

# The Bur

The Newsletter of the Virginia Chapter of  
The American Chestnut Foundation

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## A Very Special Chestnut

By Cathy Mayes

Virginia's Northern Neck is a wide peninsula of land extending south and east between two great rivers, the Potomac and the Rappahannock. It is in the geological province called the Coastal Plain, but it has pockets of terrain that are akin to the Piedmont province – rocky, steep, and loamy. As a result, there are some massive bluffs, including pristine Fones Cliffs, home to a large population of bald eagles.

On a steep slope in Northumberland County, the eastern part of the Northern Neck, surrounded by rhododendron and just a few feet above the mouth of the Potomac River, lives a handsome American chestnut tree with a special history. This is an unlikely place to find a chestnut in Virginia. While there are many wild type chestnuts surviving in the mountains, and quite a few still in the Piedmont, there are almost none in the Coastal Plain. And while there are many chestnut sprouts emerging from old stumps in the mountains of Virginia, few grow past ten feet tall before they succumb to chestnut blight or to the hungry mouths of white-tailed deer. So to find



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## Building on Success: The President's Message

By John Scrivani, Virginia Chapter President

The Virginia Chapter of The American Chestnut Foundation reached some major milestones this year in its efforts to restore the iconic American chestnut to its Virginia range. We benefited from the efforts of 587 volunteers, and the support of 490 members (with considerable overlap between the two), to conduct chestnut breeding, establish new seed orchards, locate and preserve surviving American genotypes, educate our youth and conduct public outreach. We now have three seed orchards, Blandy in Clarke County, Sky Meadows in Fauquier County, and Banshee Reeks in Loudoun County, planted with a combined total of over 10,000 third-backcross (B3F2) trees. Over the next decade we will be testing and selecting among these trees to find the families and individuals with the highest levels of blight-tolerance.

The latest advances in chestnut genetics, including cutting-edge genotyping and statistical analysis, have led us to an understanding that blight-tolerance is controlled by more genes than previously thought. This knowledge necessitates additional strategies to accomplish our goal of a restoration-ready population of chestnuts with predominantly American character. The Virginia Chapter is working with our national parent organization to support strategies of expanded traditional breeding and transgenic sources of resistance.

We are cooperating with the Virginia Department of Forestry chestnut program at Lesesne State Forest (Nelson County) to see if the complex Chinese-Japanese-



American hybrids and backcross generations there offer promise of both additional sources of blight-tolerance and improved timber form.

We are locating additional surviving American trees, and when feasible, planting them in germplasm conservation orchards to preserve genetic diversity and to be prepared for breeding with transgenic sources. We are also collecting leaf samples from surviving American chestnuts throughout Virginia to support a range-wide, landscape level, genetic study, the results of which will provide valuable strategic guidance to our breeding and restoration efforts.

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## Bur Opening at McDonalds Mill, VA

By Ned Yost

On Saturday, September 28, Carl Absher, Virginia TACF Science Vice President from Virginia's Valley and Ridge Region, drew seventeen volunteers to the historic McDonalds Mill (1860) in the North Fork/Catawba Valley near Blacksburg, Virginia. In a splendid adaptation of the "Tom Sawyer" tradition, Carl encouraged and supervised the thirteen adults and four young children in the challenging operation. Protected by heavy leather gloves, the burs were opened, nuts extracted, and tested for viability in cups of water; nuts that sank to the cups' bottoms were collected and carefully sorted as to their source. The bur opening produced 451 B3F3 nuts to be used for educational and celebratory plantings. A few may be eaten. The opening also produced 80 nuts from seven wild native American

chestnut trees. These 80 nuts will go to Germplasm Conservation Orchards, and maybe wild plantings. One nut came from a previously unknown small grove on a steep hillside below the Blue Ridge Parkway.

The four young children gave us great pleasure and encouragement. They stayed at their tasks until their last bur had been opened, nuts tested and the viable nuts collected. Thanks for their efforts will come to them next spring, when they will receive chestnut seedlings to plant and nurture as they and the trees grow to maturity. Carl provided roasted chestnuts, and all enjoyed chestnut shortbread from the Pettijohn Orchard's Dunstan chestnuts in Raphine, accompanied by apple cider and coffee.

If you know of a surviving American chestnut tree in Virginia, please contact Carl Absher at [abshercp@gmail.com](mailto:abshercp@gmail.com).



**McDonald's Mill**

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a tall tree in this location – well you can't avoid asking, "Is this the one tree in Virginia that the blight missed? Or the one tree that had natural resistance to the blight?"

