

The West Virginia Chapter of The American Chestnut Foundation NEWSLETTER



In the heart of American chestnut's natural range

September 2024

WV-TACF Officers

President--Bernie Coyle
Vice President--Jerry Legg
Treasurer--Sam Muncy
Secretary--Jeff Kochenderfer

Board of Directors

Dr. Lewis Cook
Linda Coyle
Dr. Darrell Dean
Dr. Joe Golden
Jimmy Jenkins
Carla Kesling
Dr. Don Kines
Dr. William MacDonald
Dr. Brian Perkins
Rick Sypolt
Dr. Melissa Thomas-VanGundy

Find us on Facebook: @WVTACF
National Office: 50 N. Merrimon
Street, Asheville, NC 28804
Phone: 828-281-0047

Email: WVChapter@tacf.org
Website: tacf.org/wv
Newsletter Editor: Mark Double

Table of Contents

NRCS Tour in Pisgah.....Page 1
Rowlesburg Chestnut Festival.....Page 2
USDA Multi-State Project.....Page 2



NRCS Tour in Pisgah

Robert and Shannon Tinnell, members of the WV chapter, hosted a Federal Natural Resources Conservation Service (NRCS) tour of their farm in Pisgah, between Coopers Rock and Bruceton Mills. Robert has worked with NRCS on many conservation efforts, including the planting of warm-season grasses on part of their 110-acre farm. The tour was for new NRCS employees, whether they will be conservationists, soil scientists or in human resources. Members were from a number of states including Louisiana, Arkansas, Indiana, North Carolina, Maryland, Virginia, and New York. Seven of the 35 members were from WV.



Robert Tinnell, far right, welcoming members of the NRCS tour



Robert Tinnell talking about warm-season grasses.

Robert and Shannon have a large apple orchard that includes many heirloom varieties. They also have planted many cherry and peach trees. While the Tinnell's have some Chinese chestnut trees on their property, Robert has planted some native American chestnuts, made available through the WV chapter.



A chestnut seedling at Robert and Shannon Tinnell's property

Rowlesburg Chestnut Festival

The 2024 Rowlesburg Chestnut Festival will be held in Rowlesburg (Preston County) on Sunday, October 13. This marks the 16th years of the festival. The WV chapter meeting begins at noon in a second-floor classroom in the Szilagyi Center (the old high school), located in the bend of Route 72. The WV chapter meeting will be led by president, **Bernie Coyle**. Following the chapter meeting, visitors can visit displays and vendors in the Rowlesburg Community Park. Beginning at 3:00 pm, the chestnut technical session will feature two speakers, **Dr. Melissa Thomas-Van Gundy**, Research Forester and **Jeff Kochenderfer**, Silviculturalist, both employees of the U.S. Forest Service Northern Research Station in Parsons. Dr. Thomas-Van Gundy's talk will be, "A Decade of Growth at Two Hybrid American Chestnut Plantings in West Virginia" Kochenderfer's talk is titled, "Establishing a Germplasm Conservation Orchard (GCO) in Central WV". The gala banquet begins at 5:30 in the Szilagyi Center Auditorium. The banquet features the crowning of Mr. and Mrs. Chestnut, **Dr. Lewis and Vicki Cook** of Fayetteville. **Shirley Hartley-Meissner** will lead the Chestnut-Vino Novelle Ritual (tasting the new wine). A chestnut-themed dinner will follow. The guest speak-

er will be **Mark Double** who talk about some of the many WV chestnut orchards. Banquet tickets can be purchased at the door for \$15.

USDA Multi-State Project Meeting

Beginning in 1982, members of the chestnut science community have met annually to exchange data and ideas. This group of chestnut researchers meets under the auspices of the USDA, and it is one of the longest-running multi-state projects in the country. The group consists of university professors and graduate students, chestnut growers, state and federal organization and TACF staff. This year's meeting was hosted by the State University of New York (SUNY) in Syracuse, 13-14 Sep 2024. Eleven different universities/organizations presented data on a variety of topics including transgenics, fire tolerance of chestnut, *Phytophthora* root rot, small stem assays to test for blight resistance, pollen production, progeny tests of back-cross trees, and molecular studies with the chestnut blight fungus.

Scientific talks were presented Friday morning and continued until late afternoon. Talks continued Saturday morning, and a field trip of the SUNY orchards was conducted Saturday afternoon.

One of the speakers was **Dr. Jared Westbrook**, TACF's Director of Science. Jared talked about the advantages of TACF's breeding program. He pointed out that traditional breeding does provide large gains in blight resistance, and it does not require any regulation. Jared showed a picture of a >100'-tall chestnut in the Tervuren Arboretum in the Sonian Forest in Belgium. This massive tree shows what American chestnut can do in the absence of the chestnut blight fungus.

Through breeding, we have chestnut trees with good resistance and American form. One of the problems is that flowering American chestnuts in North American are not being pollinated by good trees. That is one of the reasons that TACF is focusing on breeding the Best X Best. He raised the question, how much blight resistance do we need. Jared stated that he is looking for a minimum level of resistance of 65%. How much Chinese ancestry is required? The breeding target is to maximize blight resistance while selecting for >70% American ancestry at a minimum.

