



# The West Virginia Chapter of The American Chestnut Foundation NEWSLETTER



*In the heart of American chestnut's natural range*

December 2021

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## Editor's Note

Since this is a newsletter for the WV chapter, I try and feature stories that are specific to our state, but I also like to keep members apprised of events happening at the national level. That is why I include information from the National TACF Board of Director's meetings. I have included information in this edition on the financial health of our organization, discussion relative to the state of our backcross program, and proposed projects at Meadowview. While this information is important, it does not lend to many pictures. I'll do my best to incorporate more pictures in future editions.

Another important item in this edition is the announcement of the **WV Chapter Grant Program** that will award up to \$1,000 to WV members for anything chestnut related. We modeled our grant program after that of the Ohio chapter. See details on Page 5.

## Fall TACF Board Meeting

The fall meeting of TACF's Board of Director's was held virtually on 29 October with 52 people attending. The treasurer's report was provided by **Barbara Tormoehlen**, Board Treasurer and **Paul Wingenfelf**, TACF's chief financial officer. Income and expenses balanced at

\$2,927,432 for the last fiscal year. Expenses were proportioned by the following percentages:

- **National office (19%)**
- **Marketing and Communication (5%)**
- **Development and Fundraising (5%)**
- **Science and Research (18%)**
- **Regional Science Coordinators (15%)**
- **Chapters and Membership (9%)**
- **Research Farms (18%)**

Investments in Vanguard totaled \$4,478,354.

TACF has issued grants to external organizations for many years. This year, the national office awarded grants totalling \$44,000.

## Proposed 2022 Projects for TACF

The Board of Directors heard a presentation from **Dr. Jared Westbrook** relative to TACF's needs for 2022. The following items are not listed as expenses in the current budget, but they will be financed through granting agencies or from the Vanguard fund (detailed above). The projected cost for all the projects is \$353,000. The projects are as follows:

- 1. Fencing for Duncan and Wagner farms at Meadowview (proposed cost \$150,000).** The Meadowview farm has three

tracts of land: The **Price farm** (site of the original plantings in the 1980s), the **Wagner farm** and the **Duncan farm**. The plan is to gradually convert one of the Meadowview seed orchards (Duncan farm) to a transgenic production orchard and plant the Wagner farm with progeny from **Best x Best** crosses from the traditional breeding program. This will enable Meadowview to offer both transgenic and non-transgenic seed for restoration. Deer pressure has recently increased in Southwestern Virginia. These properties need to be fenced if we hope to establish these orchards in light of the deer pressure.

**2. Phytothora root rot RNA sequence timecourse (proposed cost \$85,000).** This is a necessary step for discovering candidate genes potentially involved in resistance to Phytophthora Root Rot (PRR). Gene expression will be compared in roots of Chinese v. American chestnut before and at multiple timepoints after infection with *P. cinnamomi*. Genes that are differentially expressed in the roots of Chinese chestnut in response to root rot, map to Quantitative Trait Loci (QTL) intervals for resistance, and/or have signatures of natural selection in the resistant *Castanea* species are potential candidates for cisgenesis or gene-editing to enhance PRR resistance.

**3. Meadowview Greenhouse infrastructure (proposed cost \$10,350).** In order to increase production of nuts and seedlings, seeds will need to be sown in January rather than March. Due to the risk of fatally cold weather in late winter and early spring, a backup

generator and additional propane tanks are needed for the greenhouse's heating system. Otherwise, seedlings can be frost-killed in a matter of hours, compromising our ability to meet or increase current production numbers.

**4. DentataBase contractor (proposed cost \$26,000).** Chestnut trees, both wild and those planted in orchards are entered into a database, **DentataBase**. TACF is currently in phase 10 for the Dentatabase development. This phase is being done by the developer **Nitidbit** and funded by the Templeton grant that expired in October 2021. We have been using a collaborator from SUNY-ESF, **Vern Coffey**, to do some development work. Vern is being funded by a Ballyshannon grant which expires in December 2021. We would like to continue to use Vern while we try to seek other funding sources to continue the Nitidbit development which will be phase 11. Vern is familiar with chestnut, and he is also a coder; he is 1/3 the cost of Nitidbit.

**5. Backup generator for the Price Laboratory (proposed cost \$10,000).** Any tissue or pollen (including transgenic pollen) that is stored at Meadowview is vital to farm operations and TACF operations overall. Within a few hours of loss of power, tissue and pollen samples' genetic material degrades and becomes unuseable. This backup generator will allow Meadowview and TACF proper to remain the research hub going forward.

