

BioLines

Where Nature and Science Meet

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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 to meet space requirements. It is not the intention of this service to infringe on copyright.

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CONTENTS:

- | | | | |
|---|---|---|---|
| i | S&T key to generating Africa's wealth (1) | i | Bees not fussy over non-GM and GM rape (7) |
| i | Zambia launches its first biotech outreach society (3) | i | Reaching a sensible conclusion on liability (8) |
| i | EU moves closer to lifting ban on GMOs (3) | i | Preserving endangered fish possible with GM (9) |
| i | Amish farmers grow biotech tobacco, potatoes (4) | i | Church nod good for GMOs says Philippine's president (9) |
| i | Biotech sweet corn outsells conventional (5) | i | GAO report: Biotech foods 'As safe as conventional foods' (10) |
| i | Biotech key to EU competitiveness – Italy (6) | i | Events (11) |
| i | Researchers use transgenic trees to help clean up toxic waste site (6) | | |

S&T key to generating Africa's wealth

Dr. Osita Ogbu, Biosafety News (Kenya), Jul 03 (Executive Director, ATPS)

<http://www.biosafetynews.com/co.htm> From AgBioView 25 Sep 03. (shortened)

Last year the African Technology Policy Studies Network (ATPS) took an important first step in marking the African scientific revival day, reminding everyone that June 30 was declared by African leaders, under the auspices of the OAU, now AU, as a day to appreciate what science can do for Africa. ATPS therefore came together with AAS, ACTS, ICRISAT, IPGRI, ICIPE, ITDG, JKUAT, the Government of Kenya and AU to organize this year's event. It was no longer a 1 day event, but a 3-day event involving key policy makers, parliamentarians, students and the private sector with a very strong signal that science and technology (S&T) can only work to Africa's benefit if all the stakeholders understand their various roles. This year, we added a science and technology exhibition to give visual reality to the use of S&T in producing goods and services.

But this was not just a science day; it was a S&T day, the African renaissance day, Africa's innovation day and principally a day to demonstrate that Africa has been using S&T and can use S&T to advance its economic and social reconstruction. Can there be Africa's renaissance without a strong dose of relevant application of science and technology? There cannot be renaissance if there is self doubt, if S&T is not used to improve Africa's competitiveness, and if S&T is not used to interrogate the intricate questions of poverty.

Thus institutions such as the ATPS and others have taken up the mantle to champion the good governance of S&T, to enlighten the populace, journalists, policy makers, parliamentarians, farmers groups and all others in the private sector that without full deployment of S&T, Africa's renaissance will be a dream. But is the message getting across? We think slowly but surely. Science and technology is often seen as an abstraction in Africa without any link to wealth creation. Science is what scientists do and wealth creation is what business and industry do. Where we appreciate the link, we allow all forms of excuses to stand in the way of forging this link in a manner that suggests that Africa has accepted its role as the producer of raw materials and consumers of finished products from the basic to the most technologically sophisticated. In the developed and many developing countries, the link is obvious in agriculture, industry, mining etc. In these countries, while the private sector takes the lead in converting S&T to wealth, the government is charged with providing an enabling environment, fostering partnership and providing the vision.

Africa remains the poorest continent in the world in spite of its natural resource endowment. Falling agricultural export has contributed to Africa's declining share of export trade from 6% in 1980 to 2% at the end of the 1990s. Africa continues to operate at the fringes of new technology such as biotechnology and information and communication technology. Biotechnology is a multi billion dollar industry in the world with enormous potential for wealth creation and ensuring food security. There is enormous potential in bio-pharmacy in Africa, in vaccine production, in application to indigenous foods, in improving yields in raw materials such as cotton. But before biotechnology can realize its potential in Africa, governments must invest in an innovative biotechnology policy that enables them to make intelligent choices that would not depend on what the Greenpeace movement wants or what the EU advocates or what the biotechnology entrepreneurs are pushing from America. Rather, it will depend on the needs and aspirations of the peoples of Africa.

Science and technology led development can only occur when there is a leader willing and ready to champion it. In Africa, this is the critical missing link. A report from the scientists confirmed that the president of Cuba, Fidel Castro, stopped by the laboratory every day for the life of a vaccine project to monitor progress. This singular act was not only a moral booster to the scientists; it gave indication that this was a project with national strategic ramifications. Fidel Castro may not understand the science of the vaccine, but he understood that major breakthroughs do not just happen because you have good scientists.

