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The Newsletter of the Virginia Chapter of
The American Chestnut Foundation

Fall 2020

Vol. 14, No. 2



THE PRESIDENT'S MESSAGE BY WARREN LAWS, VIRGINIA CHAPTER PRESIDENT

Our annual chapter meeting will take place using Zoom on October 24 at 10 AM. In the past we held our meetings in conjunction with tours of a Germplasm Conservation Orchard, Lesesne State Forest and other places of interest. Although the primary reason for holding a Zoom meeting is due to COVID-19, it also enables more members to attend. If you want to attend please RSVP at vachestnut@verizon.net. I will then send you an invitation via email several days before the 24th which will include a link to the Zoom meeting. You will have the option to use audio or video or both. You do not need a camera to participate. We are privileged to have as our guest speaker Dr. William Powell. Dr. Powell works at the State University of New York College of Environmental Science and Forestry and manages the transgenic American chestnut program. An article in this newsletter describes how this works. Dr. Powell has petitioned the U.S. Government to allow transgenic material to be released into the wild. Guidance on this is contained in: <https://www.acf.org/science-strategies/biotechnology/documents-for-public-comment-period/>. After reviewing this page I urge you to submit a comment in support of this effort in the *Federal Register*: <https://www.federalregister.gov/documents/2020/08/19/2020-18135/state-university-of-new-york-college-of-environmental-science-and-forestry-petition-for-open-comment>. The public comment period will end on October 19. Dr. Powell



has the full support of The American Chestnut Foundation and your Virginia Chapter.

Also in this newsletter is Dick Olson's article on reforestation. Although we have not started to reforest yet, we need to work out a plan. Reforestation will require many volunteers and much money.

As of this writing our harvest is going well. We will have more information at our October 24 meeting.

Due to COVID-19 a number of our outreach events have been cancelled. However, we have a number of speakers who could give presentations on Zoom. If any of you would like us to present the chestnut story to a group you belong to, please contact me at vachestnut@verizon.net.

See you on Zoom on the 24th of October at 10 AM.

Why Should You Support Governmental Approval for Releasing Transgenic American Chestnut Trees into the Wild?

By Warren Laws

In many peoples' minds there exists a skepticism about genetic engineering. We all know of instances when a product is released to the public only to find out later that it had adverse environmental effects. When this happens, the product is hopefully banned. Skepticism is justified, so we must be very careful. On the other hand, we do not want to stop all scientific progress. The solution to this dilemma is to ensure through rigorous and extensive testing that what is released into the wild is safe.

The guest speaker for our annual chapter meeting is Dr. William Powell, who has spent years ensuring that transgenic American chestnut trees are not harm-

ful to our environment. Dr. Powell has petitioned the U.S. Department of Agriculture, the Environmental Protection Agency and the Food and Drug Administration for permission to release transgenic American chestnut trees into the wild. This 290 page document (<https://www.aphis.usda.gov/brs/aphisdocs/19-309-01p.pdf>) has a four-page executive summary. What follows is a condensed version with a few embellishments.

Dr. Powell first outlines why the American chestnut tree should be rescued from functional extinction (defined as not being able to reproduce on its own). This is obvious to most of us. The American chest-

nut tree was a fast-growing hardwood which produced valuable timber. It also consistently produced a crop of healthful nuts which was consumed by people, domestic animals and wildlife.

Having established the obvious need for a return of this tree, are transgenic American chestnut trees safe? An enzyme called oxalate oxidase (OxO) is produced in this transgenic American chestnut tree. This common enzyme is found in all grains and is consumed on a daily basis by people, domestic animals and wildlife. Scientists have studied this enzyme for over 100 years and have determined that it is gluten free and chestnuts with this enzyme have the same nutritional value as those without the enzyme.

“When chestnuts were ripe I laid up half a bushel for winter. It was very exciting at that season to roam the then boundless chestnut woods of Lincoln.”

