

Belgium: Field trials planned of GM poplar trees for ethanol

Late last year, the Flanders Institute for Biotechnology (VIB), a life sciences research institution applied for permission to establish a field trial of genetically modified poplar trees in Belgium. The GM trees would have modified lignin content, aimed at making production of ethanol easier.

VIB was established in 1996. Funded largely by the Flemish government, it employs more than one thousand scientists. VIB aims to produce scientific discoveries with "industrial application potential", which it patents and either signs agreements with existing companies or establishes start-up companies to develop the discoveries into "market-ready products". By 2006, VIB had patents on 100 of its discoveries.

VIB has a communications team responsible for producing information targeted at educators, journalists and politicians. It sets up competitions for schools, provides teaching materials, books, presentations and exhibitions. Materials include titles like "What is bioengineering?", "The Safety of Genetically Engineered Crops", and "Xenotransplantation: the animal in the man...". In these glossy brochures VIB promotes biotechnology, plays down the risks and portrays scientists as neutral experts interested only in the good of society. Meanwhile, VIB lobbies politicians to relax regulations covering the use of human cells and GM crops.

According to the application submitted to the Belgian authorities, VIB plans to plant GM trees on a 0.24 hectare experimental plot in University of Ghent Science and Industry park in Zwijnaarde. The trees are planned to be planted in May 2008 and the experiment is to last until the end of 2014.

The genus *Populus* includes about 30 species of trees, which are native to most of the Northern Hemisphere, with common names including poplar, aspen and cottonwood. It is the scientists' favourite tree for genetic experimentation. The world's first release of genetically modified trees was a field trial of herbicide resistant GM poplars in 1988 in Belgium. Since then, well over half of the 200-plus GM tree trials worldwide involved poplar trees. In 2006, *Populus trichocarpa* became the first tree to have its full DNA code sequenced.

The only GM trees to be commercially released are poplars - GM poplars have been planted in China since 2002. No records are kept of where the trees are planted or how many have been planted. In 2004, Xue Dayuan of the Nanjing Institute of Environmental Science told the China Daily that genes from the GM poplars had already appeared in natural varieties growing nearby.

The risks of genetic contamination are huge, given the large and widespread population of wild relatives. Poplar trees can spread through suckers growing from roots. Pollen and seed are spread on the wind "possibly on rather long distance", notes VIB. However, VIB states that, "seed regeneration is not often observed as ecological conditions necessary to seed germination and plantlet development are seldom met." The words "not often" and "seldom" are hardly reassuring, given that the impact of genetic contamination in non-GM poplar trees is unknown, but potentially devastating.

Yet VIB states that "The environmental impact from the release is expected to be zero, since the GM poplars are not going to flower and any suckers from superficial roots will be destroyed." True, the trees to be planted will be female clones and will produce no pollen. It is probably also true that if the trees flower, VIB's researchers will remove the flowers. But the environmental impact of this trial will not be zero.

VIB ignores the fact that the purpose of the trial plantation is to develop GM trees to produce ethanol. To be commercially viable, plantations of GM poplars would need to cover vast areas of land. If large scale GM tree plantations were to be established, genetic contamination of natural varieties of poplars, aspen and cottonwoods would be inevitable.

VIB makes no mention of the impacts that industrial tree plantations have on local communities and their environments. Nor does VIB consider the fact that growing trees (or any other type of agrofuel crop) to produce ethanol on an industrial scale will increase conflicts over land. If forests and grasslands are not to be destroyed (which would release huge amounts of carbon) the tree plantations will have to be planted on agricultural land. This will increase the price of food encouraging corporations and farmers to clear land elsewhere (including forests and grasslands). Two recent papers in Science magazine demonstrate that all the major agrofuels cause more greenhouse gas emissions than conventional fuels, once the emissions caused by land clearance and producing the fuels are taken into account.

The people promoting agrofuels and GM trees as a solution to climate change tend to be scientists whose research benefits from promoting agrofuels or GM trees. "Biomass represents an abundant carbon-neutral renewable resource for the production of bioenergy and biomaterials, and its enhanced use would address several societal needs," claims an article published in Science magazine in January 2006. What's missing from such statements is a comparison of agrofuels with, say, large scale solar and wind power combined with high voltage direct current cables and hydrogen fuel cells. These technologies can be used immediately and would massively reduce greenhouse gas emissions. Unlike GM trees.

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