We have also seen leaders construct crisis in order to propel scientists to greater national feat. We need African presidents to be champions for S&T led development; to chair S&T commissions and be interested in monitoring scientific developments that can lead to major breakthroughs in social and economic transformations of their various countries. We need finance ministers that understand that we need to finance S&T institutions and an enlightened cabinet that understand that science and technology is a vital Ministry that should be equipped to provide leadership across all ministries on the issues of S&T.

We need leadership in the private sector that will transform the work of scientists into products and services and forge the link between industry, the university and other research institutions. We need scientists that are willing to market their ideas and a people that will be devoid of self-doubt and have confidence in the work of its scientists.

QUOTE:

"The greatest evils which stalk our earth are ignorance and oppression, and not science, technology and industry whose instruments when adequately managed are indispensable tools in overcoming overpopulation, starvation and worldwide diseases"

Norman Borlaug, Earth Summit, July 2000

Zambia launches its first biotech outreach society

Biosafety News (Kenya), July 03, <http://www.biosafetynews.com/>

Speaking during the launch of the Biotechnology Outreach Society of Zambia in the capital Lusaka, Dr Bruce Siamasona, an official from the Zambia Cotton Development Trust, told delegates who included scientist from other African countries that; "technology will not wait for us, it is advancing. Therefore if we do not go for it now, it will come to us later, at a price."

Dr. Mumba, the interim Chairman of BOSZ said it was unfortunate that the government snubbed the meeting at the last minute despite having participated in the planning and organization. "We involved the Ministry of Science and Technology in the planning and organization of this meeting. We are surprised that they failed to turn up for the launch without any explanation," said Dr Mumba. But undeterred, Zambian scientists who attended the meeting expressed cautious optimism that the government will change its negative attitude towards agro biotechnology once the society launches an aggressive awareness campaign in the country. "Our priority is to mount an aggressive awareness campaign that will bring all stakeholders on board to discuss all the issues relating to the technology. This is the only way the Zambian public including the government can make an informed choice regarding biotechnology." said Dr. Mumba.

More at <http://www.biosafetynews.com/story1.htm>

SNIPPET: USDA To Require Permits for Plant-Made Industrial Products

The United States Department of Agriculture's Animal and Plant Health Inspection Service (USDA /APHIS) is amending its biotechnology regulations with an interim rule that pertains to plants designed to produce industrial compounds. Movement, field testing or import of these plants now requires a permit. Previously, APHIS allowed companies or institutions to field test, move or import these types of plants under its notification process. According to USDA, biotech plants that produce industrial compounds have used new, less familiar processes and non-food, non-feed traits that no longer qualify for the notification process. Consideration will be given to comments received on or before October 6th.

More information is available at:

http://www.aphis.usda.gov/lpa/news/2003/08/bioplants_brs.html

Global Biotech Science News Sep '03

EU moves closer to lifting ban on GMOs

EUOBSERVER via Agbioview 30 Sept 03

MEPs gave their go-ahead for the lifting of the European ban on GMOs by introducing a labelling system which would enable consumers to choose whether or not to buy GM foods. The EU hopes that by lifting its moratorium, it will ease tensions between the EU and other countries, particularly the US, and the WTO. The US has been hoping for the past 5 years that the EU will lift its moratorium. Until the ban is actually lifted, the US will persevere with its request to the WTO that a panel be set up to debate the moratorium.

Greek Conservative MEP Antonios Trakatellis, who drafted one of the legislation texts approved in July 03 by the European Parliament, told EU observer that Europe's ban on GMOs has caused the European biotechnological industry to lag behind. Although he is pleased with the vote, he would prefer to see improved techniques to detect traces of GM in food and feed. Foodstuffs containing more than 0.9% GM are to be labelled. MEPs are therefore calling on the Commission to submit a report after the implementation of this regulation to check whether loopholes exist and whether it is effective. Mr Trakatellis is confident that EU ministers will accept the text adopted by the European Parliament, thereby opening the door for this legislation to come into force by next autumn.

The new scheme will extend mandatory labelling to products such as oil and sugar, which do not require labelling under the current rules. The legislation will also allow EU countries to take measures to prevent contamination of conventional and organic crops by GMOs. MEPs have also backed EU ministers in calling for any foodstuffs containing more than 0.9% GM to be clearly labelled. However, some think this level is too high. Friends of the Earth had campaigned for much stricter levels of closer to 0.1%. EU agriculture ministers are set to approve the new legislation some time later this month.

