A BENEFIT TO MEMBERS • THE JOURNAL OF THE AMERICAN CHESTNUT FOUNDATION • SPRING/SUMMER 2025

THE American Chestnut FOUNDATION

Chestnut

SPRING/SUMMER 2025 • ISSUE 2 VOLUME 39

The American Chestnut Foundation Chestnut

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Dear Chestnutters,

It's spring again, and off we go to visit our trees in orchards and forests. We see them come out of dormancy, unfurling their tender new leaves beneath a bright sky, just as they and their ancestors have done since long before we were here.

Bruce Levine

INTERIM PRESIDENT & CEO

When I began volunteering with TACF about 30 years ago I was a young man, moved by the tragedy of the American chestnut, but also filled with hope. As long as the trees continued the fight to reclaim their place, I would do whatever I could to help them. I was not alone. I joined the ranks of TACF's volunteers. I found myself especially in awe of the older folks, who offered their time, money, experience, and network of friends and family in this effort. Their confidence was contagious, and I never doubted we would succeed.

I am no longer a young man, and I have now been doing this long enough to see real change, in tree time. Plots of seedlings I helped plant have grown up and succumbed to blight, except for a precious few among them that survive with the disease, leafing out and flowering year after year, passing their resistance on to a new generation, all thanks to the work we have done. I have heard the conversation gradually change too; more talk of genomics, recurrent genomic selection, biotechnology — new technologies that allow us to build on past efforts and accelerate our progress.

Presently, having stepped in as TACF's interim president & CEO, I often find myself as the oldest person in the room. Just as I was once in awe of my elders, I now find new inspiration in the young people on staff and among our volunteers who keep coming forward, generation after generation, inspired by the American chestnut story like I was, joining in to advance this crucial restoration mission.

My long-term relationship to this project is captured beautifully in our anthem, "Through the decades — from all kinds of different backgrounds, beliefs, and abilities — we've found each other in our shared reverence for eastern forests and our grief at the loss of the American chestnut, a once-foundational species here." If this speaks to you as it does to me, and the people who came before me, you are in the right place. Welcome home.

Bruce Levine
Interim President and CEO

Read the full anthem and learn about TACF's new rebrand by visiting our Brand Center webpage: tacf.org/brand

THE MISSION OF THE AMERICAN CHESTNUT FOUNDATION IS TO RETURN THE ICONIC AMERICAN CHESTNUT TO ITS NATIVE RANGE.

THE American Chestnut FOUNDATION

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TACF's 2024 Chestnut Photo Contest winner, "Photo Birds," was taken by Berry College student Anna Rose. The picture spotlights a blue-gray gnatcatcher nest high in a backcross American chestnut tree at Berry College's orchard in Rome, GA.

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CORRECTION: In the winter 2025 issue of *Chestnut*, we correctly named Rachel Trowbridge as the third-place winner of the Poster Session at TACF's 2024 American Chestnut Symposium. However, we inadvertently shared a photo of Nadia Keller from Warren Wilson College. We apologize for the mistake and are pleased to now share the correct photo of Rachel Trowbridge. Congratulations again to Rachel on her outstanding work.

A Milestone for Restoration:

Greenhouse Dedication at Meadowview Research Farms

BY JEN PICICCI, COMMUNICATIONS SPECIALIST

Former TACF President & CEO Lisa Thomson (right) shares remarks of gratitude about the greenhouse dedication with attendees.

On April 22, 2025 — Earth Day — The American Chestnut Foundation (TACF) hosted a dedication ceremony at Meadowview Research Farms to celebrate the opening of a state-of-the-art greenhouse and solar array. Supporters, collaborators, and staff gathered to honor the generosity and hard work that brought this transformational project to life, and to dedicate the greenhouse to former TACF President & CEO Lisa Thomson.

The ceremony began with a welcome from Interim President & CEO Bruce Levine and Director of Research Dr. Vasiliy Lakoba. Levine spoke about Lisa's extraordinary leadership and her lasting impact on TACF's work. Lakoba reflected on Meadowview's evolution and pointed out the Farm's first greenhouse, which only measures 7' x 12' in comparison to the new greenhouse, which is 30' x 70'!

"Our generous supporters' vision and investment in our mission has allowed TACF to take a leap toward success like never before," said Lakoba. "We extend our heartfelt thanks to our donors, construction contractors, and fellow staff members who worked tirelessly to take this greenhouse and solar array from concept to completed reality."

Lisa Thomson shared remarks highlighting the project's impact:

"TACF has always been on the forefront of innovation in our quest to create a disease-resistant American chestnut tree. Thanks to our generous donors, we have a new year-round, state-of-the-art greenhouse and solar array at Meadowview. The greenhouse will greatly increase seedling production, and the solar array will

capture enough energy to power the majority of facilities there." Thomson continues, "This project was carefully stewarded by the anonymous philanthropist whose lead gift increased its conservation value by proposing solar power. This fortuitous and creative partnership ensured a successful outcome two full years later. I am incredibly honored to have been a part of it."

The new greenhouse represents a major leap forward in TACF's ability to advance restoration science. As a climate-controlled, year-round facility, it will accelerate the RGS process and allow TACF to validate more advanced generations of American chestnut on a faster timeline. It will also house future transgenic lines from TACF's research collaborators.

Additionally, the expanded facility will bolster chapter-led breeding and planting efforts. By increasing seedling grow-out capacity, the greenhouse will provide robust trees for regional plantings, enabling chapters to scale up restoration work across the tree's native range.

Members of Lisa's family came to the celebration (left to right): sister-in-law Nancy Larkin, brother Jim, sister-in-law Jean, sister Nancy Gray, and Lisa's husband Walt.

Meadowview's first greenhouse (bottom, right) is dwarfed by its new year-round greenhouse (above, left).

The solar array was installed behind the new greenhouse.

"This greenhouse is a powerful reminder of what's possible when generosity meets purpose," said John Chastain, TACF's director of development. "Thanks to our donors, we now have a space where restoration science can thrive, and the next generation of American chestnuts can take root."

Guests participated in a chestnut seed planting activity to symbolize their personal contributions to the species' future.

The solar array ensures sustainable operation, aligning with TACF's environmental values. These panels will substantially reduce the carbon footprint and operating costs at Meadowview's facilities.

The project was funded in part by TACF's 2023 Spring Appeal, which emphasized long-term investments in restoration science. Special recognition was given to Jon Taylor, who handcrafted the American chestnut frame that houses the sign, welcoming visitors to the new greenhouse.

As Meadowview moves forward, the new greenhouse and solar array stand as symbols of innovation and hope, embodying TACF's enduring commitment to restoring the American chestnut.

VA CHAPTER'S PARTNERSHIP

with Woodgrove High School

BY CINDY INGRAM, VA CHAPTER PRESIDENT

A couple of summers ago, I was representing the VA Chapter at a festival for the Appalachian Trail. While there, I was approached by an environmental science teacher from a local high school in Purcellville, VA. He wanted to know if we would be interested in planting chestnuts at the school, to which I replied, "Of course!" He took my contact information and said he would get back to me. The following summer, at the same festival, I was approached by a second environmental science teacher from the same school and was asked again if we might be interested in planting chestnuts there. This time, interest was expressed to involve students in this potential project. I was immediately enthralled by the prospect and readily agreed.

Several months later, Scott Fortney, one of the environmental science teachers who approached me, called to inform me that the school was ready to begin. We met soon after to choose a suitable planting site, and our Chapter science committee got to work on the experimental design. It was decided we would plant four different types of open-pollinated seeds: American, large surviving American (LSA), hybrid, and Chinese. LSAs are American trees that have a greater average resistance than wild-type American trees, are greater than 10 inches in diameter at breast height (DBH), and have survived while infected with chestnut blight for more than five years. Seeds were planted randomly to control for environmental variation and labeled and marked with

Cindy (far right in black tee) poses with Woodgrove students after two weeks of work sessions to get the test plot planted.

color-coded flags according to seed type. Students tilled the soil, used their newly acquired math and measuring skills to verify the plot's parameters and rows, set up the stakes and tree shelters, planted the nuts, and covered the tubes with netting. They accomplished all of this in four days over the span of two weeks. Later this spring, the students will gather germination data, and in the fall, they will measure each tree's height and diameter. The trees will be tested for blight resistance via inoculations in a few years. Students will be able to evaluate the difference in blight resistance between American, LSA, Chinese, and hybrid chestnuts. Our hope is that this project will produce future chestnut tree scientists, and some additional data on hybrid resistance. Stay tuned!

Woodgrove students posing after the netting installation. It was a tricky job, but they stuck with it and succeeded!

Woodgrove environmental science teacher Scott Fortney (right) helps students with the netting.

The Roots Run Deep

BY SCOTT MANN, AUTHOR, STORYTELLER, AND GREEN BERET

What do the American chestnut, storytelling, and Afghan Freedom Fighters have in common? Resistance. Let me explain.

I served in the US Army for nearly 20 years as a Green Beret with multiple deployments to Afghanistan. I worked with some amazing leaders, but my ultimate hero is my dad, Rex. Though not a soldier, he led thousands of people as a US forester and wildland firefighter. His never-quit attitude and penchant for always being on the front lines with his team made him a bit of a legend in the fire community.

But it was his advocacy for the American chestnut that still inspires me beyond measure. Through multiple illnesses my dad never wavered in his commitment to that tree and the amazing humans, like you, who fight for its return to the forest every day.

When he was in a rehab center in Asheville, NC following a stroke, I made him a vision board of the American chestnut that sat at the foot of his bed and stared at him day and night. And when cancer ravaged his body down to skin and bone, we fought death's beckoning by focusing on a TEDx talk on the American

Top right: Scott conducted multiple tours to Afghanistan as a Green Beret, often working in rural areas with Afghan tribes and building relationships.

Scott and his dad Rex Mann (KY Chapter) continue to grow in their relationship and mutual support of their big objectives. Scott refers to Rex as his ranger buddy and Rex always talks of how Scott supports his chestnut evangelism.

chestnut that he delivered in 2018 to a standing ovation at 73 years old.

RESISTANCE.

When Afghanistan collapsed in August 2021, the Taliban swarmed over the country with their draconian rule. I formed a group of veterans known as Task Force Pineapple to help rescue our Afghan allies, using our multi-decade relationships and cell phones.

During those late-night rescues, my dad sat right there at my side through the agonizing phone calls with Afghan families being beaten. I would rage at the walls through tears as we saved some of them, but most were left behind. Whenever the pressure of keeping these families alive threatened my very sanity, dad would steady my hand in the face of soul-crushing imposter syndrome with his kind smile and steady voice of encouragement.

Top right: Scott as a child on his dad's back. Scott says that he has been able to reach for the stars because of his dad's deep love and support.

Commander Massoud of the Afghan National Resistance Front has seen much loss and suffering in his young life. He was moved to tears of joy when Scott presented him with the American chestnut bottle, telling Massoud that their fathers would be proud of him.

RESISTANCE.

