How to Control Non-native Invasive Plants



Kyle Peer Superintendent Reynolds Homestead FRRC AREC Virginia Cooperative Extension Specialist- Christmas Trees

Woods and Wildlife Conference, Wytheville VA Feb 11, 2023



Outline

- What is an invasive species?
- How does an invasive plant species affect the natural environment?
- What makes plant invasives so good at invading?
- How can we control invasives?
 - 5 Common invasive plants in Virginia's woodlands
 - Japanese Stiltgrass Microstegium vimineum
 - Ailanthus -Tree of Heaven Ailanthus altissima
 - Callery Pear Bradford Pear Pyrus calleryana
 - Privets Chinese Ligustrum sp.
 - Olives Autumn, Russian Elaeagnus sp.

What is an Invasive species?

- An "invasive species" is defined as a species that is
- Non-native (or alien) to the ecosystem under consideration; and,
- Whose introduction causes or is likely to cause economic or environmental harm or harm to human health. (Executive Order 13112).
- Source: USDA

Why are they here and why do they adapt so well?





What happens once they arrive?



Invasive Plants and Animals Policy Framework, State of Victoria, Department of Primary Industries, 2010

How does an invasive plant species affect the natural environment?

- Alter ecosystem function
 - Replace native species
 - Change forest structure
 - Decrease productivity
 - Decrease biodiversity



Virginia Forest Landowner Education Helping Virginians Keep Their Woodlands Healthy and Productive Real Forestry for Real Estate Part 2

Pre - Control methods

- Start scouting your property: Walk where you don't walk.
- Learn your plant species and be able to identify the invasive species.
 - VCE publications
 - Plant ID guides
 - Apps
- Research and come up with a plan.
 - Attend classes-seminars.
 - Learn how to read a pesticide label
 - Purchase appropriate chemical, equipment, PPE (personal protective equipment)
- Be Realistic







Foliar

Virginia Forest Landowner Education Helping Virginians Keep Their Woodlands Healthy and Productive Real Forestry for Real Estate Part 2 •Mechanical – which includes hand pulling, mowing, plowing, disking, grubbing, fire

•Chemical – which includes herbicides

•Biological – which includes using biological agents, such as insects, for control



Chemical Control Methods



Hack and Squirt

Stump Treatment



Japanese Stiltgrass Microstegium vimineum

- Native to Asia, Introduced 1919 as packing material
- Adapts to a variety of sites, forms dense stands that outcompete native vegetation.
- 1000 seeds per plant, seeds viable for 7 years/
- Look-alikes.
 - Virginia cutgrass (Leersia virginica)
 - Knotweeds (*Persicaria* spp.)
 - Pennsylvania smartweed (*Polygonum pensylvanicum*)
 - Crabgrass (*Digirtaria* spp.)
 - Nimblewill (*Muhlenbergia schreberi*).
- Key: Single leaves pointed both ends, silvery offset midrib, white flowers, shallow roots.
- <u>https://www.invasivespeciesinfo.gov/terrest</u> <u>rial/plants/japanese-stiltgrass</u>



University of Maryland Extension

Japanese Stiltgrass Control Microstegium vimineum

- Hand Pulling
- Mowing or weed eater at a low setting – Before or beginning of flower stage
- Chemical Control
 - Foliar glyphosate, .5% solution
 - Foliar glufosinate
 - Foliar sethoxydim- grass specific
 - Preemergent imazapic
 - Preemergent sulfometuron
 - Preemergent pendimethalin



University of Maryland Extension

Ailanthus (Tree of Heaven) Ailanthus altissima

- Native to Asia, Introduced 1700's urban tree
- Adapts to a variety of sites, forms dense stands that outcompete native vegetation
- Rapidly growing, reproduces early, produçes 325,000 winged seeds/tree, root sprouts, roots produce chemicals that kill neighboring trees
- ID: large pinnately compound leaves, 1-4 ft with 11-25 smaller leaflets, samara seeds, stinking stems, glandular teeth near base of leaflet
- Black walnut Juglans nigra, toothed leaves, Sumacs - Rhus sp, no glands at base of leaves
- https://www.pubs.ext.vt.edu/420/420-322/420-322.html VCE publication 420-322







Photos by

VТ

Ailanthus (Tree of Heaven) Control Ailanthus altissima

DO NOT CUT WITHOUT TREATMENT

- Foliage Treatment: Seedlings and sprouts
 triclopyr ester: Use 4 to 8 quarts of Garlon 4 Ultra (60%) in enough water to make 5 gallons or more per acre of total spray.
 - triclopyr amine: mix 4 to 20 fl oz of Garlon 3A (44.4% triclopyr) in enough water to make 3 gallons of spray 1-5%.
- Cut Stump: Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted Garlon 3A or 4
- Hack and squirt: Make cuts around the tree trunk so that the cuts overlap slightly and make a continuous circle around the trunk. Spray 1/2 milliliter of undiluted Garlon 3A.
- Basal: Continuous band 12" around tree, Garlon 4, Late Sept – spring, 240ml/gal basal oil - 6.5%. Pathfinder II- premix triclopyr/oil