Amish farmers grow biotech tobacco, potatoes

AgBioView 25 Sep 03. <http://www.whybiotech.com/index.asp?id=3947> (shortened)

'Amish farmers in Pennsylvania say they can earn twice as much with biotech tobacco'. It may come as a surprise to learn that some Amish farmers, who have shunned innovations like the telephone and electricity, have embraced biotechnology. But in fact, a growing number of Amish in Pennsylvania have been using genetically enhanced seeds because they see them as another tool to help them continue their traditional agrarian lifestyle. "I myself like biotechnology," Amish farmer Daniel Dienner told the Associated Press. "I feel it's what the farmers will be using in the future." Dienner is one of about 550 Amish farmers in Pennsylvania who have been growing a GM, nicotine-free tobacco crop since 2001. Other Amish farmers have been growing a biotech potato, which is resistant to pests and viruses, on a test basis. The biotech tobacco has been commercialized by Vector Tobacco and is used in Quest cigarettes, which are designed to help smokers quit the habit. Dienner says Vector Tobacco has been paying about \$1.50 per pound for the nicotine-free tobacco, nearly double the 80-cent-per-pound rate for traditional tobacco. The increased income GM tobacco can earn up to \$3,500 per acre compared with \$300 to \$400 per acre with maize has allowed more farmers to continue farming.

"Without tobacco, I wouldn't be at it anymore," one Amish farmer told the Associated Press. "We have a 3-year contract. I wish it would be 10 years." Amish scholars say GM crops are not inconsistent with the simple life that is central to Amish beliefs because it helps them continue their ties to agriculture, allowing families to work together. Dienner, his wife and their 7 children hand-plant the biotech tobacco seedlings provided by Vector. They harvest the plants together and strip the leaves from the stalks and hang them in their barn to dry. "It teaches a whole family to work," Dienner told the Associated Press. Amish scholar Steven M. Nolt, an associate professor of history at Goshen College in Indiana, said he can't think of a reason why biotechnology would present a conflict with the Amish way of living. "If it helped them to keep on farming small-scale farms, it would present a benefit," he said. "They don't dislike technology per se. They just avoid those technologies that might cause a diminishing of their family life or other strongly held beliefs." "Amish law doesn't say anything about growing GM tobacco," added Dienner in an interview with Wired magazine.

Followers of the Amish religion, a division of the Christian Mennonites, or Anabaptists, interpret the Bible literally and follow a set of unwritten rules of the church known as the Ordnung. The Amish tradition differs from many other modern religions in that its faith is combined in its entire culture. To preserve their culture and lifestyle, the Amish try to avoid what they consider outside negative influences. But their reasons for avoiding specific technologies should not be mistaken for a complete shunning of all technology. For instance, some Amish are willing to use telephones in public places, but they don't want them in their homes. And some have adopted modern farming technologies such as milk-cooling systems. But many fruits of technology are avoided because they conflict with basic tenets of the Amish religion: devotion to God, separation from the outside world, self-sufficiency and closeness to nature.

Biotech proponent, Amish descendant Klaus Ammann, a field botanist and director of the Botanical Garden at the University of Bern and who spoke at the Biotechnology Industry Organization annual conference in June 2003, has firsthand knowledge of some Amish farmers' willingness to adopt technology. He is a vocal proponent of the benefits of biotechnology and as a specialist on biosafety he says he cannot detect any reason why organic farmers should not adopt modern breeding technologies. Ammann's family is related to Jakob Ammann, the founder of the Amish sect that began in Switzerland in the 17th century. Over the years, Klaus Ammann has developed ties with Amish communities in Pennsylvania. "As farmers, they do not reject technology out of hand but instead examine every innovation closely in an effort to determine whether it might pose a danger to their religion or way of life," said Ammann in a 2001 International Food Policy Research Institute conference. Ammann confirms that the Amish are very curious about other technologies that might help them preserve their farming way of life. And because of his own belief that biotechnology has much to offer, Ammann has spoken at length about growing biotech crops with his Amish friends. "To my amazement, they decided to test samples of GM seeds soon afterwards," said Ammann. Ammann is quick to point out, however, that not all Amish are open to biotechnology. "But the key thought is that they have an active spirituality and do not depend on any kind of 'new green religion' ~ they decide on their own," he said.

Biotech sweet corn outsells conventional

AgBioView 25 Sept 2003. <http://www.whybiotech.com/index.asp?id=2050> (shortened)

Ontario farmer's "model farm" helps inform the public about the risks and benefits of different farming methods. Stop by Jeff Wilson's farmer's market an hour from Toronto, and you might leave with more than tomorrow's dinner. The surrounding fields also offer a ground-level look into biotechnology and comparative farming practices to those willing to get their feet dirty. That's because Wilson's Birkbank Farms is a living blend not only of sweet corn and potatoes and ripe berries, but also of different growing methods - conventional, biotech, organic. For the last several years, he's worked with researchers from the University of Guelph to grow trial plots using all 3 methods, and observe, test (and, of course, taste) the results.

