

GENETICALLY MODIFIED TREES

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A large number of scientists are actively working on genetically modifying trees, to better serve industry's economic aims. Field trials are already being carried out in a number of countries and GM poplars have already been released in China, regardless of the dangers that all this implies for the world's forests. This bulletin is aimed at sharing some of the information available and at urging concerned people to involve themselves in this issue. A good starting point would be to sign the petition for a Global Ban on GM trees (available at <http://elonmerkki.net/dyn/appeal/>), which will be presented next month at the Conference of the Parties of the Convention on Climate Change, in Buenos Aires, Argentina.

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OUR VIEWPOINT

- The release of GM trees must be banned

Ever since Western forestry science defined forests as predominantly wood-producing entities, efforts have concentrated on increasing productivity of one single product: wood. Diverse forests were simplified, by weeding out all the species that industry was not interested in, while promoting the absolute predominance of "valuable" trees in the forest.

From that reductionist approach the following step appeared to be obvious: to substitute forests by large stands of fast-growing monoculture tree plantations. During the last decades, a few species of eucalyptus, pines and acacias began to cover large areas of what had previously been forests or grasslands, thus substantially reducing forest biodiversity and appropriating local peoples' lands and livelihoods. They were defined as either "forest plantations" or "planted forests", thus concealing the fact that they had nothing in common with forests and, more importantly, hiding their massive negative social and environmental impacts.

But that was not enough. Industry wanted more, so the next step was to initiate a genetic selection process, whereby only some genetic traits were considered, such as fast growth, height, diameter, wood quality, and straight trunks with few branches. The genetic base of the chosen tree species was thus further impoverished. Very soon those "super-trees" began to be cloned and plantations became single-species and clonal at the same time.

Within that logic, there was nothing more evident than the need to go a step further into genetically modifying trees to make them even more amenable to industry.

However, the dangers of genetically modified (GM) trees are in some ways even more serious than those posed by GM crops. Trees live longer than agricultural crops, which means that changes in their metabolism may occur many years after they are planted. At the same time, trees are also different from crops in that they are largely undomesticated and scientists' knowledge about forest ecosystems is poor. This implies that the ecological and other potential risks associated with GM trees are far greater than in the case of crops.

Additionally, GM trees would exacerbate the impacts of the large-scale tree monoculture model which is being increasingly challenged by local communities and organizations throughout the world precisely because of its impacts. Water would be depleted more quickly by faster-growing trees; biodiversity would be further destroyed in biological deserts containing trees engineered to be insect resistant, flowerless, fruitless and seedless; the soil would be destroyed at a faster rate through higher biomass extraction, intensive mechanization and increased agrochemical use; more communities would be deprived of their means of livelihoods and displaced to make way for even more of these "green deserts".

For those and many other reasons, the World Rainforest Movement and Friends of the Earth International decided to produce a report on the GM trees issue, which has now been finalized and its findings will be presented during the Conference of the Parties of the UN Framework Convention on Climate Change next month in Buenos Aires, Argentina.

The main reason for having chosen that venue is that at its last meeting in late 2003, the Convention on Climate Change explicitly allowed the inclusion of GM trees to act as "carbon sinks" within the framework of the Kyoto Protocol's Clean Development Mechanism. That grave decision was taken at the last minute, with practically no discussion or participation from concerned groups and governments. That totally unexpected and dangerous outcome means that now this

Convention not only supports the expansion of monoculture tree plantations supposedly to act as "carbon sinks", regardless of their negative social and environmental impacts, but allows those same plantations to be composed of GM trees, thus multiplying the impacts and adding new risks and uncertainties.

Together with many other groups, in Buenos Aires we will therefore call upon all governments present at the Conference of the Parties to the Convention on Climate Change to change course on this issue and to ban the release of GM trees.

PS. The WRM-FoEI study, carried out by researcher Chris Lang ("Genetically Modified Trees: the ultimate threat to forests"), is being published in English and Spanish and will be soon available in the WRM web page at: <http://www.wrm.org.uy/publications/index.html>, and in the FoEI page at <http://www.foei.org/publications>. It will also be available in printed format in those languages at WRM and FoEI offices and all our readers will be informed once they become available.

THE GM TREE SCENARIO

- Resistance is fertile: Protests against GM trees

Forestry scientists working on GM trees often point to the number of field trials of GM trees worldwide as evidence that the technology is increasingly accepted. In fact the reverse is true. As the number of experiments increases so does the strength of the resistance against GM trees.

Much of the media attention on protests against GM trees has focussed on a handful of actions by small groups of activists calling themselves names like Reclaim the Seeds or the Genetix Goblins. In the past six years, activists have destroyed 12 GM tree trials, in Britain, Canada and the US. In the US, the Earth Liberation Front has burned down offices and research laboratories.

Industry and scientists responses to destruction of GM trials and property focus on the damage caused and portray the protesters as irresponsible, ignorant vandals. Their responses tend, predictably, to play down the risks that their research might inflict on people and their environments.

In 1999, protesters in England cut down 152 GM poplars at agrochemical company Zeneca's Jealot's Hill research station. Zeneca spokesperson Nigel Poole appeared almost tearful. "The bark has been stripped from the trees. These poor things are now dying a slow death," he told The Times newspaper. Apparently Poole had forgotten that Zeneca planted the trees in order that they could be chipped, boiled, pulped and made into paper.

When some of his GM tree trials were destroyed in March 2001, Oregon State University's Steven Strauss tried to reassure the public that "It's all regarded as highly safe. These people pronouncing it dangerous lack expertise and are uninformed."

"The violent guys just don't understand the science," Strauss told Associated Press.

Many people and organisations are involved in other types of activities against GM trees. Protests against GM trees have taken many forms and have included banner hangs, press conferences, meetings, letters to newspapers, petitions, articles, campaigns to persuade companies not buy products from GM trees, research into the companies and institutions involved, and campaigns for GMO free zones.

Probably the first alliance of NGOs formed to oppose GM trees was the GE Free Forests Coalition (GEFF), formed in Britain in April 1999. Three months later, GEFF organised a demonstration at IUFRO's Forest Biotechnology '99 conference in Oxford.

Steven Strauss commented, "The scientists at the meeting scratched their heads and wondered how science and 'society' could be so out of whack in Europe." Meanwhile, ordinary people were wondering how long the scientists must have spent locked away in their laboratories to be surprised that genetic modification was a controversial issue.

Resistance to GM trees continues to grow. In the US, around 80 NGOs have signed on to a statement titled: "A Common Vision for Transforming the Paper Industry". The Common Vision emerged from a November 2002 meeting of more than 50 NGOs working on paper, pollution and forest issues. The Common Vision includes a demand to the paper industry: "Stop the introduction of paper fiber from genetically modified organisms, particularly transgenic trees and plants with genes inserted from other species of animals and plants."

Several countries have placed outright bans or moratoria on GMOs, including Algeria, New Zealand, Peru, El Salvador and Australia (except Queensland and the Northern Territory). In addition, several regions in Europe and three counties in the US have voted in bans on GMOs. Thailand has banned 49 GM plants.

Around the world environmental and social justice organisations are campaigning for legislation to ban GMOs from their countries, provinces, states, towns or counties. GM free zones have appeared all over the world, including the US. In November 2004, Marin County, north of San Francisco, joined California's Mendocino and Trinity counties in banning GMOs.