Henry David Thoreau, *Walden*

The OxO enzyme does not kill the fungus. The transgenic American chestnut tree will still be infected by the blight and still have cankers; however, the tree will probably survive. This enzyme detoxifies oxalic acid. This acid does much damage to the tree and causes fatal cankers. The fact that the enzyme is not a fungicide should make approval by regulators more assured. If it were a fungicide and had the potential of totally eliminating the blight fungus, would we want to introduce this into the environment? Would the absence of this fungus affect other organisms? Since it is not a fungi-

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Challenges of American Chestnut Re-forestation

By Dick Olson

With the successful establishment of seed orchards in Northern Virginia, it is time for the Virginia Chapter to start planning how we will meet the challenges of fulfilling our mission – to restore the American chestnut tree to Virginia’s woodlands to benefit our environment, our wildlife, and our society. The BC3F3 seed will potentially be available within 6-8 years from our seed orchards for plantings. There are many issues associated with restoration plantings that need to be considered, including site selection criteria, planting procedures, protection requirements, and monitoring protocols.

Restoration plantings in the SW region of Virginia (west of I-77) may be possible sooner. The Chapter does not have breeding activities in this region because locally adapted seed will be produced by the TACF seed orchards at Meadowview. Dr. Jared Westbrook has indicated that selection of the most blight-resistant chestnut hybrids is nearly completed for the Wagner (Graves line) and Duncan (Clapper line) seed orchards at the Meadowview Farms. Seed from these orchards should be available to the Chapter for the SW region within the next few years.

The Chapter is undertaking transgenic approaches in addition to traditional plant breeding. Although it will require years to produce locally adapted seed having broad genetic diversity, the restoration process will be the same.

Early restoration plantings may be conducted by the Chapter on public lands; however, as seed becomes more plentiful,



Dick Olson

small to large plantings by private landowners will be supported. A private landowner may be expected to grow seedlings and provide predator protection. Growing seedlings in a greenhouse or hoop house generally produces more robust bare-root seedlings but at significant cost.

Several forest silviculture studies have identified favorable forest site characteristics for planting American chestnuts. These studies have documented that the most successful plantings are bare-root seedlings with predator protection on open sites that are supporting oak forests. However, these studies also acknowledge the cost in growing seedlings, providing protection, and time planting large seedlings may be prohibitive at large scales. Dr. Stacy

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Clark in her recent TACF Zoom chat summarized that medium quality sites at mid-elevation (2,000-4,000 feet) were most successful in her studies. Sara Fitzsimons, TACF Director of Restoration, reviewed the major TACF breeding objectives in the 2020 spring *Chestnut* journal, including the need to initiate reintroduction trials to gather data from a variety of forest plantings.

Planting chestnut seedlings in a forest setting with predator protection can be highly successful. The SWVA Branch assisted the Meadowview staff in planting a recently logged site in 2014 and have been monitoring the site since. There is 90% survival of the 504 trees and the 5-year old BC3F3 trees average 9.3 feet in height with one almost 17 feet tall. Landscaping cloth provided weed suppression plus 5-ft high, 30-inch diameter wire cages were used for deer protection. Only about 10% are starting to show some signs of blight. As impressive as this

stand is, the Branch volunteers can attest to the significant effort that was required.

An alternative approach is to plant nuts. The Chapter participated in a study of the survival of direct planted seed. The Bull Mountain study in northern Virginia in 2012-2013 compared survival among various types of predator protection and site conditions. One-year survival was 6% on sites with either no protection or brush piled over the seeds. Second year survival was 2.4% or a level of 24 seedlings out of 1,000. The study investigators point out that seeds were planted with potting mix – possibly an invitation for predators.

They expressed their view as:

In the long term, successful American Chestnut restoration will rely on seeds maturing into saplings, but this will result from mature trees each producing many thousands of seeds and not volunteer corps planting hundreds of seeds.

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Sky Meadows Seed Orchard

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cide, this is a moot point.

This transgenic approach adds two genes to a genome with over 30,000 gene pairs. Some of you may wonder if a gene editing tool such as CRISPR was used. The answer is NO. Only two genes are added; none are modified.

The above information may have already convinced you that enabling the American chestnut tree to produce this harmless enzyme is safe. However, Dr. Powell and his staff knew that extensive testing needed to be done. The 290-page petition submitted by Dr. Powell contains descriptions of these numerous tests. Extensive tests were done to determine if these transgenic trees had any adverse effects on honeybees, tadpoles, leaf litter decomposition, interactions with nearby plants and many organisms.

