



Dedicated to restoring the American

Chestnut Tree

VOLUME 28, ISSUE 1

MARCH 2023

SPRING GROWERS MEETING | Saturday, April 1 | 8:30 AM to 4:00 PM

Speakers and Presentations at the Barron Innovation Hub

Jen Santoro Assistant Professor,
Dept. of Geography and the
Environment Villanova University



**GIS
Modeling
for
American
Chestnut
Site
Suitability**

Jen will discuss her research modeling suitable sites for planting American chestnut trees in Pennsylvania and the factors that influence good planting locations, and how GIS models can be applied to specific sites in the Mid-Atlantic region to help growers make planting decisions.

Rick Hartlieb
Assistant District Forester (DCNR),
Owner Castanea Farms



**"The
Good, Bad,
and Ugly"
of planting
chestnut
trees.**

Learn about the success and failures of planting trees in both forest and orchard settings. Rick will share his experience in projects planted since 2005, allowing growers to learn from his highlights and difficulties.

Sara Fern Fitzsimmons
Chief Conservation Officer for TACF
Penn State University (PSU)



**Pollination,
Harvest,
and Storage
of Chestnuts**

If you want to help diversify for Darling 58 scale-up and distribution, come learn how to control pollinate, harvest, and store chestnuts in this short workshop. We encourage all attendees to follow up with in-field training in the summer.

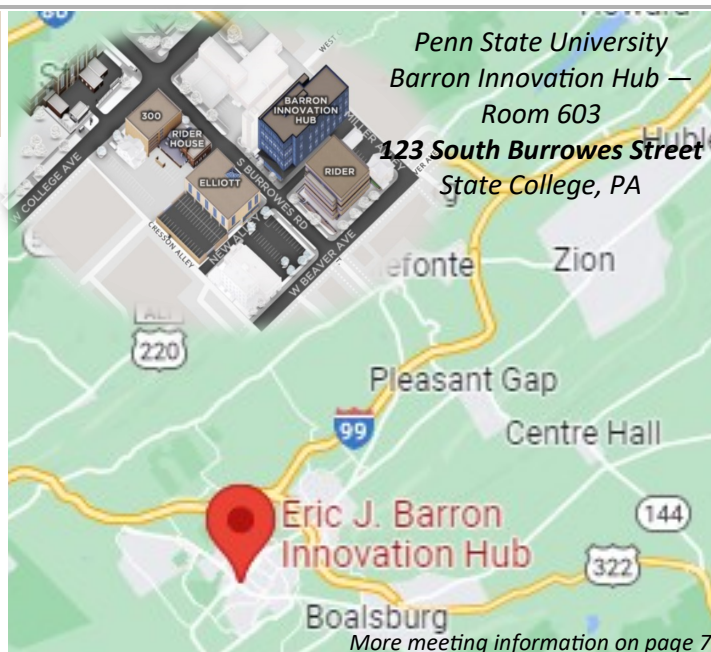
Following the presentations at the Barron Innovation Hub (BIH). Attendees are invited to join us for a tour of our research orchard and greenhouse.



Stephen Hoy (Goes by Hoy)
Orchard Manager/Research
Technician PA/NJ Chapter of TACF

Greenhouse and Orchard Tour

Tour the chestnut greenhouse and hear about the advancements being made in the propagation and speed of breeding of D58 chestnut seedlings. Afterward, follow us to the Arboretum backcross orchards to see how our work is progressing and learn about the future uses of these trees as well as the orchard space overall.



More meeting information on page 7



President's Corner

Greetings,

It looks like an exciting year is coming up. As I write this column, there is a season of new beginnings. On our home farm, our sheep flock has been lambing almost daily. One of the exciting things about living on a farm is seeing new life join this world and yielding the fruits of your labor after a long season of hard work.

The restoration of the American chestnut is undergoing an exciting season of change this year. Locally, our chapter is moving locations at PSU. While this move was somewhat sudden, our orchard manager and office staff are moving into larger and more modern facilities. Keep an eye out for volunteer events coming up to check out the new greenhouse space.

The anticipation of a deregulation announcement regarding D58 is also on the horizon. This has injected a renewed energy into the chestnut program. This new technology has the opportunity to enhance the prospects of the restoration goals. The years of hard work identifying surviving American trees, participating in the backcross program, and growing native germ conservation orchards are coming to fruition. Come join us this spring at PSU, where we "go back to the basics" of growing and nurturing chestnut trees.