In December 2003, the Austrian province of Kärnten passed a law which stated that GMOs cannot be planted within three kilometres of natural and cultural areas that are worthy of protection. Approximately 20 per cent of Kärnten's land is organically farmed. On the grounds that organic farming is worthy of protection, in practice the authorities will give no permits for planting GMOs.

In Britain, 14 million people live in areas with a GM-free policy. Twelve counties have passed GM-free resolutions in addition to more than 30 towns, cities, districts and national park authorities. In France, more than 1,250 mayors have issued GM free declarations for their towns. Friends of the Earth Europe is running a GMO-free Europe campaign, aimed at supporting regions to go GM-free (for more information, see <http://www.foeeurope.org/GMOs/gmofree>).

People opposing GM trees are linking up with organisations around the world: with networks that have opposed the spread of GMO crops in their countries; with organisations working on climate change; with anti-globalisation activists; with human rights activists and indigenous peoples; with local communities and organisations that are resisting industrial tree plantations and other forms of industrial forestry. The resistance to GM trees is growing!

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- Forestry corporations and GM tree research

GM trees are not a result of evolution. They are the result of decisions taken at institutional and corporate levels for their development and deployment. Companies, research institutions and universities work together closely on this. Companies fund university research departments, and influence what type of research is carried out.

Although there are numerous actors working on GM trees, some are clearly more important than others. Most of the research is being carried in a relatively small number of countries, among which the most prominent are the USA, Canada, Japan, New Zealand, Australia, Chile, United Kingdom, and China.

Some of the major forestry corporations are directly involved in the research. For instance, three giant forestry companies (International Paper, Westvaco and Fletcher Challenge) formed in 1999 a joint venture with Monsanto called ArborGen, which became the world's biggest GM tree company. Monsanto pulled out of ArborGen six months after it was formed. In January 2000, Genesis Research and Development, New Zealand's biggest biotechnology company, joined the joint venture. Genesis and Fletcher Challenge had been working together for five years on herbicide tolerant GM eucalyptus, poplar and pine. In 2001, Rubicon (a New Zealand company) bought Fletcher Challenge's biotechnology operations and took over its commitments to ArborGen. Westvaco has since merged with Mead Paper Company to form Meadwestvaco. In April 2003, Genesis announced a new plant science subsidiary, AgriGenesis Biosciences, which takes over Genesis' involvement in ArborGen.

ArborGen currently has 51 field trials of GM poplar, eucalyptus, pine and sweetgum (*Liquidambar styraciflua*) in the US. ArborGen's scientists have genetically manipulated trees to have less lignin, to grow faster and straighter, to be sterile or to be resistant to disease or herbicide.

Another important company involved in GM trees is New Zealand-based Horizon2 which was formed in March 2003 from a merger of Carter Holt Harvey Forest Genetics and Rubicon's Trees and Technology. Carter Holt Harvey is a New Zealand timber firm, which is 50 per cent owned by International Paper.

Chilean-based company GenFor is a joint venture between Chilean technology think tank Fundación Chile and Cellfor (Canada). The company was partly financed by the Chilean Development Agency and has established research agreements with Chilean forestry industry giants Arauco and Mininco. The companies provide GenFor with their top specimens, GenFor supplies the technology to "improve" them and earns the right to market the results of the research.

GenFor's main research focus is GM radiata pine which makes up 80 per cent of Chile's plantations. GenFor's researchers aim to create a GM pine resistant to the European shoot-tip moth (*Ryacionia buoliana*), a pest which is seriously affecting the 1.5 millions hectares of Radiata pine plantations in that country.

GenFor's partner Cellfor has entered into collaborations with a series of universities, including Oxford, Purdue, British Columbia, Alberta and Victoria. Cellfor has also worked with the Institute of Molecular Agrobiology in Singapore and SweTree Genomics in Sweden.

In addition to its research on insect resistant GM radiata pine, GenFor is working on increasing the level of cellulose and reducing the amount of lignin in radiata and loblolly pine (*Pinus taeda*).

In the U.S. several pulp and paper companies, including Weyerhaeuser, International Paper, MacMillan Blodel, Aracruz Cellulose and Potlatch Corporation have funded research at Oregon State University's Tree Genomics, Biotechnology, and Breeding Programme, which is working on GM trees for herbicide tolerance, sterility, resistance to fungus and insects and reduced lignin.

Some forestry companies also carry out their own research. Such are the cases of Aracruz Cellulose in Brazil and Japanese companies Oji Paper and Nippon Paper Industries.

Aracruz, the world top producer of bleached eucalyptus pulp produced from its huge plantations in Brazil is currently carrying out GM tree laboratory research but, according to company officials is not yet conducting either field trials or commercial plantations.

Nippon Paper, Japan's largest paper manufacturer has developed a GM salt-tolerant eucalyptus tree. It is also working on GM poplar trees which would be resistant to polluted environments. In 1995, Nippon signed an agreement with Zeneca to work on modifying lignin in pulp trees and in 2001 had developed a GM eucalyptus tree which produced 20 per cent less lignin, 10 per cent more cellulose and five per cent more pulp than non-GM eucalyptus trees.

Oji Paper is one of the largest pulp and paper companies in the world. The company has an active research programme into GM trees. Oji Paper's scientists are working on GM trees with reduced lignin, GM trees which can tolerate salty soils and GM eucalyptus that can grow in acidic soils.

All the above illustrates forestry companies' involvement in GM trees. They want to be able to plant trees in any type of environment and to ensure their fast growth; they want to accommodate plantation wood to their industrial processes (e.g. with less lignin for pulp production); they want their monocultures to be insect-resistant and herbicide-tolerant; they want them to be sterile. In sum, their aim is to manipulate nature to adapt it to their long-term economic objectives, regardless of the uncertainties and risks that this involves.

- International Legislation and GM Trees

In spite of the risks posed by genetic modification of trees, there is no international legislation specifically relating to GM trees. Instead, legislation has been produced with GM food crops and seeds in mind, and does not necessarily cover the problems presented by long-lived GM plants such as trees.

International law covering GMOs is at present focussed on issues relating to trade. There are two institutions which provide rulings covering international trade in GMOs: the Convention on Biological Diversity (CBD) and the World Trade Organisation (WTO).

The member countries of the CBD adopted the Cartagena Protocol on Biosafety in January 2000. The Protocol provides regulations for transboundary movements of GMOs and is based on the precautionary principle.

Although three major exporters of GMOs (USA, Canada and Argentina) have not ratified the Cartagena Protocol, the Protocol recognises a government's right to ban imports of GMOs when insufficient information is available to carry out an assessment of the risks. The burden of proof of safety is thus pushed back to the country exporting the GMOs.

However, under the WTO, governments can be penalised for putting in place legislation, such as a ban on GMOs, which the WTO rules is a barrier to international trade.

The WTO also has an Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) covering food safety and animal and plant health regulations. In setting their laws, to comply with the SPS Agreement, governments must assess the risks involved, rather than use the precautionary principle.

Mariam Mayet, director of the African Centre for Biosafety in South Africa, points out that the

Cartagena Protocol skips the issue of whether it takes precedence over WTO rules, by stating that the two should be “mutually supportive”.

That the two sets of legislation are not mutually supportive was illustrated in May 2003 when the US, Canada and Argentina filed a complaint with the WTO about the European Union’s legislation on GM foods.