My humanitarian work with our Afghan allies continued as my dad's advocacy for the American chestnut reached new heights. The powerful metaphor of roots running deep into the earth, resistant and steadfast against extinction, drove both of us to pursue our higher callings and support each other in the process.

In the Summer of 2024, I was invited by world class podcaster Shawn Ryan to join him on a trip to Vienna to interview the legendary leader of the Afghanistan Resistance, Ahmad Massoud. He was the young son of the iconic Ahmed Shah Massoud Sr. who had fought the Soviets in Afghanistan for years and warned the US about the coming attacks of Usama bin Laden. He was tragically killed by bin Laden just two days before 9/11/2001.

To have the opportunity to meet his son Ahmad Massoud was a very strategic opportunity to further advocate for the plight of our Afghan allies. His leadership of the Afghan Resistance was respected around the world. If I could establish rapport with him, his advice and connections could be game changing.

As I prepared to travel from my home in Tampa, Florida to Vienna, Austria to meet Massoud, I wanted to bring him a relational gift that would help me accelerate trust in our short time together. But what?

Dad was back in Florida fighting yet another diabolical attack of cancer. I sought his advice on the appropriate gift.

"Take him a chestnut bottle, Scotty." He was referring to the super-cool pieces of centuries old wormy chestnut that had been carved into the shapes of bottles by a Vietnam-era Green Beret who also shared passion for restoring the tree. "Tell him the story about it — how it's functionally extinct, yet it's roots refuse to accept that terminology," dad said. "And tell him I'm proud of him," his voice cracking.

I arrived in Vienna a few days later. Commander Massoud and I met for several minutes before the entourage showed up. Nervous and uncertain, I handed him the bottle and told him about my relationship with dad. I explained how I knew he shared a similar relationship with his dad before he died. I told him about the American chestnut tree and how the roots run deep despite the constant threat of extinction, just like the resistance Massoud was leading. "My dad wants you to know he's proud of you," I said, looking the young man in the eyes. "And he knows your dad is too. Keep resisting."

The commander looked at the bottle through tears and smiled. "This is a gift I will treasure forever, my friend. I will share this story with my people. I know we will work together for many years."

Today, I still work with Commander Massoud across the miles, and we have a trust that runs very deep. All because of the love of two fathers and the story of a tree that refuses to stop fighting.

RESISTANCE!

Capture the Beauty
of the American Chestnut

NOW THROUGH DECEMBER 31, 2025!

Grab your camera and hit the trails — the American Chestnut Photo Contest is back! We are looking for striking, creative, and unique images of American chestnut trees and hybrids. Whether it's a blue jay caught mid-theft with a spiky bur in its beak, the golden glow of American chestnut leaves in autumn, or fresh snow draped over barren chestnut branches, we would love to see your best seasonal shots.

This year, you have even more time to capture the perfect picture — entries will now be accepted through December 31, 2025. The first-place winner will have their photo featured on the cover of a future issue of *Chestnut* and will receive a one-year TACF membership, along with a T-shirt and hat. The second-place winner will receive a T-shirt and sticker, and the third-place winner will receive a sticker. All winners will be recognized in a future issue of the magazine.

HOW TO ENTER & CONTEST TERMS

All entries must:

- Be submitted digitally via email or a link to a cloud drive by December 31, 2025
- Feature or be related to the American chestnut
- Be at least 2400 x 3000 pixels (7.6 MB) and in JPEG or TIFF format
- Include the photographer's name and contact information
- Contain a full caption with subject names, location, and title
- Be limited to five photos per entrant
- Be previously unpublished and not entered in another contest

Submit your photos to communications@tacf.org

For more details, visit:
tacf.org/2025-photo-contest

DECADES OF SERVICE

Honoring Doug Gillis

BY PAUL SISCO, NC/SC CHAPTER

Doug Gillis joined the NC/SC Chapter's Board of Directors in 2004 and continued to serve for nearly 20 years, half of those as Chapter president. A true "local boy," Gillis seemed to be related to everyone in Buncombe County, NC, from the State's Civil War governor Zebulon Vance to M.B. Haynes, whose utility trucks are a frequent site on western NC roads. His background in engineering and construction gave him a practical, common-sense approach to problems, and he was always willing to pitch in and help wherever needed. He was particularly interested in chestnut wood, and he wrote several articles on this topic for *Chestnut* magazine, and looking further back, *Chestnut Mast*, the former newsletter of the NC/SC Chapter. He also had a culinary interest, and each issue of *Chestnut Mast* as well as several issues of *Chestnut* included recipes submitted by Gillis. Photography was one of his passions, and whenever the Chapter organized workdays or meetings, Gillis was always there with his camera to record the day's events. He strongly felt the need to document the Chapter's work, and these photographs, as well as stories he wrote to accompany them, were extremely helpful in keeping the broader Chapter membership abreast of current Chapter activities.

Doug Gillis and wife Marsha stand beside a wild American chestnut in 2004 at Pilot Mountain State Park in NC.

Gillis speaks to a group about American chestnut in 2004 at Crowders Mountain State Park in NC.

In 2004 when Gillis joined the Chapter Board of Directors he wrote:

"My interest in the American chestnut started with my father, Glen Gillis. He was born in 1913 and was raised in the Big Ivy Community of northern Buncombe/southern Madison County. He saw firsthand the demise of the great American chestnut trees in the area where he lived. He left home in 1933 to make a career in the Army, yet returned often to visit relatives in the mountains. He instilled in me a love of nature and told me on many occasions about the mighty American chestnut. It may be no coincidence that in 1959, he picked a house in Chestnut Hills in Raleigh, NC, in which to move his family. The tree in the front yard was a Chinese chestnut, the only available substitute for the American chestnut at the time. I saw first-hand at the age of 12 the evidence of chestnut blight. In 1959, my father and I were at a sawmill located on the Harris Dairy Farm in Barnardsville, NC. My Uncle Charles Harris had recently had the woods on the 800-acre farm selectively cut. Pieces of wormy chestnut planks, some 20 inches in width, lay discarded at the sawmill. My father arranged to salvage the wood, have it milled, and hauled to Raleigh. Wormy chestnut paneling stills lines the walls of the den in the home in Chestnut Hills that I helped him build."

NC/SC Chapter members pose for a group photo in 2008 during a gathering at Hanging Rock State Park in NC. (Gillis is center and standing in green polo.)

NC/SC Chapter members take a field trip to Bad Fork Valley Overlook in NC during their Chapter meeting in 2003.

THE NC/SC CHAPTER OF THE AMERICAN CHESTNUT FOUNDATION OWES A GREAT DEAL OF GRATITUDE TO THE SERVICE AND DEDICATION OF DOUG GILLIS' LONG-TERM COMMITMENT.

ME Chapter Featured in National Television Show

on Outdoor Network

BY MARK MCCOLLOUGH, ME CHAPTER PRESIDENT

Last July, the national office of The American Chestnut Foundation (TACF) reached out to the ME Chapter with an exciting proposal, asking if we would we be interested in working with a TV crew who was interested in filming an episode about American chestnuts for a show called WildFed.

ME Chapter President Mark McCollough (not pictured) explains the process of roasting chestnuts to WildFed host Daniel Vitalis (crouched).The WildFed crew harvested chestnuts planted by the Chapter at the Leonard's Mills logging history museum.

Our first question, "What is WildFed?," was quickly answered. WildFed, a popular hunting and foraging show on the Outdoor Channel, reaches a diverse audience passionate about the connection between nature and food. A nationally televised episode highlighting the American chestnut and TACF's work would be an incredible way to raise awareness about our mission.

The timing could not have been better. The Chapter was preparing for a busy season, including hand-pollinating our best hybrid chestnuts, visiting Maine's legacy chestnut trees, and harvesting — and even tasting — chestnuts in the fall.

With WildFed based in Maine, the collaboration was a natural and logistically good fit. Modern-day hunter-gatherer Daniel Vitalis, the show's host, explained, "WildFed reconnects people with wildness through food.

Each episode integrates hunting, fishing, foraging, and ecology with nutrition, cooking, community, and outdoor adventure. WildFed promotes a modern subsistence culture and encourages humans to be deeply connected with the wild, be ecological stewards, and honor wild harvest by revering nature. Wild foods bond us to the natural environment."

Given the ecological and nutritional value of the American chestnut, it was a perfect feature for the show's 5th season. The episode will have aired on the Outdoor Channel by the time this issue has been printed. If you missed it, season 5 of WildFed should be available for streaming early next year, and TACF will share that information broadly once it becomes available. We are excited that the work of the ME Chapter, and the remarkable story of the American chestnut, is being recognized at this scale!

ME Chapter volunteers and the WildFed crew gather for pollinating instructions from Chapter co-founder Eric Evans (left in straw hat).

WildFed host Daniel Vitalis visits the tallest wild American chestnut tree in Lovell, Maine.

Watching WildFed

BY ANGUS MULLIS-MCCORD, DEVELOPMENT ANALYST

If you have not gotten the chance to watch yet, the WildFed episode showcases footage of large American chestnuts in Maine which are breathtaking, especially if you have never seen a mature American chestnut. In addition to harvesting chestnuts, ice fishing is featured, and for the meal at the end of the episode, they cook brook trout breaded in American chestnut flour, something I will be trying this year! Also, close-ups of controlled pollinations and harvesting are featured as they tell the story of TACF's work to improve blight resistance in American chestnut populations.

The work of TACF is unique among plant breeding projects. Rather than breeding trees specifically for a domesticated life like most breeding programs, chestnuts are bred with the goal of restoration in the wild. WildFed showcases different ways humans feed ourselves from wild organisms, and the work of TACF staff and volunteers makes progress towards a landscape with incrementally more and more wild food as American chestnuts are restored.

Being featured on WildFed offered a unique opportunity for the voice of dedicated volunteers, on behalf of all of us "chestnutters," to share their passion and optimism for the future of this incredible tree.

BUT I'M A SCIENTIST

WHY DOES OUTREACH MATTER?

BY HANNAH LEEPER, SOUTHERN REGIONAL OUTREACH COORDINATOR

Volunteers participate in a partnership hike with Southern Appalachian Highlands Conservancy (SAHC) at South Yellow Mountain in Crossnore, NC.

As an organization focused on the eventual development of a restoration-ready American chestnut tree, one of The American Chestnut Foundation's (TACF) core values is "science-based decisions." Scientific inquiry is foundational in TACF's approach. For more than 40 years, the Foundation has relied on its science team, university partners, and citizen scientists to develop a science plan, from backcross breeding to its current approach of recurrent genomic selection (RGS). As a reader of this magazine, you may be a scientist or citizen scientist involved in this work, and at times you may find yourself asking questions such as "If I'm working on the science, why do I need to be involved in outreach?" or "Won't focusing on outreach mean I am diverting time away from important scientific work?" This article will share a brief introduction to some important insights about why outreach is inseparable from the scientific work of TACF and why investing in outreach will ultimately enhance scientific output.

