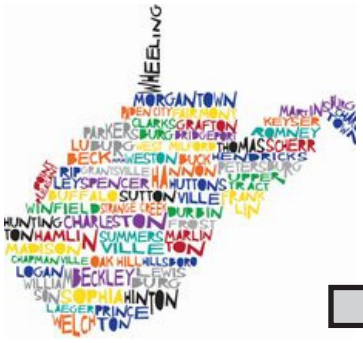

The West Virginia Chapter of The American Chestnut Foundation NEWSLETTER

In the heart of American chestnut's natural range

April 2021

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Chestnut Hybrids vs Cultivars

It has been mentioned in previous WV chapter newsletter the good quality information that is offered by TACF's ***Chestnut Chats*** that have been offered montly during the pandemic. The February 2021 chat dealt with chestnut hybrids and cultivars. The speakers were **Sandra Anagnostakis** from the Connecticut Ag. Experiment Station (retired) and **Michael Nave**, a California-based chestnut grower, and an expert on commercially available chestnuts.

Sandra began by distinguishing a chestnut hybrid from a chestnut cultivar. Unlike some organisms, all chestnut species can be crossed with each other. Sandra indicated the following species of *Castanea* (chestnut) around the world:
American chestnut (*C. dentata*)
European chestnut (*C. sativa*)
Japanese chestut (*C. crenata*)
Chinese chestnut (*C. mollissima, C. henryi* and C. *sequinii*)
Allegheny chinkquapin (*C. pumula*)
Ozark chinkquapin (*C. ozarkensis)*

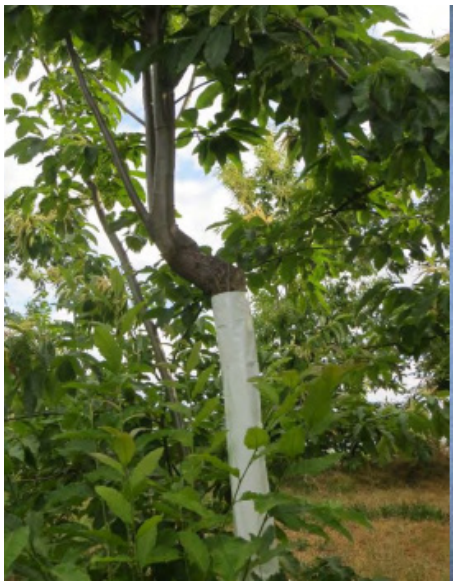
A cross between a European and Japanese chestnut is listed as: *C. sativa* X *C. crenata* with the "X" indicating the two species have been crossed to produce nuts. A cultivar on the other hand is a clone. Unlike some hardwood species, chestnut is very difficult to root. Some of you may have taken a spider plant, cut off a shoot, put it into water and roots emerge very quickly. Chestnut is the opposite. Getting chestnut to root in culture is a very exacting science that is difficult to perform. Thus, cultivars are produced by grafting scion from a good tree onto a hardy rootstock. Cultivars are designated with single quotation marks, such as 'Colossal' or 'Paragon'. The original cultivar is an ortet while offpsirng of an ortet are ramets.

While the majority of TACF's focus centers around American chestnut, there are many other *Castanea* species that are grown commercially in the U.S. According to the Iowa State University Agricultural Marketing Resource Center, the U.S. is one of the few nations in the world that can grow chestnuts, yet does not have a significant industry. The U.S. production of chestnuts is less than 1% of the total world production. According to 2018 data, the U.S. has 919 farms on more than 3,700 acres. The top five states with the most chestnut acreage were Michigan, Florida, California, Oregon and Virgnia. The value of the nut is related to its size. Generally, the value of chestnuts range from

$0.75 to $2.50 per pound wholesale and from $2.00 to $5.00 per pound retail. Chestnuts are sold primarily fresh in the shell. Added value markets may include farmer's markets, specialty grocery stores, pre-packaged foods, vegetarian food processors and mail order businesses.

Michael Nave talked a lot about cultivars in the U.S. One question that was posed to Micheal was, "given that, prior to chestnut blight, we had American chestnuts, why were chestnut seedlings imported from other parts of the world?" Michael stated that during the 1880s, there was a push to import other chestnut species for formal gardens. It is reported that Thomas Jefferson had foreign chestnuts planted as early as 1773.