He's passionate about the research, and wants to get non-farmers involved. So a few years back, drawing on his landscape architecture degree, Wilson sliced a 2.5 mile self-guided walking trail through his fields. Today a steady stream of interested people, including tour groups from as far away as China, come for a closer look at the challenges and trade-offs involved in growing food. If his visitors are expecting a pleasant pastoral stroll, Wilson's happy to set them straight. He hopes that the trail, which he's nicknamed "The Good, the Bad and the Ugly" for its warts-and-all approach, helps demystify both the science behind tools like biotechnology and, in the process, farming itself. "This isn't the agricultural equivalent of a petting zoo," he says. "It's a working farm, and I want people to see what it takes to produce food in a real context."

The trail takes his visitors through fields of sweet corn, for example, one of the farm's biggest crops. Wilson grows conventional maize and a biotech version called "Bt." Bt corn helps farmers control pests. As it grows, it releases a pesticide used by organic farmers that kills hungry bugs like corn earworm and the European corn borer by releasing a natural protein that shuts down their digestive systems without the need for chemical sprays. Wilson says it's an especially valuable tool in his neck of the woods, where corn earworm's never in short supply. "We'd have a 90% infestation rate if the maize wasn't protected, either by the Bt protein or by chemical spraying." Signage around Wilson's conventional corn acreage describes how he applies as many as 5 to 7 chemical treatments per growing season to keep the corn bug-free.

People hate being preached to, Wilson says, and he doesn't push too hard on advocating one farming method over another. But he hopes that from examples like his sweet corn, people open up to the idea that farming decisions involve trade-offs. Not planting biotech corn in places where it can help, for example, often means more chemical usage. Or, alternatively, a better chance that there's something small, voracious and unpleasant crawling in your ear of corn. It's a message that's apparently getting through. Back in his market, where the sweet corn is separated out and labeled by type, Wilson's Bt maize outsells the conventional variety by about 5 to 1. People are sold by the environmental benefits the maize can offer, Wilson says, the reduced chemical use and the fact that more "non-target" insects (such as the Monarch butterfly) survive in Bt fields. But they come back to buy it a second and third time because it also tastes great. "When voting with their dollars, people are pragmatic," Wilson says. "They don't want to be told to buy biotech foods or not to buy them. They want information, then they'll make their decision based on taste, price, safety and nutrition."

Field Research

Having grown up on another Ontario farm that's now a sewage treatment plant, Wilson knows that fewer and fewer people, however, have much of a connection to farming and how the food they eat was grown. He's concerned how that affects the debate around biotechnology and other farming issues. But that just gets him more fired up about his own field research, and the crowds that watch the corn grow along his walking trail. "I'm a curious person, and other people find this stuff interesting too once they're exposed to it," Wilson says. "Let's get out in the field and see what works."

Biotech key to EU competitiveness - Italy

EuropaBio, Brussels, 23 Sep 03 <http://www.europabio.org> (shortened)

Italy, as President of the EU, is urging other EU Member States to recognise the importance of biotechnology as a key tool to making European industry competitive. Ministers were discussing the EU's biotechnology strategy and action plan at this week's Competitiveness Council. The biotech plan aims to push biotechnology as one way of helping Europe's ailing economy to become the world's most competitive by 2010. The strategy sets out 30 actions for Member States, Science, Society and Industry to follow. The Presidency would like to see that all parties now start implementing this strategy. Commenting on the outcome, Feike Sijbesma, Chairman of EuropaBio said: "It is very important that Member States take the decisions needed to build the biotech arena, for example, 8 Member States have still not implemented the biotech patents directive."

The European Commission proposed the EU strategy on biotechnology in Jan 02 when it became apparent that EU industries could benefit from using new biological systems to produce food, drugs, and new therapies for diseases including those that treatment has eluded in the past. Biotechnology is also being used to make lots of other products like detergents, plastics, paper and pulp. The European Commission estimates the market to be worth EUR 2000 billion by 2010.

No industry will be left untouched by biotech, the pharmaceutical, agricultural and fast moving consumer goods markets are all using the technology today. "Biotech is an important technology for the development of Europe's major industries to engineer new products, processes and pathways," says Feike Sijbesma. "More Member States might follow in the tracks of the UK and others, and agree to a national biotechnology strategy to boost growth and jobs. We'd like to see Ministers developing a coordination mechanism to help different ministries and countries to do this. Because biotechnology cuts across so many sectors, we believe this merits a special discussion in itself at next Spring's European Council."