NC/SC Chapter Board member Jon Taylor (far right) gives a seed planting demonstration at Pryor Orchard in Edneyville, NC.

First, it is important to consider what "outreach" means. There is a common misconception that outreach only includes tabling at events or giving school presentations. In actuality, the scope of outreach is much broader. When considering outreach as a concept in the informal science education sphere, it can include a spectrum of methods with the intention of informing and engaging an audience, which can include diverse ages and backgrounds. Examples could be media (print, broadcast, social media), lectures and presentations, exhibitions, workshops, drama productions, musical interpretations, field days, orchard tours, and more (McCallie et al., 2009). Furthermore, it is important to realize that outreach and public engagement are most effective when they involve a meaningful two-way dialogue (NCCPE, 2024). Consider adapting a one-way flow of information, as presentations often are, to a two-way exchange; what might you learn in this expanded approach to outreach? In the context of American chestnut restoration, outreach is a cross-disciplinary concept that encourages those involved to reach beyond what has already been done to attract new audiences. Perhaps a first step in considering outreach is to slough away the notion that it is only for children or for extracurricular educational purposes.

Considering this definition of outreach, according to science communication experts Sam Illingworth and Grant Allen, scientists communicate with non-scientists for three reasons: because they have to, because they want to, and because they should (2020). To address the first of these, certain grants and other funding sources will often require a public engagement component. This is part of the reason why competitive universities and nonprofits have increasingly incorporated outreach activities in

recent years (Carver, 2014). This type of engagement, especially when integrated in pre-research, can positively impact the overall outcome of scientific inquiry by defining and legitimizing outputs, outcomes, and impacts of research (Grant, 2011). To maintain TACF's caliber in relation to others in the restoration field, it is crucial to continue to develop in a way that follows this trend, opening doors to further opportunities for chapters and the Foundation as a whole.

Many scientists "want to" communicate with non-scientists because they are passionate about their field. Though it may seem like a casual conversation, any time you share information about your work with TACF, it is an instance of outreach. Sharing information about your involvement, speaking to the work you do in the orchard, telling stories about working with interns or coordinating efforts in the lab, lifts the veil between those in the chestnut world and those who haven't yet joined. This type of interaction can ultimately remind you why you became a "chestnutter" to begin with!

Finally, research shows that members of the public in the US still trust scientists as one of their top three sources for information about the impact of science on society (Bennett, 2011). As a leader in restoration technology, TACF has a responsibility to engage with and educate the public about its progress (and pitfalls) in this pursuit. In light of the recent and rampant spread of science misinformation, TACF can combat aspects of this through outreach, which includes science communication, public engagement, and interactions with communities of diverse and varied backgrounds. From the privileged position of a well-resourced, storied, and trusted organization at the forefront of American chestnut restoration, TACF will continue to build its credibility by fostering important relationships through outreach. The purpose of outreach goes beyond educating others about the American chestnut story; it is a mechanism for including and engaging members of the public with TACF's scientific work, ultimately incorporating more perspectives and enhancing outcomes. Just as a forest is healthiest when it is diverse, so is this Foundation. Outreach works in tandem with scientific inquiry to support a sustainable approach to American chestnut restoration.

TACF's Director of Research Dr. Vasiliy Lakoba and Nadia Keller, student at Warren Wilson College in Swannanoa, NC discuss her chestnut research project during the Poster Session at TACF's 2024 American Chestnut Symposium in Cromwell, CT.

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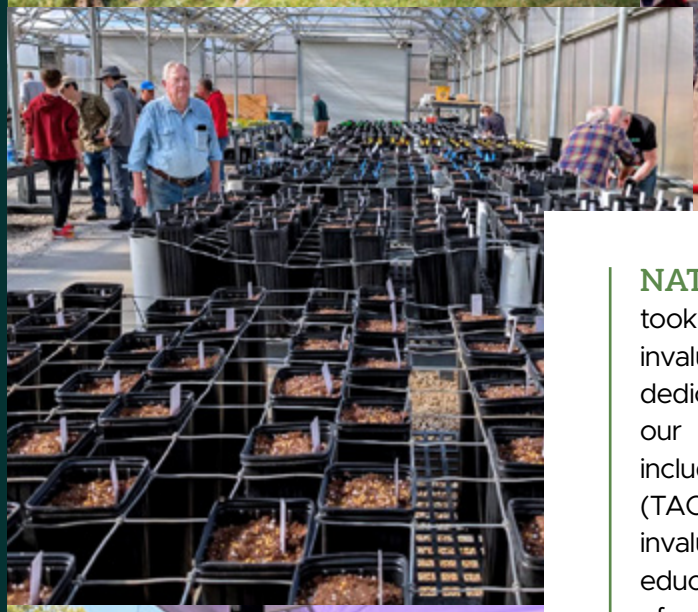
NATIONAL VOLUNTEER WEEK 2025

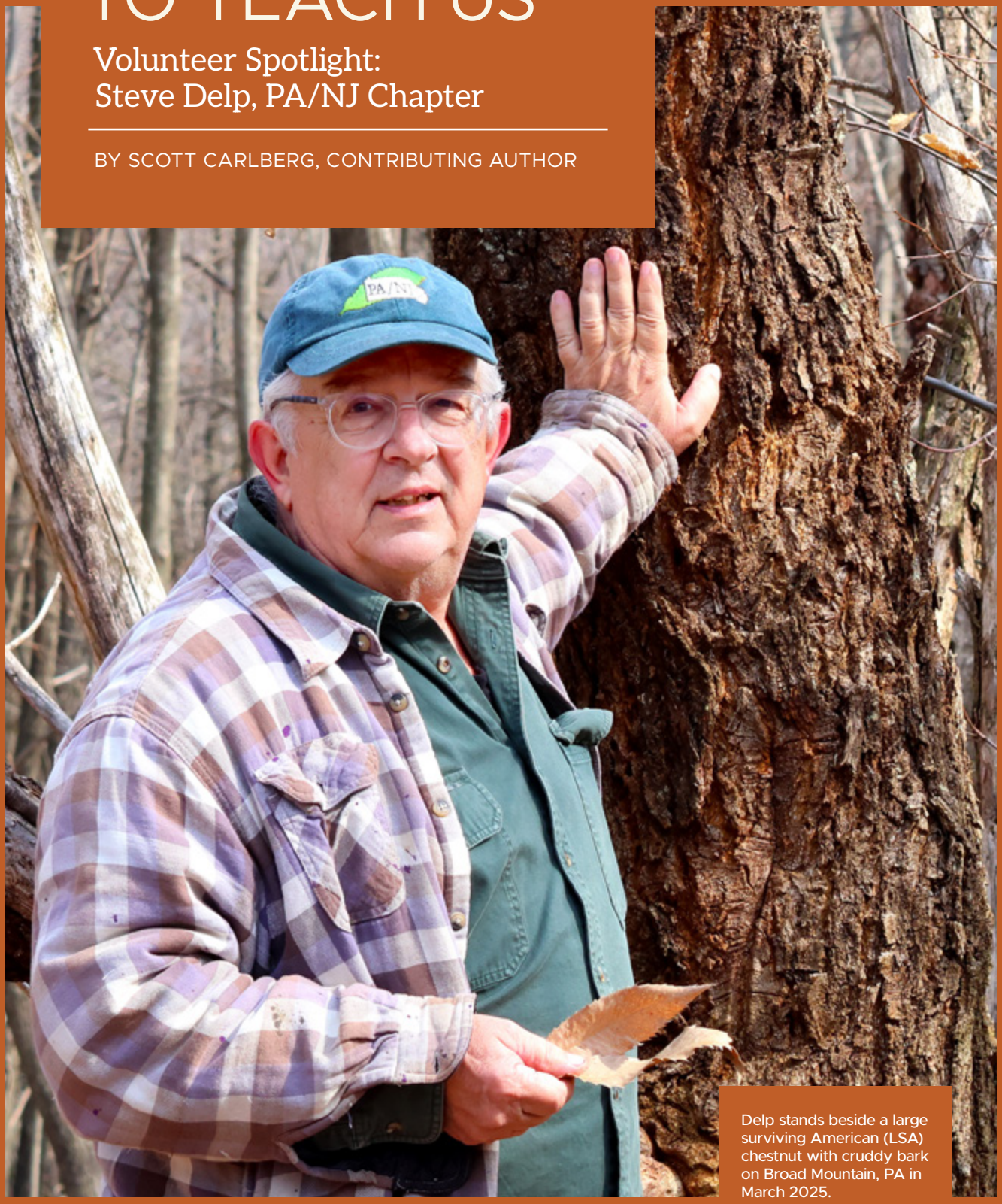


NATIONAL VOLUNTEER WEEK 2025 took place April 20–26, honoring the invaluable contributions of volunteers who dedicate their time and energy to enhancing our communities. Organizations nationwide, including The American Chestnut Foundation (TACF), rely heavily on the dedication of these invaluable stewards. From planting trees to educating the public about the importance of restoring the American chestnut, these individuals are integral to TACF's mission. Their unwavering commitment brings us closer to revitalizing eastern US forests with thriving American chestnut populations. We extend heartfelt gratitude to all volunteers for their exceptional service.

"ALLOW TREES TO TEACH US"

Volunteer Spotlight: Steve Delp, PA/NJ Chapter

BY SCOTT CARLBERG, CONTRIBUTING AUTHOR



Delp stands beside a large surviving American (LSA) chestnut with cruddy bark on Broad Mountain, PA in March 2025.

Being outside all day, catching frogs or tadpoles, and meandering through the woods seems like an idyllic life for a boy. It was for Steve Delp, as he recalled that time warmly more than six decades later.

Boyhood time outdoors helped Delp become the outstanding chestnut volunteer he is today. Delp has been volunteering with The American Chestnut Foundation (TACF) since 2020 and is now a board member of the PA/NJ Chapter, which has roughly 800 members.

Delp's experience outside as a youth is a study in contrasts. "Mom would drop us at the lake to fish all day," a bright memory. As a boy, he also saw how the environment was abused. "We would drive through areas on trips and see poisoned streams from anthracite coal mining, blue or orange tints from metals leaching from mines."

Southwest of the anthracite coal region in eastern central Pennsylvania, Delp hiked as an adult. "I felt disgusted at seeing the acid mine drainage from the Twentieth Century just now getting cleaned up. When people dig tunnels or holes those tunnels fill with water which becomes very acidic, with a low pH that leaches metals from rock, like iron and aluminum, that is high enough to become toxic. Rain comes and water overflows into streams."

That outside time, and what he saw, set the course for Delp's future. "As a boy, I knew it would be tech versus creative. I am science oriented. It would be one of the natural sciences." It was a biology degree from Penn State University. Still, he took an unexpected turn.

"A new career field was developing: industrial hygiene." Delp's education about living things shaped itself into a new way to protect people. "It was a tough sell because no one knew what it was. Coming from a science perspective, I had to develop people skills, too. People are not always the most flexible, so we had to learn how

Delp is nut grafting an LSA chestnut scion to a chestnut during a grafting workshop in March 2025 in Bedford, VA.

