



THE
AMERICAN
CHESTNUT
FOUNDATION®

**VT/NH
Chapter
Newsletter
November
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During 2020 the VT/NH Chapter changed its operating process to a committee structure that defines work responsibilities and facilitates record keeping. Committees were created for managing chestnut restoration activities, providing outreach to members and tracking membership, overseeing Chapter governance, nominating board members and officers, and managing salvaged chestnut wood. In October 2021 committee chairs submitted reports that address progress and concerns. This newsletter summarizes these reports.

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President's Corner

By Doug McLane, Chapter President

Greetings to roughly 240 members of the VTNH Chapter of The American Chestnut Foundation. Much has happened since you last received a 'President's Corner' report.

Over the past two to three years, Mother Nature has thrown our Chapter a couple of curve balls. First, of course, was the pandemic which limited our ability to work in groups in our orchards. Second, was the discovery that, despite decades of effort to develop blight resistance in the American chestnut tree by backcrossing with the Chinese chestnut, backcrossing has not produced the expected results. The decoding of chestnut DNA has shown us that resistance to chestnut blight is carried by too many genes located on too many chromosomes to significantly boost blight resistance by backcrossing with a Chinese tree. Thus, the only way to increase resistance in American trees is to increase the percentage of Chinese genes, which would produce a hybrid with fewer American traits. The path forward became murkier.

Rising to this challenge, three years ago this month, our Chapter became the first of 16 Chapters to adopt The American Chestnut Foundation's novel '**3-BUR**' approach to

developing a blight tolerant chestnut. Thus, in addition to the traditional **B**ackcross **B**reeding approach, we added **B**iotechnology, and **B**iocontrol.

Two years ago, Vice President Curt Laffin, Secretary Bill Coder, and I proposed a revised Committee Structure to facilitate implementation of this 3-BUR science plan. That structure was approved by the Board of directors and has been implemented.

The **B**io**T**echnology Committee is tasked with establishing 'Germplasm Conservation Orchards' (GCO's), of various sizes where many specimens of surviving pure American trees from our bioregion are grown. The strategy is to raise these trees to flowering stage in anticipation of USDA approving the new transgenic American chestnut tree. The transgenic tree is 100% American plus one gene from a grass plant that may give the American chestnut the ability to detoxify the damaging byproduct of the fungal blight. Currently, our Chapter has four GCO's in various stages of development: one in Plymouth, NH, one in Epping, NH, one in Walpole, NH, and one in Rutland, VT. Our Chapter's objective is to find 35 new nut producing American chestnut trees, harvest their nuts, and plant them in CGOs. One additional GCO will be created each year until there is sufficient space to plant nuts produced by the 35 new sources.

The Biotechnology Committee instituted a Board approved Inter-Chapter cooperation action where we have contributed funds and volunteer hours to assist University of New England Professor, and Maine Chapter V.P., Dr. Tom Klak, in his Chapter's effort to develop and plant USDA-approved transgenic American chestnut seedlings in coastal Maine. A big part of our Chapter's contribution to this effort has been renting and transporting a lift into the Maine woods to hand-pollinate wild American chestnut trees with transgene pollen developed by the College of Environmental Science and Forestry at SUNY Syracuse, NY. When mature, these nuts then need to be harvested, once again requiring use of the lift.

The 'Chestnut Location' Committee, Co-Chaired by Chris Leask and Lewis LaClair, is charged with reviewing reports of new flowering American chestnut 'finds' from throughout the two State region. This is where the eyes and ears of volunteers are essential. Surviving sprouts from long dead main trunks still dot our landscape. When a pure American chestnut is found this committee determines if it has potential to produce fertile nuts (two trees are required for natural pollination). If flowering, but with no nearby 'mate', we may try to hand-pollinate with pollen from a distant chestnut. Then, the race is on to beat squirrels to the harvest. The fertile nuts stratified by over wintering them in a refrigerator.

To encourage Chapter members to learn the ins and outs of American chestnut tree culture, we instituted a 'Free Nut' program in which we send eight to ten nuts and pots to members in the Spring and follow up with instructional videos. This past Spring, 42 members from both States participated. Watch for the announcement next Spring for the 2022 sign up. Our supply of fertile nuts is limited.

The Breeding Committee, chaired by Gary Hawley, was active maintaining our traditional backcross breeding orchards. Volunteers worked with Kendra and intern, Deni Rangelova, to inoculate and evaluate our orchards in both NH and VT. With her usual vigor, Kendra found time to welcome her new baby girl into the world. Congratulations!

