Europe will provide consumers with greater choice and accuracy in selecting food products and boost the

competitiveness of EU biotech companies. The aim of the ENGL, which with the new additions counts 71 control laboratories across Europe as its members, is to create a standardised detection system for GMOs through a platform of experts, who will be encouraged to exchange information and develop a common European strategy.

An enlarged ENGL will greatly improve the network's ability to detect and screen GMOs and provide a sound scientific basis for enforcing biotechnology legislation. Based on EU legislation, inspectors collect and screen food and feed samples for DNA or proteins that indicate genetic modification. If a screening shows the presence of one or more GMOs, regulations require that the amount be quantified. Mandatory labelling of food ingredients is guaranteeing the consumer's right to information. This pan-European network of scientific experts will improve public confidence as well as give consumers the opportunity to choose between products with or without GMOs. Moreover, the ENGL network will further help the development of the European Research Area (ERA) by expanding available scientific excellence and ensuring policy compliance in an enlarged EU.

### **Spain to Ban Syngenta Corn**

Spain, the only European Union country where genetically modified crops are commercially grown, banned the planting of a Syngenta AG corn variety saying it may boost resistance to antibiotics. The Bt176 variety of feed corn will no longer be allowed to be sown or cultivated. Syngenta, based in Basel, Switzerland, has sold the corn in Spain since 1998. Bt176 occupies almost two-thirds of the 32,000 hectares (79,000 acres) of Spanish land given over to gene- altered crops.

Gene-modified foods and crops still arouse suspicion in Europe, where the EU hasn't approved any for commercial use since 1998. A survey published last year found that only 2 per cent of the UK population would eat gene-altered food. In contrast, such foods are now common in the US, the world's biggest biotech producer now challenging the EU's six-year moratorium at the World Trade Organization in Geneva. Eighty-one per cent of soybeans planted in the US last year were altered to make them resistant to herbicides,

according to US Agriculture Department statistics, and a quarter of the corn crop was altered to make it pest-resistant. Gene-altered crops accounted for 3 per cent of Syngenta's sales of \$6.6 billion last year.

Spain's food-safety agency banned Bt176 after the European Food Safety Authority published scientific advice on bio-engineered plants. The Syngenta corn contains a marker gene that the EU agency said should be restricted to field trials, because it may confer resistance to ampicillin, the Spanish agency said. The European Commission hasn't made any decision based on the advice. The European Commission won authority from EU members to end the ban last week and allow the import of a Syngenta gene-modified sweet corn, Bt11. Syngenta has applied for approval to cultivate Bt11 in the EU, Payer said.

Bayer AG last month abandoned plans to introduce its Chardon LL variety of GM animal-feed corn in the UK, saying it wouldn't make money because of conditions that UK government intended to attach to growing the crop.

### **Nigeria Biotechnology Development**

The United States Agency for International Development (USAID) is to invest over N400 million in the development of biotechnology in Nigeria. In a memorandum of understanding between the Federal government of Nigeria, International Institute for Tropical Agriculture (IITA), and USAID signed yesterday in Abuja, the agency will be providing the said funds within the period of three years to establish a Foundation for Nigeria to take advantage of biotechnology to improve agriculture.

The Minister of Science and Technology Professor Turner Isoun who signed the MOU on behalf of the federal government of Nigeria explained that biotechnology in the near future will be the principal technology that will be the scale against which the nations development will be measured Professor. Isoun who also spoke during the opening ceremony of the International Workshop titled Facilitating the Biotechnology potentials in West Africa organized by the National Biotechnology Development Agency, International Institute of Tropical Agriculture, and Tuskegee University with the sponsorship of the United States Agency for International Development

which preceded the MOU signing, explained that any nation that does not take advantage of biotechnology now will pay the price of a significant technological set back in the near future.

### **Labelling to Cost 11 per cent More**

The Bureau of Food and Drugs in the Philippines commissioned a study to explore the possibility of labelling GM crops as part of the consumers' right to know and also to study the costs implications of GM food labelling in the country. The study evaluated the impact of GM food labelling in the Philippines from the standpoint of all stakeholders concerned. Focusing on two GM products, soybean and corn, significant portion of the study examined the cost implications of mandatory GM food labelling in the country and its effect to the farmers, traders and manufacturers, the government, and consumers.

