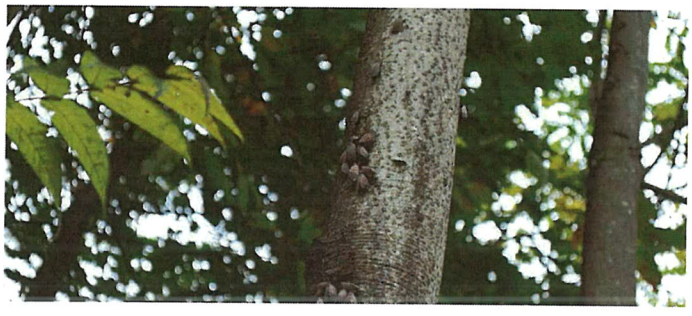
pennsylvania
DEPARTMENT OF AGRICULTURE

Look Before You Leave

SPOTTED LANTERNFLY, *LYCORMA DELICATULA*

Adult with Egg Masses | **Eggs: October - May**

Adults on *Ailanthus*

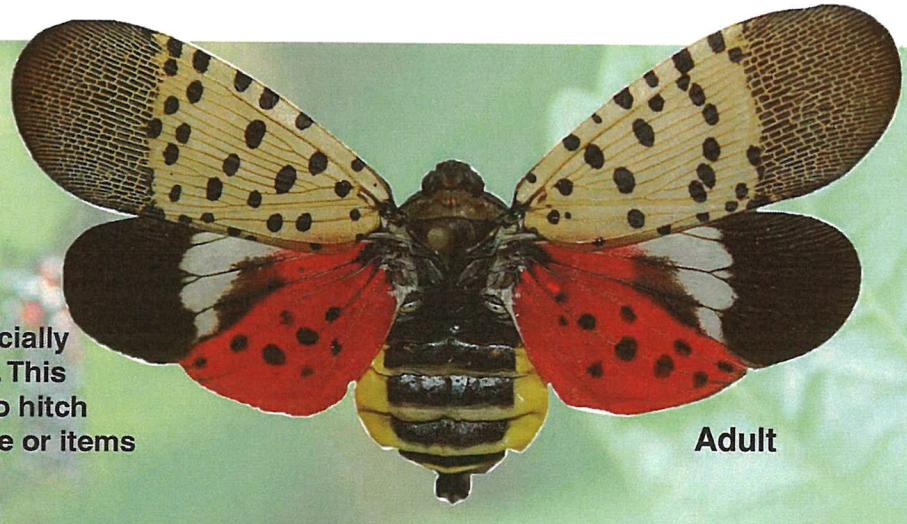


Egg Masses | **Eggs: October - May**

Early Nymph | **May - June**

Late Nymph | **June - July**

Spotted lanternfly threatens the Pennsylvania agriculture industry. The Pennsylvania Department of Agriculture and the United State Department of Agriculture (USDA) are asking for your help in the eradication efforts of this pest. Look for the insect before leaving a quarantined area, especially after walking or parking near a tree line. This insect is not a strong flier, but may try to hitch hike a ride on your clothing, your vehicle or items sitting outdoors. For more information and the current quarantine, please visit:



Adult

WWW.AGRICULTURE.PA.GOV/SPOTTEDLANTERNFLY

PennState Extension

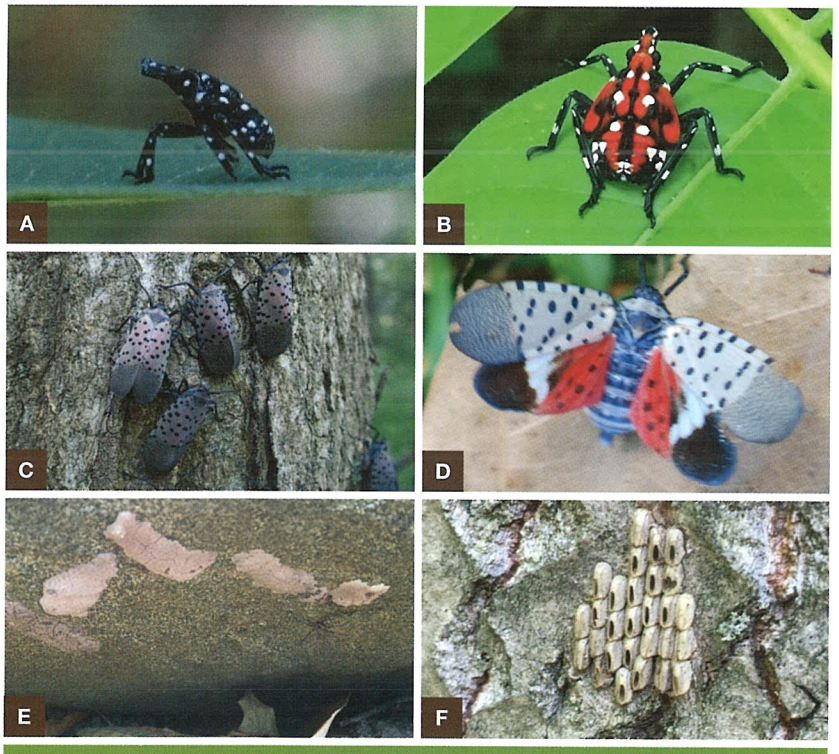
How You Can Comply with the Spotted Lanternfly Quarantine Regulations

There is a new invasive insect in southeastern Pennsylvania, *Lycorma delicatula*, commonly known as the spotted lanternfly (SLF). This insect has the potential to be harmful to grapevines, hops, tree fruit, and trees. To try to limit the spread of SLF, the Pennsylvania Department of Agriculture (PDA) has established a quarantine order in counties where SLF already exists. All residents and businesses must comply with the regulations. PDA has the authority to fine anyone who willfully violates the quarantine order.

