



Canadian Chestnut Council
Conseil Canadien du Châtaignier

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The Canadian Chestnut Council wishes to express its opposition to the release of the Darling 58 as a restoration tree in the North American which will irreversibly damage the surviving wild American Chestnut population in Canada and hinder the preservation, restoration and blight breeding work of the Canadian Chestnut Council under the American Chestnut Stewardship Agreement held under the Endangered Species Act in the province of Ontario.

The Canadian Chestnut Council (CCC) is a scientific and Charitable organization with the mission to restore the American chestnut to its original **ecological** (keystone species/mast), **economic** (chestnuts, timber, chemicals) and **cultural** (First Nations/historical/hunting) roles in the environment.

At the inception of the Endangered Species Act 2007, the Ontario Ministry of Natural Resources and Forestry followed by the Ontario Ministry of Environment, Parks and Conservation (ESA regulator), the Canadian Chestnut Council has been directed and licensed, first under permits and currently under the Stewardship Agreement, to continue to develop a blight resistant/tolerant American Chestnut based on the surviving indigenous American trees in Ontario and directed not to import or use any external trees, nuts or pollen. The CCC had previously had a dual blight resistant/tolerant breeding program. One involving solely native American Chestnuts from the historical range in Ontario and the other involving a hybrid breeding program originally using pollen from three Hybrid chestnuts provided by the Connecticut Research Station. The CCC was allowed to continue with the hybrid breeding program backcrossing to pure American Chestnut as a backup if native resistance could not be identified. The CCC is concentrating its efforts to expand pure American Chestnut breeding program which is clearly demonstrating that there is a native resistance to the blight in the population.

We disagree with the concept that the D58 is a restoration tree, and its release will contaminate the remaining population of American Chestnuts and result in possible greater harms. The approval route is taking a horticultural/agricultural approach which end runs or downplays the environmental/ecological issues and concerns of other American Chestnut organizations in North America. D58 is a single gene therapy to a complex pathogen relationship. The American chestnut utilizes a variety of defense mechanisms to prevent the entry of the fungus involving several genetic traits which are all need to act in unison. The CCC notes several concerns regarding the release of the D58 as a restoration tree. We anticipate the gene therapy will fail in a relatively short time as demonstrated in many genetically modified agricultural crops as the pathogen evolves. The intervening contamination of wild and research breeding trees with D58 pollen prior to the failure will certainly damage and set back all efforts to preserve and restore the tree ecologically. The gene therapy of the D58 may also trigger an evolutionary change in one or more of the 200 plus strains of blight that exist in North America to result in a more virulent strain that could prove in more deadly. The failure of hypovirulence in North America demonstrates the difficulty of dealing with multiple strains of blight. The unique symbiotic relationship

of the blight in the D58 will also act as a source of blight spores which will add to the blight pressure on the remaining wild population, planted colonies and on research breeding plots. In Canada, there are approximately 27 Carolinian species of trees identified that harbor chestnut blight and act as carriers for the blight. Any distribution of the D58, no matter how well regulated, will increase the spread of blight and act as a point source contaminant in the environment.

The Canadian Chestnut Council is also concerned about the lack of regard to the existing restoration efforts /strategies and preservation of the native that will be impacted by the release of D58. We are making efforts to prevent the extinction of the tree in the northern range and have taken steps to assist its northern migration to areas well outside its historical range to better protect the species. We view the release of the D58 as major contamination and threat to our efforts

The preservation of the unique Northwest population of the American Chestnut (Stoltz/Husband, 2022) found in Ontario has been a priority of the CCC for many years. In addition to breeding blight tolerant/resistant pure American Chestnuts the council has carried out numerous programs to identify, preserve and enhance the population of native American Chestnuts.