Tewelde Egziabher, Director General of the Environmental Protection Authority in Ethiopia, was one of the architects of the Cartagena Protocol. In response to the US complaint to the WTO he wrote, “We in African countries, who have fought long and hard for the agreement and ratification of the Biosafety Protocol, feel that US actions are intended to send a strong and aggressive message to us: that should we choose to implement the Protocol and reject the import of GM foods, we may also face the possibility of a WTO challenge. We cannot help but perceive that US actions are a pre-emptive strike on the Biosafety Protocol and developing country interests.”

Forestry scientists are clear that genetic pollution from GM tree plantations is inevitable. “Genes will eventually get out” as Oregon State University’s Steven Strauss puts it.

Apart from the ecological risks involved, the prospect of GM trees crossing with wild relatives, resulting in feral GM trees containing patented genes growing outside plantations, raises a number of legal questions. Will the company that owns the patent on the gene have ownership rights (or any other rights) over any trees which contain this gene? Might forest owners find that the trees on their land in fact belong to International Paper or Meadwestvaco because they contain the company’s patented genes?

Who will be liable, if gene pollution proves to have damaged trees in forests? Will it be the plantation manager, the company that sold the GM tree seedlings, the company that developed the GM tree using the patented gene, or will it be the owner of the patent on the gene?

How is “damage” to trees in forests to be determined? Who will decide what constitutes damage? Trees and forests are sacred in some cultures and although superficially there may appear to be no harm done, changing the genetic makeup of wild trees could be considered to be genetic vandalism.

Tree pollen can travel huge distances. Seeds can be (and are) easily smuggled across borders. No legislation in the world will prevent this from happening. If GM trees were to become weedy and start invading forest ecosystems as a result of smuggled seeds, who would be liable?

In May 2004, the Canadian Supreme Court ruled that Monsanto had the right to prosecute farmers who have crops containing Monsanto patented genes on their land. Pat Mooney, director of the Action Group on Erosion, Technology and Concentration, explains the implications of this ruling: “They can now say that their rights extend to anything its genes get into, whether plant, animal or human. Under this ruling spreading GM pollution appears to be recognized as a viable corporate ownership strategy.”

- Genetically Engineered Trees and Global Warming

On October 22, 2004 Russia ratified the Kyoto Protocol, the international agreement created to begin addressing the problem of global warming. Russia’s ratification of the Kyoto Protocol now gives the agreement a high enough level of participation by the countries most responsible for the world’s carbon emissions for the agreement to go into effect, even without the United States’ 25% of worldwide annual global carbon emissions.

Within days of Russia's announcement, carbon trading in Europe tripled. The carbon market is expected to be the world's largest ever, projected to reach US\$60 billion by 2008. The carbon market is included as part of the Kyoto Protocol. It was created to enable corporations to buy the right to continue emitting carbon dioxide while purporting to address global warming - a profitable commodity indeed. The carbon credits are purchased from countries or corporations that have in some way reduced carbon emissions - by, for example, converting a coal burning plant to natural gas, or by planting trees to soak up carbon emissions.

Last December in Milan, Italy the United Nations Framework Convention on Climate Change, which oversees the Kyoto Protocol, agreed that genetically engineered trees could be used in industrial tree plantations developed to soak up carbon emissions. These plantations will likely be mainly developed in the Global South, with subsidies from the World Bank, to offset emissions from the industrial North.

This UN agreement coupled with the World Bank subsidies provide huge new incentives to advance GE trees technology through the creation of this profitable carbon market. Meanwhile, the Kyoto Protocol does not contain provisions to effectively protect existing carbon-absorbing native forests.

Scientists argue that trees can be genetically engineered to sequester even more carbon than they do already, to enhance the ability of plantations to offset industrial carbon. Unfortunately, there remain several difficulties with this plan.

First is the problem of where these plantations will be located. Studies at Duke University in the US have found that when trees are subjected to increased carbon dioxide in the air, they will only increase their carbon storage if soils are rich in nitrogen. Trees in poor soils did not increase their carbon storage. This means that plantations developed specifically to store carbon will need to be located on fertile soils. Scientists at a Duke University conference on GE trees suggested these plantations could be located on abandoned agricultural lands. But this raises the question of where all of these abandoned fertile agricultural lands exist? They must be a very well-kept secret. No, in reality these plantations will be concentrated in the Global South where they will likely displace communities, either by directly taking over their agricultural lands for plantations, or by logging native forests and replacing them with plantations, with all of the resultant impacts plantations bring - from loss of fresh water and biodiversity to contamination with toxic chemicals.

Additional concerns about carbon storage plantations include the issue of protecting the plantations from any activity that would release the carbon - such as logging or fire. Some have suggested that carbon offset plantations would have to become virtual "human exclusion zones" where all human activity is prohibited - a development that would almost certainly lead to the displacement of communities.

The above problems are inherent in any carbon offset forestry plantation, genetically engineered or not. Inclusion of GE trees in these plantations, however, adds an entirely new layer of problems.

In addition to engineering trees for higher carbon absorption, scientists are engineering trees to be resistant to insects and herbicides, grow faster, and be sterile.

Nutrient-intensive monoculture tree plantations rapidly drain water tables and deplete the soil. Trees genetically engineered to grow even faster will exacerbate this problem. Satellite images from the 1980s have revealed that vast expanses of land where native forests once stood have now been converted to tree plantations. These plantations have been found by the US

Environmental Protection Agency and World Resources Institute to sequester only 1/4 the carbon of their native forest predecessors. Faster growing GE tree plantations that deplete soils and water will cause additional deforestation as native forests are cleared to replace the land denuded by the previous plantations. This process of native forest conversion to plantations greatly contributes to global warming by simultaneously releasing the carbon stored in the native forests, eliminating the natural ability of native forests to regulate the Earth's climate, and by replacing them with plantations that store carbon at a dramatically reduced rate.

Industry asserts that trees genetically engineered for the above traits will be sterile - preventing contamination. Sterility researchers have admitted, however, that achieving 100% guaranteed sterility in trees is not likely, due to the fact that trees can live for hundreds of years and have genomes longer even than the human genome. In addition, tree pollen has been documented to travel for 600 km or more. GE tree pollen is likely to contaminate vast expanses of native forests with a wide variety of destructive traits, destroying the delicate ecological balance of native forests and causing increased forest mortality - and additional releases of CO2 greenhouse gas.

GE tree plantations have no place in sustainable forest management practices that maintain healthy forest ecosystems. They certainly have no place in the fight to stop global warming. Proposals by the United Nations and the World Bank for projects - such as GE tree plantations - allow corporations to continue polluting and magnifying global warming at the disproportionate expense of peoples and ecosystems in the Global South.

GJEP has a global campaign to stop genetically engineered trees. To get involved, contact them at info@globaljusticeecology.org, <http://www.globaljusticeecology.org> or write GJEP, PO Box 412, Hinesburg, VT 05461 USA

By: Anne Petermann, Global Justice Ecology Project

- Does the World Bank have a position on GM trees?

Perhaps I'm being naïve, but I really thought that the World Bank would have a position on GM trees. The first field trial of GM trees was in 1988. Surely, I thought, 16 years is long enough for the Bank's policy experts to come up with something. When the Bank's shiny new forest policy came out two years ago, it did so after a "stakeholder consultative process" which was "supported by extensive analytical, technical and economic studies, some commissioned by the World Bank and others done by independent institutions and NGOs on a wide range of subjects," according to the Bank. Surely the new policy has something to say on GM trees?

Er, no. The World Bank's Forest Policy makes no mention of GM trees. Neither does the World Bank's Forest Strategy, a 99-page report (plus appendices) which the Bank claims "provides nuanced guidance on the different actions that should be considered in different circumstances".