We had a great showing at the PA Farm Show this year, with shoulder-to-shoulder attendance on some days. We gained new members and engaged with seasoned volunteers. I encourage you to reach out to your fellow tree enthusiasts and remind them about the great work of TACF and that we are always welcoming new members!

I wish you all the best of luck in your new beginnings in 2023 and look forward to seeing you in the spring.

*Rick Hartlieb
President
PA/NJ Chapter of TACF*

Volunteer Opportunities

Outreach: We count on volunteers to help us spread the word about our restoration mission. Check out the outreach events on page eight of this newsletter to see some what's coming up.

Orchard and Greenhouse: We count on volunteers to help with a variety of activities at our research orchard and greenhouse here at PSU. And with over 150 orchards in PA and NJ, the growing season is packed with chances to participate in planting, inoculating and harvest. Work is available for all levels of physical ability. This is a great opportunity for people who enjoy working outside and getting involved with the hands-on aspects of our breeding programs.

To learn more about these and other volunteer opportunities, contact Jean Najjar at our office: **814-863-7192 | mail@patacf.org**

Board of Directors

President

Rick Hartlieb
Robesonia, PA

Vice President

Daniel O'Keefe
Ridley Park, PA

Past President

Mary Ayres
Wynnewood, PA

Treasurer

Peter Reinhart
Allentown, PA

Board Members

Mike Aucott
Edward Buchak
Tim Eck
David Deaville
Steve Delp
Ronald Farr
Lake Graboski
Betsy Murtha
Philip Peterson
Edward Regina
James Walizer
John Wenderoth

Non-Voting Members

PA-DCNR

Representative
Annetta Ayers

US-ACE Representative

Jeff Krause

Staff

Chief Conservation Officer
Sara Fern Fitzsimmons
sff3@psu.edu
(814) 404-6013

Orchard Manager
Stephen Hoy
sdh177@psu.edu
(814) 424-0022

Chapter Administrator
Jean Najjar
jmn173@psu.edu
(814)863-7192

In Memoriam: PA/NJ Chapter Restoration Heroes

Lessons Learned from Blair Carbaugh / TACF Member Since 1996

By Dave Crowl
Anthracite Outdoor Adventure Area Authority
Northumberland County Conservation District-Associate

If you're reading this, you most likely know about the loss of our friend Dr. Blair Carbaugh this past December. Blair was a conservation mentor of mine for over 15 years here in Northumberland County. We first met as I took his place as Public Director at the Northumberland County Conservation District. Blair thought it would be a good idea for some young folks to learn the ropes. **First lesson learned from Blair ... keep an eye on the future!**

Blair was poised to teach me a lot more. Our county has 6,500 acres of Abandoned Mine Lands (AML) in the Anthracite Outdoor Adventure Area that became one of Blair's next classroom for me. Working tirelessly, Blair convinced the Department of Environmental Protection-Bureau of Abandoned Mine Reclamation (BAMR), the Appalachian Regional Reforestation Initiative (ARRI) and TACF to plant some experimental American chestnut plots on the abandoned land. We recruited volunteers from wherever we could find them. Our first volunteers were conservation professionals and inmates from county prison. Blair never missed an opportunity to educate. **Second Lesson ... Blair treated from the wisest to the learner.**

Finally, Blair's last couple of years were challenging. Every time I visited or brought a guest to Blair and Mary's farm. Never a complaint, just glad to see you! **Final lesson from Blair ... he made everyone feel welcome.**

We must also mention the work of Blair's partner in all good works, his wife Mary Carbaugh. We send our condolences to her and their family. Many thanks to those who have donated in his memory:

Anthracite Outdoor Adventure Area, Paula and Gregory Bankovic, Joanne and Mark Deibler, Scott and Joyce Lad-

ner, Duane and Maria Moberg, and the Northumberland County Conservation District.

Gracious, Dedicated, and Generous—Alan Palmer Remembered / TACF Member since 1995

Alan Palmer passed away last October at the age of eighty-eight. A member since 1995, Alan was an early joiner and dedicated supporter of our restoration mission. Along with Al Eelman, another chestnut hero, who coordinated the establishment of the chestnut orchard at the Tyler Arboretum back in the spring of 1997,

Alan worked on the planting and maintenance of this research orchard for many years. worked alongside John Carson and John Wenderoth. His generous contributions to TACF resulted in B3F3 seeds for the Tyler Orchard.