Researchers use transgenic trees to help clean up toxic waste site

Science Letter, NewsRx.com, 29 Sept 03. (Fr Agbioview 27 Sep 03)

Can GM cottonwood trees clean up a site contaminated with toxic mercury? A team of researchers from the University of Georgia, in the first such field test ever done with trees, is about to find out. The results could make clearer the future of phytoremediation, a technique of using trees, grasses, and other plants to remove hazardous materials from the soil. UGA scientists and city officials in Danbury, Connecticut, planted on 16 Jul 03, some 60 cottonwoods bearing a special gene at the site of a 19th-century hat factory in that northeastern city. "We hope to see a significant difference in the levels of mercury in the soil within 18 months, perhaps as much as a twofold reduction," said Richard Meagher, professor of genetics at UGA. The field test is a collaboration between UGA, Western Connecticut State University, Applied PhytoGenetics, Inc., of Athens, Georgia, and the City of Danbury.

While the technology now being used in Danbury does not apply to all sites, mercury pollution is a pervasive problem in Georgia as it is elsewhere. The site of a former chemical factory near the southeast Georgia city of Brunswick, for example, is polluted with mercury and other toxic chemicals. Mercury contamination has been reported around the sites of former gold mines in north Georgia, and advisories have been issued during the past decade for mercury-contaminated fish in more than 80 streams, lakes, and creeks in the state. Meagher's team did the first-ever field trial of a GM plant to sequester mercury when it grew transgenic tobacco in a New Jersey field trial in 2001, but this is the first such trial using trees, whose larger root systems and year-round life cycle makes them better candidates for long-term cleaning of polluted soil.

Phytoremediation is a relatively new field and one gaining international interest. A team of photographers working for the National Geographic Society, for instance, recently spent considerable time with Meagher capturing on film his work as part of a 4-part documentary that will be aired some time next winter. Meagher has for more than a decade been a pioneer in phytoremediation, and he was the first to demonstrate that a gene called *merA* can be inserted into plants and used to detoxify mercury in the environment. While no plant can break mercury down, since it is an element, less toxic forms can be created, and that has been the goal of Meagher's lab: to find ways

to let plants or trees grow on polluted sites, draw such heavy metals as mercury into the plants themselves, and then either transpire the much less toxic forms of the metal into the air where they are quickly diffused or trap the metal aboveground for later harvest.

The project with Danbury came about because Danbury's environmental coordinator, Jack Kozuchowski, had published in 1977 a study that showed how native plants could transfer mercury from contaminated soils into the atmosphere. Kozuchowski, aware of Meagher's work, convinced officials in Danbury that the so-called Barnum Court site in that town would be a perfect site for a field trial of the GM trees that Meagher and his collaborator Scott Merkle developed. The city was awarded a grant of some \$55 162 from the Environmental Protection Agency to explore use of the technology, and the trial was set up, though most costs for the work are being borne by those involved in it. "It is our hope that the research will lead to a cleansing of the Barnum Court property so the city can transfer the property for development," said Mark Boughton, mayor of Danbury.

Meagher's mercury phytoremediation technology is exclusively licensed to Applied PhytoGenetics, or APGEN. The company has been instrumental in helping set up the field trial. (Meagher is a consultant to and cofounder of APGEN.) Postdoctoral associate Andrew Heaton of Meagher's lab and one other of Meagher's students traveled to Danbury in Jul 03 to supervise planting the GM trees on the site in enclosed plastic containers buried on the site. Because the mercury on the site ranges, depending on location, from 5 to more than 300 parts per million, trials were set up to measure the effects of the cottonwood trees on progressively more polluted samples of soil. Forty-five plots, most planted with 4 trees each, are located on the site, which is in a mixed-use urban area and whose total area is less than an acre. (Some 15 plots have 4 *merA* trees, 15 are nonengineered or "wild-type" trees, and 15 received no trees at all, so there are 120 trees in the field test.)

The form of mercury at the Danbury site is ionic mercury, a species that can be sequestered and transformed into less toxic metallic mercury in the transgenic trees and then transpired into the atmosphere. (Several forms of mercury were used in hat-making in the 19th century, but their toxic effects often sickened workers, hence the phrase "mad hatter," which described the process of neurological degeneration that came from working with the metal. In this part of New England, the symptoms of mercury poisoning were called the "Danbury shakes.")