Another reason to import other chestnut species and cultivars was nut size. American chestnut produces the smallest nut of all the *Castanea* species with Japanese chestnut producing the largest nut. Nave had pictures of, 'Gillet', a European X Japaniese cultivar. The picture below is a 3-year-old 'Gillet' that was grafted just about the tree shelter.



The nuts pictured in the above photo are from a 'Gillet' cultivar. They are massive, weighing in a 8.6 grams per nut, or less than 9 nuts per pound. This cultivar is a prime example of why people imported chesntuts from other countries or created cultivars by grafting.

Besides nut size, there are scores of other reasons to create cultivars:

- Early or late nut drop
- Frost tolerance
- Drought tolerance
- Nut taste
- Easy-to-peel nut
- Tree architecture

New State Champion American Chestnut

In last month's newsletter, we reported on a tentative new champion American chestnut. It is now official; the tree in southern Randolph County is the largest known American chestnut in WV, as confirumed by members of the **Big Tree Program.** Total points for big trees are calculated as: (1) circumference in inches + (2) total height in feet + (3) 1/4 the crown spread in feet = Big Tree Total Points. The Randolph County tree had 157 points, compared to the previous champion with 145 points. We thank Richard Wernecke, WV state forester for Randolph County for bringing this tree to our attentiion.

Clements Tree Nursery, Response from Tom Cover, Director, WV Division of Forestry

As was reported in last month's newsletter, the WV-TACF has been working to keep open the only state tree nursery in WV. The Clements Tree nursery is located in Mason County along the Ohio River. There have been financial issues with the nursery for several years, and the WV chapter has been actively supporting the nursery as thosands of chestnut seedlings are raised annually and sold to WV residents. There are no chestnut seedlings available in 2021 as no seed was planted from last fall's harvest.

From Tom Cover:
Thank you for your inquiry into the status of the Clements Tree Nursery.

As you know, the Division has suffered severe setbacks recently that have greatly reduced the Division's available funding; therefore, operations at the nursery remain suspended at this time. Unfortunately, the Division was not only forced to suspend nursery operations to save revenue, but we also had to suspend purchasing necessities such as uniforms, equipment, etc. just to meet payroll.

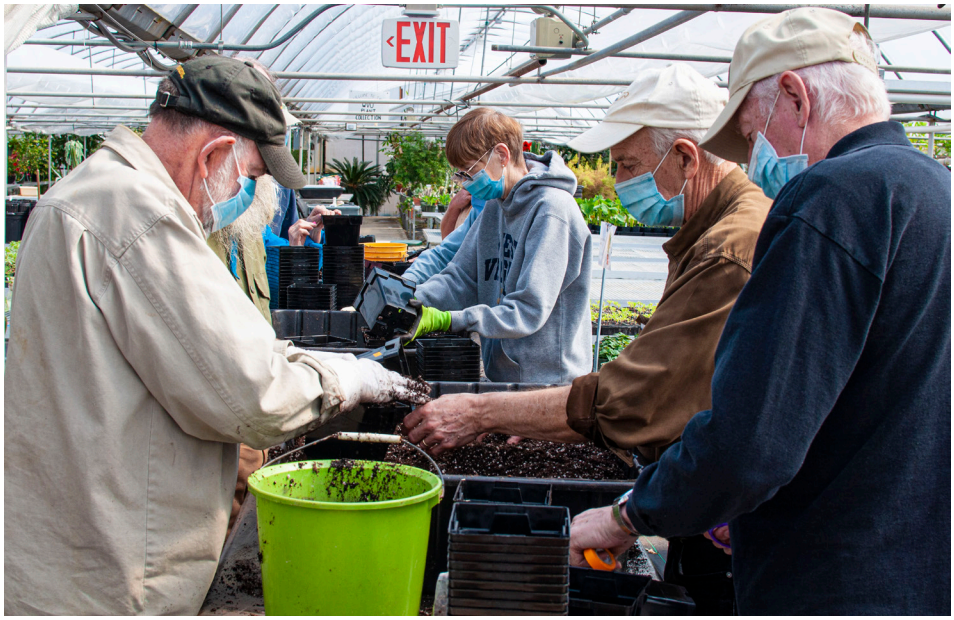
Additionally, the COVID-19 pandemic further crippled nursery operations when its primary labor source was no longer available from Lakin Correctional Center for Women.