Our Membership and Outreach Committee, chaired by Curt Laffin, was busy on several fronts. UVM Doctoral Candidate, and Board Fellow, Jess Wikle, worked hard to integrate a new Chapter website with the National TACF platform. Curt also transitioned our main venue of communication from ground mail to digital via Constant Contact.

An additional outreach opportunity was an interview by Dr. Tom Klak and me on the NH Public Radio show, The Exchange, with Laura Knoy.

Vice President, Curt Laffin recognized the need for an all-encompassing review of the Chapter's Strategic Plan for achieving its goal. Curt solicited input from Board members

and whittled it down to a realistic 'Strategic Plan' Draft which will be voted on at our upcoming Winter Board meeting which may be in December. When a date is confirmed you will be notified. Chapter members are welcome to attend Board meetings.

Our Governance Committee, Chaired by Bill Coder, dealt with the many issues vital to keeping a volunteer organization functioning smoothly.

Only with the support of our 240, and growing, members can we forge ahead into the promising world of **B**reeding, **B**io technology, and **B**io control. Thank you for your past and future support. Together we will eventually introduce a blight-tolerant American chestnut tree into our forests. We look forward to seeing many of you this Spring at an in-person Annual Meeting, where we will welcome a new President and Vice President and continue our march forward to a healthier forest ecosystem.



Breeding Program

By Kendra Collins

The VT/NH Chapter manages 12 orchards as part of our breeding program. There are both breeding and seed orchards in the program; seven in VT and five in NH. Most of the trees in the breeding orchards are third or fourth generation backcross trees, produced by crossing wild American chestnuts with earlier backcross generation pollen. As these trees mature, they are inoculated with chestnut blight fungus (pictured below) to test their resistance. Those that prove resistant enough are crossed to make seed for the seed orchards. The High Shelter Farm breeding orchard in VT and the Shieling Forest breeding orchard in NH are the most recently inoculated orchards, and we are in the process of assessing the trees to determine the degree of blight resistance they have inherited and finalizing breeding selections. Those that are selected will be crossed to make more seed for the seed orchards, with hopes to harvest seed for planting next fall. Plans are underway to inoculate and select additional orchards next year.

The breeding approach to American chestnut restoration has not been as effective as originally thought because more Chinese genes are needed to produce blight resistance. As a result, we have expanded our selection process to take this reality into account. After inoculation trees are first rated based on how the cankers look. Those that appear to have good resistance are then sampled for genotyping to determine the amount of Chinese chestnut in their genetic make-up. Finally, genotyped trees are assessed for additional blight-resistance traits and those data, along with the genotyping results, are used to predict which trees should be used for further breeding. Predictions are then verified in the field, and the best trees are crossed for seed orchard planting. Those that don't make the cut for breeding still represent unique and valuable genetics and may be used for other program purposes in the future, like transgenic diversification.



Biotechnology

By Will Abbott

Most VT/NH Chapter work is currently focused on preparing for the anticipated USDA and EPA approval of transgenic tree pollen distribution. This effort is spear-headed by Chapter President Doug McLane (pictured below). To be prepared the Chapter is striving to conserve quantities of at least 35 genetically diverse flowering wild-type American chestnut trees and have them ready to pollinate after approval. These new sources will be grown in Germplasm Conservation Orchards (GCO). At the end of the 2021 growing season viable nuts had been harvested from 22 new sources.

Two committees oversee this process. First, the **Location Committee** searches for wild flowering American chestnut trees. When a tree is located a leaf sample is sent to Regional Science Coordinator, Kendra Collins, to confirm its identity. Information on each tree is permanently stored in the TACF **dentataBase**. For trees that are confirmed to be American the committee determines if has the potential to naturally pollinated, or if another tree needs to be located for hand cross-pollination. Trees that produce viable nuts are harvested and the nuts are delivered to the **Biotechnology Committee**. A summary of 2021 Location Committee work follows this write-up.

The Biotechnology Committee is charged with creating GCOs for growing the diversity of new American chestnut sources. The chapter currently has two active CGOs and two that are being tested to determine if they will support the growth of healthy trees. The strategy is to create one CGO each year until there is sufficient space for the 35 new sources. The second charge is to properly store the nuts over winter (called stratification), grow them to seedlings in spring, and plant them in GCOs when the growing season begins.

In addition, VT/NH Chapter biotechnology activities include interaction with the Maine Chapter and Dr. Tom Klak at the University of New England to plant, harvest and process nuts from trees pollinated with transgenic pollen. These actions are strictly controlled in accordance with USDA permits.

As the Location and Biotechnology committees began operating it became apparent that the Chapter's 2017 Strategic Plan was outdated. As a result, the Board of directors has rewritten the plan to be responsive to advances in chestnut restoration science and technology. Once approved, this Strategic Plan will be available to all members. Anyone wanting a copy of the updated plan should contact Chapter VP, Curt Laffin at calaffin@comcast.net or (603) 305-2522.