Meagher's lab actually has 2 genes that can effect phytoremediation, *merA* and *merB*, but since the *merA* is active on ionic mercury, the cottonwoods trees chosen for the Danbury trial express the *merA* gene. "This is a field test, not a cleanup," said Meagher. "And we will be measuring mercury in both the soil and the trees to see just how much success we have in reducing the mercury levels in the soil. We are very optimistic that this technology will work."

While the trees at the site will have to be watered, the costs of that pale in comparison to traditional clean-up methods: digging up the polluted soil and hauling it off for storage at another site, possibly greater than \$1 million. A team of researchers from Western Connecticut State University will be studying the role of soil microorganisms in the potential clean-up of mercury on the site. According to the City of Danbury, the field test will run through the 2004 growing season, and if results are positive, GM cottonwood trees will be used to clean the whole site.

Bees not fussy over non-GM and GM rape

From Agbioview 27 Sep 03, <http://www.agbiotech.net/> (shortened)

A study of the foraging behaviour of various bees showed that they did not discriminate between GM and non-GM rape varieties. Jacqueline Pierre of INRA and her colleagues studied honeybees, bumblebees, solitary bees and Diptera on two conventional varieties of rape and their herbicide-tolerant GM counterparts. Similar insect numbers and behaviour were found, and the equivalent plants showed similar nectar volume, nectar sugar concentration and composition.

Pierre explains that the introduction of a new gene in the genome can induce "collateral" phenotypic effects named pleiotropic effects which cannot be foreseen. "In the particular case of the transgene conferring resistance to herbicide, there was no reason it should induce modifications in the plant leading to a discrimination of the GM plants by the foraging insects, because that gene does not concern resistance to insects. Nevertheless, it was necessary to verify if that gene had no pleiotropic effects having incidences on the foraging behaviour or the health of the honeybees.

The pleiotropic effects leading to a potential discrimination between transgenic and non-transgenic varieties by bees are: the number of flowers produced, their earliness in blooming time, their nectar and pollen production (qualitatively and quantitatively), the shape of the flower. At the beginning of our research some transgenic lines of several transgenes seemed to produce more flower and more nectar, which was not further confirmed (unpublished), that is why we very carefully studied the herbicide tolerant transgenic lines."

Pierre's research suggests that bees and other insects move freely from one rape plant to another, regardless of their GM status. "In that case, for honeybees and other pollinating insects there is no difference between GM and non GM plants, which means that they can fly from a GM flower to a non-GM flower and transfer the GM pollen easily to the non GM flowers." Pierre points out that it could be different in other cases: pointing out that her earlier research shows that when the flowers are different in shape, the honeybees specialise on particular shapes.

The issue of isolation distances for GM crops from non-GM crops has attracted much interest. Pierre says that "all varieties of oilseed rape (OSR), even non GM, having some specificity in their production (oil quality and so on) are produced in isolated fields in order to warrant their purity. It is the law." While GM rape is not commercially grown in France, there are already protocols for limiting unwanted hybridization." In France, presently the obligatory isolation distance is 200m for pure lines seed production, 400m for hybrid seeds production of conventional OSR but generally seed producers prefer 500 m or 1000 m isolation distance, as far as possible," says Pierre. "Nothing has been decided about GMOs but in our scientific experiments the distance is often 1500m."

What do GM crops mean for honey producers? Pierre says that in their experiment," there was neither difference in nectar production between GM and non GM plants nor in insect foraging behaviour. So, that transgene has no particular commercial implications for honey production." However, some conventional varieties are nectar-poor, which means that the oilseed rape honey production is impaired, "especially in countries where oilseed rape is, at spring, nearly the only source of nectar." She says that plant breeders are generally aware of the importance of nectar levels, especially for hybrid seed production where pollen transfer by insect pollinators between male and female plants is necessary. "Since 1978, Michel Renard and his team have demonstrated that it was very important to select female lines having sufficient nectar production in order to ensure similar bee frequentations of male and female plants by bees." Production of lines with sufficient nectar should keep honey farmers happy too.

Pierre says that it is important not to generalise from this research that GM plants have no impact on pollinator behaviour. "In GM plants, a case by case approach is absolutely recommended," she says. Few plants species and genes have yet been studied for their effects on pollinating insects. The paper, Effects of herbicide-tolerant transgenic oilseed rape genotypes on honeybees and other pollinating insects under field conditions, by J. Pierre, D. Marsault, E Genecque, M. Renard, J. Champolivier and M.H. Pham-Delègue appears in Entomologia Experimentalis et Applicata 108, 159-168.

