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## 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

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activity is prohibited—a development that would almost certainly lead to the displacement of forest dwelling 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 CO<sub>2</sub> 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](mailto:info@globaljusticeecology.org) , <http://www.globaljusticeecology.org> or write GJEP, PO Box 412, Hinesburg, VT 05461 USA

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