Michael Karkowski, Director of Horticulture at the Tyler Arboretum shared, "Alan Palmer was a gracious volunteer, long-time member, and supporter of the Tyler Arboretum. He took an interest in what Tyler Arboretum was doing to help the cause of finding a viable American Chestnut to restore this once magnificent tree to our landscapes. For many years he dedicated countless hours to our Chestnut Nursery. We thank him for all his work."

Alan had no children but he left a generous bequest to further our restoration research. Thank you, Alan for living a life dedicated making the world a better place for all those who will come after you.



The restoration of the American chestnut is the work of generations. Join or renew your membership today!

<https://support.acf.org/membership>

Using High-Intensity Light for Pollen Production

By Steve Hoy, Orchard Manager

Many members of The American Chestnut Foundation (TACF) know the goal of breeding blight tolerance into the American chestnut is a long-term project. Even with the advantage of chestnut being quick to reach reproductive maturity (on average 5 - 7 years under ideal conditions), after forty years of breeding we've achieved up to seven generations of trees. This is impressive when you compare chestnut to white oak, which takes an average of twenty-five years (or more) to produce a single generation in a forest setting. However, there is still much to be done in chestnut breeding, so leveraging technologies and methods to decrease



Newly transplanted D58 hybrid seedlings under new high-intensity crop lights in greenhouse.

the time between generations will greatly benefit the work of TACF.

Speed breeding has been used since the 1940's to decrease the amount of time between generations of plant material. This can be accomplished through a few methods, but for American chestnut work, we're focusing on the use of high-intensity lighting to accelerate maturation

of seedlings and generate pollen to be used on other trees in the TACF program, both backcross lines and wild American lines.

The State University of New York Environmental Science and Forestry (SUNY-ESF) has been using a dedicated growth chamber, in addition to chestnut seedlings under supplemental high light in their greenhouses, to reduce the time between generations of Darling 58 crosses. This has been a great success and has enabled researchers at SUNY-ESF to produce pollen in under one year.

The University of New England and Meadowview research farm have also installed high light setups in their respective operations and successfully created pollen from seedlings planted between nine and twelve months prior. In some instances, even producing chestnut seeds.

Here in the greenhouses at Penn State, Sara Fitzsimmons was awarded a Penn State small equipment grant in 2022. This grant provided the funds to purchase several, broad spectrum, LED crop lights and

Continued on page 5



Close-up of female flowers on D58 hybrid seedling, January 2023.



Bisexual catkins forming on D58 hybrid seedling, January 2023.

Continued from page 4 irrigation equipment. The crop lights were installed in June of 2022 in a corner of the greenhouse at University Park campus. To avoid causing additional stress to the other 4,000 seedlings in the greenhouse, a reflective tarp was installed to block the supplemental lights. We selected forty-one D58 x B3F2s from a variety of lines in the Arboretum, having tested positive for the Oxo gene. These forty-one seedlings were transplanted into large three gallon pots and put under the high-intensity lights. The seedlings have been getting sixteen to eighteen hours of light every day since June. After seven months, January 2023, under the high-intensity lights the first catkin was found on a seedling. Since January 6, four female flowers have developed on two bisexual catkins on the same seedling.

Once the female flowers reach maturity, D58 pollen will be applied in the hopes of creating homozygous D58 seeds. The male portion of the catkins should mature by the end of February. As the pollen begins to shed, daily collections of pollen will be made onto glass slides, which will

then be dried and frozen until pollination season in the summer of 2023. By repeating this process over time, we'll be able to further diversify the Darling 58 lines, reducing the concentration of genes from the original Ellis tree used in the initial event.

While this is a great success for the PA/NJ Chapter, there is ongoing collaboration with the three other locations to determine best practices and products for this process. The hope is to refine the fertilizer, irrigation, and light regimes to maximize the efficiency of pollen production.

1. Samantara, et. al; Breeding More Crops in Less Time: A Perspective on Speed Breeding; Biology Feb. 2022; Google Scholar Search
2. Kathleen Baier, Dr. Chuck Maynard, Dr. William Powell; Chestnuts and Light, Early Flowering in Chestnut Species Under High-Intensity, High-Dose Light in Growth Chambers; The Journal of The American Chestnut Foundation; May/June 2012

The Big Move

After twenty years, the PA/NJ Chapter office will have a new home starting on Thursday, February 23. Penn State is moving us across the parking lot from our home at 206 Forest Resources Lab, to 108 Research Unit A Modular Lab. We'll still be near the corner of University Drive and Hastings Road. Our new space is larger, and the equipment is more modern, so we are looking forward to the move.