**6. Development of antibody test strips for OxO development of antibody test strips for OxO (proposed cost \$75,000).** This project is a potentially a cheaper, easier, faster method to test seeds and seedlings for inheritance of OxO. As TACF ramps up production, a rapid test for OxO inheritance is needed that is non-tech-

nical and can be conducted by volunteers. We'd also like to be able to offer people a quick and easy test in case there is ever a question about whether a tree is transgenic or not.

**7. Assessing the adaptive genetic diversity in TACF's backcross populations (proposed cost \$20,000).** Results from this project will tell us how much of the adaptive diversity in American chestnut we've captured in high percentage (e.g. >95%) American chestnut backcross trees. One possible result is that we've captured most (95%) of the adaptive diversity from wild populations. Hence, we could use our existing high percentage American backcross trees as parents to diversify the Darling 58 crosses without the need for additional germplasm conservation. Another result could be that we have undersampled adaptive alleles in particular portions of the range. In that case, we could strategically target our germplasm conservation efforts to these regions with important and undersampled adaptive diversity.

At the conclusion of the discussion relative to the above-mentioned proposed projects, one member of the Board of Directors volunteered to cover the entire \$150,000 cost of the fencing for the Duncan and Wagner farms, freeing up funds for the remaining projects.

## Status of TACF's Hybrid Chestnuts

The national **Backcross Breeding Program Distribution Committee** met on 31 Aug 2021 and made

the following recommendations relative to the current hybrid chestnuts that were harvested in that fall of 2021. This sub-committee of the restoration committee was tasked with the objective to make a recommendation to the board of directors at the 2021 fall meeting regarding the **Germplasm Agreement (GPA)**, as the Meadowview backcross breeding program moves to the next step of utilizing the nuts produced from the seed orchards after rouging is completed. The Meadowview nuts that were harvested this fall and distributed next spring would represent the completion of the originally designed backcross breeding program and these nuts should represent the beginning of restoration trials and chestnut restoration. The GPA was developed for the protection of these trees from misuse during development and testing. If we are going to eliminate or replace the GPA at this point, we first need to determine how these nuts will be used and distributed, and then make sure we have a document or documents in place to match the needs created by that usage. The tasks of this committee as follows. (1) determine how we want these Meadowview BC3F3 nuts to be used; (2) how they will be distributed; (3) and what will we replace the GPA with.

**(1) Use** - The committee guessed in mid-August that there may be 30,000 B3F3 nuts from the 2021 Meadowview farm harvest. Determining how to use these nuts will be complicated by the fact the trees they produce will not be as blight resistant as originally hoped. In general, the more blight resistant they are the less American like they will be, and the

more American-like the less resistant they will be. It is unlikely that any will be as blight resistant as Chinese. We do not know how long these trees will live, how competitive they will be in the forest, or how much they will look and grow like pure American chestnut trees. We need to get answers to these questions, which is one reason to get these nuts outplanted in performance trials. Other reasons for making these seedlings available for outplanting is to fulfill the needs of our members to be involved in a constructive way. The recommendation of this committee is to produce seedlings from these nuts and make them available to TACF cooperators and members for the establishment of performance trials. This recommendation will be reevaluated each year as the number of nuts produced grows, demand for seedlings changes, and the future of the transgenic trees becomes clearer. The TACF Seed Level Membership Program has been an important membership and fundraising program. These seeds also should be made available to continue the program along with any newly-developed paperwork, for as long as appropriate.

**(2) Distribution** – In addition to the TACF Seed Level Membership Program, TACF would develop a contract and provide BC3F3 nuts to private nurseries to grow into seedlings. Each nursery would receive nuts by mother trees and keep each line separated in the nursery beds. Quality standards would be set by TACF. The nurseries would lift, bundle, package, sell, and ship seedlings to cooperators, and members. TACF would receive an agreed upon payment from nurseries for each seedling sold, which would be based on production and shipping cost. The lines of trees mixed into each bundle sold would be handled at the nursery, based on the objective of each planting project.