Tom Cover, Director, WV Division of Forestry

I am sorry to report the nursery must remain closed at this time due to a lack of both funding and workforce availability. The nursery's closure remains a temporary situation, but I expect it to continue until the Division can obtain funding sufficient to ensure its successful operation. Please note, the Division is committed to fulfilling all pending orders provided that the product is available onsite. Thank you for your time and attention to this matter. I appreciate your willingness to help us evaluate nursery operations so that it can be successful in the future and I will be calling on you for assistance when the opportunity arises.

Potting Chestnuts at the WVU Greenhouse

A group of WV chapter members gathered at the West Virginia University Division of Plant and Soil Sciences greenhouse on March 13 to pot about 900 chestnuts. The nuts were from various trees around the state and from the backcross orchards at TACF's farms in Meadowview, VA. The crew of 14 volunteers worked for three hours, labeling, potting and watering the pots. The individuals who assisted were: **Janis Boury, Darrell Dean, Donny Dodd, Mark and Mindy Double, Mike Frasher, Linda and Jimmy Jenkins, Bill and Nora MacDonald, Steve McClelland, Sam Muncy, and Rick and Robert Sypolt**. Many hands made the work much easier. Hopefully, hundreds of seedlings will be planted across the state this summer as a result of the good work by the volunteers.

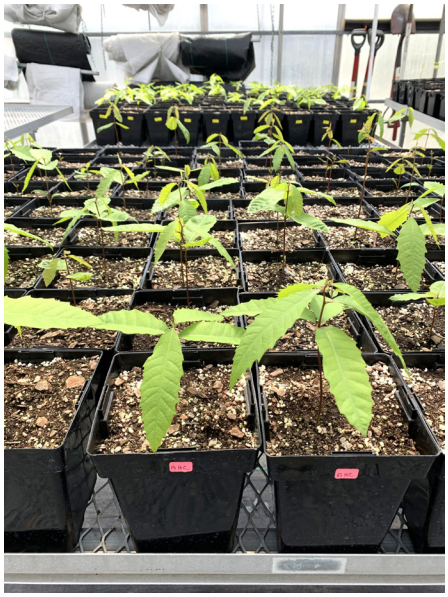


Chestnut were potted up by volunteers who worked in three separate groups of four.

Some of the volunteers who helpd pot chesntut are (left to right): Rick Sypolt, Bill MacDonald, Nora MacDonald, Steve McClelland, Janis Boury, Sam Muncy, Mike Frasher, Donny Dodd, Jimmy Jenkins, Robert Sypolt, Darrell Dean and Linda Jenkins.

Eight days after being potted, a number of shoots appeared among the 900 pots. Not all the nuts that were planted had a radical that was evident.

Thirteen days after potting, many more shoots appeared.



Thiree weeks after potting.

Spotlight on a WV Chapter Board Member

Dr. Joe Golden

"In addition to getting my hands dirty in the care of certain individual trees, I appreciate the connection to the much larger project and goal that TACF is devoted to."

I was born in Norwalk, CT , but our family moved to Stamford, CT shortly thereafter. Although my father was a biochemist at the local hospital, he was at heart a chicken farmer. At my age of 5, he bought a small subsistence farm at the edge of Stamford, which at the time has a population of about 100,000. There I grew up along with chores and responsibilities taking care of 5,000 or so chickens, raised primarily for egg production. My father continued to work as a biochemist until I was through college, when he slowed down and only did chicken farming.

I went to public schooling, graduating from Stamford High School in 1966. I subsequently went to Yale University, and graduated in 1970 with a BA in Psychology, that incluced several Biology courses. On a historical note, our college class of 1970 was the last all-male class at Yale. Looking back it would have been better if women had matriculated years before.

Subsequently I spent a year in VISTA, Volunteers in Service to America, mainly working with a brand new rural health organization in South Carolina, just beginning to provide services to a 2-county area.