Steve Hoy will split his time between this new office and a greenhouse closer to the Tyson Building and Penn State Creamery. Our office phone will not change but our new address will be:

**Penn State University
PA/NJ TACF
108 Research Unit A Modular Lab
University Park, PA 16802**



The graduation cap points to our new office in 108 Research Unit A Modular Lab — labeled Research Center

Volunteers Kick Off 2023!

Outreach at PA Farm Show



Twenty-one volunteers kicked off 2023 with a big bang at the PA Farm Show. Their presence welcomed twenty-nine new members, sold

dozens of t-shirts, and spread word of the American chestnut to thousands of attendees.

A special shoutout to Tim Eck and Judy Milliken, who covered our opening weekend and several evenings. Tim brought a healthy supply of hybrid chestnuts from his orchard to distribute to attendees—a big hit!

Many thanks to Mike Aucott, Kimberly and Daniel Baldwin, Xander Beckett, Jay Brenneman, John Civitts, Ruth Chin, David Deaville, Steve Delp, Chris Ditlow, Tim Eck, Mike Fee, Rick Hartlieb, Peter and Juliet Lane, Bobbi Little, Don McCann, Judy Milliken, Rose and Mike Pavolko, Betsy Winch-Murtha.

Fieldwork at the PSU Greenhouse

On January 13, four volunteers joined us at PSU to help wash and sanitize 2,500 D40 pots. This is not high on the desirable jobs list for any of us, so our hats are off to the folks who made the trip here to wash a seemingly endless pile of pots.

The freshly washed pots were restacked and piled on tables when some of the same volunteers returned a week later to fill pots with media and plant the first chestnuts for 2023. Another 1,500 D40s were added to the 2,500 to plant 4,000 chestnut seeds of different varieties. Over half of these are replicates of a trial being done at the Meadowview to compare resistance levels of a different material. These include crosses between some of the best trees in the Arboretum B3F3 orchard at University Park, crosses of B3F3 trees with D58 material, Large Surviving Americans, and Chinese, American, and F1 controls. Be on the lookout for volunteer announcements in May for tree plantings and in June when we inoculate the seedlings.

Many thanks to Beverly Auvil, Steve Delp, Gene Eddinger, Brian Kolar, Dylan Longale, and John Yoder.

A Volunteer's Experience at the PA Farm Show

By David Deaville, Chapter Board Member

I worked the outreach table at the PA Farm Show from noon to closing time on Thursday (Jan 12). Farm Show attendance was great, and our booth had continuous traffic nearly the whole time. Support for the Darling 58 among those who stopped by was overwhelmingly positive, and the universal question was, "When can I get some trees?"

One conversation stood out. I was talking to a high school biology teacher who was asking about the specifics of the gene transfer process. While I was responding to her, a bystander energetically interrupted to say he was opposed to all genetic engineering. The high school teacher (who was clearly skilled in conflict management) did not take offense but asked him for his reasons. It turned out he was a mixed (arable and livestock) farmer who considered himself hostage to big companies and herbicide-resistant seeds. He felt compelled to use these seeds to be competitive, which had left him with high herbicide costs and the emergence of weed resistance.

We acknowledged the difficulties he'd experienced and explained that the goals of restoring a functionally extinct tree are quite different. Gene modification will add a single wheat gene to the tree, which won't kill the fungus blight, even as it protects the tree. And no herbicides or other products will be linked to the use of D58. Our goal is to return this tree back to the forest for everyone to enjoy.

It was a lively but civil discussion, and his objections had moderated by the time we finished explaining the aim of the Darling 58 program. After the teacher moved on to the next booth, the farmer remained around to hear more of the chestnut story. He shared family memories of chestnuts on his farm and his wish to try fattening a pig with chestnuts. His opinion was that pigs are, more than any other animal, "printed through" the taste of the feed into the meat.

His was the only negative comment I heard about Darling 58 during my nine-hour shift. It was heartening to see that our outreach effort was able to address his concerns and open his mind to the benefits of this advance.