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Reaching a sensible conclusion on liability

National AgLaw Centre & NZ Herald, 27 Sep 03

At a time when the subject of liability for possible adverse events caused by GMOs is again making headlines, readers will find the paper by Drew L. Kershen, Earl Sneed Centennial Professor of Law from the University of Oklahoma, a useful discussion of the issues inherent in reaching a sensible conclusion. Kershen argues that there appears to be no good reason why GM crops should be singled out for special treatment when there are other, just as technologically challenging, methods of crop development which have not been similarly encumbered in the past. In Europe, NZ and the US, producers and users of agricultural biotechnology are subject to the usual rules of civil (legal) liability that apply to all persons and products. Specifically, if a producer or user of transgenic crops or animals causes damage to the property, person or markets of another person, the producer or user may be liable for those damages."

After hearing submissions from both those who oppose agricultural biotechnology and those who support it, the Royal Commission said: "From a legal liability perspective we have not been persuaded there is anything radically different in genetic modification as to require new or special remedies." (RCGM Report 12.2). Minister for the Environment, the Hon Marian Hobbs confirms that anyone who caused injury or damage through use of a GMO could be held liable whether or not they were insured. If there was any possibility of significant harm to the environment or human health, the expert independent regulatory authority, ERMA, would not approve the application for release in the first place.

Preserving endangered fish possible with GM

Nature Science Update, 30 Sep 03 via The Life Sciences Network. 30 Sep 03

A new technique that speeds up the production of GM fish could help to preserve endangered species such as Atlantic salmon and Gila trout. So far the trick has been used to nurture GM trout cells into live fry. "Other researchers will now double their efforts to get this to work in other species, like zebrafish," says fish biologist Brendan McAndrew of Stirling University, UK. Small transgenic zebrafish are commonplace in the lab, where they help researchers to study the effects of genes on development. Larger species have been modified for commercial gain, salmon have been altered to grow larger and survive low temperatures. But production techniques are time-consuming, expensive and unpredictable.

Methods that work in mice fail to produce fertile fish. "We can't convert fish embryonic stem cells into eggs and sperm," explains Goro Yoshizaki from Tokyo University of Fisheries. Instead, Yoshizaki's team extracted primordial germ cells (PGCs), which only give rise to sex cells, from the gonads of immature fish. The team implanted up to ten PGCs, modified to make a fluorescent green marker protein, into the body cavity of 74 freshly hatched rainbow trout (*Oncorhynchus mykiss*). In 16 of the fish, the cells migrated to the gonads, where their green glow revealed them turning into eggs or sperm. After normal fertilization, 4% of these sex cells developed into live fry. The success rate is low, but could be improved by implanting PGCs into sterile fish, Yoshizaki speculates. The technique is twice as fast as conventional methods, in which GM fish are selected after an extra round of breeding. "It used to be a long process," says developmental biologist Yaniv Hinits of Kings College London. Trout take a year to mature and spawn only annually.

The method may help to safeguard endangered fish. Fish eggs and embryos are too large to survive cold storage, so there is no way to preserve them. PGCs are smaller. "It should be possible to freeze and revive them," says McAndrew. Stored PGCs could even be matured in surrogates of another species, Yoshizaki adds. The cells may also help to feed the world's sushi habit. Tuna PGCs, for example, could be transplanted into sterile mackerel. The smaller fish are cheaper to house and could produce large numbers of tuna sperm and eggs quickly. Juveniles could be reared in a hatchery and released into the sea, says Yoshizaki.

Church nod good for GMOs says Philippine's president

Manila Time, Agence France-Presse, 29 Sept 03 (shortened)

http://www.inq7.net/brk/2003/sep/29/brkpol_4-1.htm

Use of GMOs, including seeds will get a boost in the Philippines following a Vatican explanation that they are not sinful, said President Gloria Macapagal-Arroyo. Arroyo said this was clarified to her in a talk with Vatican State Secretary Angelo Cardinal Sodano after her audience with Pope John Paul II at the weekend. In a statement in Rome which was released in Manila, the President said, "we have our policies on GMOs and I think what's important now for opposers is that the Vatican said that GMOs are not immoral." She said this explanation would be used in government information campaigns on GMO seeds in the largely Roman Catholic Philippines. The government has approved the use of GM seeds in the Philippines. However leftist and environmental groups have opposed the propagation of such GMOs, citing Catholic bishops' support for their campaign. Ms Macapagal-Arroyo said Cardinal Sodano clarified that while the Vatican considers human cloning as immoral, it does not condemn GM agricultural products. With the issue of morality out of the way, "we will address the concerns of the oppositors by making sure the safety concerns are addressed," she said. She visited the Vatican as part of a 5-day trip to the US and Europe.