Verticillium nonalfalfae A proposed fungal bioherbicide for tree-of-heaven

000

Discovered naturally infecting tree-of-heaven in PA, OH, & VA

- Previous field inoculations show 100% death of inoculated host within first year, no damage to native species
- Pathogen continues to spread through root grafts for several years, killing entire stands
- Recent research has shown attenuation of isolates can occur in lab settings
- Pending approval by the EPA as a commercially available bioherbicide (spore suspension applied directly to xylem tissue)



Effects of Verticillium nonalfalfae tree-ofheaven in PA

> Locations of current field trials testing efficacy and restoration to native plant communities

Callery Pear – Bradford + other cultivars *Pyrus calleryana*

- Commercially released in 1961, escaped cultivation in AR in 1964 -1965, showed structural problems in MD in early 1980s, yet - \$23 million in sales in 2009 with many new cultivars created.
- Adapts to a variety of sites, forms dense stands that outcompete native vegetation.
- Although sold as sterile and unable to self fertilize it can actually readily be fertilized with other cultivars.
- A small tree with alternately arranged teardrop shape rippled leaves with finely toothed margins. White flowers in early spring form and in bundles, have a rancid odor followed by the appearance of clusters of hard fruits.
- https://dendro.cnre.vt.edu/dendrology/syllabus/fact sheet.cfm?ID=132



Photos by: John Seiler, Edward Jensen, Alex Niemiera, and John Peterson



Along roadsides...





Callery Pear – Control; Pyrus calleryana

- Good news! It can be killed.
- Foliar Treatment: Seedlings and sprouts
 - □ Glyphosate, 2-5% solution □ Triclopyr- 2-5% solution
- Cut stump: Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted Garlon 3A or 4.
- Hack and squirt: Make cuts around the tree trunk so that the cuts overlap slightly and make a continuous circle around the trunk. Spray 1/2 milliliter of undiluted Garlon 3A.
- Basal: Continuous band 12" around tree, Garlon 4, Late Sept – late winter, 240ml/gal basal oil - 6.5%. Pathfinder II- premix triclopyr/oil.



Photo by: John Seiler, Edward Jensen, Alex Niemiera, and John Peterson, VT

Privets spp. (Chinese privet) Ligustrum sinesense

- Introduced European, Japanese, Chinese 1800's
- Shade tolerant, form dense thickets particularly in lowlands, root sprouts, prolific seeder scattered by birds and animals
- ID: Semi-evergreen-evergreen, opposite ovate leaves, white flowers, ovoid blue black drupe fruit



https://extension.psu.edu/privet

Contributed by: USDA NRCS National Plant Data Center & Louisiana State University-Plant Science; partial funding from the US Geological Survey and the US National Biological Information Infrastructure





Photos by: John Seiler, Edward Jensen, Alex Niemiera, and John Peterson, VT

Privett spp – Control

- Good news! It can also be killed.
- Foliar Treatment: Seedlings and sprouts
 - □ Glyphosate, 2-5% solution □ Triclopyr- 2-5% solution
- Cut Stump: Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted Garlon 3A 50% rate immediately or Garlon 4 20% anytime after cutting
- Basal: Continuous band 12" around tree, Garlon 4, Anytime at 20%, Pathfinder II- premix triclopyr/oil



Photo by: John Seiler, Edward Jensen, Alex Niemiera, and John Peterson, VT



Table courtesy of Penn State https://extension.psu.edu/privet

Olive spp. (Autumn Olive) Eleagnus umbellata

- Introduced Japan, China 1830's
- Intentionally planted for wildlife, shelter beds, mine reclamation
- Forms dense thickets, root sprouts, prolific seeder scattered by birds and animals
- ID: underside of leaves/stem speckled, often has thorns on stem, cream /yellow flowers, silvery fruit ripen
 - https://blueridgeprism.org/wpcontent/uploads/2021/09/Autumn-Olive-Factsheet-2021-9-9-FINAL.pdf







Photos by: Matt Yancey, Jen Gagnon VT

Eleagnus spp – Control

- Good luck! Things that make it angry include:
 - Cutting or mowing
 - Pulling without getting entire root
 - Fire
 - Foliar or cut stump treatments especially with glyphosate or anytime in the spring or summer
- Things that sort of work.
 - Foliar treatment on small seedlings and sprouts in fall
 - □ Triclopyr- 5% solution
- Best shot at "winning"
 - Basal: Continuous band 12" around tree, Garlon 4, while plant is dormant at 20%, Pathfinder II- premix triclopyr/oil, repeat.
 - Be content with keeping it out of non-infested areas while eating jam made from berries from non-treated infested areas.



Photo by: Matt Yancey, Jen Gagnon VT