In September 1971, I entered medical school at University of Connecticut, graduating in May 1975, and going on to a Family Medicine residency at University of Maryland in Baltimore. I finished this 3 years later, and spent another year in Baltimore getting a Masters in Public Health at Johns Hopkins School of Public Health. It was during these years in Baltimore, that as a bachelor, I began to do a little more cooking for myself, and tried out some recipes that used chestnut puree, "creme de Marron." From there, curiosity led me to read up on chestnuts, and I started my journey of discovery of what has happened to the American chestnuts.

After Baltimore, I moved to West Virginia, to work initially at Cabin Creek Health Center in Kanawha County. After about 2 years, I moved to Beckley and worked in another health center until I set up my own practice in 1984. Of particular interest is that soon after I left Cabin Creek, a Nurse Practitioner came who took over many of my patients. A few years later I met her, and discovered

that we had been classmates 22 years earlier in high school. A couple years after this renewal of our acquaintance, we got married. So.... I had become a member of TACF during my early years in Beckley, but I did not know of any WV statewide activities. As time went on, I acquired some bare root seedlings of American chestnuts, some of which were probably hybrids. This initiated me into the practical aspects of planting and care of them. Of the original approximately 10 seedlings, I have one surviving which I believe is a hybrid. Unfortunately, it does not bear nuts.

Gradually, I learned more about the American chestnut story, and TACFs program to develop a mostly American hybrid in order to restore the tree as an active and viable species in our forests. I subsequently found national TACF conferences to attend, and then hooked up with the nascent WV Chapter.

I have a farm, mostly for hay production for resale, in Summers County. There I have planted over the years a variety of pure American, B2F2 hybrids, and mostly now B3F3 hybrids. We have approximately 30 individual plants, ranging in age from 2 year old seedlings to approximately 10 year olds, mostly of the B2F2s. I have them tagged as to their hybrid or pure status and the year planted. Of course. there have been some that have died, mostly as young seedlings, but some older ones, mostly from blight. There was one tree, a B3F3 about 8 years old that got catkins and looked good, but suddenly died, but not from blight. I suspect it died from root rot, since it was during a particularly heavy rainy season.

Although I had initial ideas of having some strongly viable B3F3 growing at my farm, such is not the situation at present. Yet, I have some satisfaction in nursing along those trees that have some viability and promise. Their care has given me that experience of what it takes and is involved in this masssive project to restore American chestnut. So, in addition to getting my hands dirty in the care of certain individual trees, I appreciate the connection to the much larger project and goal that TACF is devoted to. So, there is my individual satisfaction in growing and nurturing particular seedlings, and the intellectual attachment to the big picture and complexity surrounding the American chestnut.