The American Chestnut Foundation continues to

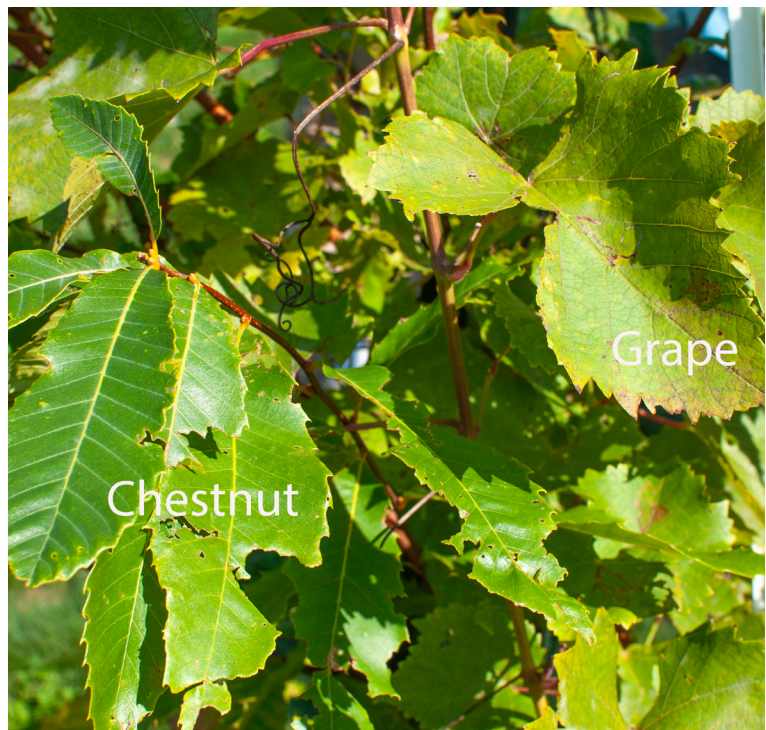
assess chestnut trees for the amount of American genes. Leaf/bud samples are sent to an Australian company, Diversity Arrays Technology for about \$20 per sample. At this point, only trees in research plots are being assessed due to the cost. To date, TACF is genotyping about 6,000 per year.

Jared raised the question how long will it take to go from our current status to trees with >65% resistance. He feels two generations should be able to reach that resistance goal with trees that are >70% American.

Jared would like to install 20-30 orchards around the range of American chestnut with 300 trees per orchard using the Best X Best material.

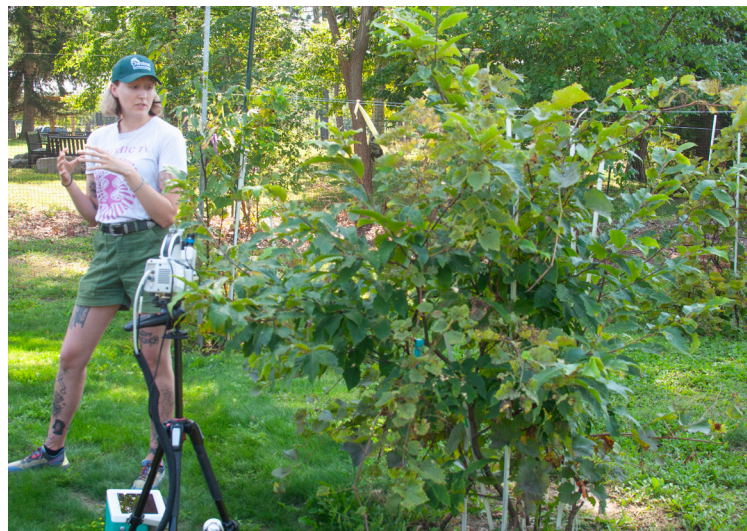
The following are pictures that were taken at the SUNY chestnut orchards located outside Syracuse.

Chestnut/Grape study. Chestnut and grapes have different water needs. Chestnut can be somewhat drought tolerant while grapes have much higher water requirements. Experimental plantings included one chestnut tree with 1- to-5 grape vines planted in the same site. Preliminary data suggests that chestnut trees with 1-3 grapes are performing much better than trees with 5 grape plants. Below is a closeup of a chestnut and grape at the same site.



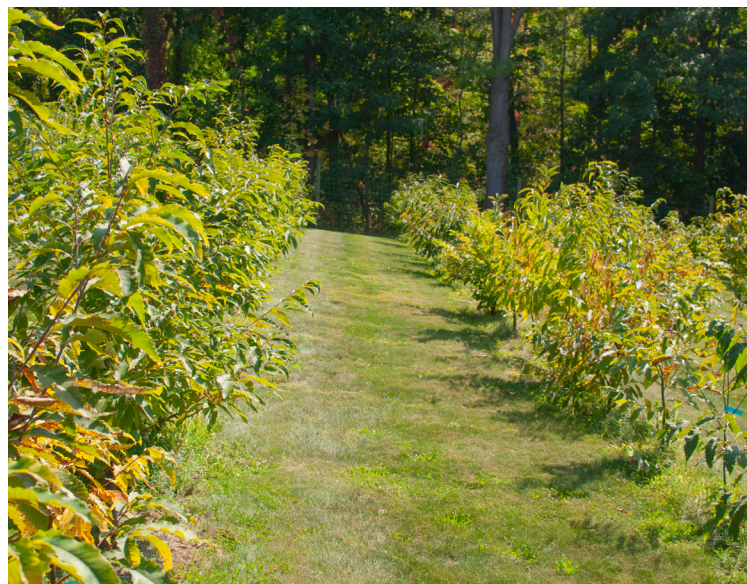
In the above picture, the chestnut leaves are on the left, while the grape leaves are on the right. Both species grow well together.

