

VATACF is currently working on breeding about 20 genetically unique breeding lines from each of two sources of resistance. The source of resistance refers to the naturally blight-resistant Chinese chestnut tree that is used in the first of six crosses. Yes, that's six generations of breeding before we hit our target of a blight-resistant, 15/16 American chestnut. Over 20 lines have been bred and are growing in orchards for the first source and nearly ten lines for the second source have been bred. These are all fourth-generation trees, so two away from the sixth and hopefully final generation. Locating mature, wild American chestnuts to breed with is one of the main barriers to developing more lines. Well, that and time.



Controlled pollination is used for breeding blight-resistant chestnuts (right) at Meadowview Research Farm (left). Photos by: Matt Brinckman, TACF.



During our first decades, we have advanced mightily in addressing our mission. A crowning achievement during this time was demonstrating that we could indeed produce a chestnut resistant to chestnut blight. As TACF looks to the future, the next chapter in our history will contain more stories of success; a realization that the power of dedicated volunteers, skilled scientists, and a strong donor base and vision can make almost anything happen. Our next chapter will surely influence other ecological restoration challenges; in many respects it already has.

Nuts and Bolts

- **Has TACF developed a blight-resistant American chestnut yet?** Our latest generation, Restoration Chestnuts 1.0, are still under testing and are only potentially blight-resistant for the time being until we can cull out the worst seed trees in our seed orchards. Though we have witnessed some trees with high resistance, this generation currently has an average of moderate blight resistance, something we hope to see move much closer towards the resistance found in Asian species as we cull our seed orchard.
- **How can I get a Restoration Chestnut 1.0?** Our production of this generation is far below our demand. Only long-time members and Annual Sponsors can get access to a few of these seeds to plant for now. Learn more about becoming a member and our Annual Sponsorship Program at <http://www.acf.org/join.php>.
- **Do you need land for orchards or research plantings?** We occasionally need sites to host breeding orchards and test plantings. We generally look for landowners willing to cover the cost of deer fencing, planting materials, and cover maintenance. If interested, contact Matt Brinckman. Just remember the need for sites is very occasional!
- **Can I go see native or hybrid chestnuts growing near where I live?** YES! There are native chestnuts growing throughout most of the state, especially in the mountains. Look for them on well drained, acidic sites and especially in areas with some light getting into the understory such as along the Appalachian Trail, forest roads, woods edges, etc. To see our hybrids, you can visit our Meadowview Farms anytime during the work week and many of our State Chapter orchards are on accessible public land. Visit the state chapter website at <http://vachestnut.org/> for more information.
- **Where does the funding for TACF come from?** We operate primarily on the generous donations of private individuals and foundations. To donate or become a member, visit <http://www.acf.org>.
- **Can I volunteer to help with restoring the American chestnut with TACF?** Please Do!! There is a very wide variety of areas in which we need volunteers to accomplish our goals including planting and care of trees, data collection and management, outreach and education, fund raising, and organizational tasks. If interested, contact Matt Brinckman.

Matt Brinckman is the Mid-Atlantic Regional Science Coordinator; matt@acf.org; 434/906-9312.

Editor's note: The Virginia Department of Forestry also has a long-running American chestnut backcross breeding program at the Lesesne and Matthews State Forests. Learn more here: <http://www.dof.virginia.gov/research/index.htm>.

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Useful Resources

Do you enjoy identifying trees? Then you're probably familiar with the Virginia Department of Forestry's *Common Native Trees of Virginia* book. But what about identifying those other plants growing in your woodlands and yard? The Virginia Department of Forestry announces the release of its new book, *Common Native Shrubs and Woody Vines of Virginia*. A companion to *Common Native Trees of Virginia*, this book is small enough to take into the field. It contains a key to shrubs and vines by leaf, as well as descriptive text, line drawings, and other information. The book is available for purchase or download at dof.virginia.gov, or for over-the-counter purchase at several VDof offices, listed on the web site. The cost will be \$2 (plus shipping if purchasing online.)