Notes from the National Science and Technology Virtual Meeting

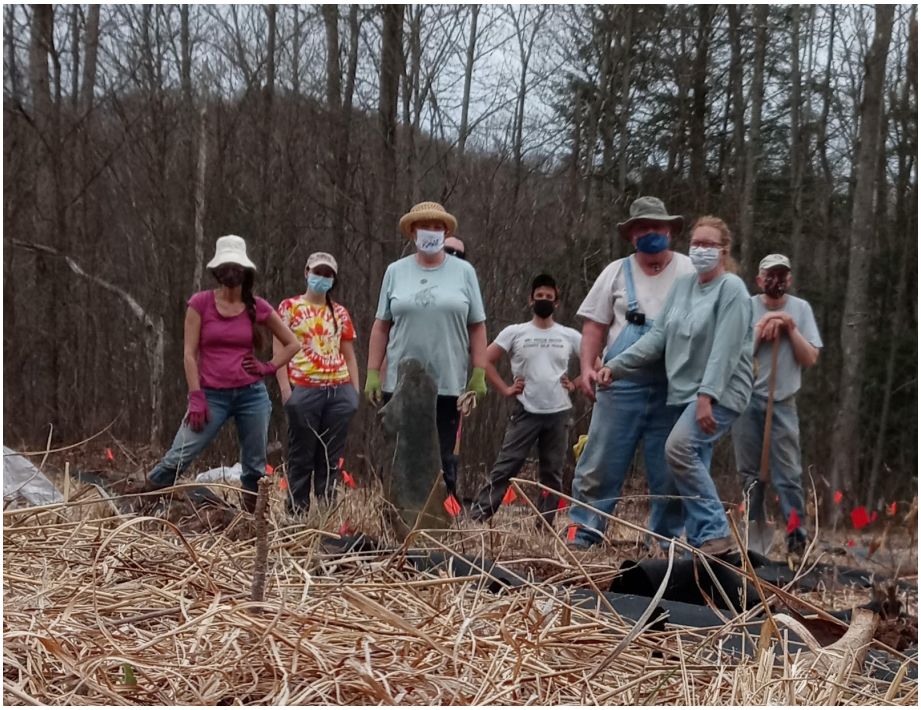
TACF's Science and Techology meeting was held virutally on April 8 with 57 attendees. Presenters provided information to bring TACF up-to-date with the latest information. **Andy Newhouse** from the State University of New York (SUNY), gave an update on the regulatory status of SUNY's transgenic (TG) tree. Three regulatory agencies (USDA, EPA and FDA) along with Canada must give their permission for deregulation of the TG tree. The estimated timeline for deregulation is 2-3 years. The USDA is one of the more stringent agencies and a plant pest risk assessment (PPRA) is being prepared at SUNY for the USDA. This follows the public comment period that was held last year. The PPRA is ongoing and will take 7-10 months to complete. This will be followed by a second public comment period that will be open for 1 month. The final decision is epected 2-9 months following the second public comment period. The next step for Darling 58 (the name of the TG tree) is initial distribution that will be of limited diversity. They expect to distribute seed, seedlings and/or pollen (on microscope slides). Large-scale distribution will occur later. The Darling 58 tree is not the end product. They hope to develop better lines of transgenic trees using different promoters that are inducible, meaning that the enzyme oxalate oxidase (OXO) that breaks down the oxalic acid produced by the fungus, will only be produced in the presence of oxalic acid. The current tree produces OXO continually. Thus, there is room for improvement.

Dr. Scott Merkle from the University of Georgia, talked about the development of chestnut somatic embryogenesis, an artifical process in which chestnut plants are derived from a single somatic cell. In essence, many plants can be produced by clonal propagation. This is important if TACF is to scale up production of trees that have very good resistance to the chestnut blight fungus. Merkle uses a liquid suspension culture to produce many embryos, although only there is only a 2% success rate.

Globular embryõs are plated onto Petri plates with a medium to allow the embryos to enlarge, after which they are refrigerated for 15 weeks. A

James Madison Planting near Rowlesburg, WV

On Saturday, March 27, six members of the WV chapter joined Dr. Heather Griscom and Taylor Evans from James Madison University to plant about 350 backcross seedlings on the Griscom farm in Rowlesburg, WV. The seedlings were part of Taylor Evans' M.S. work at James Madison where he tested four propagation techniques on hybrid chestnut seedling quality. It was a long day, but the group managed to plant all the seedlings.



Dr. Heather Griscom, Amy Metheny, Carla Kesling, Rob Eckenrode (behind Carla), Taylor Evans, Sam Muncy, Sharon Cottrill and Kyle Ellison.

charcoal medium is the next step, followed by potting into soil. The entire process takes 2-2.5 years. It's a slow process that has room for refinement.

Jared Westbrook, TACF's Director of Science, provided a list of current TACF priorities:

- stringent selection for blight resistance in the backcross program;
- selection of *Phytophthora* resistance in backcross parents;
- Contolled pollinations--

i. intercross blight resistant parents
ii. Darling 58 X backcross parents
iii. Darling 58 x *Phytophthora* resistant parents
iv. Darling 58 x large surviving American chestnuts
v. Darling 58 x wild-type American chestnut

Wesbrook stated that we need to ramp up the production of blight resistant seed and ensure we have diverse samples of Amercian chestnuts.

He noted that the selection of blight resistant trees is 80%-90% complete at the two Meadowview orchards. There are about 1,500 trees remaining.

Westbrook posed the question, "Why do we get intermediate blight resistance in the backcross program?" He has several hypotheses:

- low heridibility of resistant phenotypes;
- there is a mosaic inheritance of resistant alleles, possibly because there are more resistance genes that originally theorized;
- there is low Chinese homozygosity because of inbreeding depression--in other words, more Chinese alleles are retained at a higher rate than expected.