**(3) Paperwork** – Because these breeding program trees are not as good as originally hoped, we do not recommend them for full restoration release to the public. They need to be used for restoration trials or some form of performance trials so we can learn what we do have, and how to best use and improve them. Therefore, we recommend working with cooperators to establish performance trials, using recently updated planting protocols when appropriate. We recommend replacing the current GPA with a **Material Transfer Agreement** that would include a very clear explanation of what these trees are and the purpose for the performance trials. We need to maintain some form of access to these trees. We will need to work closely with our legal advisors on the drafting of a new document. It should be renamed so that it is not confused with the current GPA. Recipients of these trees need to fully understand what they are getting. Members who receive seeds or seedlings for personal plantings need this same information. We recommend a clear name for these trees such as **“TACF 2021 backcross trees”**.

*The distribution of 2021 seeds elicited a great deal of discussion at the fall board meeting. Many board members expressed their concern over handing over seed to private nurseries. If the seedlings from the 2021 nuts do not perform well, that sheds a poor light on TACF. It was decided that the Promotion and Outreach Committee should review these policies before they are implemented in 2022. Comments were made that commercial nurseries will be needed at some point, but not with the current nut crop.*



# Lisa Thomson's President's Report

**Lisa Thomson**, President and CEO of TACF, gave her report to the Board of Directors.

- A documentary film on TACF began production nearly 4 years ago. Lisa hopes with some newly taped interviews the video will be complete in 2022.
- An interview is currently being conducted with **Dolly Parton**. It has taken nearly two years to work with Dolly's handlers to conduct an interview with TACF. Lisa thanked **Dr. Hill Craddock**, University of Tennessee, Chattanooga, for facilitating the relationship with Dolly.
- **National Geographic** ran a story on American chestnut in 1990. This was an iconic story that was read worldwide. *National Geographic* has a new article on American chestnut planned for the May 2022 edition.
- With the help of TACF member, **Rex Mann** from Kentucky, TACF members planted chestnut seedlings in October with the **Eastern Band of the Cherokee Indians**.
- Lisa is in her 7th year at the helm of TACF. She stated that the national membership is about 5,100 members and that despite the pandemic, 574 new members have been added this year.
- The fall appeal of \$250,000 is at 30% of the goal with nearly \$80,000 raised to date.
- TACF has hired a post-doc to work on gene expression after infection by the chestnut blight fungus. The person hired to complete this com-

puter-driven task is working currently in Germany.

- The newly elected Chapter's Committee Chair is **Bruce Levine**, the MD chapter president. **Kathy Patrick**, GA chapter president, will be the new vice chair of the committee.

## Dr. Vasiliy Lakoba, TACF's Director of Research

Vasiliy, who started with TACF in June 2021, reported on some of the progress made at the Meadowview farms in 2021.

- In the spring, 2829 chestnut trees were planted at Meadowview.
- Hand pollination took place between 28 June and 12 July.
- Field inoculations (n=6,000) were made on 2017 progeny.
- Phenotyping was conducted on more than 700 trees at Meadowview. They used a number of metrics such as branch angles, height, etc. in an effort to weed out trees that do not possess sufficient American traits.
- About 50,000 nuts were harvested in 2021.
- The acreage of the Meadowview farms is: Price farm (88 acres); Wagner farm (11 acres); Duncan farm (15 acres). They hope to transition the Wagner farm to Best X Best production and the Duncan farm to production of transgenic trees.

## Proposed WV Planting in 2022

The following details relate to a tentative planting in Alderson, WV

in the fall of 2022. **Donny Dodd**, WV-TACF member and an employee of the National Resources Conservation Service (NRCS) in Beckley has spearheaded this project. Donny, working with **Tom Saielli**, our Mid-Atlantic Regional Science Coordinator, proposes to plant 800 hybrid chestnut seedlings. The scope of this planting will test the effectiveness of small stem assays (SSA). Small stem assays use greenhouse seedlings that are inoculated with the chestnut blight fungus to provide an early assessment of blight resistance. These assays were developed as a quicker mechanism to determine resistance in trees.

### **Background:**

The American Chestnut Foundation historically grew hybrid chestnut trees in orchards for several years before challenging them with an isolate of the chestnut blight fungus to test their susceptibility to chestnut blight. In order to shorten that time frame, TACF has been using small stem assays (SSA). This procedure utilizes greenhouse seedlings that are inoculated with a weakly pathogenic isolate of the chestnut blight fungus. Those seedlings that survive the inoculation may contain the necessary resistance genes. This method, which is more simple and rapid than long-term field trials, allows for the rough selection of potentially resistant trees from obviously susceptible ones. Selected seedlings are then typically planted in orchards. The question remains, can SSAs reliably predict which seedlings are truly susceptible and which are potentially resistant.