Attendant costs of mandatory labelling of GM food products in the Philippines will be borne in raw material segregation and differentiation at the farm level and in manufacturing. The imposition of mandatory labelling laws will imply an additional manufacturing cost by 11 per cent to 12 per cent. With the increase in raw material and manufacturing costs, even the top earning companies in the country will not be able to absorb the increase. What is expected, however, is that part, if not all of the additional cost will be passed on to the consumers. Regardless of the type of labelling to be adopted, whether voluntary or mandatory, the Philippine government will have to incur regulatory costs in the implementation of a GM labelling policy.

### **Audit Finds Low Level of GM in Maize Seed**

An audit of US-based GM testing laboratory Biogenetic Services Ltd (BGS) by the Ministry of Agriculture and Forestry (MAF) identified that BGS was deficient in several audited areas, including the way it was interpreting and reporting testing results. Subsequent MAF-sponsored tests of BGS-certified seed consignments have revealed a very low level of GM in two of 15 consignments tested to date. MAF has a zero tolerance for GM material in imported seed for sowing. MAF-accredited international laboratories undertake GM testing and MAF routinely audits them to ensure they meet New Zealand's strict testing standards.

The MAF as a precaution chose to retest 15 of 52 consignments of seed material shipped to New Zealand that had been tested by the BGS laboratory since January 2003. These 15 consignments represent about 80 per cent of the volume of seeds in the 52 consignments involved. The test results supplied to MAF by AgriQuality GMO Services in Melbourne showed the presence of GM material at a very low level (less than one GM seed per 2,000 seeds) in two of the 15 consignments tested. The remaining 13 consignments returned negative results. The GM construct in one consignment has been identified as LibertyLink T25. Maize containing LibertyLink T25 is widely grown in the United States and Canada. While this GM construct has been approved by Food Standards Australia and New Zealand as safe for human consumption, MAF has been advised that that the type of maize in question is grown in New Zealand for stock feed and is not used for human foodstuffs. MAF is now endeavouring to re-test the remaining 37 seed consignments previously certified by BGS and shipped to New Zealand, which represent only 20 per cent of the total. MAF will take appropriate action if any of these consignments are found to contain GM seeds.

Crops grown from seeds contaminated with genetically modified material may be grown and exported after harvest rather than automatically being destroyed. The Ministry of Agriculture and Forestry says it will take days to track down hundreds of bags of maize seeds from a consignment imported this year and which might contain small numbers of GM seeds. The accidental release of GM-contaminated seed is New Zealand's biggest, but Acting Biosecurity Minister Marian Hobbs yesterday told Parliament it was not a threat to human health or the environment. She was unable to offer any assurance that farmers who unwittingly planted the seed and might have crops destroyed would be compensated.

The Biosecurity Act covers compensation in the event of a pest or disease outbreak, and liability issues, but it is not clear whether the act can also apply to the release of GM-contaminated material under New Zealand's "zero tolerance" policy for GM contamination. MAF has said that some of the contaminated seed has probably been planted. The seed came into New Zealand after it was passed by a United States testing company which

an MAF audit later found had faulty procedures. The company, Biogenic Services, is no longer allowed to test seed for entry to New Zealand.

### **Research on GM Wheat, Canola and Corn**

Syngenta will continue with plans to develop genetically modified wheat despite a decision by rival Monsanto to suspend its own programme after protests. Monsanto planned to introduce its genetically modified wheat in the United States and Canada, but its efforts triggered opposition by environmentalists, farmers, consumers and religious groups as well as overseas wheat buyers, so the US biotech pioneer said on Monday it had suspended its plans. Syngenta has field trials currently in Germany and Spain for genetically modified wheat, and it will likely take several years for the development of its own product.

Meanwhile Monsanto has also pulled the plug on its genetically modified (GM) canola breeding programmes in Australia following a series of state moratoriums on the practice.