Sara Fitsimmons, TACF's Director of Restoration, talked about projections of germplasm production and distribution. There are three ways to disbribute chestnut: pollen; scions for grafting; and seed/seedlings. She focused her talk mostly on pollen as a new method using ultra-high light can produce pollen on chestnuts in a very short timeframe. She stated that about 1.5 million nuts have been collected by TACF over the last 30 years. In terms of nut production by TACF at Meadowview, about 500,000 nuts have been produced between 2009-2020. The highest yield year was 2014 when Meadowview produced 122,687 nuts.

If the SUNY transgenic tree is deregulated in 2-3 years, TACF then can ramp up distribution of pollen that can be used in crosses across the U.S. That is why germplasm conservation orchards (GCOs) are so vital. Local American chestnut trees can be crossed with pollen from TG trees and we should than have locally-adapted chestnut trees that have the form of American and blight resistance.

She forecasts that we will need 50,000 chestnuts from controlled crosses between American and TG trees. When a TG and American tree are crossed, only 41% of the nuts are

transgenic. In order to acheive 50,000 nuts, we will need to bag 25,000 female flowers. Thus, each of the 16 state chapters are crucial to this endeavor.

At the Universty of New England, they are producing TG pollen under high light. They have about 700 microsope slides that are frozen for future use. About 15 female flowers can be pollinated with the pollen from one microscope slide. Thus, they have enough pollen currently to fertilize 10,000 female flowers.

Most chestnut trees take about 6-7 years before they begin to flower. While all American chestnut trees in a GCO will contract chestnut blight, about 50% will sprout to the point that flowers are produced. Thus, of 1,000 American chestnuts planted, about 500 will flower and be useful in the breeding program.

Changes at TACF
Lisa Thomson, President and CEO

TACF friends and colleagues:
We're growing and changing! Thanks to the incredible generosity of our members and donors, and some belt-tightening, TACF ended a challenging year in a strong financial position. We are proceeding with hiring plans previously frozen due to the pandemic. We not only survived last year, but thrived, thanks to this generosity and the deep dedication of our staff and volunteers. We are ready to re-align the organization for peak performance and I write to share some changes in the staffing, most of which are very positive, but one is particularly bittersweet.

After 11 years of faithful service, **Betsy Gamber i**s stepping down as Chief Operating Officer. Hired in 2000 as a membership coordinator, she grew into her current leadership position thanks to her versatile skills as a team manager, board and governance liaison and organizational policy maker. Often known as our "rock" in the Asheville office, Betsy will be sorely missed. She and her husband Rick are moving closer to their daughter's family in Chapel Hill and already have a cross-country camping trip planned. Her last day is May 28.

In our continual effort to encourage professional growth and promote from within the organization, we have decided to increase the duties of current staff in Asheville rather than hire a replacement for Betsy. Effective June 1, **Paul Wingenfeld** will become the Chief Financial Officer and continue to manage all HR functions and finance responsibilities. You may remember Paul was hired in the very beginning of the pandemic and deftly learned the ropes, sometimes single handedly and always remotely, of a complex decentralized organization. Samantha Bowers will become the Director of Philanthropy and External Affairs, recognizing that she is lead on many of our funding and formal partnerships beyond her grant management responsibilities. We have reopened the Donor Relations Manager position (vacated by David Kaufman-Moore in late 2019) in the new fiscal year to report to Sam. Our current Gifts and Records Specialist, **Shana Zimnoch**, will assume that position beginning July 1 in recognition of her strong member and donor stewardship skills. Membership Manager Judy Antaramian will advertise for Shana's replacement beginning in late April. **Cherin Marmon-Saxe** will assume many of Betsy's governance and board liaison duties along with her current essential focus as Office and Business Systems Manager. **Jules Smith** will become the Director of Communication and a new hire, **Tamia Dame**, will be the Communications Coordinator reporting to Jules.

Tamia is a recent graduate from UNC-Asheville and is finishing up her appointment with AmeriCorps Project Conserve as a Forest Keeper with a local conservation non-profit, MountainTrue. Her communications skills in social media, newsletter production, as well as creative and technical writing, are a welcome addition to Jules' many talents. Chapter folks…be on the lookout for Tamia's emails in the future for your stories, photos and other outreach requests.