### **Objective:**

The primary objective of the SSA correlation field trial in West Virginia is to examine how to most effectively phenotype and select for blight resistance among backcross trees,

in order to maximize gains in resistance while minimizing effort. For this experiment, we have selected hybrid trees from among the highest-rated backcross lines in the Mid-Atlantic Region, including TACF and the Virginia Division of Forestry backcross programs. The trees selected are currently growing in a greenhouse and will be tested via small stem assays, followed by field trials at the site in West Virginia, where continued testing and evaluating will take place. Eventually, the best seedlings (those that score very well in both trials) will become permanent trees at the site, becoming a component of the forest.

**Project phases:**

- Conduct SSAs on a common set of backcross families and controls using a standardized protocol for phenotyping at a greenhouse in Virginia (early summer 2022).
- Plant out all of the progeny at the West Virginia location (fall 2022).
- Reinoculate with chestnut blight inoculum at 3 years.
- Assess canker severity annually post inoculation.

## **WV Chapter Grant Program**

**West Virginia Chapter of The American Chestnut Foundation**  
**Due: 31 Jan 2022**

We invite members of the West Virginia chapter of The American Chestnut Foundation to apply for grants up to a maximum of \$1,000 to support education, outreach and scholarly activities related to American chestnut in the State of West Virginia.

### **Purpose**

Grants are available to assist members with active restoration projects in the State, outreach activities, as well as with their scholarly activities. Funding may be requested for supporting a range of ideas and projects, including but not limited to: chestnut demonstration plantings; signage for new or existing planting; travel and supplies for maintenance of existing plantings; educational outreach; research and scholarship related to chestnut restoration in West Virginia. Funding for completed work is not allowed unless the project has had prior approval by the WV chapter Board of Directors. Travel funds for conferences are not available unless you/your group will be representing the West Virginia Chapter.

### **Rules and Responsibilities**

Recipients must be a current member in good standing with the West Virginia Chapter of The American Chestnut Foundation, WV-TACF (see acf.org to join). Each recipient is expected to present a summary of the results of the funded project to the West Virginia Chapter at a chapter meeting within two years of the award. Publications, public and private presentations, and other products derived from work funded by the WV-TACF must include acknowledgment of the funding received from the Chapter. Information and products of the funded work are required to be freely disseminated by the American Chestnut Foundation unless protected by copyright.

Proposal ideas should be discussed with the President of the West Virginia Chapter and/or members of the WV Board of Directors prior to submitting the written proposal. Proposals should be submitted electronically to WV chair of the grant award subcommittee:

**Dr. Melissa Thomas-Van Gundy (mthomasvangundy@fs.fed.us).** Include the completed information found on Page 6 as a cover. The proposal should be three pages maximum (including the cover page), single-spaced, in Times New Roman (minimum 12 pt), minimum 1" margins. Proposals over the page limit will not be considered.

### **Research Grant Guidelines:**

- Brief project overview, including goals, expected impact and relevance to chestnut restoration;
- Proposed activities and connections to project goals, including a project timeline;
- Plans for dissemination (e.g., publications and presentations) and subsequent funding request.

Attach a list of references cited, a line-item budget, evidence of cost-sharing (e.g., proposal, letter of award), and a description of special technology or infrastructure considerations (if applicable).

### **Education and Outreach Grant Guidelines**

- Brief project overview, including goals, target audience and participants
- Proposed activities, including a project timeline and detailed budget (including shared costs)
- Plans for maintaining trees (if project involves tree planting)

Proposals will be evaluated by a subcommittee of the WV-TACF Board of Directors. Proposal reviewers will not necessarily be experts in any specific field, and therefore proposals should be written clearly for the educated layperson.

## WV-TACF GRANT APPLICATION COVER SHEET

Deadline: 31 Jan 2022

Award announcement date: 01 March 2022

Submit electronically to: Dr. Melissa Thomas-Van Gundy (mthomasvangundy@fs.fed.us)

Name(s):

E-mail(s):

Phone number(s):

Project Title:

Amount Requested:

Previous Grant Awardee?     Yes     No

Year of Last Award (N/A if not applicable) \_\_\_\_\_

Amount awarded (will be completed by subcommittee): \_\_\_\_\_

### Discerning *Castanea* Species

Sara Fitzsimmons, TACF's Director of Restoration, put together an Excel sheet detailing some of the characteristics of the various *Castanea* species. This can serve as a guide for speciating trees that are found in the wild.