Monsanto would now divert canola investment into other business opportunities in the region where there was a higher degree of certainty. Monsanto may review the situation in 2005 and could change if there was a “significant change” in the environment across the states in the future. The imposition of inconsistent and restrictive trial conditions between states and the delay in trial approvals led to this decision. The suspension follows a NSW government ban on a 3,000 hectares trial of GM canola. It allowed three smaller research trials to test different varieties of the crop against conventional canola. Western Australia and Tasmania have both banned GM crops, while Victoria extended its moratorium recently on the technology by four years. South Australia also has a moratorium in place.

Syngenta has drawn plans to work on GM corn. It has moved for acquiring the rights to a glyphosate-tolerance technology for treating corn from Bayer CropScience. The technology known as GA21 is being used by Monsanto in some of its Roundup Ready corn seed products. It makes the plants resistant to applications of weedkiller so farmers can more effectively control

weeds in their fields. In 2003, there were 12 million acres of RR corn planted in the United States, according to Monsanto. Syngenta said it planned to break Monsanto's monopoly on the market and would start selling GA21 in its branded corn hybrids and through seed company customers in 2005.

Currently Monsanto holds 100 per cent of the glyphosate-tolerant corn market, with products containing the GA21 event holding approximately 30-35 per cent of the market. With GA21, Syngenta will offer customers, including seed companies, a strong alternative choice in the herbicide-tolerant corn market. Syngenta said a recent North Carolina federal district court decision affirmed Bayer's ownership rights to the technology, and Bayer had been licensing Monsanto and Monsanto licensees to produce and sell GA21 for only a limited period of time. But Monsanto said that it holds a patent on the "fundamental technique" used in producing glyphosate-tolerant plants. Glyphosate is a key ingredient used in herbicides and was Monsanto's bread and butter for years through the company's Roundup herbicide until its patent on glyphosate expired in 1999. The bottom line is Bayer did not have a license for the intellectual property owned by Monsanto, and Syngenta does not have a license either, said Monsanto. Monsanto has been phasing out what it called the GA21(R) technology in favour of a glyphosate-tolerant event called "NK603." Syngenta's acquisition of the Bayer technology was one in a series of deals announced by Syngenta. The company is also buying part of Advanta BV's North American corn and soybean business seed company from AstraZeneca and Dutch sugar and foods group Royal Cosun.

### **UNICEF Recommends GM Maize for Zambia**

Genetically modified (GM) maize can be a solution to Zambia's hunger situation if farmers pledge not to plant it, said the United Nations Children's Fund (UNICEF) goodwill ambassador in Lusaka on Sunday. The Zambian government has maintained its earlier position not to accept GM maize offered to Zambia as relief food, saying that the country still lacks biotechnology required managing the effects of products. Zambia has refused emergency food aid from the United States despite being one of the six countries affected by famine in southern Africa.

Zambian officials say the supplies of maize from the United States come from GM crops, adding that they are concerned that GM food aid could be used to grow new crops and so enter the local food chain. This could jeopardize exports to Europe, where GM food is less common than in the United States, they say. Around 3 million Zambians are facing famine after failed harvests. Some Zambians disagree with the government's position. Hungry villagers recently raided a chief's palace and stole GM food, which the authorities were refusing to distribute.

### **Biotechnology Increases Yields**

Researchers from the Marche Polytechnic University, and the University of Verona, in Italy, recently reported that the DefH9-iaaM gene is expressed and biologically active in the Rosaceae species of strawberry and raspberry plants. Angelo Spena, Bruno Mezzetti, Lucia Landi, and Tiziana Pandolfini observed that the DefH9-iaaM gene could be used to improve fruit productivity by increasing the number of inflorescences per plant, and the number of flowers per inflorescence. This, in turn, would result in an increase in the number of fruits per plant.

