ALERT

PROPOSED RELEASE OF GENETICALLY ENGINEERED AMERICAN CHESTNUT TREES

Genetic engineering is being used to develop GE (genetically modified or GM) trees, to make it easier and cheaper to grow trees to produce wood, fiber, fuel, and other products. For example, experiments are underway to genetically engineer trees to grow faster, resist insects and diseases, tolerate herbicide sprayings, and to have altered wood composition.[1]

Researchers in the United States are requesting government approval to **plant a genetically engineered American chestnut tree in the wild**. They claim that this GE tree is disease-resistant and are proposing to use it to replace or "restore" the decimated populations of American chestnut trees.

The promise of "restoring" the American chestnut by using a genetically engineered tree comes with great risks and threatens existing efforts in Canada and the US to recover the wild American chestnut.

WHAT IS THE GE AMERICAN CHESTNUT?

Researchers at the State University of New York College of Environmental Science and Forestry (SUNY ESF) say they have genetically engineered an American chestnut tree to be blight-tolerant and they are asking the US government to approve it for **unrestricted planting in the wild**.

The historic range of the American chestnut covers most of the eastern United States and parts of **southern Ontario**. However, the species was decimated by the fungal blight *Cryphonectria parasitica* in the first half of the 20th century. The SUNY ESF researchers claim that their GE American chestnut tree will be able to survive the blight and spread its blight-tolerance by cross-pollinating with wild American chestnut "Mother trees".

The researchers called the GE tree "Darling 58" but had to rename it when, in 2023, it was discovered that, since 2016, they had mistakenly been experimenting with a different GE event called "Darling 54."[2]

If approved in the US and Canada, this genetically engineered tree would be the **first-ever GE plant released to spread freely through wild ecosystems**. Its release would be a large-scale experiment, and there will be little or no potential to track or reverse its spread.

HOW WAS THIS TREE GENETICALLY ENGINEERED?

Genetic engineering directly changes the genetic makeup (DNA) of an organism, bypassing normal reproduction to create new characteristics. Genetic engineering includes techniques that make changes to DNA by inserting genetic material from the same or totally unrelated organisms, or, with genome editing, by introducing genetic material that acts as an "editor" to change DNA.

This genetically engineered tree is transgenic which means that it was genetically engineered by inserting genetic material from other species. A package of DNA was inserted into the American chestnut that contains genetic material from five species: wheat, a plant related to mustard, two different bacteria, and a plant virus.

THE RISKS

The promise of technological fixes to the biodiversity and climate crises is compelling, however, each new genetically engineered "solution" could create serious new problems.

Forest ecosystems are highly complex and poorly understood. Assessing how the release of a GE tree will affect other trees, understory plants, insects, soils, fungi, wildlife, and human communities over time, would require a far better understanding of forest ecology than we currently have. For example, recent advances have revealed highly intricate interdependencies, feedback loops and communication networks between and among forest species. This incredible complexity increases the unknowns and uncertainties of introducing GE trees.[3]

THIS GE TREE THREATENS CHESTNUT CONSERVATION WORK IN CANADA

The Canadian Chestnut Council (CCC) has a mission to preserve and restore the wild American chestnut (*Cantanea dentata*), which is a protected as **an endangered species in Canada**. With a Stewardship Agreement under Ontario's Endangered Species Act (2007), the CCC has been working to identify and breed healthy American chestnuts for more than twenty years.

Recent DNA analysis shows that the population of American chestnut found in Ontario is unique from neighboring regions in the US. Many individual trees within this population exhibit high genetic fitness (i.e. they can reproduce successfully) and a high tolerance to chestnut blight. The CCC's blight resistance breeding program draws on the strengths of this population.

If this GE tree is **brought across the border or spreads into Canada over time**, it would seriously threaten their blight resistance breeding program and the future of this unique Northwest population of American chestnuts.

> **"We disagree with the concept that the D58 is a restoration tree, and [believe] its release will contaminate the remaining population of American Chestnuts and result in possible greater harms."**
>
> CANADIAN CHESTNUT COUNCIL, DECEMBER 2022[4]

There is also no way to guarantee that a genetically engineered tree will function as planned in the wild.[5]

The precautionary principle demands that, given our lack of understanding and the vast uncertainty, we must take action to avoid risk. The future of forests is at stake.

THE FAILING GE TREE

New research from field tests shows that **the GE American chestnut trees do not work as intended**.[6] The GE trees are not blight tolerant. They are also short and have very low survival rates.

In 2023, The American Chestnut Foundation, SUNY ESF's scientific collaborators and project funders, pulled their support from this GE tree project because of the "significant performance limitations" as well as the Darling 54 "identity error."[7]

RELEASE SOON?

SUNY ESF has requested US government approval to release this GE tree into the wild. Due to inadequate regulation, the government could be close to allowing it, despite the risks and the genetic defects that render it ineffective.

The researchers say they will also seek government approval to plant the GE tree in Canada. The Canadian Food Inspection Agency will not confirm or deny that it has received an application.

Thousands of concerned individuals and organizations submitted comments to the US government opposing the release of this GE tree. The American Chestnut Foundation, the Canadian Chestnut Council, and the Canadian Biotechnology Action Network have all asked SUNY ESF to withdraw its request for government approval.

1 Canadian Biotechnology Action Network, The Global Status of Genetically Engineered Tree Development, 2022. https://stopgetrees.org/resources/global-status-report/

2 The American Chestnut Foundation, Discovery That Darling 58 Was Actually Darling 54, 2023. https://tacf.org/darling-58/

3 Genetically Engineered American Chestnut: Discussion of the performance limitations of Darling 58/54, EcoNexus, 2024. https://www.econexus.info/publication/genetically-engineered-american-chestnut

4 Canadian Chestnut Council, Comments to the United States Department of Agriculture, December 20, 2022. https://cban.ca/wp-content/uploads/Canadian-Chestnut-Council-response-APHIS-D58.pdf

5 Biotechnology for Forest Health? The Test Case of the Genetically Engineered American Chestnut, The Campaign to STOP GE Trees, Global Justice Ecology Project and Biofuelwatch, 2019. https://stopgetrees.org/wp-content/uploads/2019/04/biotechnology-for-forest-health-test-case-american-chestnut-report-WEB-1.pdf

6 The American Chestnut Foundation, Darling Performance Results, 2023. https://tacf.org/darling-58-performance/

7 The American Chestnut Foundation, Press Release: TACF Discontinues Development of Darling 58, December 8, 2023. https://tacf.org/tacf-discontinues-development-of-darling-58/

Contact us to get more information or to get involved: trees@cban.ca

cban.ca/trees

The Canadian Biotechnology Action Network (CBAN) brings together 15 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 of MakeWay's shared platform.

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