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VIRGINIA FOREST LANDOWNER UPDATE

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

FOREST LANDOWNER EDUCATION PROGRAM

Summer L. Gagnon, Editor

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How Green is Your Grill?

By: Jason Fisher and Anne Carter-Carrington, Virginia Cooperative Extension



Grilling is a great way to cook fresh meats and vegetables quickly, make a meal more festive, and delegate some of the cooking. Cooking organically is all the rage, but which grilling method is the best for the environment...and for you?

When getting ready to grill, there are several types of fuels to choose from -- gas, electricity or charcoal. Each has its own environmental and monetary costs.

The most common grilling fuel is natural gas. It heats quickly and leaves a very small carbon footprint. Once the grill and gas tank are purchased, it is very cost effective, just pennies to operate. But the wood smoke flavor is missing from this method.

Similarly, electric grills don't leave much of a carbon footprint. But, since they are powered by electricity, they are more costly to operate. And, again, very little flavor is added to the food.

Charcoal, the third fuel option, is made two different ways; one method is much more organic than the other. The commercial method uses leftover sawdust, combined with binders, including coal dust, sodium nitrate, limestone, borax and lighter fluids, and bakes them into briquettes. Regular and self-lighting charcoal briquettes pollute the environment with volatile organic compounds (VOCs), a dangerous ozone-causing pollutant. Every year Americans alone release over 14,000 tons of VOCs into the atmosphere from the 46,000 tons of lighter fluid burned through charcoal grills. The ash from charcoal briquettes contains chemical residues and must be disposed of in the garbage.



A new producer in Amherst County takes advantage of winter weather and cool temperatures to produce his first batch of natural hardwood lump charcoal.

Photo by: Jason Fisher, VCE.

Natural lump hardwood charcoal, on the other hand, is carbon neutral or even slightly carbon negative if the fines are used as a bio-char soil amendment. Nothing compares to the flavor of natural lump hardwood charcoal -- it is the fuel of choice for barbeque masters. This type of charcoal is made from wood allowed to dry in a kiln. This process releases the same amount of carbon dioxide as if the wood was allowed to decay on its own in the forest, and it imparts a smoky flavor to foods that complements meats, poultry, fish and vegetables. Hardwood lump charcoal burns hotter and cleaner

than briquettes and is much easier to light -- even without lighter fluid. You also know where it came from, what it contains and what was done to it *en route*. Even the leftover ash is good for the environment, as its alkaline properties neutralize acidic soils.



Natural hardwood lump charcoal can be produced by families. Shown are three generations of the Slagle family from Halifax who participate in a small producer grant-funded project. This family earns a living as professional loggers. Photo by: Jason Fisher, VCE.

Charcoal cont. on page 4

EVENTS CALENDAR			For the most complete listing of natural resource education events, visit the on-line events calendar at www.cnr.vt.edu/forestupdate		
Contact	Date	Location	Event	Time	Fee
DCR	April, May & June	Virginia State Parks	A variety of events and activities. For a complete list, visit: www.dcr.virginia.gov/parks	Varies	Varies
MP	Year-round	State-wide	Virginia Master Naturalist Volunteer basic training. www.virginiamasternaturalist.org/chapters.html	Varies	Varies
JF	April 1	Lynchburg	Spring Venture Outdoors Program Learn about thinning your timber, American chestnut restoration efforts, invasive species control, & shiitake mushroom production. Free mushroom log to first 20 registrants.	9 - 3:30	\$10/person; \$15/household
GP	April 7-10	Williamsburg	Virginia Forestry Summit Joint annual meeting for VA SAF, ACF and VFA.	All day	Varies
PS	April 19	On-line	White-tailed Deer Breeding Biology & Communication	12 & 7	Free
WP	April 20	On-line	Communicating About Climate Change	12	Free
CG	April 30	Catawba	Wildflower Tour at TNC's Mill Creek	9 - 4	Free
VLM	May 1	Newport News	Virginia Bats at Risk Conservation biologist, Rob Miles, will speak about the benefits of bats, why we need to conserve them and what you can do to help these unique mammals.	1:00	Inc. in museum admission
JF	May 6	Halifax	Spring Venture Outdoors Program See description above.	9 - 3:30	\$10/person; \$15/household
JG	May 14	Steele's Tavern	On-line Woodland Options for Landowners Field Trip This hands-on field day will focus on tree identification, the use of field equipment, and discussion of forest management activities in the outdoor LEAF classroom at McCormick Farm.	9 - 4:30	Free for on-line students; \$15 for others
PS	May 17	On-line	Providing Quality Habitat for White-tailed Deer	12 & 7	Free
CG	May 21	Catawba	Streamside Management	9 - 12	Free
CG	June 4	Catawba	So You'd Like to Have a Pond	8:30 - 12	Free
AD	Aug. 9 & 16	Palmyra	Family Forestland Short Course: Transferring Land to Generation NEXT Bring your family to this 2-part class to learn how to make the transition of your land to your heirs as smooth as possible.	12:30 - 7	\$50 / couple