Like the Virginia Forest Landowner Education Program on Facebook and follow us on Twitter @VFLEP.

We have started a monthly trivia contest - on the first of each month, be the first to answer a forestry-related trivia question, and win a free VFLEP logo hat! See the Facebook page for complete rules: www.facebook.com/VFLEP.

CONTACT OUR SPONSORS AND STATE NATURAL RESOURCE MANAGEMENT AGENCIES:

					
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900 Natural Resources Drive Ste. 800 Charlottesville, VA 22903 434/977-6555 www.dof.virginia.gov	228 Cheatham Hall 0324 Blacksburg, VA 24061 540/231-6391 http://forestupdate.freec.vt.edu	1400 Independence Ave. SW Washington, D.C. 20078 202/205-8333 http://www.fs.fed.us/spf/coop/programs/loa/fsp.shtml	3808 Augusta Ave Richmond, VA 23230 804/278-8733 www.vaforestry.org	3808 Augusta Ave Richmond, VA 23230 804/278-8733 www.vaforestry.org/virginia_tree_farm.html	

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VIRGINIA FOREST LANDOWNER UPDATE

Events, news, and information promoting the stewardship of Virginia's forest resources.

VIRGINIA FOREST LANDOWNER EDUCATION PROGRAM

Jennifer L. Gagnon, Editor
 Address all correspondence to: Virginia Forest Landowner Update
 228 Cheatham Hall (0324)
 Blacksburg, VA 24061
 ph: 540/231-6391; fax: 540/231-3330
 e-mail: forester@vt.edu
<http://forestupdate.freec.vt.edu>

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Sign up to receive the Virginia Forest Landowner Update at: <http://forestupdate.freec.vt.edu>

An Update on Efforts to Restore the American Chestnut By: Matt Brinckman, The American Chestnut Foundation

It wasn't too long ago that many people felt the American chestnut would remain merely an artifact in our history books; nothing more than a black-and-white photo and a memory that would vanish with time. But The American Chestnut Foundation® (TACF) is writing a different story.

Like any good story of triumph, this one starts with adversity in the form of a fungal blight that took out one-quarter of the dominant trees in the eastern deciduous forest in less than fifty years. Discovered first in the New York Zoological Park in 1904, chestnut blight, or *Cryphonectria parasitica*, started killing chestnuts and moved through the native range incredibly fast, at a pace of 20 to 50 miles per year. Tiny spores from this invasive fungus brought over on a Chinese or Japanese chestnut can travel easily, being carried by wind and animals. Spores enter the tree through openings in the bark (injuries or natural splitting during growth) and infect the vascular cells that transport water and nutrients to the tree, eventually resulting in death. This effective pathogen is here to stay in our eastern woodlands, as it is hosted by some species of oak, though they are largely unaffected by it.



TACF backcross hybrid displaying a high resistance to chestnut blight. Arrows indicate points that were inoculated with *Cryphonectria parasitica*. Photo by: Matt Brinckman, TACF.

This year, TACF celebrates 25 years of chestnut research and breeding at Meadowview Research Farms, our national research station located in southwestern Virginia. TACF was established in 1983 by a group of scientists and laypersons with the mission to restore the American chestnut to its former glory through a genetic breeding process called backcross breeding. In 1989, foundation leadership established the Meadowview Research Station to undertake the monumental task of breeding blight-resistant trees.

Through the generosity of many donors and volunteers, the research station has rapidly progressed from one research farm operated by a single staff person to five research farms and a state-of-the-art laboratory run by over ten full-time and part-time staff. Our breeding efforts are further advanced by a growing troop of more than 5,000 dedicated members and volunteers who manage nearly 500 chestnut plantings and orchards spread across the native range of the tree. In 2005, Meadowview Farms seed orchards started producing the generation of trees that are currently being tested for release into the wild, Restoration Chestnuts 1.0, or B3F3's as they are

known to many. Based on data starting to come in from test plantings, Meadowview will continue culling out bad trees from our seed orchard over the next 5-10 years and average blight resistance among genetic lines should increase.