The Bank's Forest Policy does state that the Bank will only fund plantations that are "environmentally appropriate, socially beneficial, and economically viable." This would, in a just and fair world, exclude any GM tree plantations as they are neither "environmentally appropriate" nor "socially beneficial". But some of those experts at the World Bank have some pretty strange ideas about what is "appropriate" and "beneficial" for rural communities living thousands of miles from Washington DC.

The World Bank, through its Carbon Finance Unit is keen on financing carbon projects, including tree plantations as carbon sinks. Since December 2003, the Kyoto Protocol allows plantations of

GM trees as carbon sinks to be included under its clean development mechanism. So far no GM tree carbon sink plantations have been established but scientists at Oak Ridge National Laboratory, for example, are working on producing carbon storing GM trees.

I was curious to find out whether this meant that the World Bank might be funding GM tree carbon sinks in the future, so on 21 July 2004, I wrote to Jason Steele at the World Bank's Carbon Finance Unit to ask a few questions about GM trees. A week later he told me he was "still trying" to find the answers.

A couple of months later, when I'd still not heard anything, I thought I should jog his memory. I wrote again, told him I was working on an article, the deadline was mid-November and I'd like an on-the-record response. Steele responded immediately, but only to pass me on to the Carbon Finance Unit's Senior Communication Officer, Anita Gordon.

I asked Anita Gordon the same questions I'd asked Jason Steele two months earlier. Gordon also responded immediately, but only to pass me on to the Carbon Finance Unit's Stakeholder Relations Specialist, Charles Cormier.

I met Charles Cormier in June 2004 at the World Bank organised Carbon Expo in Cologne, Germany. I asked him for an interview about Plantar, an industrial tree plantation project in Brazil funded by the World Bank's Prototype Carbon Fund (PCF). In terms of the amount of carbon emissions the project is supposed to save, Plantar is by far the largest project on PCF's books. Cormier turned down my request for an interview. "I don't know anything about Plantar," he said.

PCF's contract with Plantar requires that Plantar is certified as well managed by the Forest Stewardship Council. If the FSC certification is withdrawn for any reason, PCF will stop the payments to Plantar. FSC standards state that the "use of genetically modified organisms shall be prohibited". So, at least in Plantar's case, the World Bank will not fund GM tree plantations.

"Charles Cormier will get back to you on your query," Anita Gordon promised me back in September. I still haven't heard from him. Perhaps I shouldn't be too surprised.

I looked up the "Who's Who" page of the World Bank's Forests and Forestry web-site and wrote to the 18 Bank staff listed on that page to ask them about the World Bank's policy on GM trees. I even clicked on a little button and sent an e-mail to the Bank's "Advisory Service". The Bank's web-site describes these people as "experts and specialists". They should, at least in theory, know the World Bank's position on important forestry issues like GM trees. But apart from four "out of office" automatic replies, I haven't heard anything from any of them.

For the record, here are the four questions that I would like someone at the World Bank to answer:

1. Does the World Bank have any guidelines on funding projects which include GM trees?_
2. In a question and answer sheet on its new forest policy, the World Bank states that "The strategy does not commit the Bank to any such activities [i.e. carbon forestry and carbon trading] unless these are specifically allowed under the Clean Development Mechanism or Joint Implementation mechanisms of the Kyoto Protocol" Since GM trees are included in the Kyoto Protocol, does this mean that the Bank can fund GM tree plantations as carbon sinks?
3. Does the Prototype Carbon Fund (or any of the other World Bank carbon financing mechanisms) have any guidelines on funding projects which include GM trees? If so, please provide details.
4. If there are World Bank documents which clarify the Bank's position on GM trees, could you

please send me copies?

I'm sure I can't be the only one who would like to know the answers to these questions. So, if anyone in the World Bank is reading this, I'd be delighted to hear from you.

By: Chris Lang, e-mail: chrislang@t-online.de

- Pollen from pine plantations generates problems - what if in addition they were transgenic pines?

Plant pollination takes place in different ways. One way is done by bees, butterflies, humming birds and bats. Another type of pollination is caused by wind blowing through plants that have their reproductive cells in open flowers. This happens with coniferous trees (for example, pines). For fecundation to be effective, these trees have to produce an enormous amount of pollen that the wind blows away and distributes, passing it from plant to plant and covering great distances.

Pollen can produce allergic reactions, such as conjunctivitis, hay-fever, asthma and general malaise. The symptoms of irritation and a watery secretion in eyes and nose announce the arrival of spring because in general they appear when the mucous comes in contact with environmental pollen transported by the wind. Seasonal hay-fever is suffered by 1 in 6 of the industrialized world's inhabitants.

Although pine pollen has been considered to cause a low degree of sensitivity, the counts during pollination are usually very high. Allergenic proteins have been found in a study carried out with the pollen from *Pinus radiata*, very abundant in the atmosphere in New Zealand, and tests have been carried out for cross reactivity with the pollen of a species of grass (*Lolium perenne*). Recently, other authors have found a considerable increase in the allergenic properties of this pollen due to the effect of air pollution.

Furthermore, the increase in levels of carbon dioxide associated with the warming of the earth's atmosphere may be causing an increase in allergies. Researchers have affirmed that in an atmosphere with twice the amount of carbon dioxide than there is now, there would be 61 per cent more pollen.

In this scenario two factors further increasing the problem are introduced: large-scale pine plantations and additionally, the project to convert them into transgenic pine plantations.

Regarding large-scale monoculture pine plantations, it may be inferred that the phenomenon related to pollination would be increased, one could say in an exponential way. For example, in Chile, the area covered by pines is over one and a half million hectares. It is not hard to imagine what size the clouds of pollen could be from such an enormous quantity of trees of the same species, generally close together and covering vast spaces. The evidence from neighbours in the Community of Lumaco in the Traiguén Commune, IX Region, reports that "in October, the pollen from the pines leaves the fields all yellow. Health problems arise. The market garden gets covered in yellow and the leaves of the plants have to be watered to enable them to survive." "(...) really nobody knows what happens with pine pollen. Perhaps it is causing us harm. We hear about contamination and how water has to be able to drink it, but finally one consumes what one has handy." Last August even the press recorded a phenomenon called "Yellow rain" a layer of yellowish-green powder that covered pavements, streets and cars and turned out to be pine pollen.

Something similar happened in Japan, where since 1950 there has been a policy promoting

plantations of practically a single species of fast growth conifer (*Cryptomeria japonica*), which two years ago covered 10 million hectares. Now, each spring, a great cloud of pollen descends on Japan, leaving 2 out of 6 inhabitants affected by allergy. In Tokyo over the past ten years, the proportion of affected population has increased from 7 to 20 per cent (see WRM bulletin 60).

Furthermore, concerning genetic manipulation of plant varieties, indications of possible cases of allergy to transgenic maize pollen have been observed. In July 2003, in Mindanao in the southern region of the Philippines, various people from a rural population living in the proximity of a transgenic Bt maize plantation (manipulated to exude the *Bacillus thuringiensis* toxin) suffered from fever, head-aches, nausea, respiratory and intestinal disorders, general weakness and skin problems. The situation coincided with the flowering season of transgenic maize in the zone and persisted over several weeks. This led the Social Action Centre to ask for help from various organizations and local NGOs, such as Searice and Masipag, to try to identify the cause of the symptoms and to find a solution.