GAO report: Biotech foods 'As safe as conventional foods'

whybiotech.com via Agbioview 30 Sep 03 (shortened)

The investigative arm of the US Congress says biotech foods pose no long-term health threats and that safety tests are adequate. A recently published US government report concludes that foods produced using biotechnology are as safe as conventional foods. There is no scientific evidence to suggest that they pose a long-term health risk to consumers, the General Accounting Office (GAO) report said. The report "Genetically Modified Foods: Experts View Regimen of Safety Tests as Adequate, but FDA's Evaluation Process Could Be Enhanced" recommends modest changes to the process used by the US Food and Drug Administration (FDA) to evaluate new biotech foods.

A cross-section of experts, from consumer groups, research and academic institutions, regulatory bodies and industry, contributed to the report published by the GAO, Congress' independent investigative arm. "experts believe that the current regimen of tests has been adequate for ensuring that GM foods marketed to consumers are as safe as conventional foods," said the report. Its conclusions support the consensus view that while biotech foods are not risk-free since all foods pose at least some potential threat to human health - the risks are the same as those posed by nonbiotech food products. Through their own research, the National Academy of Sciences and other respected scientific groups have reached similar conclusions. "Foods from GM plants pose three types of risk to human health: they can potentially contain allergens, toxins, or antinutrients," the GAO report said. "These risks are not unique to GM foods. People have consumed foods containing allergens, toxins and antinutrients throughout history"

Every new biotech food undergoes rigorous testing by its manufacturer and review by the FDA to ensure it's safe within those three categories of risk, the report notes. This process can take anywhere from 18 months to 3 years, depending on how similar the food is to other products that have already been approved. FDA review is managed by a 'biotechnology evaluation team' composed of a consumer safety officer, molecular biologist, chemist, environmental scientist, toxicologist and nutritionist. Among the experts contributing to the GAO report, even those opposed to biotechnology on ethical or other nonscientific grounds agreed that the FDA evaluation process is adequate for assessing safety.

In fact, the report points out that biotech foods may be safer than conventional foods in that they are more thoroughly tested. Many naturally occurring toxins, for example, such as the substance tomatine in tomatoes, are often disregarded in conventional foods but carefully measured in the premarket safety assessment of biotech varieties. The report recommends that the FDA enhance its oversight role in two ways: first, by randomly verifying the raw data companies provide about new products (currently the agency reviews summaries of that data) and, second, by doing a better job of informing the public about its evaluation process and the scientific rationale behind its decisions.

The FDA has proposed changes to make its approval process clearer to the public. The agency also wants to make FDA review mandatory for all new biotech foods entering the marketplace. FDA review is currently voluntary, but all manufacturers have voluntarily submitted their products for review. As biotech foods grow more complex with multiple beneficial traits of maize, for example, that is both insect resistant and contains higher levels of vitamin E, premarket testing procedures will need to improve. The report concludes that there's no reason to specially monitor biotech foods long-term because there's no evidence of heightened risk. Monitoring the long-term health risks of GM foods is generally neither necessary nor feasible, according to scientists and regulatory officials we contacted. In their view, such monitoring is unnecessary because there is no scientific evidence, or even a hypothesis, suggesting that long-term harm (such as increased cancer rates) results from these foods.

DID YOU KNOW?

Microbial rennet is a product of GM used to make hard cheeses

Events

19 – 23 April 04: GMO biosafety & risk assessment workshop - A workshop entitled "Introduction to biosafety and risk assessment for the environmental release of GMOs: Theoretical approach and scientific background" will be held in **Trieste, Italy**. Organized by the International Centre for Genetic Engineering and Biotechnology (ICGEB), the closing date for applications is on **10 Nov 03**. See <http://www.icgeb.org/~bsafesrv/bsfn0309.htm#anchor442802> or contact courses@icgeb.org for more information.

26 Sep – 1 Oct 04: International Crop Science Congress – Queensland, Australia. The 4th International Crop Science Congress entitled "New directions for a hungry planet" will review and harness the best science in all disciplines that must be integrated to achieve sustainable development in the great cropping systems that feed the world. <http://www.crops2004.com/>

Quote:

With respect to biotechnology: "The situation is more disturbing in the UK than anywhere else in the world. The untruths, lies and lack of orchestrated information make it almost impossible for the average person to make an informed decision."

Dr Richard Flavell, Ex-director, John Innes Centre in Norwich, UK,
The Guardian, 25 Sep 03