Left to right: PA/NJ Chapter members Jared Quesenberry and Clinton Morse; Penn State Forest Genetics Field Trial and Greenhouse Specialist Noah Vincent; and Steve Delp. Selfie taken at Quesenberry's property prior to the grafting workshop in Bedford, VA.

Used under a Creative Commons license.

ANTHRACITE COAL is a hard type of coal that is slower to burn and produces more heat when burned compared to Bituminous coal. It also has fewer impurities and a higher carbon percentage. Thus, it burns more cleanly, unlike Bituminous coal. Anthracite coal's relative scarcity makes it more expensive than Bituminous coal. Today, there are still around 40 active underground coal mines and more than 5,000 abandoned mines across Pennsylvania. To read more, visit illuminatingfacts.com/the-story-of-coal-in-pennsylvania.

HARNESSING THE POWER OF GENOMICS

Once a prominent tree in eastern US forests, the American chestnut was nearly eradicated by a blight that was accidentally imported in the late 1800s. Though billions of trees were lost, some persist and survive as stump sprouts, offering hope for restoration. The American Chestnut Foundation (TACF) is committed to bringing this iconic species back through a state-of-the-art breeding program: recurrent genomic selection (RGS). While continuing to cross American chestnuts with blight-resistant Asian varieties, TACF will now utilize genomic testing to select progeny with increased blight resistance while preserving 70% – 100% of the tree's American heritage. This will allow TACF to predict which seedlings are most likely to survive the blight and thrive in forest conditions.

2025 Spring Appeal

In 2024, TACF made significant strides by:

- Creating 10,000 seeds from 200 controlled pollinations
- Establishing two new seed orchards featuring RGS trees
- Genotyping 8,000 trees to strengthen breeding efforts
- Improving prediction models for blight resistance
- Joining the North Carolina State University Tree Improvement Cooperative for added research support

Your gift to TACF's 2025 Spring Appeal drives this vital research. Harnessing the power of genomics requires a bold investment in things like genotyping and DNA collection, as well as essential tools for pollination and intensified greenhouse work. As orchards are expected to begin producing large numbers of blight-resistant seeds in 7-10 years, TACF is joining forces with landowners, researchers, and volunteers to reintroduce this foundational species to its native range.

Together, we are restoring a legacy — one tree, one forest, one generation at a time.

to share goals about personal and industrial health and safety." That career lasted 41 years, and the science of industrial hygiene evolved considerably (with Delp's prodding, we know).

No matter how successful his industrial career was, the outdoors still called Delp's name. "I bought a 60-acre tree farm near Pine Grove in Schuylkill County. Part of that was a small retail Christmas tree business." Delp sold trees to Christmas tree sellers.

Diverse tree species, not just pines, were important to Delp's land. "I began reforesting portions of the farm with native trees grown in pots from seeds I collected in the wild on my hikes. I have apple, paw-paws, persimmon, and 13 different oak species." Other parts of his farm were enrolled in conservation programs, including the Conservation Reserve Program and the Conservation Reserve Enhancement Program. The farm was his avocation for 25 years.

What Delp brings to TACF is the same as his career: precision, a scientific approach to establishing goals, a sense of objectivity, and seeing reality versus what you want to see. It is discipline.

So, what does Delp make of all the environmental news today about our forests? "There is a lot of drama these days when it comes to the state of the environment — all components of the environment. Except for some truly tragic cases like American chestnut and ash, trees for the most part are doing okay. Natural regeneration is improving with better control over white-tailed deer populations, forestry practices are being refined, and old mining scars are being repaired and replanted. On the other hand, we still have significant stresses on some tree species caused by invasive pests — for example, the gypsy moth defoliation of oak trees and wooly adelgid infestation of hemlock trees."

One of Delp's grandsons assists him in planting a chestnut tree.

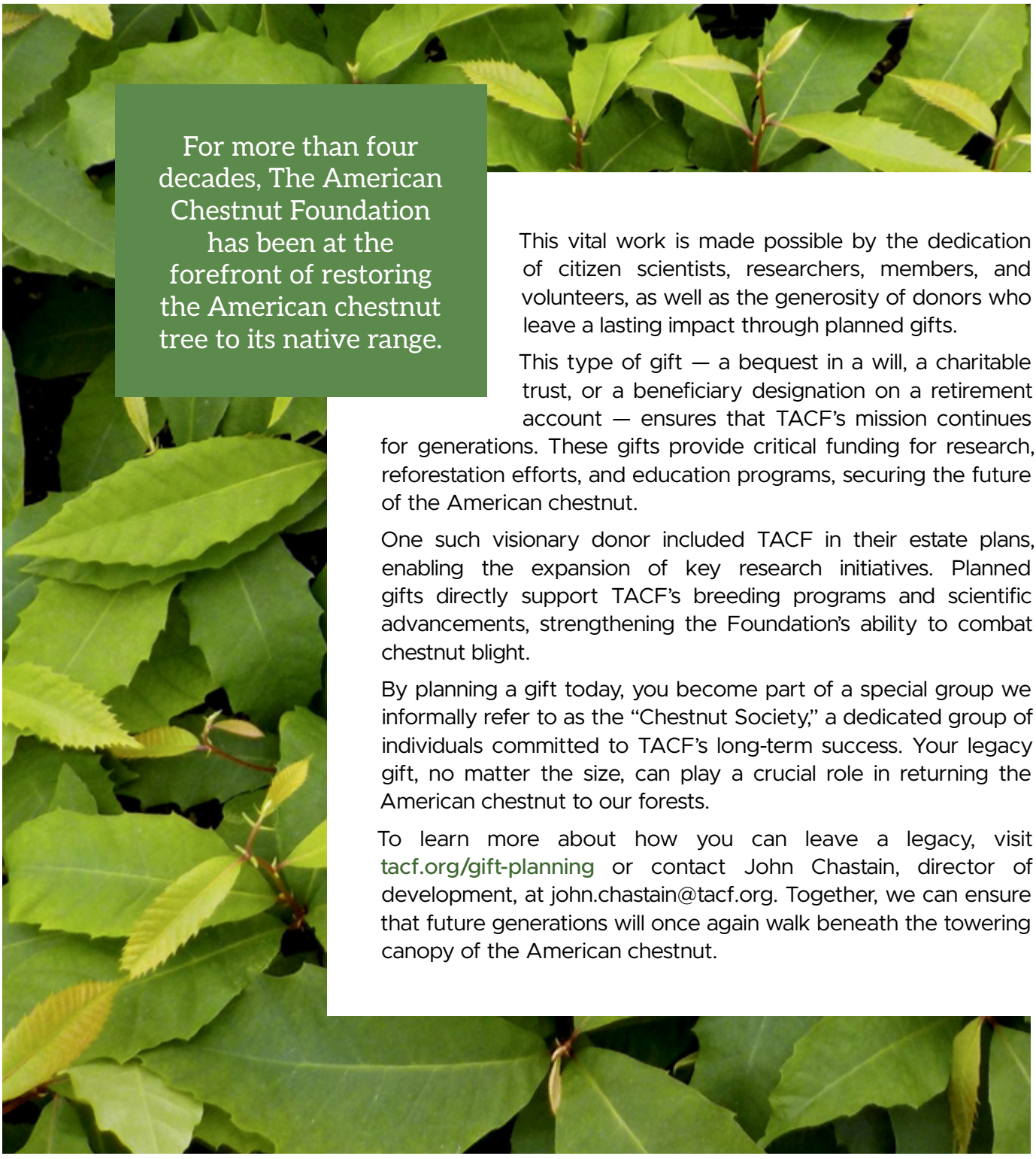
Delp shares information about how to nut graft to a chestnut seed.

Delp knows he is one part of a big picture. "The reason I mention acid mine drainage and the thousands of miles of streams where life was destroyed over the course of 100 years here in Pennsylvania is because things are finally getting cleaned up. It is the right thing to do. I am helping to restore the American chestnut for the same reason."

With Delp, it's about taking an orderly approach in the present to improve the future and give life direction. Trees are a prime example of rebirth, dropping leaves only to grow them again next season. "Allow trees to teach us," says Delp. "Let go of the old and allow room for transformation, for growth. When we see that welcome sign of spring, don't just see it in trees, but ourselves, too." It is just like that when Delp is out with his five grandsons at the creek.

Planting a Legacy

THE IMPACT OF A PLANNED GIFT



For more than four decades, The American Chestnut Foundation has been at the forefront of restoring the American chestnut tree to its native range.

This vital work is made possible by the dedication of citizen scientists, researchers, members, and volunteers, as well as the generosity of donors who leave a lasting impact through planned gifts.

This type of gift — a bequest in a will, a charitable trust, or a beneficiary designation on a retirement account — ensures that TACF's mission continues for generations. These gifts provide critical funding for research, reforestation efforts, and education programs, securing the future of the American chestnut.

One such visionary donor included TACF in their estate plans, enabling the expansion of key research initiatives. Planned gifts directly support TACF's breeding programs and scientific advancements, strengthening the Foundation's ability to combat chestnut blight.

By planning a gift today, you become part of a special group we informally refer to as the "Chestnut Society," a dedicated group of individuals committed to TACF's long-term success. Your legacy gift, no matter the size, can play a crucial role in returning the American chestnut to our forests.

To learn more about how you can leave a legacy, visit tacf.org/gift-planning or contact John Chastain, director of development, at john.chastain@tacf.org. Together, we can ensure that future generations will once again walk beneath the towering canopy of the American chestnut.

BREAKING THE RESTORATION PARADIGM:

How Recurrent Genomic Selection and Synthetic Biology Can Create a Future for the American Chestnut

BY SARA FERN FITZSIMMONS, CHIEF CONSERVATION OFFICER, AND JARED WESTBROOK, DIRECTOR OF SCIENCE

Restoring the American chestnut will require a coordinated approach that integrates multiple technologies and methodologies. In 2025, The American Chestnut Foundation (TACF) anticipates significant advancements in disease resistance through the implementation of recurrent genomic selection (RGS). These gains will establish the groundwork for restoration populations of American chestnuts, providing a robust foundation to incorporate additional technologies in the future. While RGS is expected to produce populations with disease resistance and American chestnut characteristics sufficient for long-term survival, these populations can be further enhanced through the integration of complementary technologies and methodologies.

UNDERSTANDING RECURRENT GENOMIC SELECTION

Recurrent genomic selection (RGS) has become a cornerstone of modern tree breeding, particularly for incorporating disease resistance into improvement programs. In loblolly pine (*Pinus taeda*), RGS has been critical for combating fusiform rust disease. In Eucalyptus, RGS has been applied to enhance resistance against fungal pathogens. While traditional breeding relied on hybridizing Eucalyptus species, genomic selection improved precision by analyzing 5,000+ SNP (single nucleotide polymorphism) markers to predict disease tolerance in seedlings.