The Virginia Chapter of TACF (VATACF) was established in 2006 to carry out the mission of TACF in Virginia. Each state in the chestnut's native range has a TACF State Chapter and most of them are conducting their own breeding programs. This is jump-started by breeding with an advanced generation at Meadowview and incorporating increased genetic diversity and adaptability by locating reproductively mature native chestnut trees to breed within each respective state.

EVENTS CALENDAR			For the most complete listing of natural resource education events, visit the on-line events calendar at http://forestupdate.frec.vt.edu		
Contact	Date	Location	Event	Time	Fee
DCR	Oct., Nov., & Dec.	Virginia's State Parks	A variety of events and activities For a complete list, visit: www.dcr.virginia.gov/parks .	Varies	Varies
AC	Year-round	State-wide	Virginia Master Naturalist Volunteer Basic Training www.virginiamasternaturalist.org/chapters.html	Varies	Varies
JG	Fall 2014 Oct. 9 Oct. 29 Nov. 10 Dec. 12	On-line	Non-timber Forest Products Fall 2014 Webinar Series <ul style="list-style-type: none"> Manage Your Forest for Pine Straw and Rake in the Profits Art from the Forest Forest-Cultivated Mushrooms: A Rotten Business Forest Botanicals' Deep and Twisted Roots 	2 - 3 p.m.	Free
TO	Sept. 22 & 29	Warrenton	The Woods in Your Backyard The workshop will use the award-winning, The Woods in Your Backyard: Learning to Create and Enhance Natural Areas Around Your Home publication, to equip owners of 1-10 acres to be better stewards of their property.	6 - 8:30 p.m.	\$20/person or couple
JR	Sept. 25 & Oct. 2	Manassas	The Woods in Your Backyard See above.	6 - 8:30 p.m.	\$20/person or couple
JF	Oct. 10	South Boston	Halifax County Fall Forestry & Wildlife Field Tour On this tour of Halifax County in south central Virginia, we'll learn about agroforestry, loblolly pine management, and exotic invasives. We'll end the day with a tour of a wood products manufacturing facility.	8 a.m.	\$45*/person; \$75*/couple
BW	Oct. 30	Galax	Grayson-Carroll Counties Fall Forestry & Wildlife Field Tour This tour of beautiful southwest Virginia will highlight current forest management research projects on the Matthews State Forest. But white pine is really the star of this tour as we explore the many management options available for this species.	8 a.m.	\$30*/person; \$50*/couple
PR	Nov. 8	Warrenton	Fields, Pastures, Creek Sides...and Trees See article below.	9 a.m. - 4:30 p.m.	\$15*
If you are a real estate professional or Commissioner of the Revenue, please visit the Landowner Update website for a schedule of our continuing education classes, Real Forestry for Real Estate. (http://forestupdate.frec.vt.edu).					
*meal(s) included					

EVENT CONTACTS			
Contact	Name/Affiliation	Phone	e-mail/website
DCR	Virginia Department of Conservation & Recreation	804/786-1712	www.dcr.virginia.gov
AC	Alycia Crall	434/872-4580	www.virginiamasternaturalist.org
JG	Jennifer Gagnon	540/231-6391	jgagnon@vt.edu
TO	Tim Ohlwiler	540/341-7950 x 3	tohlwile@vt.edu
JR	Joe Rossetti	540/347-6358	joe.rossetti@dof.virginia.gov
JF	Jason Fisher	434/476-2147	jasonf@vt.edu
BW	Bill Worrell	276/889-8056	bworrell@vt.edu
PR	Paxton Ramsdell	540/231-0790	pramsdel@vt.edu

Fields, Pastures, Creek Sides... and Trees: How Could it Work for You?

Come find out in a day-long workshop focused on agroforestry riparian buffer and silvopasture systems. These practices provide a way to bring trees back onto our farms to work for us and the land. Silvopasture is the intentional management of trees, forage, and livestock that can make for happy, healthy herds. Agroforestry riparian buffers are bands of trees planted parallel to creeks. The buffers provide opportunities to produce market products such as fruits, nuts, florals, and more. Because both practices incorporate more trees in the landscape, they play an important role in improving our soil health and water quality.