The long process of hiring the Southern Regional Science Coordinator had a happy ending as we offered the position to **Jamie Van Clief**. Jamie was an intern for TACF in Kendra Collins' New England region and worked two summers on database entry and field work. After graduating from the University of Vermont, she joined the Peace Corps in Panama and most recently worked at the USDA as an international program specialist. Relocating from DC, Jamie will begin as a part-time contract employee until she joins us full-time June 1.

Special thanks to David Morris and Lynn Garrison for their participation in the search committee, to Sara Fitzsimmons and Cherin for carefully vetting all 70 candidates, and to Tom Saielli, who has done double-duty covering the southern region for almost a year along with his current position as mid-Atlantic regional science coordinator.

Because our pool of candidates for the RSC position was so strong, we recruited another finalist, **Vasiliy Lakoba**, to fill the newly created Director of Research position at our Meadowview Research Farms. This position was created to ensure the overall science direction was represented both externally and onsite at the farm and to aid in upcoming ambitious research projects as planned by Jared Westbrook and the Science and Technology Committee. Dan McKinnon will continue to focus on the many responsibilities and needs of land management at the farm and the four other dedicated science and field professionals there, Eric Jenkins, Lily Kingsolver, Jim Tolton, and Brandon Yaez-Breeding, will remain in their current positions. We owe this team a debt of gratitude for their perseverance in a year where work-from-home was not an option for a research farm. I visited there Monday and it was a joy to see all the fruits of their labor of the past year, in spite of COVID restrictions.

Vasiliy has a varied background including a B.S. in architecture, M.S. in landscape architecture and will be awarded a Ph.D. in invasive species ecology from VA Tech this May. He has worked at the Penn State Arboretum and has extensive experience in the management of volunteers and field projects. Rather than pursue a career in academia, he applied to TACF to work in a mission-based organization focusing on plants and restoration. He begins his position June 1 and will relocate to Meadowview from Blacksburg, VA.

Please join me in welcoming our new colleagues to the chestnut team, congratulate our current staff and their promotions, and in wishing Betsy the very best in her future endeavors. It is an exciting time at TACF where we are poised to take the organization to the next level, nearly 40 years since its inception. As always, if you have any thoughts or questions, please don't hesitate to reach out to me.

Best wishes, Lisa

Clements Tree Nursery, Final Disposition

(This article came in after most of the newsletter was already formatted. It should have followed the article on Page 2. My apologies.)

Tom Cover informed the WV chapter that after much deliberation, the Clements tree nursery will be closed permanently at the end of April, 2021. The money supplied to the WV Division of Forestry by the WV Legislature was for salaries only. Since the Clements nursery needed about $200,000 of repairs and upgrades, Governor Justice agreed with the Division of Forestry to close the nursery. The nursery has lost money every year, except one, since 2006, and the Division could no longer afford those losses. The land on which the nursery sits in Mason County is owned by the WV Department of Natural Resources. Cover encouraged the WV chapter of TACF to continue working with the two chestnut orchards, if desired. The agreement between the DNR and the Division of Forestry is long-term, and the orchard will not be sold. However, they are looking for a group who might lease the property.

WV Chapter Spring Virtual Meeting

The spring WV chapter meeting was held via Zoom on Saturday, April 10. Here are some brief highlights from the meeting.

- The meeting minutes from the Oct 2020 meeting were approved.
- Sam Muncy gave the treasurer's report for the chapter. As of Dec 31, 2020, the WV chapter's balance was $71,470.22.
- As of March 2021, the chapter has 152 paid members.
- There was much discussion about the Clements Tree Nursery. A subcommitee was formed comprised of Mark Double, Lewis Cook and Joe Golden, who will travel to the nursery to assess the chestnut trees. If is hoped that the nursery superintendent will be able to offer some guidance as to the trees' origins. Following that visit, Mark Double agreed to write to Ed Gaunch, WV Secretary of Commerce to explore their view of the future of the land.
- According to Lisa Thomson, TACF's President and CEO, TACF's Executive Committee decided to sell the Bolgiano property in Randolph County. The property was deeded to TACF, but TACF does not want the liability of unsupervised property.
- Robert Sypolt requested $2,000 for the Rowlesburg Chestnut Festival in October. There were no dissentions and the vote passed.
- Tom Saielli, our Regional Science Coordinator, talked about several issues relative to chestnut restoration.