The success of RGS hinges on its ability to handle complex genetic architectures, which is certainly the case for combining disease resistance into American chestnut backgrounds. In poplar, RGS has been used to combine major-effect rust resistance QTLs (quantitative trait loci) with background polygenic tolerance, achieving 55% faster genetic gain compared to marker-assisted selection.

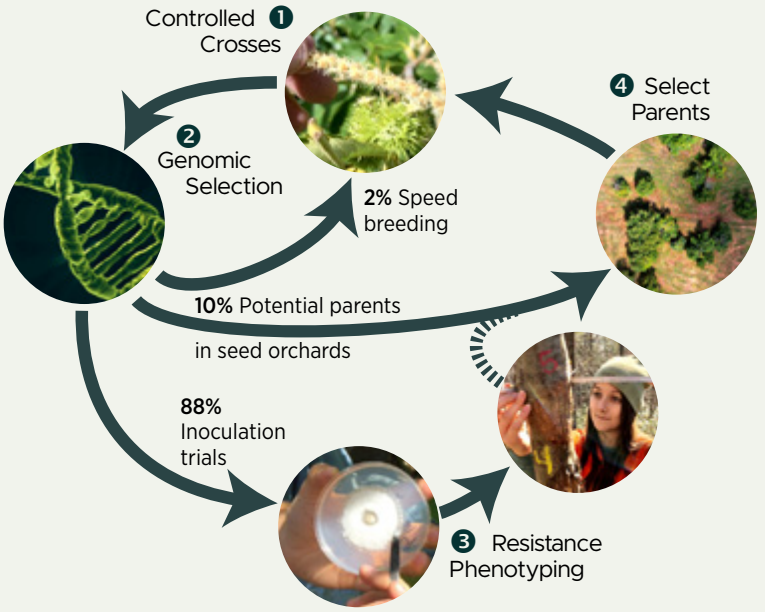
Following extensive review by TACF's Research Advisory Council (RAC) and consultation with the North Carolina State University's Tree Improvement Cooperative, consensus has been reached that RGS represents the most effective method for advancing TACF's breeding program. By continuously selecting individuals with superior genetic traits using genome-wide markers, RGS increases selection accuracy and accelerates genetic gains by rapidly accumulating favorable traits across generations.

THE SCIENCE BEHIND RGS FOR AMERICAN CHESTNUT

The backcross breeding program of TACF was historically based on the hypothesis that resistance to chestnut blight was controlled by a few large-effect genes from Chinese chestnut. However, scientists now understand that blight resistance is genetically complex, controlled by hundreds of genes across all 12 chromosomes contributed by the Chinese parent. This discovery necessitated a shift in breeding strategy.

HOW RGS WORKS: A FOUR-STEP CYCLE

1. **Selection:** TACF staff and consulting scientists have identified over 300 superior parent trees using genomic data (5,000+ genetic markers) and field performance metrics like canker severity and canopy health (**Table I**). As more trees are included in the testing pipeline that number will likewise increase.
2. **Breeding:** Controlled crosses between elite parents. In 2025 a total of 2,270 crosses have been designed to improve disease resistance in TACF American chestnut populations.
3. **Genotyping:** High-throughput DNA analysis screens would-be parents and seedlings from controlled crosses for resistance genes and American ancestry.
4. **Repetition:** The best progeny re-enter the breeding pool, creating cumulative gains — resistance indices jump from 45 in first-generation hybrids to 55 in the second generation.



In the second generation, TACF plans to increase the minimum selection threshold for blight resistance to 50 and Phytophthora root rot (PRR) resistance to 40 while maintaining the minimum American chestnut ancestry at 70%. This strategic approach aims to balance disease resistance with the preservation of American chestnut characteristics.

Chapter	Total Trees
Alabama	24
CAES	6
Carolinas	130
Connecticut	32
Georgia	46
Indiana	4
Maine	22
Maryland	59
Massachusetts/ Rhode Island	21
Meadowview	502
Pennsylvania/ New Jersey	97
Tennessee	48
Vermont/ New Hampshire	9
Virginia	278
Grand Total	**1,278**

TABLE I. The number of selected trees from contributing Chapters currently involved in the RGS program of TACF. Note that these numbers will fluctuate as the genotyping model changes and new trees are identified to be used in the program.

PROJECTED GAINS IN DISEASE RESISTANCE

As seen in **Figure 1** below, there are four separate breeding tracks being proposed, which will utilize RGS.

1. **Maximize blight resistance** in hybrids while maintaining > 70% American chestnut ancestry
2. **Balance gains** in blight and PRR resistance
3. **Maximize PRR resistance** while maintaining basal levels of blight resistance
4. **Improve blight resistance** in progeny of large surviving American chestnuts

Simulations conducted for the breeding program demonstrated that controlled pollination and genomic selection are necessary steps to achieve the desired gains in disease resistance without increasing Chinese chestnut ancestry. First-generation selections were predicted to have blight resistance varying from 40 to 57 (average 45), PRR resistance from 25 to 55 (average 34), and American chestnut ancestry from 70% to 81% (average 73%).

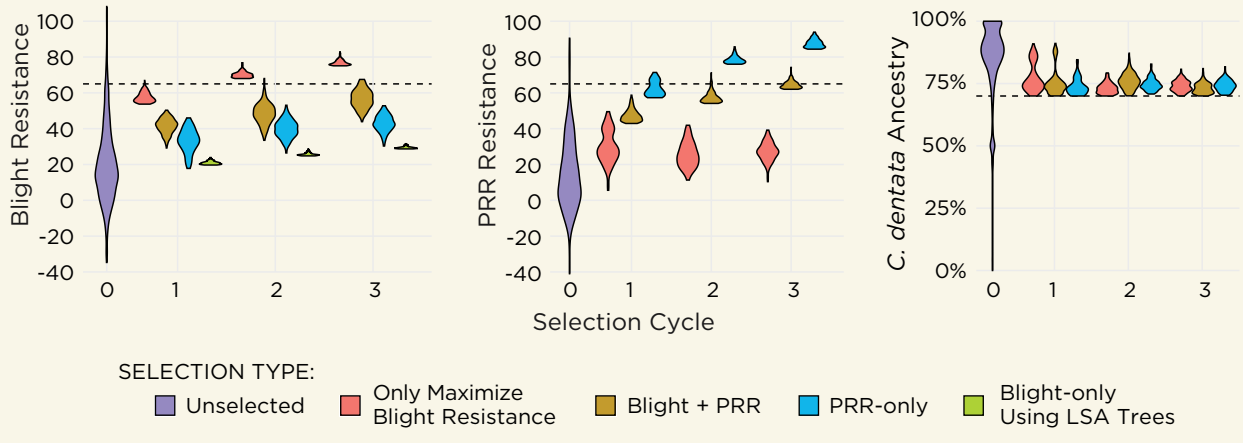
For the second generation, with controlled pollinations between first-generation selections, blight resistance was predicted to vary from 50 to 75 (average 55), PRR resistance from 40 to 63 (average 47.4), and American chestnut ancestry from 70% to 89% (average 74%).

The simulations revealed a stark contrast between controlled pollination and open pollination scenarios. In the open pollination scenario, only 2.2% of progeny surpassed second-generation standards — too few to plant a seed orchard. By contrast, in the controlled pollination scenario, 18.5% of progeny exceeded standards, providing sufficient material for establishing seed orchards.

ADDRESSING MALE STERILITY

An important consideration in the breeding program is male sterility, which has arisen in some progeny due to incompatibilities between genes inherited from Chinese chestnut and mitochondria inherited from American chestnut. Since TACF ultimately wants these trees to reproduce on their own, male sterility is an undesirable trait.

FIGURE 1: SIMULATED RESISTANCE GAINS AND *C. DENTATA* ANCESTRY ACROSS THREE RGS GENERATIONS



The genetic variants that cause male sterility have recently been genetically mapped to a single location at the end of chromosome 3. Selection for American chestnut ancestry at this genome location should produce trees and progeny which are male fertile.

FUTURE DIRECTIONS AND INCORPORATION OF NEW TECHNOLOGIES

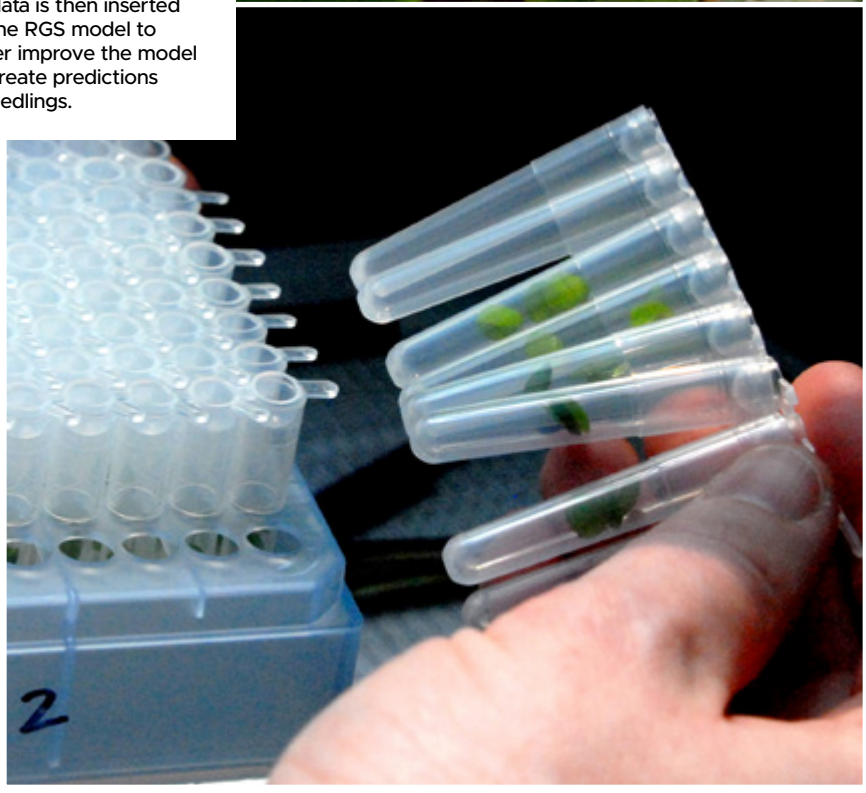
The RGS program at TACF represents the most promising avenue for achieving substantial gains in disease resistance while maintaining the genetic diversity necessary for adaptation to diverse environments and climate change. However, TACF recognizes that RGS alone may not fully address the complexity of restoring the American chestnut, and emerging technologies are being actively reviewed and integrated into the broader restoration strategy. Importantly, the data generated through RGS is providing critical insights into resistance mechanisms and genetic diversity, which will be instrumental in integrating these emerging biotechnologies into TACF's breeding efforts.