Chestnut Location Committee

By Ann Hazelrigg

The purpose of the Chestnut Location Committee is to identify and harvest new sources of wild-type American chestnuts. Nuts from these genetically diverse sources are planted in Germplasm Conservation Orchards and will be pollinated with transgenic tree pollen once it is approved for distribution.

The committee is currently co-chaired by two New Hampshire volunteers, Lewis LaClair and Chris Leask while Chapter President, Doug McLane provides mentorship. Gillian Galford is the committee's VT member. The group follows up on leads of new trees reported on the VT/NH Chapter website, and from volunteer observations. Leaf samples are sent to the New England Regional Science Coordinator, Kendra Collins, for verification as wild-type American chestnuts. When a tree is verified, the committee oversees cross-pollination by hand or monitors natural pollination. This past year the Committee met its annual strategy of finding four new sources and harvested approximately 400 viable nuts.

An example of how the Location Committee works happened in Concord, NH where Chapter member Craig Tufts reached out to Kendra to report an American chestnut in his backyard. After confirming the tree's identity, Chapter Vice President, Curt Laffin, who lives in Hudson, NH, met on site with Craig and his children, Ellis and Julian (pictured below) to cross-pollinate the tree. It produced four viable nuts.

Another source was found by Doug McLane and one was supplied by the Maine Chapter. The Location Committee is responsible for harvesting the nuts and providing them to the Biotechnology Committee for winter stratification. The nuts harvested this year are being stratified in Plymouth, NH and Burlington, VT in preparation for planting next season. The two committees will coordinate to plant the nuts, or their saplings, in Germplasm Conservation Orchards.

Prior to approval of transgenic tree pollen for distribution, which may still be two years away, capturing American chestnut genetic diversity is the most important action the VT/NH Chapter will be taking in the near future. Citizen scientists are crucial players in this process. If you think you know the location of a flowering American chestnut tree, please collect a leaf sample and send it to Kendra. To obtain a copy of the tree Locator Form and instructions, go to the TACF web page, acf.org.



Membership and Outreach

By Curt Laffin

The current number of VT/NH Chapter members is 241. This number normally increases by 3-5 each month even though several memberships typically lapse each month. Lapsed members are periodically asked to rejoin. Since COVID has prevented personal contact, outreach strategies used to attract new members have been limited to tools such as Constant Contact (CC) and virtual meetings. However, this situation is improving. Our Chapter will have a booth at the VT Farm Show, February 1-3, 2022 in Essex Junction, VT and at the NH Farm, Forest and Garden EXPO February 4 & 5, 2022 in Manchester, NH.

Constant Contact is our most effective communication tool used to inform members of chestnut restoration progress and attract new members. In addition to active members, CC campaigns are sent to lapsed members and non-members who have asked to be included. Most campaigns are sent to more than 500 contacts. We are pleased when some of these additional contacts join TACF.

The VT/NH Chapter web page is another good outreach resource that has recently been updated by Board Fellow, Jessica Wikle, a Doctoral candidate at UVM. Jessica has done an excellent job to make the page more user friendly and to become a storage tool for Chapter news and documents. The Board of Directors hopes to find a volunteer to spend 1-2 hours a month maintaining the web page after Jessica's fellowship ends. Please contact Outreach Committee chair, Curt Laffin, at calaffin@comcast.net if you are willing to take on this important function, or other projects requiring computer skills.

Due to the extra cost and effort required to reach approximately 30 members who do not have access to email, these members receive less communication than those who do.



Governance

By Bill Coder

The Governance Committee is working toward improving the efficiency and resilience of managing Chapter business functions and interaction among committees. Being able to easily share information about business processes should help as Board members and volunteers transition responsibilities, especially as new team members come on board. A Google Drive has been embedded in the Chapter web page to store and retrieve important documents. In addition, Board members can use this Google Drive to record activities such as orchard management and outreach projects as they occur. This information is then then be available in standard format for periodic reporting and record keeping required by the National TACF office and various agencies.

Good governance in organizations such as the VT/NH Chapter requires input from people who have computer technology skills and knowledge. If you have related skills, and are willing to volunteer some time help us in this area, please contact Chapter VP, Curt Laffin at calaffin@comcast.net, or 603 305-2522.

Salvaged American Chestnut Wood

The VT/NH Chapter owns American Chestnut wood harvested from large trees that have died. It is stored at locations in VT and NH and has been used to make items for fund raising and gifts. An example is the chair, pictured below, that was made by VT wood worker Tom Fontaine and sold at auction for \$1250.

Thank you Tom!



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