DefH9-iaaM strawberry and raspberry plants, which were genetically modified and grown under standard cultivation conditions, exhibited a significant increase in the number of fruits produced, the weight and size of the fruit, and the total fruit yield. This was observed in all of the three Rosaceae species tested, namely: *Fragaria vesca*, *Fragaria x ananassa*, and *Rubus idaeus*. Fruit yield increase was approximately 180 per cent in cultivated strawberry, 140 per cent in wild strawberry, and 100 per cent in raspberry.

### **Prioritise AgBiotech Research: FAO Report**

Biotechnology holds great promise for agriculture in developing countries, but so far only farmers in a few developing countries are reaping these benefits, FAO said in its annual report 'The State of Food and Agriculture 2003-04'. Basic food crops of the poor such as cassava, potato, rice and wheat receive little attention by scientists, FAO said. It also says that neither the private nor the public sector has invested significantly in new genetic technologies

for the so-called 'orphan crops' such as cowpea, millet, sorghum and that are critical for the food supply and livelihoods of the world's poorest people.

Other barriers that prevent the poor from accessing and fully benefiting from modern biotechnology include inadequate regulatory procedures, complex intellectual property issues, poorly functioning markets and seed delivery systems, and weak domestic plant breeding capacity. Biotechnology, one of the tools of the gene revolution, is much more than genetically modified organisms (GMOs). While the potential benefits and risks of GMOs need to be carefully assessed case by case, the controversy surrounding transgenics should not distract from the potential offered by other applications of biotechnology such as genomics, marker-assisted breeding and animal vaccines. Agriculture will have to sustain an additional 2 billion people over the next 30 years from an increasingly fragile natural resource base. The challenge is to develop technologies that combine several objectives - increase yields and reduce costs, protect the environment, address consumer concerns for food safety and quality, enhance rural livelihoods and food security, FAO said. Agricultural research can lift people out of poverty, by boosting agricultural incomes and reducing food prices.

More than 70 per cent of the world's poor still live in rural areas and depend on agriculture for their survival. Agricultural research - including biotechnology - holds an important key to meeting their needs. Biotechnology should complement - not replace - conventional agricultural technologies, FAO said. Biotechnology can speed up conventional breeding programmes and may offer solutions where conventional methods fail. It can provide farmers with disease-free planting materials and develop crops that resist pests and diseases, reducing use of chemicals that harm the environment and human health. It can provide diagnostic tools and vaccines that help control devastating animal diseases. It can improve the nutritional quality of staple foods such as rice and cassava and create new products for health and industrial uses.

Research and commercialization data on transgenic crops show that many crops and traits of interest to the poor are being neglected. There are no

major public- or private-sector programmes to tackle the critical problems of the poor or targeting crops and animals that they rely on,” the report said. A large part of the private-sector investment is concentrated on just four crops: cotton, maize, canola and soybean. Six countries (Argentina, Brazil, Canada, China, South Africa and the US), four crops (maize, soybean, canola/rapeseed and cotton) and two traits (insect resistance and herbicide tolerance) accounted for 99 per cent of the global area planted in transgenic crops in 2003, the report said. One of the key constraints many developing countries are facing in adopting and adapting biotechnology innovations is their lack of agricultural research capacity particularly in plant and animal breeding, FAO said.

The private-sector research dominates global biotechnology. The world’s top ten transnational bioscience corporations spend nearly \$3 billion per year on agricultural biotechnology research and development. Private biotech research in most developing countries is negligible. Brazil, China and India, which have the largest public agricultural research programmes in developing countries, spend less than half a billion dollars each annually. The largest international public supplier of agricultural technologies, the CGIAR, has a total annual budget of only about \$300 million for crop improvement. In the few developing countries where transgenic crops have been introduced, small farmers have gained economically and the use of toxic agro-chemicals has been reduced, FAO said. Transgenic crops have delivered large economic benefits to farmers in some areas of the world over the past seven years,” the report said. In several cases, per hectare gains have been large when compared with almost any other technological innovation introduced over the past few decades.