GENE DISCOVERY THROUGH COMPARATIVE GENOMICS AND QUANTITATIVE TRAIT LOCI (QTL) MAPPING

The development of high-quality reference genomes for Chinese (*Castanea mollissima*) and American chestnut (*Castanea dentata*) has revolutionized gene discovery efforts. Comparative genomic analysis has identified hundreds of regions associated with blight resistance in Chinese chestnut, distributed across all 12 chromosomes. QTL mapping has pinpointed specific chromosomal segments linked to resistance, including loci on chromosomes 3, 5, 10, and 12 that significantly enhance blight resistance when inherited. These findings confirm the polygenic nature of resistance and can enable precise selection of favorable alleles during breeding cycles.

Hundreds of controlled crosses between selected RGS parents are created every season to find the right combination of disease resistance and American chestnut background.

Leaf tissue is sampled from all seedling progeny of controlled crosses for genotype sequencing. The data is then inserted into the RGS model to further improve the model and create predictions for seedlings.



Each harvest, thousands of burs are shucked, providing hundreds of thousands of nuts for research and outreach pipelines. PA/NJ Chapter member Jay Brenneman shucking burs at the Penn State orchard.

FUNCTIONAL GENOMICS AND CANDIDATE GENE VALIDATION

Transcriptomic data further enriches TACF's understanding of resistance mechanisms by identifying genes involved in pathogen response. For example, hybrids inoculated with blight fungus reveal 37 genes uniquely upregulated in resistant Chinese chestnuts, including a fungal chitinase that breaks down pathogen cell walls. Conversely, researchers have identified 26 susceptibility genes present in American chestnuts but absent in resistant Chinese genotypes. These genes could be targeted for editing using CRISPR technology to either knock out susceptibility alleles or introduce resistance genes directly into American chestnut lineages.

ONGOING GENETIC TRANSFORMATIONS

While TACF has determined that the transgenic Darling lines using an OxO

gene and constitutive promoter are unsuitable for large-scale restoration (tacf.org/darling-58-performance), new OxO lines developed in collaboration with the Merkle lab at the University of Georgia employ novel promoters. These lines will undergo testing this year to evaluate their potential for restoration.

EMERGING BIOTECHNOLOGIES: RNA INTERFERENCE (RNAI)

Beyond CRISPR and transgenics, RNA interference (RNAi) offers another promising avenue for enhancing disease resistance. Early research aims to use RNAi to silence virulence genes in *Cryphonectria parasitica*, disrupting fungal communication and reducing pathogenicity without introducing foreign genes into the chestnut genome. This approach could reduce reliance on Chinese chestnut ancestry while preserving native traits, further diversifying TACF's toolkit for combating blight.

LOOKING AHEAD: A MULTI-PRONGED APPROACH TO RESTORATION

As TACF continues to refine its RGS program and incorporate emerging technologies, like improved transgenics and RNAi, its commitment to restoring the American chestnut remains unwavering. The enthusiasm of volunteers, expertise of chapter leaders, and support from research collaborators drive progress with each breeding cycle. By 2025-2026, TACF plans to provide trees from best x best crosses to long-time sponsors and research supporters through nursery partnerships — a significant milestone demonstrating tangible progress toward restoration goals.

The integration of genomic selection with cutting-edge biotechnologies highlights TACF's innovative approach to tackling one of forestry's most complex challenges. By combining traditional breeding with modern molecular tools, TACF edges closer to its ultimate goal: reintroducing resilient populations of American chestnuts into their native range while ensuring their long-term survival against evolving threats.

Bartlett Tree Care Company is a long-time supporter of TACF and its work to restore the American chestnut tree. The company donates time and use of its bucket trucks in making controlled crosses for many purposes, including the RGS program.

FOR AN IN-DEPTH LOOK AT THE SCIENCE AND EFFORTS IN DEVELOPING THE RECURRENT GENOMIC SELECTION (RGS) APPLICATION TO AMERICAN CHESTNUT, BE SURE TO FOLLOW DR. JARED WESTBROOK'S ARTICLE CURRENTLY IN REVIEW BY CLICKING THIS LINK:

tinyurl.com/3e4r5dmm

Stay Tuned!

In upcoming issues, we will be introducing two new segments: *Nuts About Giving*, a special feature highlighting our donors, their inspirations, and the impact of their generosity on The American Chestnut Foundation.

Partners in Progress, where we'll spotlight a key partner, whose support strengthens our mission.

Ecological Discoveries:

Advancing American Chestnut Hybrid Restoration Through Research and Education

BY DR. CAMILA C. FILGUEIRAS AND DR. JONATHAN HORTON,
DEPARTMENT OF BIOLOGY AT THE UNIVERSITY OF NORTH CAROLINA ASHEVILLE

Dryocosmus kuriphilus is a parasitic wasp that forms galls on chestnut trees.

In 2022, researchers at the University of North Carolina Asheville received an external research funding grant from The American Chestnut Foundation (TACF) to study stress responses and herbivory patterns in wild-type and hybrid American chestnuts in western North Carolina.

This research addressed TACF's objectives of comparing ecological functionality between chestnut cultivars and evaluating their adaptation to environmental stressors. The project examined how American chestnut hybrids interact with their environment through three key areas:

- **Insect diversity and herbivory patterns**
- **Soil biodiversity**
- **Plant physiology under stress conditions**

Researchers conducted field experiments comparing three types of chestnut stands:

- **Wild-type American chestnuts (100% American chestnut ancestry)**
- **BC_3 populations (estimated 94% American chestnut ancestry)**
- **BC_1 populations (estimated 75% American chestnut ancestry)**

The team used pyramid traps to collect insects, gathered soil and leaf litter samples to study underground organisms, and analyzed leaf physiology through light response curves and water stress measurements. These methods provided comprehensive data on how the different chestnut types function in their environment.

Key Findings

ABOVE GROUND INSECT DIVERSITY

The study revealed eight major orders of insects across the different chestnut stands, including Hymenoptera, Coleoptera, and Lepidoptera. Interestingly, while the total abundance of insects did not differ significantly among the hybrid types, there were marked differences in community composition. The BC_3 stands exhibited unique insect community structures compared to the BC_1 and wild-type American chestnut stands, driven in part by the presence of certain insect orders like Diptera and Coleoptera.

Additionally, the study highlighted the impact of the Asian chestnut gall wasp (*Dryocosmus kuriphilus*), a parasitic wasp that forms galls on chestnut trees. Gall infestation was most severe in the BC_1s, with these trees being 3.7 times more likely to be infested compared to the BC_3 trees (**Figure 1**). Wild-type American chestnut trees showed no galling, perhaps due to their smaller size and resprouting growth habits. These findings emphasize how subtle genetic differences in hybrids

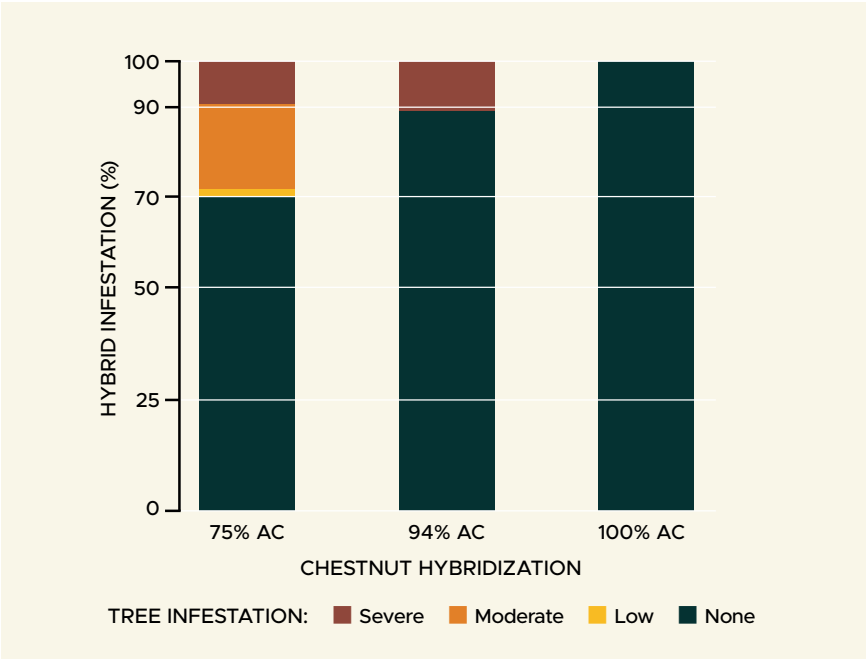


FIGURE 1. Asian chestnut gall wasp infestation. Specifically, percent infestation across stands by Asian chestnut gall wasp on American chestnut hybrids. Severity of infestation was assessed on a per tree basis. From Reed et al. 2024.

influence both pest dynamics and insect community structure, underscoring the ecological complexity of chestnut hybrid reintroduction.

SOIL BIODIVERSITY

Below ground, the diversity of soil arthropods also varied across chestnut hybrid stands. Five primary arthropod classes, including Arachnida, Protura, and Collembola, were identified, with distinct differences between the BC_3 and wild-type stands. Notably, the BC_3 trees showed greater overall soil biodiversity than the wild-type American chestnuts, which had a lower Shannon diversity index. These results suggest that the genetic makeup of the hybrids might contribute to more complex soil ecosystems, potentially enhancing nutrient cycling and soil health. However, seasonal variations also influenced the diversity, emphasizing the need for long-term monitoring to fully understand the implications of these findings.

LEAF PHYSIOLOGY

BC_3 trees showed higher photosynthetic efficiency under optimal light conditions compared to BC_1s (**Figure 2**). Diurnal measurements revealed that BC_3s also maintained higher gas exchange rates and better tolerance to midday water stress. These findings suggest that BC_3s more closely resemble wild-type American chestnuts in their physiological characteristics and may be better suited for areas with fluctuating water availability than BC_1 hybrids.

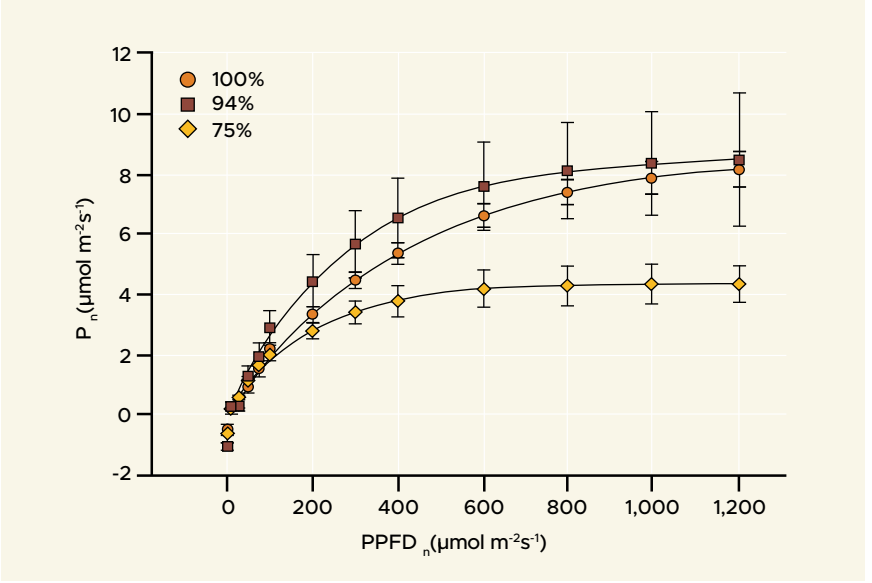


FIGURE 2. Steady-state light response curves for 100, 94%, and 75% stands. Points represent the mean (±1 SE) of six trees. From Cleary et al 2024.