The Director of the Norwegian Institute for Genetic Ecology, Dr. Terje Traavik, carried out blood tests and followed up on the case. Dr. Traavik stated that the antibodies present in the blood showed that the persons affected had been exposed to the Bt toxin over the past few months. That is to say, that the blood tests indicated that the symptoms were the result of having inhaled pollen from GM maize.

In an extrapolation using common sense and prudence, the following question arises: what would happen if, to the already problematic disorders of massive pollen counts from commercial pine plantations are added those of the uncertainty and risk of unknown effects from transgenic pollen from pine trees that have been genetically manipulated for purely commercial purposes? Perhaps this is yet another element to say a resounding NO to transgenic trees?

Article based on information from:

testimonials gathered by Ricardo Carrere during a visit to the IX Region of Chile, Comuna Traiguén, Comunidad Lumaco, in June 2004;

"Preliminary Results of Study Show Immunological Reaction to Bt Toxin", Gentech-news 91,

http://www.blauen-institut.ch/Tx/tM/tm_nov/tm0913.html;

"La invasión de las plantaciones forestales en Chile", José Araya Cornejo, Observatorio Latinoamericano de Conflictos Ambientales, <http://www.wrm.org.uy/paises/Chile/invasion.pdf>;

"Lluvia amarilla" es polen de pino",

<http://www.australtemuco.cl/site/edic/20030819023407/pags/20030819025615.html>;

"Pinos", <http://www.uma.es/Estudios/Departamentos/BioVeg/02Aer/00HAer/PolPin.html>;

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<http://www.diariomedico.com/edicion/noticia/0,2458,129561,00.html>

GM TREES IN THE SOUTH

- Brazil: Plantations, profits and GM trees

Proponents of industrial tree plantations often argue that plantations can relieve pressure on forests. Brazil's pulp and paper industry exposes this myth for the pro-industry propaganda that it is. Rather than growing more wood on less land, the industry grows more wood on more land. Every year the area of plantations increases and every year the area of forest decreases.

Take Brazil's Aracruz Cellulose, for example, the world's largest producer of bleached eucalyptus pulp. Aracruz's three pulp mills produce a total of two million tons of pulp a year. The company's

eucalyptus plantations were established on the lands of the Tupinikim and Guarani indigenous peoples and other local communities. The eucalyptus trees that feed Aracruz's pulp mills are among the fastest growing trees in the world. Yet Aracruz continues to expand both its pulp operations and the area of its plantations, pushing yet more people off the land.

Aracruz is also carrying out laboratory research into genetically modified trees. In 1998, Aracruz became the first company to receive permission from Brazil's National Technical Commission of Biosecurity (CTNBio) for laboratory experiments on GM trees.

A year before receiving this application, which is still current, Aracruz produced a statement on GM trees. "Many sectors such as agriculture are using genetics, and there is no reason to impose a genetic prohibition on the forestry industry, which, for plantations, follow the same basic concepts as any food crop," the company explained. To Aracruz, then, there is no difference between an annual food crop and trees which can live for hundreds of years.

Gabriel Dehon Rezende, Forest Improvement Manager at Aracruz told me in July 2004 that "the company believes that Genetic Engineering could help bring about sustainable social, environmental and economic benefits to agricultural and forestry activities in the future." Rezende was quick to point out that at present "Aracruz does not use Genetically Modified Organisms (GMOs) in its field trials or commercial plantations."

Brazilian pulp and paper company Suzano owns more than 180,000 hectares of eucalyptus plantations in the states of Sao Paulo, Bahia, Espirito Santo, Minas Gerais and Maranhao. Last year, Suzano spent US\$180 million on expanding its mills in Bahia and Sao Paulo and has plans to double its production capacity by 2008.

Each year, Suzano spends US\$2 million on research and development. Suzano is financing research into GM eucalyptus at the Luiz de Queiroz Agricultural College. The research aims to engineer trees with reduced lignin and higher cellulose content, an attempt to find what Suzano describes as the "perfect tree".

Suzano is also interested in producing a GM eucalyptus tree which can withstand drought. While the company acknowledges that "the water shortage already being experienced in some areas is a huge challenge", it fails to mention that Suzano's water guzzling eucalyptus plantations are one of the causes of the water shortage.

Suzano is among thirteen companies working with Brazil's Ministry for Science and Technology on a project to map the eucalyptus genome. More than 50 scientists are involved in the "Genolyptus" project, which focuses particularly on the way genes affect wood formation and disease resistance. The project started in 2002 and is due to be completed in 2006.

International Paper, the world's largest pulp and paper firm, has almost 200,000 hectares of industrial tree plantations in Brazil. Wood chips from Brazil are exported to International Paper's mills in the US. Two years ago, International Paper of Brazil received permission from CTNBio for experiments with GM trees.

International Paper is a partner in ArborGen, the world's largest GM tree company. ArborGen has plans to test its GM eucalyptus in Brazil. New Zealand biotech firm Horizon2 has a research contract with ArborGen. The company states that the research aims "to help improve the pulping characteristics of eucalyptus destined for the Brazilian market."

In March 2004, Bruce Burton, the vice-president of Rubicon, a partner in ArborGen, announced

that ArborGen would not carry out any GM tree trials in New Zealand. Instead, “we’ll carry on doing test in the US and Brazil” he said.

Aracruz, Suzano, International Paper and ArborGen are involved in research into GM trees because they believe they can make more money by doing so.

In April this year, the Movement of Landless Peasants protested against the pulp and paper industry’s take over of vast tracts of land in Brazil. Landless people occupied areas of industrial tree plantations owned by the pulp and paper companies Veracel, Suzano, Klabin, VCP, Aracruz and Trombini.

None of the companies hoping to plant GM trees in Brazil is doing so in order to relieve pressure on forests or to help resolve the land problem in Brazil. Their profits come at the expense of Brazil’s people and forests.

By: Chris Lang, e-mail: chrislang@t-online.de

- Chile: Made-to-measure trees for the forestry industry

The Chilean forestry sector seems to accept no limits to the expansion of its monoculture pine and eucalyptus plantations. On the one hand it has turned to repression and lies to face local opposition. On the other, it has extended its operations to other countries, such as Argentina and Uruguay, where it has installed plantations, timber industries and pulp mills, thus increasing its impact on other environments and populations.

In addition to the above, it also does not accept the limits imposed by nature and is appealing to biotechnology to make trees with the right characteristics to be able to plant more and obtain greater benefits.

At the present time, Chile leads the development of the biotechnology sector in Latin America, and it may well become the first country to market transgenic trees on a world level and a platform from which to produce and export transgenic pines and technology to the Continent – a dangerous issue.

Although the process began earlier, it started to strengthen in 1999 with the establishment of GenFor as a joint venture between the Fundación Chile and the Canadian company Cellfor. The initial hub of interest regarding genetically modified tree production is to make pines resistant to the pine shoot moth (*Rhyacionia buoliana*) which is affecting wide areas of monoculture radiata pine plantations, covering one and a half million hectares in Chile. The company hopes to have these pines ready for commercial plantation by the year 2008.

To create this technology, Genfor has established an agreement with the Forest Research Institute (FRI), a research body of the New Zealand Government. The work at FRI is developed on the basis of genetic material from radiata pine, with different lines of selected embryos from Chile being reproduced, in which three proteins with high pesticide levels have been identified. This transgenic pine is obtained by incorporating a Bt (*Bacillus thuringiensis*) gene, similar to the one used in transgenic crops such as maize and cotton.