The next step in the approval process is a public comment period. Assuming these transgenic trees are approved for dispersal into the environment, what happens then?

The most practical way to disseminate this tremendous advance in environmental progress is to ship vials of pollen from existing transgenic trees to Virginia. Fortunately, trees generating this pollen will not be patented. This avoids all licensing paperwork and is in the spirit of environmental altruism. This also enables citizen scientists and landowners to more easily propagate blight-tolerant American chestnut trees.

This summarizes the executive summary of the petition with some of my embellishments. If you have the time and inclination, read the four-page executive summary or even the whole petition. The



Blandy Seed Orchard

more you read the more you will be supportive.

Current Information on Restoring the American Chestnut Tree on Zoom

Since the implementation of COVID-19 restrictions this spring, The American Chestnut Foundation has created a series of “chat” sessions on Zoom. These are initially live but are recorded for those who cannot participate. During these sessions, an expert makes a short presentation followed by questions. Each session is about one and a half hours. Subjects vary but all pertain to our mission. Here are just a few of the topics: transgenics, pollination, Meadowview Farm, finding American chestnut trees in the wild, reforestation and chestnut harvests. For a complete list of subjects see: <https://www.acf.org/resources/chestnut-chat-series/>.

ANNUAL CHAPTER MEETING

OCTOBER 24, 2020

10:00 AM

VIA ZOOM

RSVP TO

VACHESTNUT@VERIZON.NET

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The SW Branch is proposing a trial restoration planting using direct seeding. The general concept would be to randomly plant generous numbers of nuts per acre on large forest sites that are suitable for growing chestnuts. At least 1,000-1,500 seed/acre, which represents a 5-6 ft average spacing, would be planted. There would be no protection and minimal disturbance during planting. Although there may be significant loss of seed and young seedlings, the survivors may be adequate to allow the planting to evolve into a blight-tolerant forest.

The appeal of direct seeding is the lower cost compared to growing and plant-

ing bare-root seedlings with predator protection. In addition, planting seed often results in faster growth without the initial transplant shock. A cost/benefit comparison could quantify differences between the two approaches before selecting one for broad restoration plantings.

There are challenges to establishing restoration plantings, but by starting the planning process now, the Chapter will be able to restore the American chestnut to our woodlands as soon as seed become available.



Harper Hebard Taking a Break at Banshee Reeks Seed Orchard



Native Plant Garden at Meadowview



Potting at the Southwest Region

Bobi Thornhill, Outstanding Volunteer

One of Bobi Thornhill’s earliest memories from the age of three was of annual family vacations in our National Parks. She received her earliest education in the natural sciences from USNPS Rangers on guided hikes, visiting natural history exhibits and nightly slide shows at park campfire meetings. This may very well be responsible for a lifelong preference for life in the out-of-doors.

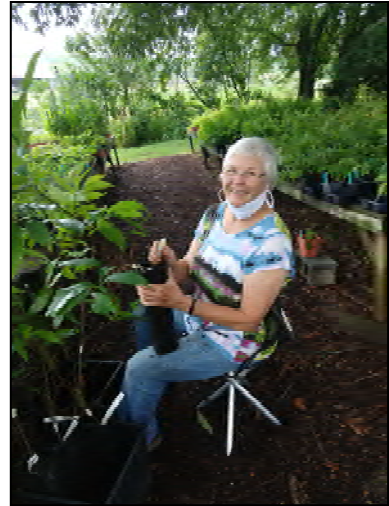
In 1979 she graduated from Blue Ridge Community College with an AAS in Veterinary Technology and worked in Tucson, AZ, as an animal surgical nurse for several years.

She retired after 30 years at the University of Virginia in the Pediatric Nephrology Laboratory. During this time she co-authored over 49 peer reviewed scientific papers.

In 2020 she celebrated her 11th year as a Virginia Master Naturalist.

She spends her time at home working at restoring her 2 acre yard with native plants.

When not involved in this project she actively supports the Central Virginia Region. This includes harvesting, pollinations, orchard maintenance, Small Stem Assay studies, outreach events and just about anything needed to accomplish our mission. As such she is one of our most loyal and hardworking volunteers.



Marshall, VA 20116

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Virginia Chapter

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