In the Breaking Isolation Program, geographically isolated reproductive trees are provided six to a dozen young but reproductive aged, grafted trees which allow for cross pollination and nut production to be restored. In the process genetic biodiversity within the population and natural recruitment is possible. Best Forestry Management and Practices for the American Chestnut are under development to improve the number of isolated trees that can be incorporated in this program.

In the Gene Conservation Nut Colony Program, a combination of seedlings and grafted trees representing a broad genetic cross section of the Canadian genome are planted in grouping of 200 plus trees to act a gene conservation effort and allow for genetic recombination in the resulting nuts which will be distributed to adjacent woodlands by wildlife. This program is used in areas that lack a wild population of American Chestnut both within and outside the historical range and involve public lands (Conservation Authorities, Land Trusts, Provincial Parks, Nature Conservancy of Canada, Royal Botanical Gardens-Hamilton, First Nations). Colonies are established in blocks or interspersed in reforestation projects so that the best restoration practices can be studied and developed. A vigorous vegetative propagation program gathers scion from all mature wild trees for grafting and planting out in plots to preserve the gene pool. This brings together various chestnut genetics that would normally not occur in the wild due to distance.

In the Survey and Analysis of Remnant American Chestnuts, formal surveys recording the condition, survival, location, ecological and habitat parameters of all known wild, native American Chestnut in the historical range are performed each decade in co-operation with the University of Guelph. The initial survey of 800 trees is currently 1800 plus wild American Chestnut in Ontario. Analysis of the data has provided a variety of papers that provide important insights to the current state of the native trees, persistence of the blight, environmental parameters that influence the survival of the tree in the wild. The Northwest population consists of mature canopy trees with a high number of subcanopy trees and poor natural recruitment due to a closed canopy. Best Forestry Management and Practices are being implemented to release suppressed chestnuts and open light holes for recruitment. These studies also direct our future to better enhance our restoration work and survival of the species.

In DNA Analysis, all native trees and research trees have been tested for purity. The results have shown that the Northwest population is homogenous and uncontaminated by foreign strains. In total only 13

trees have been removed from the survey population due to non-American genetics and the verification of the pure American Chestnut blight resistant breeding program continues. The contaminated trees were all from the Niagara region bordering New York State and indicative of the past work of hobbyists/horticulturalists. In addition, three subpopulations were identified in the historical range in Ontario which require preservation as some are underrepresented in the overall population. Recent DNA analysis has additionally shown that the Northwest population found in Ontario is genetically unique from the neighboring regions in the United States (Stoltz/Husband, 2022). The closest similar genetic makeup is in Georgia at the extreme southern range which indicates a probable unique migration and development of the northwest population of the species. The D58 being from New York State American Chestnuts would be seen as a contamination to the uniqueness of the Northwest population in Ontario.

The CCC in the past distributed Canadian stock of the American Chestnut to the Maritime provinces for preservation well outside the historical range for safe keeping against the blight. The species has been planted and viable as far north as Sault Ste. Marie and North Bay in Ontario.

The CCC has demonstrated aggressive restoration efforts, and considerable effort and coordination at landscape scales to protect, preserve and restore the American Chestnut in Canada. There are 32000 planted out American Chestnut in Canada that part of the North American effort to save an endangered species and restore it to its ecological, cultural, and economic roles. The American Chestnut was falsely declared expatriated back in the 1950s in Ontario and has been predicted to be expatriated by 2100 without intervention. The CCC believes that it is reversing that prediction with the addition of more trees by human intervention and natural recruitment. The Blight Resistant Breeding Program is increasing the tolerance to blight and total resistance may not be far off.

If it will take “centuries” for the D58 to be established and “centuries before conservation impacts are seen” why are the alternative (non-GE) restoration efforts of other American Chestnut organizations such as the CCC not being provided the benefit of this same timeframe?

The CCC finds it highly improbable that any methods for controlling pollination by transgenic chestnuts can be applied to potential restoration programs once the D58 is released in North America.

