

ALERT

Proposed Release of Genetically Engineered American Chestnut Trees in US and Canada

- The US government is considering a request to allow the release of genetically engineered (GE or genetically modified) American chestnut trees into US forests.
- The GE trees could spread from US forests into forests in eastern Canada.
- Researchers say they will also ask the Canadian government to approve planting this GE tree in Canadian forests.

US researchers want approval to plant genetically engineered American chestnut trees into forests in eastern Canada and US.

Introduction

The American chestnut is an endangered species in Canada, and is almost extinct in the US. It was a dominant tree in the eastern forests of the US and Canada until a fungal blight, along with logging, decimated populations in the first half of the 1900s.

Now, researchers at the State University of New York College of Environmental Science and Forestry (SUNY-ESF) have genetically engineered an American chestnut (AC) tree to be blight-tolerant and are asking the US government to approve its planting in the wild, in eastern US forests.¹ The researchers also say they will ask for approval to release the GE tree in Canada.

If approved, the GE American chestnut will be the first genetically engineered forest tree planted in the wild in North America, and the first genetically engineered plant released with the purpose to spread freely through wild ecosystems.

If the GE AC is released, it will be the first GE tree planted specifically to spread freely through forests. Once it is released in the wild, there will be little or no potential to track or reverse its spread.

If this GE tree is released, it will be difficult, or impossible, to track or reverse its spread over time. The impacts of its release on forest ecosystems are unknown and cannot be known until they are observed in the wild over decades and centuries. **The release of genetically engineered American chestnut trees, or any GE trees, into the wild would be a large-scale experiment.**

The genetically engineered American chestnut (GE AC)

The genetically engineered American chestnut tree (GE AC) has been engineered to tolerate the blight *Cryphonectria parasitica* that decimated American chestnut tree populations.

The GE AC is a transgenic tree, meaning that it was genetically engineered by inserting genetic material from other species into the tree's DNA. The package of DNA inserted into the American chestnut contains genetic material from five species: wheat, a plant related to mustard, two different bacteria, and a plant virus.

The researchers propose to plant GE AC trees in wild forests so that the blight-tolerant GE trees can cross-pollinate wild American chestnuts, spreading blight-tolerance to subsequent generations. The researchers say that planting this genetic engineered tree in the wild will "restore" the species.

Releasing GE AC is a large-scale experiment

Researchers intend to release the GE AC into forests so that it will spread GE pollen and seeds, and cross-pollinate with any remaining wild American chestnut trees.

GE AC pollen and nuts could also spread across borders and jurisdictions.

It is not possible to assess the risks of releasing this GE tree because we do not know what will happen in highly complex forest ecosystems, subject to climate change, over the long life-span and multiple generations of American chestnut trees. **American chestnut trees can live for over 200 years.**

What is genetic engineering?

Genetic engineering (also commonly called genetic modification or GM) is the introduction of new traits to an organism by making changes directly to its genetic makeup, e.g. DNA, through intervention at the molecular level.

Scientists can change the traits of organisms by inserting pieces of DNA, whole genes, or long stretches of assembled DNA segments originating from different sources. The inserted genetic material is often derived from unrelated species, but it can also be taken from the same or a closely related species, or be newly made up. Scientists can also change traits by disrupting genes, deleting or swapping small DNA segments, or introducing genetic material to silence genes.

Unlike conventional breeding and hybridization, genetic engineering is a laboratory technology that enables the direct transfer of genes between organisms in different species or kingdoms that would not breed in nature, and the introduction of new sequences that do not even exist in nature.

The processes used to genetically engineer organisms can create unintended changes in the host organism. Such possible unexpected effects can be difficult to detect in the genetically modified organism (GMO).

The release of GE AC into forests would be a large-scale, irreversible experiment.

Locating and monitoring all the GE AC trees and their progeny in our forests will be nearly impossible, especially over a long period of time.

Releasing GE trees would be an uncontrolled and uncontrollable experiment that could have profound risks for the future of our already-threatened forest ecosystems.

The release of GE AC into forests would be a large-scale, irreversible experiment.

Additionally, the blight tolerance trait that has been genetically engineered into the American chestnut tree may not even work. The trait may not be stable over the long lifespan of the trees, especially when faced with variable conditions in the wild. Furthermore, the survival of American chestnuts is additionally challenged by at least one other lethal pathogen, as well as a variety of other stresses such as unsustainable logging practices, invasive species, urban sprawl, and climate change.

Restoring the American chestnut tree

The range of the American chestnut tree extends in the east of North America from Florida to southern Ontario, and is projected to move into the Maritimes due to climate change. However, the tree can also grow outside its range. In fact, the largest American chestnut tree in Canada is growing in Nova Scotia. Sites of American chestnut have been identified and/or initiated by conservationists in eastern Ontario, Quebec, Nova Scotia, Prince Edward Island, and British Columbia.

For decades, dedicated volunteers and researchers in Canada and the US have worked to find naturally blight-resistant trees in the wild, and conventionally cross-breed American chestnut trees with naturally resistant Chinese chestnuts. These efforts will be undermined by the release of a genetically engineered American chestnut tree.

“A lot of important and valuable back cross breeding work is being done and we feel that this progress is threatened if these 94% American hybrids are contaminated by GE chestnuts that are allowed to spread their pollen with no controls or regulations as is proposed.”

Lois A. Breault-Melican & Denis M. Melican, former board members of the Massachusetts/Rhode Island Chapter of The American Chestnut Foundation (TACF), in their letter of resignation from the TACF.²

Conclusion

Rather than “restore” this endangered species, the release of genetically engineered American chestnut trees into our forests could create new problems and exacerbate existing pressures on forest ecosystems.

Government decisions about the introduction of the GE AC will set a regulatory precedent and could change forest ecosystems forever. Approving the release of the GE AC will set the stage to genetically engineer our forests in other ways, and to use GE trees in industrial plantations for timber, pulp and biofuels.

For more information and updates in Canada: cban.ca/trees

For more information and updates in the US and internationally: stopgetrees.org

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- 1 See US Department of Agriculture, Availability of Petition for Deregulation of American Chestnut Developed Through Genetic Engineering, Posted August 18, 2020. https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/sa-2020/sa-08/ge-chestnut
- 2 Accessible at: <https://globaljusticeecology.org/american-chestnut-foundation-board-members-resign-over-ge-chestnut/>

The Canadian Biotechnology Action Network (CBAN) brings together 16 groups to research, monitor and raise awareness about issues relating to genetic engineering in food and farming. CBAN members include farmer associations, environmental and social justice organizations, and regional coalitions of grassroots groups. CBAN is a project on MakeWay's shared platform.



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