	American	Chinese	European	Japanese
Genus/species	<i>C. dentata</i>	<i>C. mollissima</i>	<i>C. sativa</i>	<i>C. crenata</i>
Macroscopic Traits	Possible Options			
Leaf thickness	Thin	Thick	Thick	Pointed top, curved base
Leaf shape	Canoe	Oval	Pointed top, curved base	Pointed top, curved base
Leaf shininess	Dull	Shiny	Shiny or dull	Shiny
Dentation	Ocean-wave	Wedge	Ocean-wave	Wedge
Bud shape	Cylindar	Oval	Round	Oval
Bud color	Red	Yellow	Green	Intermediate
Bud hairiness	No	Yes	Sometimes	Yes
Stipules	Thin	Flared	Not present	Intermediate
Twig color	Red	Yellow/brown	Brown	Pink
Twig hairiness	No	Yes	Sometimes	Yes
Petiole angle	Acute	Obtuse	Acute	Acute
Relative stem size	Thin	Thick	Moderate	Thick
Lenticel size	Small	Medium	Large	Medium
<i>This is not an exhaustive list; not all Castanea species are listed.</i>				



American, Chinese, European and hybrid chestnut leaves (left to right)



American, hybrid, Chinese and European chestnut twigs (top to bottom).



## Robert Sybolt at Preston High School

Robert Sybolt gave presentations to three of Tina Cool's biology classes at Preston High School. The Waddell Orchard, established by Robert, is directly behind the high school. As you can see in the photos, the backdrop for an outdoor learning laboratory is very scenic.



Robert Sybolt speaking about chestnut.

## IUFRO Chestnut Ecology and Silviculture Newsletter

Interconnecting Forests, Science and People (IUFRO) is a newly formed international working party that hopes to share information, exchange ideas and build a network among chestnut researchers. Their newsletter will be published every three months. A download of the PDF can be found at:

<https://www.iufro.org/fileadmin/material/science/divisions/div1/10113/10113-newsletter1-2021.pdf>

The coordinating group consists of: **Stacy Clark**, USDA Forest Service,

Knoxville, TN; **Maria Patricio**, Braganca, Portugal, **Veronica Loewe**, Santiago, Chile; and **Enrico Marcolin**, Padova, Italy. They featured a number of articles that may be of interest to WV chapter members.

## Chestnut Tree Plantings in Fayette County

by Dr. Lewis Cook

Members of WV-TACF in Fayette County established four sites in November. The plantings were later than usual due to weather changes. These four sites are in addition to Sam Muncy's efforts at the Summit Bechtel Family National Scout Reserve area which has been a large, ongoing effort for several years.

The four sites are:

1. A **progeny site** within the National Park Service along the LeCrox Trail. Fifteen B3 seedlings were planted in a wooded area and simply marked with rebar stakes. Each was marked with flagging and bright paint to provide location ID. No caging was used.
2. A four tree, **demonstration site** was established along the Long Point Trail at a public observation platform. The purpose of this site is to provide the public a visual opportunity to bring attention to the TACF activity. These seedlings include hybrids that are more likely to survive and grow to some significant height.
3. Another **demonstration site** was located at the Oak Hill High School beside the Vocational Technical Center. That site had been a previous planting attempt that had not done well due to wet and shallow soil conditions. The Board of Education allowed for a wider site development to move the plantings to a better area of that property. Twenty-eight chestnut seedlings were planted there, some with the help of the school's forestry class. The intent of this site is to plant a variety of trees including non-chestnut West Virginia trees to observe and compare how they

grow in the same environment. This will, hopefully, provide an educational opportunity for the students and the public. We will add the non-chestnut trees as we are able to obtain them. Robert Sybolt offered assistance in that regard.

4. This site is located on our publicly owned Fayette County Farm in Fayetteville. It is our attempt to establish a **Germplasm Chestnut Orchard (GCO)**. All the trees are pure American Chestnut provided by Sara Fitzsimmons and Robert Sybolt. The site is designed to conform to the TACF's recommendations as far as distances and layout. This initial planting contains twenty seedling which creates two plots of ten trees. Guidelines such as cage use and weed control measures were followed according to TACF recommendations.



Lewis Cook and Steve Swank survey a plot.



Lewis Cook and Steve Swank laying out a plot.



Lewis Cook and Oak Hill High School students.