My inquiries led to an unexpected explanation. I traced the tree's story back to the 1980's. At that time, the slope was covered with rhododendron. The landowners cleared the slope and found a chestnut stump 3' in diameter. To their surprise, two sprouts emerged from the dormant stump. The property was then purchased by Dr. Robert Lumsden, a plant pathologist and researcher at the U.S. Department of Agriculture. He watched the sprouts grow and, inevitably, become infected by chestnut blight. When one sprout was severely blighted and the other had only a small canker, Dr. Lumsden isolated the fungus in his laboratory at the USDA's Beltsville Agricultural Research Station. He sent the fungus sample to Dr. William L. MacDonald, now TACF Director Emeritus, at West Virginia University. Dr. MacDonald who was one of the foremost scientists working on chestnut blight. He infected the Lumsden sample with a strain of mycovirus that had been discovered in Europe. At that time, the mycovirus was thought to be conferring partial blight resistance in the European chestnut, which was faring far better than its American cousin.

Dr. MacDonald returned the now the infected blight to Dr. Lumsden, who, with the help of an agile grandson, applied it to the canker on the healthier of his two chestnut

sprouts. As time passed, the untreated sprout died, but the one that was treated with the infected blight continued to thrive.

It is now 30 years later. The surviving chestnut has grown to 45 feet tall, 10 inches in diameter, straight like its ancestors, with no visible die-back in the crown. It has produced flowers and burs but, owing to its isolation, no fertile seed. Dr. Lumsden sold the property, and the current landowners are keeping an eye on it. A Virginia Chapter volunteer collected leaves from the tree for genetic analysis in 2018, as it is probably the lowest elevation tree in the state. The Chapter hopes to pollinate the tree in 2020, or collect some of its pollen to pollinate another American, to preserve the genetics that may now be unique in the Commonwealth.

The success of Dr. Lumsden's experiment of applying virus-infected chestnut blight to his already diseased tree offers hope that some – probably not all – wild type American trees can be saved by a similar technique. Scientists from the Universities of Maryland and West Virginia learned a lot about using hypovirus as a biocontrol in the decades since the Northern Neck chestnut was treated. They learned that the forms ("strains") of chestnut blight in the United States are not identical to the form or forms infecting European chestnuts. And there are several different strains in the U.S.

Some variants of the European hypovirus infect some strains of the American chestnut blight, but no one natural virus will infect all the strains of chestnut blight in the United States.

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## Virginia Chapter Announces Annual Meeting

The Virginia Chapter of The American Chestnut Foundation will conduct its annual membership meeting on Saturday, November 16, 2019, at Claytor Nature Center in Bedford. The meeting is open to the public and members are especially invited to attend.

The meeting begins at 1:00. Our special guest is Dr. Jason Holliday, Associate Professor, Department of Forest Resources and Environmental Conservation, Virginia Tech. Dr. Holliday's topic is **Genomic Tools to Accelerate Chestnut Restoration**. Following his talk, we will tour the chestnut germplasm conservation orchard maintained by Claytor Nature Center.

The technological changes in environmental sciences are coming so fast, and are so dramatic, that the breeding program of The American Chestnut Foundation can hardly keep up. And yet, keep up we must.

In addition to Dr. Holliday's presentation, chapter president John Scrivani will report on the status of the Virginia chestnut breeding program and related activities during the year.

A germplasm conservation orchard is an orchard containing only wild-type American chestnuts. While it is still possible to see wild American chestnut in our forests, the numbers continue to decline, so conserving the genetic material becomes increasingly important. With proper care, American chestnuts can live to sexual maturity and produce fertile nuts. The Virginia chapter has four of these orchards now: this is your chance to see one of them.

The Virginia Chapter Board of Directors will be conducting its fall board of directors meeting at Claytor Nature Center before the public program. This meeting is also open to all members.

The Claytor Nature Center is part of the University of Lynchburg. It serves as an education and research center for environmental study and to preserve the land for future generations. The 18th century farm and plantation house were given to the University by A. Boyd Claytor, III; an additional 21 acres were donated by alumnus Bob Kibler.

The GPS address of the Center is 1844 Woods Road, Bedford, VA 24523.

We look forward to seeing you there.

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This year we held at least 11 educational events reaching over 1,500 people. Our Education Committee developed materials that teach our youth about the science

of chestnut and the great ecological and social values the "perfect tree" of eastern North America.

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Dr. Donald Nuss tried to apply CRISPR technology to create a synthetic, universal hypovirus that would attack all strains. While he was not completely successful, he was able to create a hypovirus that attacks half of the fungal strains in the wild and a second hypovirus that attacks the other half.

Research into this now-called hypovirus continued at the Universities of Maryland and West Virginia and is led today by Dr. Matthew Kason, Interim Director of the International Culture Collection of (Vesicular) Arbuscular Mycorrhizal Fungi (INVAM) and Assistant Professor of Forest Pathology, and his lab techni-

cian Amy Metheny. One huge problem remains: the universal hypovirus kills chestnut blight cankers that it comes in contact with, but it dies when that canker dies. Scientists still need to develop a universal hypovirus that can spread from one canker to another, from one tree to another, from one forest to another. As we see in the Northern Neck tree, applying the virus to individual cankers can significantly prolong the life of the one tree, but millions of American chestnuts suffer blight, so manual application is not a viable biocontrol. We need a virus that will leave its host and establish itself on another canker, for example by infected fungus spores. Ideally, we need a virus that can survive aerial application at the forest level.

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