Commercial growers dealing with chestnut orchards is very different from controlling pollination in a research plot or protecting wild chestnuts from pollen contamination. Hobbyists, horticulturalists, and commercial tree nurseries can not be regulated from the haphazard planting D58 in areas adjacent to breeding plots or wild native populations. The CCC has consistently battled with residents wanting to import chestnuts from outside sources since the Endangered Species Act 2007 restricts the distribution of pure American Chestnut. The public is ignorant of the work to protect the endangered American Chestnut and the release and importation of the D58 is a quick fix for their avarice.

Regarding Weediness/invasiveness, the CCC views the D58 tree or pollen as a threat to the native American Chestnut genome of the unique Northwest population. Our population is uncontaminated by non-native chestnut material and unique. As stated prior the D58 will be a major source of contamination and result in the destruction of the American Chestnut that we have been charged with to protect under the Stewardship Agreement of the Endangered Species Act.

With the current foreign pests and diseases disrupting the remaining Carolinian Eastern Deciduous Forests, we see that the release of the D58 as a strong opportunistic species that will readily be planted

out in reforestation programs as a substitute for the elimination of ash, beech, hickory, oak, etc. We do not see the spread of D58 as slow or controlled in any manner. It will not be a restoration tree as sold but a commercial/horticultural/timber tree. In fifty years the first timber could be cut as demonstrated previously here in Ontario as the tree is fast growing even in our northern location. Its purported ecological role will be secondary.

The American Chestnut was a Keystone species of the Eastern Deciduous Forest and support a variety of wildlife approaching approximately 275 known species and probably additional lifeforms. Its original demise by the blight resulted in the extinction of at least eleven insects which cascaded in the decimation of insectivore bird species and decline of larger forest raptors such as the Goshawk. The American Chestnut was the support for a myriad of food chains and intricate food webs. The role of the American Chestnut in the life cycle of the brook trout being one of the most interesting with the high protein leaves feeding the benthic macroinvertebrates that the brook trout feed upon and that the rot resistant wood of the tree provided nearly permanent stream structures for the best trout habitat in a watershed. The CCC questions if sufficient scientific studies have been made regarding the possible ecological detrimental impacts D58 may have once in the natural environment. A single bee species study does not cover the multitude of bees and other pollinator species that the tree will host. There is a lack of scientific studies on the insect consumption and survival rate that will feed on the D58. D58's ecological role as the restoration tree for a keystone species requires additional study before it is released to make certain it will not have unseen irreparable harm on the remaining Eastern Deciduous Forest.

The spread of the D58 by seed and pollen is very underestimated. In Ontario the isolation distance for pollen is defined as a minimum of one kilometer but literature references up to 18 kilometers. With the increase in wind speed, frequency, and duration due to climate change pollen isolation is questionable. The natural spread of nuts by wildlife, gravity, water, etc may be a few kilometers per century but that is also suspect as many bird species that feed on the smaller American Chestnut are movers of the seed either through dropped nuts or by predation by larger predators. The premise also completely ignores the human factor in the greater distribution of nuts. The assisted migration of nut tree species by First Nation people in the post-glacial period is a prime example. Modern humans will certainly speed the spread of the tree from its out plantings with or without permission.

The assertion that the risk of using Darling 58 American chestnut in a commercial venture is likely too high for adoption in the foreseeable future is not realistic. Some hobbyists, horticulturalists and commercial tree nurseries growers in Canada have promoted the Darling 58 as the solution since the tree's inception. There are growers and hobbyists are very keen to obtain the Darling 58 from Ontario tree nurseries that are willing seek importation of the tree if it is released in the United States. The Canadian Chestnut Council sincerely hopes that serious reconsideration be made prior to any possible approval of the release of the D58 as a restoration tree or in any other form in the environment. The possible irreparable harm to a continentally shared endangered species is reason enough to take pause.

Respectfully Submitted on behalf of the Canadian Chestnut Council
Ron Casier
Chair
Canadian Chestnut Council