

Will we soon have genetically engineered forests?

Trees created with new methods of genetic engineering to be released for the first time in Sweden

17 August 2016 / In China, the US and Sweden, new methods of genetic engineering such as CRISPR are being used on forest trees. The first field trials are planned to take place in Sweden with genetically engineered poplars that show a range of genetic changes in their genome that affect flowering, growth, production of branches, leaves and roots. The goal of this type of engineering is to drastically change the phenotype and characteristics of the trees, without any specific purpose being provided. The poplars are genetically manipulated using various methods of genetic engineering, including the so-called CRISPR technique, which is said to ease deletion and insertion of DNA.

The biotech industry is pushing for plants and animals manipulated with the new methods such as CRISPR, to be released and marketed without being subjected to regulations for genetically engineered organisms. However, legal dossiers published in 2015 show that these methods should clearly be considered to be genetic engineering, and plants and animals produced in this way should therefore also have to undergo risk assessment and labelling. So far, the EU Commission has failed to give any clear guidance on the import and release of the respective plants and animals.

“Due to the inactivity of the EU Commission, we are at risk of losing control of the import and release of genetically engineered organisms. Indeed, the uncontrolled import of genetically engineered plants and animals from the US and China might already be a reality. Furthermore, companies or research institutions might feel encouraged to release or sell such organisms, without any authorisation in the EU,” Christoph Then says for Testbiotech. “Especially genetically engineered forest trees, which can spread their artificial DNA into sensitive ecosystems, pose a great risk to biodiversity.”

Forest trees have complex interaction with the environment, including mycorrhizae, insects, wild life species and other plant species. Within the lifetime of a poplar tree, millions of pollen or seeds can be produced, which can be transported by wind over many kilometres. The artificial DNA can spread via pollen, seeds and shoots. Compared to crop plants such as maize, trees live much longer. This, in turn, raises doubts about their genetic stability during their whole lifetime and increases the probability of unintended long-term effects. If genetically engineered trees introgress native populations, there can be irreversible negative consequences for the ecosystem.

“The EU Commission now has to ensure legal clarity. Otherwise no one can take adequate measures to protect biodiversity anymore,” Christoph Then says. “Lack of control is also an increasing problem in relation to food plants such as oilseed rape and maize as well as breeding material for animals such as cattle and pigs, which can be imported into the EU.”

At the end of 2015, the EU Commission announced that it would provide clarification. However, the decision was then postponed for an indefinite period. Observers are of the opinion that the

negotiations on the free trade agreements TTIP and CETA are playing a significant role in this process. In the US, genetically engineered plants can be released without mandatory measures to prevent them from spreading into the environment. The planned free trade agreements aim to harmonise regulation of genetically engineered organisms, leaving the precautionary principle established in the EU open to considerable weakening.

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The application for the release of genetically engineered poplars in Sweden:
http://gmoinfo.jrc.ec.europa.eu/gmp_report.aspx?CurNot=B/SE/16/3494

Publication on using CRISPR in forest trees: www.ncbi.nlm.nih.gov/pmc/articles/PMC4507398/

Legal dossier on new methods of genetic engineering: www.testbiotech.org/en/node/1342

Impact of TTIP and CETA on regulation of new methods for genetic engineering:
www.testbiotech.org/en/node/1621