We invite highly interested landowners and producers to join us for this day-long workshop where we will provide you with information on how to get started. Experts from both the private and public sectors will be on hand to answer questions, and landowners will share their experiences with these practices. See the Events Calendar for details.

You Ain't From Around Here! Exotic Invasive of the Quarter: Japanese Beetle (*Popillia japonica*)

By: Jennifer Gagnon, Virginia Tech

For this month's article, I looked to nature for inspiration. I quickly found it while picking blackberries in July. Japanese beetles love blackberries. They also love buzzing in your face when you try to pick said fruit. Adding to the fun are the bald-faced hornets who also have a penchant for blackberries – so you are left guessing if the buzzing insect is going to sting you in the face, or just fly harmlessly away. Needless to say, there is a lot of yelling involved while I'm fruit picking.

According to the University of Kentucky's entomology department, the Japanese beetle is probably the most devastating pest of urban landscape plants in the eastern United States. So, even though they aren't technically forest pests, they do affect all of us who are homeowners in addition to woodland owners.

The Japanese beetle arrived in Burlington County, NJ, in 1916 on the roots of ornamental azaleas. Seemingly, they enjoyed the climate and the food, and decided to set up residence in the United States.

According to a news article in The Reading Eagle, there was a desperate search for biological controls as early as 1923 because, only 8 years after introduction, the beetles were wreaking havoc on agriculture. Farmers in many Mid-Atlantic states were reporting total crop losses. Natural parasites from Hawaii, China, Korea, and Japan were brought in and "[These specimens], with others [were] being turned loose as rapidly as possible." Based on what we know about biological controls today and the rigorous testing they must undergo before release, I have to wonder what other destructive forces were unleashed in the name of Japanese beetle biological control.

Today, this insect is the most widespread turfgrass pest in the United States. Control efforts cost more than \$460 million per year. Annual losses attributed to the larval stage alone are estimated at \$234 million. Japanese beetles have been well-established throughout Virginia since the 1970's. They are in all eastern states; west of the Mississippi, they are found in isolated pockets.

The Japanese beetle life cycle is 1 year. Adults emerge from the soil in early June and are most abundant from late June through early August. During this time, adults start feeding and mating on host plants. Periodically, mated females will take a late afternoon trip down to the lawn where they grub out a hole 2-3 inches deep and do some egg laying. A female can lay 40-60 eggs over the course of her 4-8 week life span.

Laying females prefer irrigated over non-irrigated lawns because eggs and newly hatched larvae are sensitive to soil moisture levels. In droughty years, many will not survive. As a result, heavy Japanese beetle outbreaks tend to be cyclical. With all the rain we had last year, it's no wonder populations were high here in Montgomery County this summer.

Newly hatched larvae seek out grass roots to feed on. Larvae are fully grown by September and are then less sensitive to drying. Most of the feeding damage to your lawn is apparent by this late in the season. Larvae feed until soil temperatures drop below 60 degrees F, then they burrow down deep in the soil to overwinter. When the soil warms back up in the spring, larval activity resumes and adults emerge after another 4-6 weeks of feeding on grass roots.

The highly-mobile adults love to feed on many of the same plant species as we humans. Unlike some of the exotic invasive species we've covered in this column, which are specific to one or a few species, Japanese beetles feed on about 300 different species. Some of their favorites include maples, soybeans, ornamental apples, roses, grapes, corn, and species in the *Prunus* genus, including plums, cherries, peaches, and of course, blackberries. They are also major pests of Christmas trees.

Adults feed in groups and eat soft leaf tissues, leaving the veins. This results in a skeletonized leaf appearance. They will also feed on fruits and buds. Beetles chew small holes in the tender twigs of Christmas trees creating a wound that collects resin and leaves small white marks on the bark.