In the same chestnut/grape plot, leaf measurements are being addressed with a \$100,000 instrument, as seen in the photo below. The instrument takes a multitude of measurements such as light intensity, amount of photosynthesis, water transpiration, etc. Measurements of both chestnut and grapes are taken from replicates of sun and shade leaves. Data will help researchers to determine if the chestnut/grape planting is feasible for both plants. Western NY is a large grape producing area, and this research will aid in determining if chestnuts can be a beneficial addition to grape arbors.



A SUNY graduate student explains the light instrument.

SUNY is one of three sites of a **Common Garden Study**. The other sites are in Maine and Virginia. This study compares 13 chestnut families grown in the same scheme across different locales. This study will test if certain chestnut families are better than others and if that trend holds across the three varied regions. Nearly 450 chestnut trees are planted at each of the three sites. A small portion of the NY planting is pictured below.





Two TACF regional science coordinators Cassie Stark, (Mid-Atlantic, left) and Jamie Van Clief (Southern) examine leaves at the Common Garden Study.

Another project at SUNY is growing chestnut trees with other tree species. A total of 10 different species were planted in 2020 to see if chestnut can benefit from the presence of other species. **Dr. Tom Klak** from the University of New England in Maine, reported that chestnut grows very well in the presence of native white pine. The theory is that the acidic needles from the pine are advantageous to chestnut. Some of the species included in the planting are hickory, red and white oak, and white pine. Mycorrhizae (soil fungi that aid in tree growth) are being assessed as well as other soil microorganisms. Below is a picture of a portion of this study. A few white pines are visible among the chestnut trees.



SUNY has large numbers of transgenic trees at their orchard. One of the requirements for breeding is native American chestnut trees. Since native American chestnut trees have little-to-no resistance, all of the Mother trees are infected with chestnut blight cankers. In an attempt to keep the Mother trees alive, the old tried-and-true method of using mud packs was noticed all over the Mother tree orchard. Mud packs are used to kill the chestnut blight fungus by adding moist native soil in black plastic bags that are sealed above and below cankers. Since the chestnut blight fungus is an aerobic organism, the reduced oxygen potential coupled with the array of antagonistic microorganisms found in soil combine to kill the fungal pathogen. The bags are left on the tree from 6-16 months. Trees with basal cankers are treated with heavy black plastic cylinders that are filled with soil. Pictures of two mud pack trees are seen on in the following three photos.



A sprout clump with a basal canker. If you look closely, there is a new infection on the sprout on the left.



A tree has a basal canker and a canker above the black plastic pot. Keeping trees alive is a challenge that requires constant monitoring.



A single mud pack on a canker shows how tape is used to seal the soil in the bag above and below the canker.

Mother trees are used for breeding, and many female flowers are pollinated with specific pollen. This often requires the use of a bucket truck as the flowers are in the crown of many trees. Below is a picture of a Mother tree with many pollination bags.



A bagged mother tree at the SUNY chestnut orchard

Bagging female flowers can be a tricky process. Male catkins on chestnut are produced prior to the female flowers. Pollen, whether fresh or frozen, is delicately placed on the female flowers when female flowers are most receptive. Any male catkins that are adjacent to a female flower are removed, and a paper bag is then secured in place covering the female flower. This way, both the male and female parents are known, and that information is written on the bags.

Since many of these trees are pollinated with transgenic pollen, wire mesh bags must be placed over the paper bags. The mesh bags are needed to keep squirrels from breaking open the bags and distributing transgenic nuts across the landscape. All

transgenic trees are highly regulated. That means that all male catkins from transgenic trees must be removed in June when flowering occurs. This is a monumental task. Maneuvering bucket trucks can be difficult, and windy conditions often make for a breezy stint when up 30'-40' off the ground. Below are pictures of male catkins and female flowers.



Showy male flowers (catkins). These are most pronounced in mid-to-late June.



Female flowers often look like small pineapples, as seen in this picture. They are produced on the same stem as male flowers.



Wire mesh bag covering a female chestnut flower.

In late September/early October, the bags are removed, and the nuts are harvested. The nuts are placed in marked containers and then stratified over the winter before being planted in early spring next year.

The American Chestnut Foundation was well represented at the SUNY meeting. Below are four members of TACF's staff, (left to right) **Jamie Van Clief** (Southern region), **Sara Fitzsimmons** (Chief Conservation Officer), **Kendra Collins** (New England region) and **Cassie Stark** (Mid-Atlantic region).