Chapter News

Committee Reports

Wild American Update

Lake Graboski, Chair of Wild American Conservation Committee

There are currently two targeted missions described on our website <https://patacf.org/report-a-tree/>. But we encourage you to report any sightings of possible American chestnuts. Here's how to report a tree:

TWO WAYS TO REPORT A TREE

● **Tree Locator Form:** Download the form from our Chapter website (www.patacf.org) or request a printed form from the office (814-863-7192).



● **TreeSnap.org:** Use your smartphone to report a tree via the TreeSnap.org app. Note: We still require a leaf and twig sample for trees reported electronically.



Remember, whether you use a paper form or the smartphone app, we need for you to submit a leaf and twig sample for each reported tree (if at all possible).

To review all current missions and learn more about wild American conservation, visit our website:

<https://patacf.org/report-a-tree/>

Chapter Membership

Peter Reinhart, Chair of the Membership Committee

Members of the PA/NJ Chapter of TACF have many opportunities to connect, network, and share their stories and experiences as we all share the common goal of restoring the American chestnut to the Eastern forests. By sharing your experiences and knowledge within your community, place of work, or other venues, you are part of the Chapter's citizen scientist team. As a citizen scientist, your connection to those not as familiar with our mission is critical in helping to support our restoration efforts. Encourage those who are not as familiar and who want to learn, to join TACF. They will not only enjoy the many benefits of a membership, but they will have the opportunity to meet many talented and knowledgeable members. Encourage them to attend the many outreach Chapter events. Our Chapter hosts and participates in many events throughout the year: The Spring Growers Meeting, the Chapter's Fall Meeting, Earth Day Activities, Native Plant Festivals, Ag Progress Days, and the PA Farm Show. Our collective effort is critical in supporting our science-based restoration mission. So let's spread the word and grow our membership!

<https://support.acf.org/membership>

Continued from page 1

PARKING

There are several municipal lots within walking distance of our meeting. The daytime rate is \$1 per hour. Estimated meeting time before the tour is seven hours.

- **Beaver Garage** (200 W Beaver Avenue): Entrance faces Hyatt Place.
- **Fraser Garage** (135 S Fraser Street): Entrance on Fraser St. facing Hyatt Place.

Permits are required for **Penn State Visitor Parking lots** across from the Barron Innovation Hub (BIH). Permits are limited and cost \$10/day. If you would like to

request a permit, please email me as soon as possible and I will send you instructions. You will have to provide your license plate number and pay in advance.

Three Ticket Options

- **Box Lunch Option (\$25)**—Enjoy coffee and scones at our coffee social and choose from four Panera Box lunch options when they purchase their ticket. *Purchase this ticket by Monday, March 27.*
- **Brown Bag Option (\$10)**—Enjoy coffee and scones at our coffee social and pack your own lunch. *Purchase this ticket or RSVP by noon on Thursday, March 30.*

- **Virtual Option (\$10)**—The meeting will be streamed live for those who want to attend remotely. You will be sent a private link to attend online in real-time (tours and social segments not included). *Purchase this ticket by noon on Thursday, March 30.*

Purchase your ticket here:

<https://pa-nj-tacf-store.square.site/>

OR

RSVP by Thursday, March 30
mail@patacf.org | (814)863-7192
and pay at the door



Pennsylvania State University

PA/NJ TACF

108 Research Unit A Modular Lab

University Park, PA 16802

mail@patacf.org

Phone: 814-863-7192

RETURN SERVICE REQUESTED

OUTREACH DATES

2023 Forest Landowners Conference

March 24—25, 2023

State College, PA

Lancaster Native Plant & Wildlife Festival

Saturday, April 29 | 8:00 AM—1:00 PM

Lancaster, PA

Earth Day Event at Core Creek

Saturday, April 29 | 11:00 AM—2:00 PM

Langhorne, PA

Central PA Native Plant Festival

Saturday, May 6 | 9:00 AM—2:00 PM

State College, PA

ECO Event at Codorus State Park

Friday, June 9 | 4pm—8PM and

Saturday, June 10 | 11AM—8PM

Hanover, PA

PSU Ag Progress Days

August 9—11

Pennsylvania Furnace, PA

Fall Member Meeting

November 4, 2023 | 8:30 AM—3:30 PM

Location TBD

Updates on our website: www.panjtacf.org



The PA/NJ Chapter of TACF is grateful for the continued support of NPC and their pro bono printing of this newsletter. NPC has freely printed every issue of The Chestnut Tree.