At the same time, GenFor is also working on the genetic modification of radiata and loblolly pine to increase the level of cellulose and lessen the amount of lignin in the wood. The objective of such studies is to supply the industry with timber that contains a greater proportion of the required raw

material (cellulose) and a smaller percentage of what has to be separated and discarded (lignin), thus considerably lowering production costs.

Furthermore, in 2001, the Foundation for Agrarian Innovation (Fundación para la Innovación Agraria –FIA) of the Chilean Ministry of Agriculture, signed an agreement with the International Redbio Foundation, becoming its representative branch in Chile. Its web page has a section on the subject of “Biotechnology in Chile” summarizing its vision of the issue. It states that “Chile has notoriously diversified its productive and export base over the past years. However, its economic development continues to be firmly based on exploitation and marketing of natural resources. In this context, biotechnology appears to be a very useful tool in the improvement of the competitive capacity of productive sectors.” Regarding the forestry sector, it mentions a project which “increases the cellulose content and reduces the lignin content of radiata pine,” adding that “other applications will make it possible to produce better quality trees that are more uniform and have better quality and yields.”

This is not all. According to an entrepreneurial vision, there are many hectares of land in Chile (they estimate at least half a million hectares) that are being “sub-utilized” because the trees used in plantations cannot resist the intense cold prevailing there. To solve this problem, the Forestry Institute (Instituto Forestal – INFOR) and a group of forestry companies are working in conventional genetic selection to produce clones of cold-resistant eucalyptus. According to INFOR “In the pre-cordillera Andes area there are soils that are extraordinarily well suited to the production of *Eucalyptus globulus*, but they are presently unavailable due to the limitation of the cold, a problem that could be solved with the results of this project.”

At the same time, the Universidad de la Frontera in the south of Chile is studying (with funding from the Fund for Scientific and Technological Development) the possible use of the genes of a small grass that survives in the Antarctic (*Deschampsia antarctica*) to produce cold-resistant trees. Its particular tolerance to low temperatures has given rise to the interest in identifying the responsible gene or genes to apply them to eucalyptus and thus further increase the area to be planted with this species.

Beyond all the problems discussed in this bulletin, caused by the liberation of transgenic trees, all these technological “advances” choose to ignore what is evident: that the large-scale monoculture pine and eucalyptus plantations have caused serious social and environmental problems in Chile and it is more than evident that the plantation of transgenic trees will only make them even more serious.

Article based on information from:

"La planta que mueve a la ciencia. UFRO lidera atractiva investigación de *Deschampsia* antártica".

Eduardo Henríquez, Diario Austral, 8 June 2004

http://www.australtemuco.cl/prontus4_noticias/site/edic/2004_06_08_1/home/home.html

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http://www.bioplanet.net/magazine/bio_enefeb_2000/bio_2000_enefeb_reportaje.htm

María Isabel Manzur.- "Investigación biotecnológica en Chile orientada a la producción de transgénicos". Santiago, Fundación Sociedades Sustentables, 2003

- Kenya: Biotechnology, eucalyptus but no GM trees

Wangari Maathai and Florence Wambugu have dramatically opposing approaches to tree planting in Kenya. Maathai's approach is anti-colonialist and empowers the people planting trees.

Wambugu's is neo-colonialist and makes the people planting trees dependent on biotechnology.

Wangari Maathai is this year's Nobel Prize winner. Her Green Belt Movement trains women to set up their own tree nurseries. "We make them independent people who can take care of their environment by themselves," says Maathai. As well as tree planting, Maathai is African Co-President of Jubilee 2000 and is campaigning for the cancellation of Third World Debt.

Florence Wambugu is the founder of A Harvest Biotechnology Foundation International. Until 2002, she was the director of the International Service for the Acquisition of Agri-biotech Applications (ISAAA).

In 1997, ISAAA started a "Tree Biotechnology Project". The project is a partnership between the Kenyan Forest Department, the Kenyan Forestry Research Institute and Mondi Forests, South Africa's pulp and paper giant. Funding for the project comes from the UK's Gatsby Foundation.

Mondi supplied hybrid clonal eucalyptus trees for the project, a cross between *Eucalyptus grandis* and *Eucalyptus camaldulensis*. The Tree Biotechnology Project planted the clonal trees in trial plots to see which grew best in Kenya's soils and climate. The project set up a nursery at Karura, near Nairobi, which now produces more than one million tree cuttings a year to be delivered to farmers.

ISAAA is pro-genetic modification. "Commercialized GM crops continue to deliver significant economic, environmental, and social benefits to both small and large farmers in developing and industrial countries," writes ISAAA's chair Clive James. Florence Wambugu previously worked for Monsanto on a GM virus-resistant sweet potato project. ISAAA's funders include Bayer CropScience, Monsanto, Syngenta, Pioneer Hi-Bred and the Biotechnology and Biological Sciences Research Council. Past and present board members include representatives from Monsanto, Syngenta and the AusBiotech Alliance.

ISAAA's statements about its tree planting project (as well as the word "Biotechnology" in the project's title) hint at genetic modification. ISAAA states that Mondi's "genetically superior Eucalyptus" grows faster and "the hybrid is drought- and cold-tolerant." The project "aims to provide superior clonal material to both rural and urban communities in Kenya".

In a July 2004 article, EcoTerra accused Florence Wambugu of using the project to import genetically modified trees from South Africa into Kenya. In the UK, the Guardian reported that "GM eucalyptus is to replace the country's forest cover."

ISAAA denies that the trees are genetically modified. "The project does not involve transgenic trees, it involves genetically enhanced trees, which are the result of traditional breeding programmes at Mondi Forests," ISAAA's Catherine Ngamau told me.

Peter Gardiner, Mondi Forests' Natural Resource Manager denies that Mondi has ever produced GM trees. "We don't deploy any GMO material in the research, on a research plot or commercially anywhere. We haven't done it anywhere. There's no intention to do that," Gardiner told me.

Flic Blakeway was one of Mondi's forestry scientists that Florence Wambugu met when she visited Mondi's nurseries in South Africa. Blakeway co-authored a paper presented at the 1997 World Forestry Congress in Turkey, which describes how scientists in Mondi's laboratories had started "preliminary work" on GM trees, including "the transformation of eucalyptus leaf and cell cultures using *Agrobacterium* mediated procedures." Blakeway's paper reported that the experiments did not produce any GM trees.

Although I've found no evidence to back EcoTerra's claim that Mondi and Florence Wambugu have sneaked GM eucalyptus trees into Kenya, ISAAA's Tree Biotechnology Project is not immune to problems.

Fast growing eucalyptus trees cause streams and ponds to dry up and the water table to drop in the areas they are planted. One of the Kikuyu names for eucalyptus is munyua maai, which means the "drinker of water". Little or nothing will grow under the trees.

In 1995 in a presentation at the UN Women's conference in Beijing, Wangari Maathai explained that during the colonial era, "species of trees like the eucalyptus, black wattle and conifer trees replaced indigenous species not only on farmlands but also in forest areas." As a result, she continued, "farmlands have lost water and certain crops like bananas, sugarcanes and local species of arrow roots no longer thrive on the drier farmlands to give food security to the local communities."

Then there's the Blue Gum Chalcid, a tiny black insect which is threatening Kenya's eucalyptus trees. Affected trees are useless for timber or poles. In November 2004, the Daily Nation reported that the pest could threaten up to 40 per cent of Kenya's plantations. Eston Mutitu of the Kenya Forestry Research Institute commented that the worst affected trees are those produced through biotechnology such as through ISAAA's project.