Impacts and Outcomes

This research provided valuable insights into the ecological and physiological impacts of reintroducing American chestnut hybrids. The findings inform strategies for successful reintroduction by highlighting how genetic variations influence ecological dynamics and environmental adaptability.

The project also had significant educational impact. Six undergraduate students participated in the research, three of whom were directly funded by this grant. These students gained hands-on experience in fieldwork, data analysis, and scientific communication, presenting their findings at the Association for Southeastern Biologists conference. They also co-authored two publications, one already published and another in progress.

Conclusion

This project advanced understanding of American chestnut hybrid dynamics in forest ecosystems, revealing how genetic differences affect interactions with insects, soil communities, and environmental stressors. By combining research with student involvement, the project contributed to both ecological restoration knowledge and scientific education. Support from The American Chestnut Foundation was crucial in these efforts to restore this culturally and ecologically significant species to North American forests.

MANUSCRIPTS RESULTING FROM FUNDED WORK:

Reed*, J, E Hausler*, A Levinson*, JL. Horton, DS Willett, and CC Filgueiras. 2024. Ecological impact of American chestnut hybridization on invertebrate communities above and below ground. Forests 15:1159 https://doi.org/10.3390/f15071159 published in July 2024

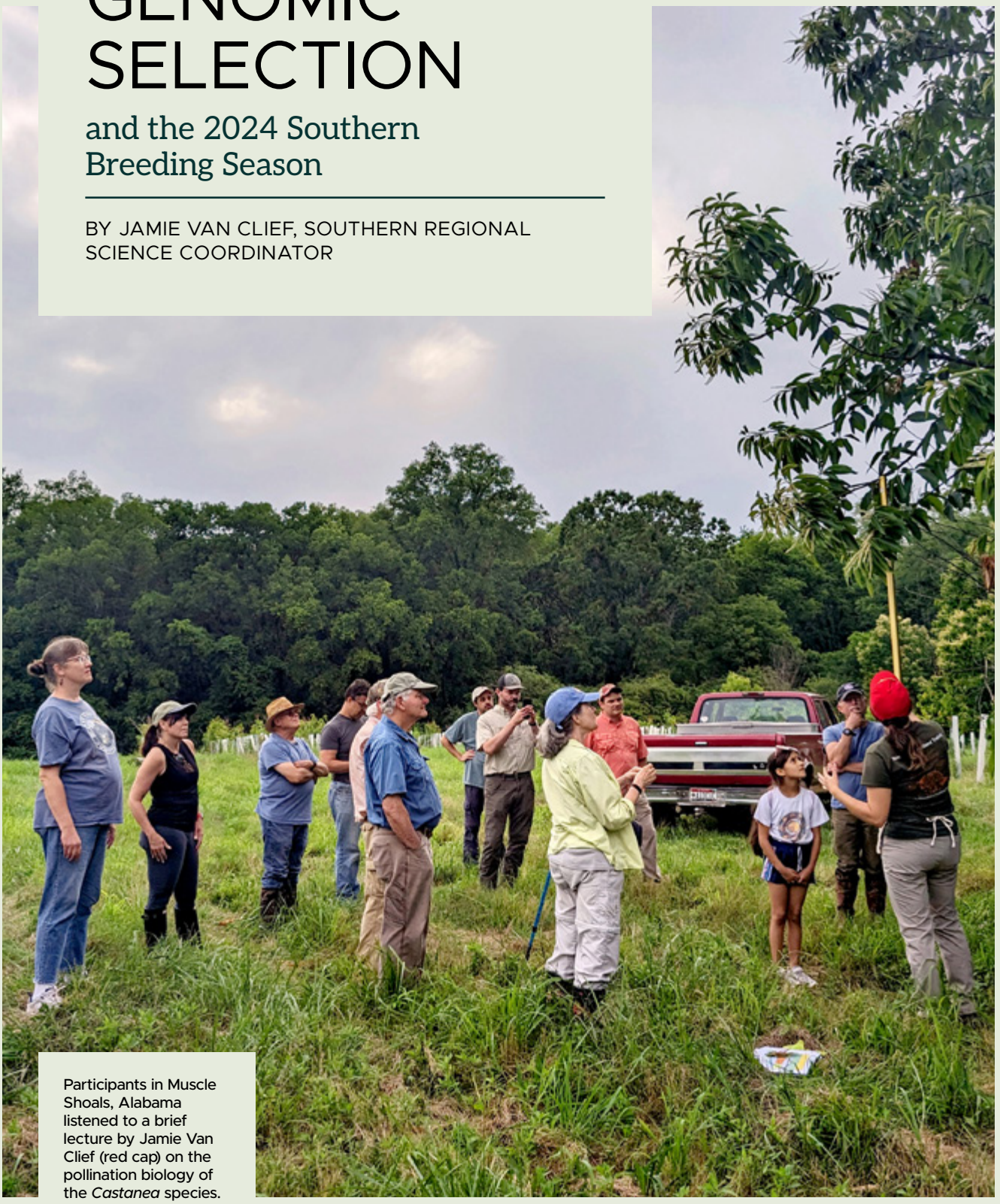
Cleary*, MS, JL Horton, and CC Filgueiras (in review). Investigating physiological differences among outplanted wild-type and hybrid chestnuts in western North Carolina. Castanea. Submitted June 27, 2024

Drs. Filgueiras and Jonathan Horton were also guests on TACF's March 2025 Chestnut Chat. Watch the recording at: tacf.org/chestnut-chat

RECURRENT GENOMIC SELECTION

and the 2024 Southern Breeding Season

BY JAMIE VAN CLIEF, SOUTHERN REGIONAL SCIENCE COORDINATOR



Participants in Muscle Shoals, Alabama listened to a brief lecture by Jamie Van Clief (red cap) on the pollination biology of the *Castanea* species.

2024 marked the second breeding season using the recurrent genomic selection (RGS) methodology in the southern region (Alabama, Georgia, North Carolina, South Carolina, and Tennessee). RGS is a proven breeding approach widely used in agriculture to enhance crop yields and other desirable traits. A thorough explanation of RGS by Chief Conservation Officer Sara Fitzsimmons and Director of Science Dr. Jared Westbrook is on page 24 of this issue. Additionally, an article by Westbrook in the 2024 spring issue of the magazine was the first explanation of how The American Chestnut Foundation (TACF) is using RGS in our restoration efforts.

WHAT IS RECURRENT GENOMIC SELECTION?

RGS is an advanced breeding technique that continuously selects individuals with superior genetic traits using genomic data. This approach provides several key advantages including increased selection accuracy by using genome-wide markers and accelerated gains with the rapid accumulation of favorable traits in each generation.

RGS represents a significant advancement for our breeding program, allowing us to integrate modern genomic tools with TACF's four decades of dedicated restoration work. The ability to genotype trees at an unprecedentedly low cost has improved our approach, allowing us to make informed breeding decisions with greater precision. As described earlier, the fundamental steps of RGS include:

1. Selecting the best individuals based on genotypic and phenotypic data.
2. Breeding those selected individuals together to create new progeny.
3. Genotyping the progeny and choosing the best candidates for continued breeding.
4. Repeating this process over multiple generations with models that predict both high resistance to diseases and high American chestnut ancestry.

Justin Payne taking leaf samples to be analyzed from the 2023 harvest. About three hole punches are taken from each leaf and put into 96 well plates.

PROGRESS IN THE FIRST GENERATION OF RGS

Through his detailed analysis, Westbrook identified 102 Phytophthora root rot (PRR) selections and 112 blight selections in the south as the most promising candidates for future resistance breeding efforts for the 2024 season.

To coordinate these efforts across the region, a virtual meeting was held in February 2024, bringing together all four chapters with our researchers, orchard owners, and volunteers. Pollen collection, shipment, and application are time-sensitive — pollen must be shipped and used at the right moment to maximize fertilization. As we transition to a more regionalized breeding program, these logistical challenges become more complex. For example, Alabama-sourced pollen was carefully transported and applied to trees in North Carolina, ensuring that southern genetic lines remain intact while maximizing genetic diversity and resistance within the program.

EXPANDING TRAINING AND OUTREACH

Pollination workshops were conducted in four states, providing essential hands-on training for new volunteers. These workshops are key to our program; they ensure that the next generation of chestnut stewards gains the necessary skills for effective polli-

nation. The impact of these workshops cannot be overstated. Training new participants helps ensure long-term sustainability and fosters a broader community dedicated to American chestnut restoration. From understanding the science behind RGS to developing practical pollination techniques, volunteers gained valuable expertise that will help expand our breeding efforts in the years to come.

A RECORD HARVEST

Thanks to the dedication of our volunteers, leaders, and partners across all southern chapters, we successfully completed 51 controlled RGS crosses during the 2024 breeding season. More than 3,000 nuts were harvested, highlighting the effectiveness of our evolving breeding strategies and chapter system.

PLANTING THE REGIONALIZED RGS MATERIAL

From the 2023 harvest, 1,000 southern RGS trees were greenhouse-grown and sampled for genomic analysis. 200 have been selected to advance to our regionalized seed orchards. This spring marks our second year of planting genetically selected material in regionalized breeding orchards in Tennessee and North Carolina.

LOOKING AHEAD

We are excited to continue expanding these orchards. Next spring, we plan to plant a portion of the 2024 harvest once the trees have been sampled, selected, and reached dormancy, ensuring the strongest candidates contribute to the next generation of RGS selections.

The commitment of our volunteers, the expertise of our chapter leaders, and the enthusiasm of our broader community are what make this program successful. With each breeding cycle, we edge closer to our ultimate goal. The 2024 season has set a strong foundation for future RGS efforts at TACF, and we are excited to build upon these successes in the coming years.

Shucking party at the University of Tennessee at Chattanooga. Thousands of chestnuts needed to be shucked from their burs!

CASTANEA CORNER

CALLING THE NEXT GENERATION OF CHESTNUTTERS

We are excited to introduce ***Castanea* Corner**, a special space for young artists, writers, and nature lovers! If you know a budding chestnut enthusiast, we would love to feature their drawings, poems, or short stories in our next issue. Submit their work to communications@tacf.org and help inspire the future of restoration. (Please put "*Castanea* Corner Submission" in the subject line.)