EVENT CONTACTS			
Contact	Name/Affiliation	Phone	e-mail/website
DCR	Department of Conservation & Recreation	804/786-1712	www.dcr.virginia.gov
MP	Michelle Prysby	434/872-4580	www.virginiamasternaturalist.org
JF	Jason Fisher	434/476-2147	jasonf@vt.edu
GP	Glenda Parrish	804/278-8733	gparrish@vaforestry.org
PS	Penn State Natural Resources Extension	http://nrnext.cas.psu.edu/PAForestWeb/upcomingseminars.html	
WP	Forestry & Natural Resources Webinar Portal	http://forestrywebinar.net	
CG	Christy Gabbard	540/767-6114	cgunnels@vt.edu
VLM	Virginia Living Museum	757/595/1900	www.thevlm.org
AD	Adam Downing	540/948-6881	adowning@vt.edu
JG	Jennifer Gagnon	540/231-6391	jgagnon@vt.edu

You Ain't From Around Here! Exotic Invasive of the Quarter: Witchweed (*Striga asiatica*)

By: Jennifer Gagnon, Virginia Tech

Looking back in the annals of You Ain't from Around Here! I realized I have never written about a parasitic invasive. And it just so happens, that the next up and coming species to be wary of is an obligate root hemiparasite!

Let me take just a minute to discuss what it means to be an obligate root hemiparasite. A parasite is a living organism that must obtain some or all of its nutrition from a host plant. A hemiparasite means that the parasitic plant has green leaves and can photosynthesize to produce its own carbon; however, the majority of its carbon comes from the host plant (holoparasitic plants are unable to photosynthesize, and must obtain all of their nutrition from host plants). Root parasites connect to their host plants via haustoria – specialized roots which can tap into the root system of the host plant and sieve away the fruits of its photosynthesizing labors. And obligate means the parasite must have a host in order to complete its lifecycle. So, this quarter's exotic invasive is witchweed, a plant that can photosynthesize, but must obtain some of its nutrition from the roots of a host plant in order to complete its lifecycle.



Witchweed parasitizing a corn plant. Photo by: USDA APHIS PPQ Archive.

Witchweed is a native to Asia and, ironically enough, one source stated that it can be used to treat internal parasites in humans. It parasitizes tropical and subtropical annual grasses, such as corn, sorghum, sugarcane, rice and certain weedy grasses. Infected host plants use all their energy feeding the parasite. Symptoms of infection include stunted growth, wilting, chlorosis (yellowing of the leaves) and decreases in productivity (95-100% reduction in grain yield). Unlike many of the other invasives we've learned about, witchweed devastates important agronomic crops in its homeland as well.

The date and mode of witchweed's arrival in the United States are not known (although the fact that it belongs to the **Broomrape** family may shed some light on its mode of transport). The first plants were discovered by a graduate student from India, who recognized the parasite from his country.

Before the flowers of this plant open, they self-pollinate, which means that a lone individual plant is capable of reproduction. And reproduce it will. A single plant can produce 500,000 seeds in its one-year lifetime. The tiny dust-like seeds are disseminated (spread) by wind, water and humans. Since witchweed plants cannot survive without a host, the seeds remain viable in the soil (for up to 10 years), until they sense the root exudates of a host plant. Then they germinate. Very clever. However, this clever trait can also be used to the detriment of witchweed, as will be discussed in the control section.

Although this species is not at all wide-spread in the United States (it's only found in a few counties in North and South Carolina) it is worth keeping an eye on because of its proximity to Virginia and its devastating effect on valuable crops. Control of this species has been very successful (I'm not used to writing that statement in these columns!). In fact, over 99% of the infestation has been eradicated (from 450,000 acres to 5,000).

How to identify the witchweed:

Stems: stiff, branched, 6-12" tall, covered with coarse, short, white hairs

Flowers: vary in color from red, purple, white to yellow; less than 0.5" in diameter; emerge in July

Fruit: the microscopic dust-like seeds form in small capsules; the seeds themselves come in many different shapes and are often twisted and irregular due to crowding while they develop in the capsule.