"We are now experiencing exotic pests attacking exotic trees. It seems we are getting the bad side of incorporating the exotic trees," Mutitu told Biosafety News in April 2004.

Three years ago, at a conference in South Africa, Wangari Maathai said, "We are trying to stop the current government from expanding the plantations. The government sees indigenous forests as useless." It seems that no one from the Kenyan government, ISAAA or Mondi was listening. Perhaps they will pay attention now that the problems caused by planting eucalyptus trees are becoming all too apparent.

By: Chris Lang, e-mail: chrislang@t-online.de

GM TREES IN THE NORTH

- Finland: Some remarks on the campaign against GM trees

In June 2004, unknown activists attacked the last remaining trial of genetically modified trees in Finland. About 400 GM birch trees were felled. How should we react now? That was the first question for GM tree campaigners when we heard about the attack.

Our campaign against GM trees in Finland started in 2000, when I was among a small group of concerned activists who formed the People's Biosafety Association (PBA) to monitor GMOs in Finland. Earlier the same year, the Finnish Forest Research Institute received permission for a trial of GM trees in Punkaharaj.

In spring 2000, PBA asked the Board of Genetechnology for the location of all GMO field trials in Finland. They told us that there were 13 open field releases and more than 130 trials in laboratories or greenhouses, but refused to release the locations of the trials, arguing that there was no register of GMO trials. Yet according to Finland's Gene Technology Act a publicly available register of all GMO trials must be kept.

Our next move was to take the case to the Supreme Administrative Court. In response, the Board of Genetechnology released a remarkable statement. Signed by Pirjo Mäkelä, the Board's chair, the statement admitted the risks involved, explaining that any unauthorized visits to the GM field trials might cause a danger to the environment and to people's health. Therefore, the Board argued, the location of the field trials must remain secret.

In October 2001, I wrote an article titled "Finland should oppose genetic modification of trees" for Finland's largest circulation newspaper, Helsingin Sanomat. During the next week the newspaper published two pro-GMO articles written by forestry scientists and declined to publish an article that I sent them countering the scientists' arguments.

PBA then launched a petition demanding that these field trials should be stopped. We pointed out that no adequate assessment of the risks had been carried out and people living near to the GMO trials had not even been informed. Early in 2002, PBA presented the petition, signed by 1500 people, to Osmo Soininvaara, Minister of Social and Health Affairs and leader of Finland's Green League political party.

PBA decided to find out for ourselves where the GM tree trials were. We discovered that there were two field trails, one in Punkaharju and another in Viikki, near Helsinki.

The Finnish public found out about the GM tree field trials on 22 July 2002 when the television news showed PBA's activists hammering biohazard warning signs into the ground next to the trials. A few months later the Finnish Supreme Administrative Court announced its decision that the location of the GM field trials should be made public. However, no real public discussion of the risks took place.

In December 2003, with the Finnish media apparently having lost interest, the campaign against GM trees received another blow. In Milan, at a UN climate change meeting, governments decided to allow plantations of GM trees as carbon sinks under the Kyoto Protocol's "clean development mechanism".

In response, three Finnish NGOs (People's Biosafety Association, Friends of the Earth Finland and Union of Ecoforestry), launched an international petition demanding a UN ban on GM trees. In May 2004, PBA took part in a side event on GM trees at the UN Forum on Forests in Geneva. By then 1600 people and 140 NGOs had signed on to the petition.

On returning from Geneva, PBA continued to try to raise the issue of GM trees publicly. We visited the Finnish Parliament to tell parliamentarians about our message to the UN. We invited several forestry scientists involved in GM tree research to a PBA press conference. Only three journalists turned up and no scientists.

In June 2004 we got some good news, at last! Kim von Weissenberg, Professor of Forest Pathology at Helsinki University told WRM's Chris Lang that Helsinki University's GM birch tree field trial "was terminated in the fall of 2003".

The media silence on GM trees was shattered when activists destroyed Finland's only other field trial of GM trees.

The forestry scientists responsible for the trial now claimed that the purpose of the trial was to examine environmental risks, in particular the risk of genetic pollution and the stability of the transferred genes. In fact, the aim of the experiment was to study carbon-nitrogen processes, looking at the impact on growth rates.

In addition to lying about the purpose of their GM tree trial, the forestry scientists appear to be in breach of Finnish law. PBA had argued all along that no proper risk assessment had been conducted BEFORE establishing these field trials and now they actually admitted that by launching a new study which would study these risks on the ongoing field trial.

Under Finnish law, risk assessments must take into account current developments and knowledge and the Board of Genetechnology must be informed of any new discoveries which may affect the previous risk assessment.

PBA argues that the forestry scientists must have some new information about gene pollution and gene instability: they have even received funding from the Finnish Academy for the new study on these risks.

Before continuing the field trial they should therefore have informed the Board of Genetechnology of this new information which gives the need for new risk assessment studies.

Together with the Finnish Union of Ecoforestry, PBA has made a formal complaint about this apparent breach of Finnish law. The authorities are currently considering the complaint, before they decide whether to start a legal process.

After four years campaigning against GM trees, we are optimistic that there will be no new GM tree trials in Finland.

By Hannu Hyvönen, campaign coordinator, Union of Ecoforestry in Finland, e-mail: hannu@elonmerkki.net

- GE Trees in the United States: An Update

Over November 17-19, 2004 a major conference on genetically engineered trees technology took place at North Carolina's Duke University in the US. Representatives were present from major biotechnology companies including Arborgen, Cellfor and others, as well as some of the leading institutions conducting research, such as the Institute of Forest Biotechnology, the Department of Energy's Joint Genome Initiative, the US Forest Service and the Canadian Forest Service, as well as many others simply interested in learning more about the technology of GE trees. Finally there were five of us who represented the "opposition" - organizers working to stop genetically engineered trees by educating land owners, researching potential legal action to stop GE trees, and through international campaigning, among other things. We had been invited to squeeze together onto a panel at the end in an attempt to add some "balance."

Most of the conference appeared to be a giant cheerleading session for the technology, with each presenter patting his or herself on the back for their accomplishments as well as applauding the work of those others in the room.

In his keynote presentation entitled "Precision Forestry," Jesse H. Ausubel of the Program for the Human Environment at Rockefeller University explained that forestry in our growing world needed to follow the model of agriculture. He argued that the intensification of agriculture, which started in the 1940s with the use of mechanized tractors and chemical fertilizers, pesticides and herbicides, was a great boon to all of mankind and that forestry must follow the same model. Intensive forestry plantations need to be pursued, he argued, including the use of chemicals and genetic engineering, in order to meet the growing need for forestry products in the world, while

simultaneously protecting remaining native forests. He unfortunately neglected to mention that the agricultural “green revolution” has been a disaster for much of the Global South, and has served to create virtual monopolies of control over much of the world’s food supply - leading to widespread malnourishment and starvation. He suggested these hi-tech tree plantations be located on “abandoned” agricultural lands (in the Global South).

While the name of the conference was “Landscape Genomics and Transgenic Conifer Forests,” its overarching theme was public relations. Time after time, speakers presented their piece of the GE trees puzzle while asking, “How do we get people on board with this issue?” or “What are the ‘white hat’ issues in this technology that we can use to win over the public?” This made the event seem more like a GE trees marketing conference than a discussion on the state of the technology. Presenters acknowledged that selling GE trees is going to be very difficult because of the negative reaction people already have toward genetically engineered food. They also acknowledged that people’s relationship to trees - as a wild, quiet refuge - would make people resistant to the idea of tinkering with them. As one presenter explained, “early education and cultural groundwork will be required to deploy GE trees across the private forest landscape.”

