

GENETICALLY ENGINEERED TREES: THE GROWING DANGER

By Global Justice Ecology Project



Introduction

Tree biotech company ArborGen is seeking regulatory approval for genetically engineered (GE) freeze-tolerant eucalyptus trees.

If granted approval, ArborGen plans to sell hundreds of millions of seedlings every year across the southeastern US, from Texas to South Carolina. They will also likely seek approval for GE eucalyptus designed for faster growth and altered lignin content.

Non-GE eucalyptus is the most widely planted hardwood plantation tree in the world. It is known to reduce local groundwater and can be highly invasive and flammable. If ArborGen wins approval for GE freeze-tolerant eucalyptus trees, it will spread the ecological and social disaster of eucalyptus plantations to new regions of the world.

For these and other reasons, activists, scientists and lawyers are working hard to fight the approval and planting of GE eucalyptus in the US.

GE Trees – The New Frontier of Biotechnology

Unlike traditional plant breeding methods, genetic engineering involves high-tech biotechnology. GE trees (sometimes called GM trees or GMO trees) are similar to other GMOs: Scientists manipulate the genetic material of trees by inserting DNA often from an unrelated species to achieve desired results. This is called transgenics.

The results are organisms with traits not found anywhere in

nature, designed to meet the needs of industry. Common desired traits are freeze tolerance, easier processing into pulp and liquid biofuels, and pest and disease resistance. Scientists have even engineered poplar (*Populus* spp.) trees to produce artificial rose fragrance.

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Unlike traditional plant breeding methods, genetic engineering involves high-tech biotechnology. This includes transgenics: the transfer of genes from one species to another. The results are organisms with traits not found anywhere in nature, designed to meet the needs of industry. GE trees are relatively new, and are not yet planted on a large scale anywhere except China, where approximately 450 hectares of insect resistant black poplars were developed, though no records were kept.

GE trees are unlike GMO food crops in some very important

ways: Trees can live for decades to centuries; have seeds and pollen that can travel up to hundreds of miles; and have numerous wild relatives in native forests that could be contaminated. Conducting long-term risk assessments on organisms that could persist in the environment for decades is next to impossible. Such risk assessment isn't even required for regulatory approval. These factors make GE trees a much greater threat than GMO food crops.

For all of these reasons, commercial plantations of GE trees pose an enormous threat to forests internationally. The threat of large-scale commercial plantations of GE trees for timber, pulp, bioenergy, and chemicals is quickly advancing. ArborGen is also developing GE eucalyptus in Brazil, as is their main competitor, Futuragene (owned by Suzano Paper, one of the world's largest timber companies).

Worldwide Impacts of Eucalyptus

Non-GE eucalyptus plantations already have devastating impacts on communities across the world. These impacts would be dangerously expanded to new regions if freeze tolerant GE

Global Justice Ecology Project
266 Elmwood Avenue, Suite 307
Buffalo, NY 14222
716.931.5833

globaljusticeecology.org
climate-connections.org
email: info@globaljusticeecology.org



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eucalyptus trees are approved.

In Chile, Mapuche communities surrounded by eucalyptus and pine plantations face water shortages and have to truck in water for part of the year. Political repression for organizing against plantations in Mapuche communities has resulted in harassment, arrests, and murders of Mapuche leaders. The Mapuche see their struggle against plantations as “a fight for survival, for rights, dignity, recognition, and the possibility of autonomous development.”

In South Africa, eucalyptus is widely invasive, and intense water use has been well documented. Increased drought and disappearance of surface and ground water plague areas where eucalyptus plantations are established.

Indigenous Tupinikim and Guarani communities and Landless Workers' Movement (MST) camps in Brazil have taken over and occupy eucalyptus plantations. On International Women's Day in 2006, thousands of women in Brazil destroyed millions of eucalyptus seedlings, denouncing the impacts plantations have on their communities.

In early 2009 in Australia, raging wildfires, exacerbated by a drought, moved through eucalyptus groves at over 100 kilometers per hour, devastating wildlife and killing nearly 200 people.

ArborGen: More Clones. Less Forests

In 1999 International Paper, Fletcher Forests, Rubicon Limited, WestVaco (now WestRock) and Monsanto partnered to create a pioneering tree biotechnology venture. Monsanto quickly backed out and in 2000, GE tree company ArborGen was formed. Two years later, ArborGen named Barbara Wells as its first CEO. Wells worked for Monsanto for eighteen years, overseeing its RoundUp Ready GE soy division in Brazil.

ArborGen is now the world's leading tree seedling provider. Current and former employees serve on various government advisory boards. Several executives

came from Monsanto.

The company attempted to go public on the NASDAQ in 2011, but rescinded their Initial Public Offering after a lawsuit against GE eucalyptus field trials increased investor wariness. In 2017, International Paper and WestRock sold their shares of ArborGen and Rubicon Limited became the sole owner of ArborGen.

Corporate Greenwashing

Under the guise of conservation, the GE tree industry is trying to sell their risky science experiments to the public. Tree geneticists in New York are working to develop blight-resistant GE American chestnut trees. Blight resistance has already been achieved via conventional breeding techniques.

ArborGen's brand-name conservation system, FlexStand, does more to maximize profits than conserve forests. In fact, FlexStand encourages forest owners to continue using chemicals in their plantations, and to cash in on emerging domestic carbon and bioenergy markets. Posturing as “sustainable” forestry, this is little more than economic opportunism, soon to be enabled by faster growing GE eucalyptus trees.

GE eucalyptus is seen as a key species for emerging bioenergy markets. Demand for wood pellets has already been linked to increased clear-cutting of southern hardwood forests. Replacing fossil fuels with equally polluting biomass energy has grave consequences for southern forests and the global climate. According to ArborGen's parent company Rubicon, ArborGen could sell half a billion GE eucalyptus seedlings every year for bioenergy plantations in the US South.

Using fast growing GE trees to supply pellet mills and biomass incinerators will release dangerous amounts of greenhouse gases into the atmosphere. While burning wood to create energy sounds sustainable, new science suggests that it will have a similar impact on the climate as burning coal. Fast growing plantations will also deplete soil nutrients, increasing the need for chemical fertilizers.

While ArborGen might think the solution to saving the world's forests is to grow “more wood on less land,” plantations of fast growing GE trees will only lead to increased deforestation, just as natural forests have been replaced by other industrial tree plantations.

In fact, the UN Food and Agriculture Organization reported that between 1990 and 2010, the area of land covered by industrial tree plantations (including eucalyptus) in the Global South increased more than 50%, even though the plantations doubled the yield of wood per hectare.

While plantations might produce timber more efficiently, they don't provide other benefits like medicinal plants, food and shelter for forest dependent communities. Nor do they provide ecological processes like water filtration, wildlife habitat and carbon sequestration as well as biodiverse forests. A much better solution is the restoration of natural, sustainably managed forests.

Help Us Stop GE Eucalyptus

The USDA is currently considering approval for GE eucalyptus trees. This would open up the door for approval of other GE trees, like chestnut, poplar and pine.

Here's what you can do to help!

- See how you can take action against GE trees at globaljusticeecology.org/take-action-on-ge-trees/
- Visit our website for news, resources, and to join our mailing list: globaljusticeecology.org
- Share this fact sheet with friends, family, co-workers, and neighbors.
- Host a screening of the documentary *A Silent Forest: The Growing Threat, Genetically Engineered Trees* available on DVD or YouTube.