How to identify the Japanese beetle

Adults: 3/8" long, metallic green with coppery wing covers, tufts of white hairs along outer edge of abdomen, mouths full of leaves from your fruit trees.
Grubs: Off-white, C-shaped, brown head, distinctive V-shaped row of abdominal spines.

Beetle cont. on page 4

Beetle cont. from page 3



An adult Japanese beetle (left). Notice the distinguishing white tufts of hair along the abdomen. Grubs, found in your lawn, are white (right). Photos by: Clemson University, USDA Cooperative Extension Slide Series and Jim Baker, North Carolina State University.

Control:

Although Japanese beetles typically do not kill the plants they feed on, they do result in less than aesthetically pleasing foliage. If you are a commercial grower, they can definitely cause financial loss. In addition, the litter, frass, and dead beetles make a mess. One of the most eaten plants in our yard this year was the sweet cherry that overhangs our back deck. We had to pressure wash the deck and the furniture last week to get rid of the mess the beetles created. So depending on what you're growing, where you're growing it, and why you're growing it, you may want to consider some control methods:

Trapping: If, for some demented reason, you appreciate the skeletonized appearance of leaves, by all means, purchase a commercially available Japanese beetle trap. These traps typically use pheromones and floral scents to lure beetles. Once they fly in to the trap, they cannot get out. Unfortunately, traps tend to attract far more beetles than they actually catch, making them more effective lures than controls.

Manual: Small beetle infestations can be controlled by hand. In the morning, place a tarp under an infested plant and give the plant a good shake. The beetles will fall onto the tarp. Their dew-soaked wings will prevent them from flying off. Drop the beetles into soapy water. Repeat daily.

Avoidance: Despite the seemingly endless list of species they eat, there are plants Japanese beetles do not like to munch on. These include arborvitae, baby's breath, begonia, bleeding heart, boxwood, buttercups, caladium, carnations, columbine, coralberry, coreopsis, cornflower, daisies, dogwood (flowering), dusty miller, euonymus, firs, forget-me-not, forsythia, foxglove, hemlock, hollies, hydrangeas, junipers, kale (ornamental), lilacs, lilies, magnolias, maple (red or silver only), mulberry, nasturtium, oaks (red and white only), pines, poppies, snapdragon, snowberry, speed well, sweet pea, sweetwilliam, tulip-poplar, violets and pansies, and yews. Use more of these species in your landscape to avoid attracting Japanese beetles. Additionally, not irrigating your lawn will create drier conditions less suitable for eggs and new larvae.

Biological: Milky spore disease was once touted as an effective means of controlling grubs. Recent studies, however, have shown the disease may not be as effective as once thought. Nematodes, specifically entomophagous nematodes, can provide effective grub control. Use preparations containing *Heterorhabditis* spp., and apply them in mid-August. Irrigate with about 1/4 inch of water both before and after application of the nematodes. To treat an acre will cost between \$30-40.

Chemical: There are many suitable chemicals available for controlling both grub stage and adult Japanese beetles. A full list and recommended application methods is available from Virginia Cooperative Extension's 2014 Pest Management Guide (http://pubs.ext.vt.edu/456/456-018/456-018-14_Home_grounds_and_animals.pdf).

Here in Montgomery County, this summer was dry early on. But the last couple of weeks have been exceedingly wet. Have the stars aligned making 2015 another bad beetle year? We will have to wait and see.

On a final note: Strangely enough, yelling at Japanese beetles is hereditary. From the New England days of my youth, back in the 1970's, I clearly recall my mother, an avid gardener, bemoaning the Japanese beetle. I'm not sure which plants of hers they were feeding on, but I learned some choice words from her. Which I will not repeat. Here. I'll save them for when I'm picking blackberries.

Jennifer Gagnon is an Extension Associate; jgagnon@vt.edu; 540/231-6391.



Adult Japanese beetles having a dinner party on my sweet cherry. Photo by: Jennifer Gagnon, Virginia Tech.



The mess on my back deck. Photo by: Jennifer Gagnon, Virginia Tech.