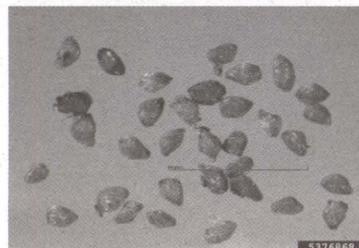
Leaves: bright-green, linear and round, about 1" long, nearly opposite

Roots: succulent, round, white, no hairs

How to control the witchweed:

Control involves three steps:

- Locating and mapping the infested areas. These surveys are conducted by federal and state governments as well as private landowners.



A witchweed plant (top) and a magnified look at the seeds (bottom). Photos by: Florida Division of Plant Industries Archives, FL Department of Agriculture & Consumer Services and Julia Scher, USDA APHIS PPQ.

Witchweed cont. on page 4

Witchweed cont. from page 3

- Quarantining the infested areas to prevent human spread. The movement of soil, plants or machinery from infested lands may be limited.
- Eradicating includes both preventing existing plants from producing seeds and destroying the seed bank. Existing plants can be eliminated using herbicides (with active ingredients of paraquat or glyphosate) before the plants start to flower. To destroy the seed bank (recall, seeds can stay viable for 10 years), a method called suicidal germination is used. This tricks the seeds into germinating by making them believe a host plant is present (ok, a bit of anthropomorphizing, I know). To do this, ethylene gas is injected into the soil (ethylene gas is produced by fruits –it’s what causes peaches in a paper bag to ripen quickly). The seeds germinate, realizing their folly far too late. In the absence of a host plant, they quickly die. If you prefer a control method other than injecting ethylene gas into your soil, you can plant a trap crop such as cotton, sunflowers or linseed, which stimulate the seeds to germinate, but are not suitable host plants. These trap crops should be grown for at least 3 years.

Now, if you are an astute observer and need some cash, the USDA Animal and Plant Health Inspection Service (APHIS) is offering a \$25 reward to anyone who spots and reports this weed. Just call APHIS at 919/716-5590. This is a wonderful opportunity to earn enough money to purchase a couple gallons of gas!

Although I haven’t come across any other exotic invasive parasites yet, parasites in general are fascinating (at least to us plant geeks). There are many different types and some are majorly weird! To learn more, visit “The Parasitic Plant Connection” at www.parasiticplants.siu.edu.

Jennifer Gagnon is an Extension Associate in the Department of Forest Resources & Environmental Conservation, 540/231-6391, jgagnon@vt.edu.

Charcoal cont. from page 1

Here are a few positive points regarding natural hardwood lump charcoal:

- 90% pure carbon (moisture, ash, volatiles)
- no petroleum additives, binders, or fillers
- no unwanted starter fluid taste
- faster lighting times
- better control over temperature
- long burn times
- reusable
- easily extinguished
- impart excellent flavor and aroma to foods
- less expensive than briquettes
- can be marketed locally

Some studies suggest an elevated cancer risk related to eating charcoal-grilled foods. Current research shows that eating moderate amounts of grilled meats that have been cooked without charring does not impose a health risk. Precooking meats in the microwave before placing them on the grill, and then using slow and steady heat, minimizes cancer risks. Cutting away fats and any charred areas (which are the real culprits) also reduces risk.

In addition, hardwood lump charcoal provides an opportunity to use low-value wood from forest management activities. For example, small trees removed in thinning operations and wood of exotic invasive species, such as tree-of-heaven, make excellent charcoal. In fact, over two acres of tree-of-heaven have been cleared in Southside and made into charcoal. Lump charcoal consumers have found that cooking with natural charcoal makes good sense for the economy and the environment.

Jason Fisher, Extension Agent, Forestry and Natural Resources, has recently formed a working group of landowners who have expressed interest in producing natural lump charcoal as a value-added forestry enterprise. The startup cost for this project (nearly \$5,000) has been secured through grants. The group meets quarterly for program planning and market updates. The theme of “Local Fuel for Local Food” is the slogan of choice in Virginia. Increasing demand in the region may possibly lead to a future cooperative arrangement. Farmer’s and community markets have been strong partners. Additional partnering agencies include Virginia Cooperative Extension, Virginia Department of Forestry, Virginia Tech Department of Forest Resources and Environmental Conservation, New River Highlands Resource Conservation and Development Council, Virginia Master Gardeners, and Virginia Master Naturalists.

The public may obtain a list of hardwood lump charcoal suppliers in Southside Virginia by contacting Jason Fisher.