In China, for example, more than four million small farmers are growing insect-resistant cotton on about 30 per cent of the country’s total cotton area. Yields for insect-resistant cotton were about 20 per cent higher than for conventional varieties and pesticide costs were around 70 per cent lower. Pesticide use was reduced by an estimated 78 000 tonnes in 2001, an amount equal to about one-quarter of the total quantity of chemical pesticides used in China. As a result, cotton farmers experienced fewer

pesticide poisonings than those growing conventional varieties. Even though transgenic crops have been delivered through the private sector in most cases, the benefits have been widely distributed among industry, farmers and consumers. This suggests that the monopoly position engendered by intellectual property protection does not automatically lead to excessive industry profits,” the report said. The scientific evidence concerning the environmental and health impacts of genetic engineering is still emerging. Scientists generally agree that the transgenic crops currently being grown and the foods derived from them are safe to eat, although little is known about their long-term effects.

There is less scientific agreement on the environmental impacts of transgenic crops. The legitimate concerns for the safety of each transgenic product must be addressed prior to its release. Careful monitoring of the post-release effects of these products is essential. FAO recommends a case-by-case evaluation that considers the potential benefits and risks of individual transgenic crops. The report says that, while some benefits have been observed, adverse environmental effects have not been detected in commercial production. Continued monitoring is needed, FAO stressed. The report also stresses the need for science-based biosafety assessments. Where crops have not been cleared through biosafety risk assessments, a greater risk of harmful environmental consequences exists. Unauthorized varieties may not provide farmers with the expected level of pest control, leading to continued need for chemical pesticides and a greater risk of the development of pest resistance.

Furthermore, neither private companies nor public research institutes can be expected to develop transgenic crops for poor producers in countries that lack reliable, transparent regulatory procedures. The FAO/WHO Codex Alimentarius Commission has agreed on principles and guidelines for assessing health risks related to foods derived from modern biotechnology. Members of the International Plant Protection Convention are developing guidelines for pest-risk analysis for living modified organisms. These agreements can help harmonize regulatory procedures globally.

### **Four GM Products Removed from Market**

Four products tested positive for traces of Genetically Modified Organisms (GMO) despite labels claiming they were 'GM free' in Cyprus. The State Laboratory made the discovery over the past year during a National Control Programme for the Detection of GMO in Food. The four products – two types of pasta and two soya minces – were subsequently removed from the supermarkets, she said. The State Lab tests food products that go straight to the consumer or raw materials that end up in the food industry. The detection programme first began in July 2003, during which 45 products labelled as 'GM Free' or containing soya and maize were tested. It ends over the next few days and a second annual screening programme will begin shortly. It is expected to test around 50 products over the next 12 months. Foods labelled as GM free must contain no traces of GMOs. Foods containing over 0.9 per cent of GM soya or maize must specify so on their label. If we find traces less than that percentage, we ask for clarification and the company must prove that contamination took place without its knowledge. In this instance, GM soya was found in products labelled 'GM Free'. The GMOs we found are not a matter of public health, but a matter of labelling. (In other words) you won't die if you have consumed these products," she said. According to Eleftheriades the foods were being tested for round-up ready soya and maize BT 176 because they were the most common modifications. They had also been through extensive testing and their use was EU approved. Although the EU's position is that these products are not a public health concern, due to the public reaction to GM foods, the EU has said the consumer has the right to choose whether or not to consume them and has a right to know what foods contain GM products.

Label such as 'GM Free' was a marketing tool to encourage consumers to buy a specific product. Therefore these products are to be tested first because the consumers are to be protected. This includes trusting what is written on a label. The Health Ministry was not concerned about the four products, which tested positive on the market. However, other agencies have started checking products and soon everyone will comply. In this instance the companies themselves didn't know they were selling imported products containing GM soya. Up until recently no one was been checked

and we have only just started making efforts to apply EU legislation on GMOs that came into force on May 1.

**Source:** Checkbiotech.org, April 28, 2004; Checkbiotech.org, April 30, 2004, Checkbiotech.org, May 10, 2004; Checkbiotech.org, May 12, 2004; Checkbiotech.org, May 13, 2004; Checkbiotech.org, May 14, 2004; Checkbiotech.org, May 18, 2004; AllAfrica.com, May 4, 2004 and MAF Press Release, May 11, 2004.