A VIEW

from Meadowview

It's an exciting time in the world of tree species rescue, and especially at TACF, as we embark on multiple scientific pathways toward success. Leading the way is our work in recurrent genomic selection (RGS), the plant and animal breeding standard across industries and continents, and backed by the most up-to-date scientific understanding. Working with complex, quantitative traits like chestnut blight and Phytophthora root rot resistance, we are able to harness the power of modern genomics to select the best trees for further propagation and seed production at a highly accelerated rate. Within several months of growth, these seedlings yield insights across tens of thousands of genes that are sequenced to predict their performance and future usability. Paired with accelerated breeding strategies, RGS allows the production, testing, and establishment of improved generations each year, further refining the underlying bioinformatic models with thousands of datapoints.

This effort takes place across all of TACF's regions, whether at Meadowview Research Farms as pictured here, or with our volunteer chapters from Georgia to Maine. Inquire about joining your local TACF chapter today!

We extend many thanks to our collaborators and advisors with the North Carolina State University Tree Improvement Cooperative for their expertise and support in this work.

BEHIND THE SCENES:

Preserving the American Chestnut

BY KYLIE ROTH, 2024 NEW ENGLAND REGION SUMMER INTERN

Roth's first day in the field in Maine next to one of the larger American chestnuts in the orchard.

At my very first dendrology lab at the University of Vermont (UVM) research forest, the teacher's assistant leading a hike stopped at a small sapling on the side of the trail. "This," he said, grabbing hold of the skimpy tree, "is an American chestnut. And this is the biggest you'll probably ever see one get." He then explained why the American chestnut was considered "functionally extinct," which is because of a fungal blight that ravaged the species a century ago, but the root systems were able to live on and send up new shoots, even when the tree died.

He was wrong, of course — not about the tree being a chestnut or about the blight, but in assuming I had never seen an American chestnut bigger than that one. In fact, three years later I would get to see more large American chestnut trees in one summer than most people today will see in their lifetime. I still have the page in my Rite in the Rain all-weather notebook where I wrote down "*Castanea dentata*" for the first time.

What surprised me most about interning with The American Chestnut Foundation (TACF) is realizing how many people are working tirelessly to solve problems that most of us are not even aware of. I often encounter people who are surprised that an entire organization is dedicated to saving a single tree species. Many are unaware of the vast network TACF has built across the country to restore a tree that my generation never even knew was missing. I have had the wonderful opportunity to visit many chestnut orchards, often hidden deep in rural New England along overgrown dirt roads. You would never guess that these remote sites are conducting scientific research on hundreds, if not thousands, of trees. The scale of the operation is quite impressive, considering how many dozens of orchards span the eastern US (the tree's native range), and how many countless numbers of volunteers have given their time and effort to bag catkins, pollinate, collect seeds, inoculate, plant trees, and more.

TACF's work has a strong scientific foundation, from genomics research to its hybrid breeding program. However, during my summer there, I found that much of what I learned came from the

Two freshly split open chestnut burs from a harvest day.

Volunteers after a work day preparing for planting at the orchard in Tom Rush Forest in NH.

people we worked with. There were so many volunteers from a variety of professional backgrounds that came together for this one tree, knowing that most of us will not be around long enough to see them flourishing in the wild. Many of them knew more about the tree and TACF than I did. I also heard stories from people several generations older than me about growing up in a time when these trees were still a dominant presence in the landscape. Our outlook of this collective mission is somewhat different: mine of bringing something back from near devastation, and theirs of returning the forests to how they remembered them as children. So, there we were, in the orchards together, doing the same work toward the same goal for the same tree that seemed to be faring particularly well!

Besides the days spent in the field, I often worked independently at UVM's lab, caring for the trees in our greenhouse and logging data from the orchards, but I still experienced the community's involvement. We received dozens of wild tree ID samples from week to week, opening my eyes to how many more people pay attention to the forests than I realized. It is heartwarming to witness the excitement of those who discover a wild chestnut tree in the woods and collect a sample to send to us, allowing that tree to be remembered in a small but meaningful way. The network of chestnut enthusiasts continues to grow and expand, and one day even those who are not looking for them will be able to find chestnuts where they belong.

SAVE THE DATE

American Chestnut Day at the NC Arboretum in Asheville

October 4, 2025 • 10:00AM – 3:00PM

Enjoy chestnut-themed events and educational opportunities including speakers, performers, vendors, student poster sessions, and a screening of the award-winning documentary *Clear Day Thunder: Rescuing the American Chestnut*.

Free admission with paid $20 parking

For more information about submitting posters, please scan the QR code.

Chocolate and Chestnut Flourless Cake

BY FLORIAN CARLE, CT CHAPTER BOARD MEMBER

During a recent trip to my hometown in southern France, I had the pleasure of visiting my Aunt Colette. She has been a steadfast supporter of my involvement with The American Chestnut Foundation (TACF). Over the years, my aunt has collected every issue of *Chestnut* that features my articles, attended numerous Chestnut Chat webinars, and cheered on my rowing boat, "Charlie the Chestnut."

In celebration of my birthday, Aunt Colette surprised me with a delectable flourless chestnut and chocolate fondant cake. The chestnut spread in the cake gives it a softer consistency, compared to a traditional chocolate ganache cake, and perfectly balances the bitterness of dark chocolate.

This experience has further inspired my commitment to TACF's mission to ensure future generations can savor delightful chestnut birthday cakes for years to come!

Preparation 15 minutes • Cooking time 35 minutes
Rest 4 hours minimum or overnight

INGREDIENTS

7 oz dark chocolate

4.5 tbsp lightly salted butter

17.5 oz chestnut spread (ideally one can of Clement Faugier Gourmet Chestnut Spread, available in gourmet grocery shops or online)

3 eggs

STEPS

Preheat oven to 300°F

In a double boiler, or at very low heat, melt the chocolate with the butter ensuring that there are no lumps.

Remove from heat, stir in the chestnut spread.

Add the eggs one by one and stir until you have a homogeneous mix.

Pour the mix into a well-buttered 8-inch cake pan and bake in a preheated oven at 300°F for 30 to 35 minutes. The cake should still be slightly tremulous in the center but this will set in the fridge.

Allow to cool to room temperature and place in the fridge for three to four hours or overnight.

Carefully remove cake from the tin and serve cold with vanilla custard or ice cream.

Aunt Collette enjoying a taste of the birthday cake she baked for me.

In Honor (1/1/2025 - 3/31/2025)

CHARLIE BROOKS
from Jeanette Justice Fleming, PhD

HARTWELL AND MARTHA DAVIS
from Sarah Davis

DR. LAURA GEORGI
from David McMillin

JOHN MEIKLEJOHN
from Katherine Meiklejohn

OUR HOLY EARTH MOTHER from CedarLight Grove, ADF

SILVER BRANCH GOLDEN HORN
from Anthony Fleming

MAXWELL TURPIN
from Darcie Hudson

In Memory (1/1/2025 - 3/31/2025)

CHARLES LARRY ALLEN
from Margaret and Tom Vaughn

WILLIAM FV BAEDER, III
from Jennifer M Voegeli

ALLENE C. BARANS
from Charles Barans

AUDREY BAYLISS from Susan Robertson

ANTHONY JOHN BELLANTONI
from Rose Bellantoni

CARLENE T. BLANKENSHIP
from Delia and John Olson

JAMES ELY BRADFIELD
from John G. and Amy Bradfield

DR. ROBERT W. BRANDT
from Kathy Brandt

MICHAEL DAVID BRIDGHAM
from Denise and Jim Blakeney

DONNA CARLTON
from Mark Carlton

PRESIDENT JIMMY CARTER
from Elizabeth Allison, Carol Geck, and Barbara Wood

FREDRIC L. CHEYETTE from Catherine and Oren Cheyette

DAN CLARK from Lisa McNeilly

ANDREW COGBILL
from Aaron Cogbill

BARBARA B. COX from W. and M. Manceaux

AL ELLINGBOE from Ann Ellingboe

ANDREW FARRELL
from Denise Farrell

JOHN YOUNG FAULCONER, SR.
from Ellen Wessel and Anne Hallett

HAROLD FEINBERG
from Pam Ferrari

RANDY FOWLER from Ray Ellis

ANTHONY GENESE
from Michael Genese

JAMES LEE HACKNEY
from Lewis Kearney

THOMAS HARRINGTON
from Wendy, Shang, and David Harrington

VINCENT HATTON
from Anne Hatton

RICHARD L. HENRY
from Joanne Henry

JOAN Z. HIMMELHOCH
from Rebecca Simmons

JOHN AND BERNICE HOFFMAN
from Steve and Catherine Palmateer

LAURA HURD from Casey Donnelly

PETE JOHNSON
from Barbara Bryers

CATHERINE MAE JONES
from Vincent Valentino

AUSTIN JONES from Janet and Victor Bernhards

WEBB JONES from Beau Acuff

JAMES JUHASZ from Grace Douglas, Rochelle Farah, Justin Juhasz, Ryan P. Lawson, Michele Nalley, and Valerie and Kenny Randolph

CHANDIS AND VIOLET KLINGER from Kristy Klinger

KENNETH H. KLIPSTEIN
from Ernest Klipstein

KENNETH S. LAY
from Kenneth G. Lay

MORRIS AND HADASSAH LEEDS from Morris Cooperman

ARTHUR NEWLIN LEEDS
from Morris Cooperman

KARL MECH, JR. from Susan Davis

JIM MORRISON from Pamela Kostle

MARTIN NYDICK from Jaye Nydick

RAY PARTIN from Gary Partin

ARTHUR PETERSON
from Daniel Peterson

MARGARET PHILLIPS
from Joanna Morrison

HUGH R. PHYTHYON
from Laurel Phythyon

DR. BILL POWELL from Richard Habermann

GORDON POWELL from Margaret and Tom Vaughn

RICHARD D. PUTNAM from Kathleen and Dean Grinch

JAMES RAMAGE, VMD
from Lynn Ramage

HARRY E. RITTER
from Robert Ritter

RUTH SCHURR from Beth Gray, Seneca Rocks Audubon Society

KENNETH M. STANLEY
from Linda Stanley

MELVIN WILKENFELD
from M. Jack Wilkenfeld, MD

MIKE WRUBLEWSKI
from Peter Wrublewski

We regret any errors or omissions and hope you will bring them to our attention.

THE American Chestnut FOUNDATION

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TOGETHER

Restoring a Legacy by Harnessing the Power of Genomics

The American Chestnut Foundation (TACF) is joining forces with landowners, researchers, and volunteers to reintroduce this foundational species to its native range through recurrent genomic selection (RGS). Harnessing the power of genomics requires a bold investment in things like genotyping and DNA collection, as well as essential tools for pollination and intensified greenhouse work. Your gift to TACF's 2025 Spring Appeal will drive this vital research, offering hope for restoration.

Using genomic testing, TACF aims to boost resistance while preserving 70% – 100% of the tree's American heritage by crossing American chestnuts with blight-resistant Asian varieties. This helps TACF predict which seedlings are most likely to survive with blight and thrive in forest conditions. In the next 7-10 years TACF orchards are expected to begin producing large numbers of these blight-resistant seeds.

Together, we are bringing the American chestnut back to the landscape it once defined.

THE American Chestnut FOUNDATION