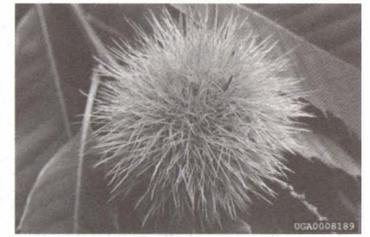
Jason Fisher is the Central District Forestry & Natural Resource Extension Agent, 434/476-2147, jasonf@vt.edu.

Anne Carter Carrington is the Central District FNP Coordinator, Family and Consumer Sciences, 434/476-9927, acarring@vt.edu.

Two Great Trees

By: Adam Downing, Virginia Cooperative Extension

Two old forest friends are making a comeback after years of both gradual and rapid demise. They are the American chestnut and American elm. These two species almost disappeared from our forest and street tree scene because of pathogenic fungi introduced from Europe years ago. The American chestnut met its fate through the chestnut blight introduced in 1904 and the American elm succumbed to the Dutch elm fungus introduced in the 1930's. However, a glimmer of hope is growing stronger for these former stalwarts as long-term research efforts are beginning to reach fruition.



*An American chestnut fruit.
Photo by: Paul Wray, Iowa State University.*

Even though the American chestnut nearly vanished by the late 1930's, many trees retained their ability to sprout from the root collar area where some life still existed. Nevertheless, once these new sprouts reached large sapling size, the blight, still present in the soil, attacked again, rendering this re-growth a fatal blow. New sprouts and ultimate death occurred time and again until the root stock lost all viability. Individual and widely scattered chestnut trees, however, still exist within their former growing area — some even showing an ability to resist the blight more readily than others.



On-going research is developing hybrids with the form of American chestnut and the disease resistance of Asiatic chestnut. Photo by: Joseph O'Brien, USDA Forest Service.

Flowers selected from these trees are being cross-pollinated with blight resistant species of Asiatic chestnut in a wide variety of research efforts. Foremost in many of these efforts are projects sponsored and conducted by the American Chestnut Foundation. When the hybrid trees produced reach flowering stage, they are then back-crossed with selected American chestnut trees in a series of long-term experiments. Back-crossing is a procedure whereby hybrids are crossed with one of the original hybrid parents (in this case one of the American chestnut parents) to ultimately produce a hybrid exhibiting strong American chestnut traits. These new hybrids are then inoculated with blight fungus to determine resistance qualities.

Positive results are gradually coming forth from these experiments. There is a reasonable expectation that the American chestnut may be back as a ruling member of Virginia's mountains and foothills for the next generation.

Regarding the American elm, death has been more complete for individual trees because of the virulent effect Dutch elm disease (DED) has on the elm's water-conducting cells, killing all vascular tissue (roots included). But not all trees have succumbed. Since inception of DED, elms displaying resistance have been sought throughout their natural growing area. Cuttings have been taken from those showing promise and then propagated. The trees propagated from the cuttings were inoculated with DED to study their inherent resistance. Many of these studies have been undertaken at various universities and at the National Arboretum.

Results from these various experiments have produced multiple American elm cultivated varieties (cultivars) displaying DED resistance. There are many different cultivars available through mail-order or local nurseries. According to research at the Bartlett Tree Research Laboratories, the best true American elms, in terms of tolerance to DED and form, are the Princeton and the new Jefferson American elm from the Washington mall.



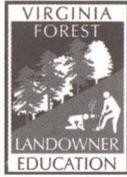
The American elm is loved for its graceful form and was widely planted as a street tree. Photo by: Joseph O'Brien, USDA Forest Service.

Elm cultivars resulting from a series of crossings of American elms with different Asiatic elms, which are naturally resistant to DED, have produced many options. The two best in terms of resembling the American are the Accolade and Triumph which are also available from selected Virginia-based nurseries.

Thanks to science and the dedication of growers, these two important trees have hope of once again gracing our woodlands and urban forests. You can be part of the comeback by planting an American elm today and supporting the work of The American Chestnut Society in hopes of one day planting an American chestnut.

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Useful Resources

Emerald Ash Borer Monitoring and Management Online Course

This free online course provides an overview of EAB ecology and will empower learners to effectively detect and manage EAB in their communities. The course consists of 6 modules which users can take at their own pace and the entire course takes about 90 minutes to complete.

Students can receive 1.5 Continuing Education Units (CEU's) with the following organizations: Society of American Foresters, International Society of Arboriculture, VA Nursery and Landscape Association, VA Master Gardeners, and VA Master Naturalists. Visit <http://www.hort.vt.edu/eab> to get started!

Contact Sarah Gugercin (dickinso@vt.edu) with any questions or concerns.

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