These “private land” strategies for public acceptance of GE trees are critical in the US where 63% of the ‘forested landscape’ is in private hands. Industry must devise strategies to get GE trees onto these lands.

As the conference progressed, participants identified a few “white hat” issues they believed would be potentially useful in selling GE trees to the public. The first they examined was the genetic engineering of Chestnut and Elm trees to be resistant to the diseases that have largely wiped them out in the US. They felt that selling people on the idea that genetic engineering could bring back the beloved lost Chestnut and Elm trees was very useful.

A second idea explored was the use of GE trees to deal with the infestations of invasive species that have been devastating native forests all over the US. The US Fish and Wildlife Service states that invasive species are the number one threat to wildlife habitat. As a solution, one conference presenter proposed creating genetically engineered “native” species that outcompete the invasives. The fact that GE trees, by the very nature of their engineered trans-genes, are not “native,” but potentially extremely invasive, was somehow overlooked. Also omitted was a discussion about how to deal with the *causes* of these invasions - such as the elimination of trade barriers under neoliberalism. Some of these so-called “trade barriers” include phytosanitary standards that are used to try to stop invasives from entering the country on imported logs or other such hosts in the first place.

The third idea, which was a theme of much of the conference was use of genetically engineered trees in plantations to store carbon emitted from burning fossil fuels (to supposedly help stop global warming). Participants loved this idea, and felt that it was a win-win strategy. Promote GE trees as a solution to global warming - who wouldn’t love that?

Unfortunately, there are already communities in Brazil, Ecuador, Costa Rica and elsewhere who are experiencing the harmful impacts of so-called “carbon offset” forestry plantations. The addition of genetically engineered trees to these plantations will lead to forest health crises that worsen global warming and further compromise the ability of rural and forest dwelling peoples to live sustainably on the land (see related article in this issue).

Scientists in the US are proceeding with the technology of GE trees with blinders on. They look only at the “benefits” they have convinced each other that GE trees will bring, while ignoring the obvious lessons from GE agriculture that serve as giant warning flags. But at the same time they

are very nervous. They know people hate this technology, and look for ways to “spin” it to make it more acceptable. This is a highly controversial technology that will only become more so as they prepare to execute commercial plantations of these franken-trees in and around communities throughout the world.

GJEP has a global campaign to stop genetically engineered trees. To get involved, contact them at info@globaljusticeecology.org
<http://www.globaljusticeecology.org>
or write GJEP, PO Box 412, Hinesburg, VT 05461 USA.

By: Anne Petermann, Global Justice Ecology Project

- USA: Potlatch Corporation, FSC certification and GM trees

Potlatch Corporation's 7000 hectares of poplar plantations in Boardman, Oregon are just about as high tech as a plantation can be. The trees are planted in the sandy desert soil and will only grow because of tens of thousands of kilometres of thin black hosepipe. Water, fertilizer and pesticides are pumped to the trees through the irrigation pipes. The water for the irrigation comes from the John Day Dam, constructed by the US Army Corps Engineers in 1971. The dam is one of the 19 dams that block the Columbia River and which have devastated salmon fisheries in the river.

Potlatch's plantations are monocultures of clonal hybrid poplars. In 1999, the company allowed Oregon State University to start a trial plantation of genetically modified (herbicide tolerant and insect resistant) poplar trees on 1.2 hectares of its land. Potlatch was one of the founding members of Oregon State University's Tree Genetic Engineering Research Cooperative (TGERC). "They're top-of-the-line scientists with an international reputation. TGERC gives us a very big bang for our buck," explained Jake Eaton, Potlatch's research manager, in 1999."

Potlatch's direct involvement with GM technology was set back when the company decided it wanted to sell the timber to Home Depot, the world's largest home improvement store. In 1999, to get environmental activists off its case, Home Depot produced a wood purchasing policy which “gives preference” to timber from “certified well managed forests”. Today, Home Depot sells more Forest Stewardship Council (FSC) certified wood than any other retailer in the US. Potlatch decided FSC certification was just what it needed.

Because FSC's standards prohibit the use of any GMOs in certified forestry operations Potlatch agreed to remove the GM trees in December 2000. Eight months later, Scientific Certification Systems (SCS) certified Potlatch's plantations as well managed according to FSC's standards.

Yet at the time the certificate was awarded, the GM trees were still growing in Potlatch's plantations. SCS even gave Potlatch another four months to clear the trees. “By December 31, 2001 Potlatch must follow through with their commitment to remove the 2-year old sexually immature transgenic hybrid poplars and continue to abstain from GMO research on their eastern Oregon facility,” SCS's assessors wrote in the public summary of the certification assessment.

SCS did not check whether the trees had been removed until June 2002, six months after the deadline, when SCS's assessor Dave Wagner carried out an annual audit of Potlatch's Boardman plantations.

“The genetically modified hybrid poplar trees were removed prior to December 31, 2001,” Wager noted. However, he continued, “Following removal, there was some re-sprouting that had not been

treated at the time of the 2002 annual audit.” More than nine months after the certificate was awarded, Potlatch still had GM trees sprouting on its land.

SCS did not withdraw the certificate, but issued a corrective action request. Once again, Potlatch did not have to do anything until the end of the year: “By December 31, 2002 Potlatch must remove stumps and associated sprouts from the genetically modified hybrid poplar trees that were removed.”

Once again, SCS did not check whether Potlatch had removed the GM tree stumps and sprouts until six months after the deadline. In June 2003, Barry Sims, a Portland-based forestry consultant and SCS assessor, carried out an annual audit of Potlatch’s Boardman plantations.

“All GMO material has been removed,” Sims reported, without explaining what evidence had helped him to reach this conclusion. He does not mention in the public summary whether he inspected the area himself, or if he simply asked Potlatch staff.

After each annual audit, SCS’s assessors arrived at a word-for-word identical conclusion: “the overall level of forest stewardship has clearly been strengthened on the forest estate over the past year.” This conclusion is surprising, not least because the only thing Potlatch’s high tech plantations have in common with forests is that they are full of trees.

More importantly, cutting poplar trees and leaving the stumps in the ground is a hopelessly inadequate way of removing poplars from a piece of land, whether the poplars are GM or non-GM. “All poplars tend to sprout vigorously from stumps after trees are cut,” explains Oregon State University’s Steven Strauss.

Matthius Fladung, of the Institute for Forest Genetics and Forest Tree Breeding near Hamburg in Germany, has documented how difficult it can be to remove all traces of GM poplars from the soil. Fladung’s trial was completed in 2001 and the plot cleared of trees. Eighteen months later, Fladung reported, root shoots of the GM trees were still present in the soil.

Fladung is concerned that “conclusions should be drawn carefully from the fact that root suckers appear several months after clearing the field trial.” If the trial is nowhere near any other poplar trees then it is simple, “because every poplar plant must be transgenic”. However, if there are other poplar trees around “it might be difficult to distinguish between transgenic and non-transgenic root suckers,” says Fladung.

It is improbable that any GM poplar trees have managed to grow from the roots that Potlatch has apparently left in the ground. It is improbable, perhaps, but not impossible. Certainly SCS was in breach of FSC rules in awarding a certificate to a company that was growing GM trees on its land. That SCS did not check more carefully that Potlatch had removed all traces of the GM poplar trees is a scandal.

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