Here are some tips to help you avoid spreading SLF and be in compliance with the regulations.

1. Learn about which counties are included in the quarantine order. The area of the quarantine will continue to change as new discoveries are made. As you move within and out of the quarantined area, you must make sure that you are not transporting any living life stages of the SLF to new areas. If you believe you have discovered SLF, report your discovery online at **extension.psu.edu/spotted-lanternfly** or call 1-888-4BAD-FLY (1-888-422-3359). The most recent quarantine map can always be found at **extension.psu.edu/spotted-lanternfly**.

2. Learn about what SLF looks like in every stage of its development throughout the year.



A. The young nymphs are black with white spots and can be present from April through July.

B. The older nymphs are black and red with white spots and can be present from July through September.

C. The adults (shown at rest) can be present from July until late December. The adults are 1 to 1¼ inches long.

D. Adults will show their red underwings when disturbed.

E. The egg masses can be on trees, rocks, or any other solid object and can be present from September through June.

F. The empty remains of the eggs that have hatched can be found at any time of the year.

To see additional pictures of SLF, go to **extension.psu.edu/spotted-lanternfly-what-to-look-for**

3. Avoid parking or storing things under trees in infested areas. The female SLF often lays eggs on objects that are under the trees she is feeding on. You should try to change your habits about where you park. Park vehicles in open fields, away from tree lines, or in a closed garage if possible. You should not store things that you might need to move to outside of the quarantined area under infested trees. These things include firewood, tools, construction supplies, equipment, or any other solid object.

4. Inspect all items that you need to move from within the quarantined area to areas outside the quarantined area. You should remove and destroy any SLF that you find before you move the item. Also check all vehicles, trailers, campers, and equipment, including around windshield wipers, grills, wheel wells, and truck beds. Inspect plant material, woody debris, lawn furniture, construction supplies, tools, and all solid objects. Destroy mobile stages of SLF by crushing them. Destroy eggs by smashing them or scraping them into a container of rubbing alcohol.

5. All businesses should get a permit issued through PDA. A permit provides evidence that you have completed training about how to follow the rules of the quarantine order and you agree to do all you can to ensure the items you transport are not carrying SLF. You will receive documentation for your vehicles to show that you have obtained the SLF permit from PDA. To obtain a permit, take the training online at **extension.psu.edu/spotted-lanternfly**. This is a "train the trainer" course to train designated employees (usually an owner, manager, or supervisor) within a company on how to comply with the quarantine regulations. The designated employee must then train fellow employees. In-person training and questions may be directed to **SLFPermit@PA.gov**.

6. Use the checklist for residents if you need to move items that are not included in a permit through a business. This checklist is a legal document to show that you have inspected the item, removed and destroyed any living life stages of SLF, and are in compliance. You can print the checklist, fill it out, sign it, and take it with you when you move the item(s). The checklist is available at **extension.psu.edu/spotted-lanternfly**.

7. If you sell plants, have them inspected by PDA to receive a phytosanitary certificate. Pennsylvania law requires horticultural businesses that produce and/or sell plants to have either a Nursery/Greenhouse License or a Nursery Dealer's License. When you have a license, plant inspectors will check your plants. For more information, see **www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/plant-health/Phytosanitary/Pages/default.aspx**.

8. If you sell and/or produce mulch, you must use specific practices to ensure it does not harbor SLF. The specific practices are outlined at **extension.psu.edu/spotted-lanternfly** under Spotted Lanternfly Management. You will need to enter into a compliance agreement with PDA.

These regulations do not apply to grass clippings or autumn leaf collection. We believe that the spotted lanternfly does not lay eggs on these lightweight objects. Clippings and leaves may be moved from the quarantined area if necessary, as long as the truck and/or trailer you are hauling them with has been checked.

The regulations of the quarantine order are in place to prevent the spotted lanternfly from being spread by people. This pest is not just a concern to agricultural and horticultural professionals, it is a community concern. To protect the agriculture industry, we need everyone to be aware of the best practices to avoid spreading the spotted lanternfly and use these practices in their daily activities.

You can find the official quarantine order, a summary in plain language, and more information at **www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/Entomology/spotted_lanternfly/quarantine/Pages/default.aspx**.

If you do not have access to the Internet, contact the Penn State Extension office in your county to receive copies of the checklist for residents or to access the online permit training.

Prepared by Emelie Swackhamer, horticulture extension educator.

Photo D: PA Department of Agriculture; all other photos: Emelie Swackhamer.

extension.psu.edu

Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

Produced by Ag Communications and Marketing

Code EE0232 R70M10/18mpc

Checklist for Residents Living in Spotted Lanternfly Quarantine Areas

IMPORTANT: Before you move outdoor items from the quarantine area, check for spotted lanternfly egg masses, adults, and nymphs. Make sure all items are pest free before you move them. Help keep this pest from spreading.

Check before you move

Recreational or Camping Items

- ☐ Backpacks
- ☐ Basketball backboards
- ☐ Bicycles
- ☐ Boats/Boat trailers
- ☐ Campers
- ☐ Ice chests
- ☐ Motorcycles
- ☐ Motor homes
- ☐ Recreational vehicles
- ☐ Snowmobiles
- ☐ Tarps
- ☐ Tents
- ☐ Other

Outdoor Household Items

- ☐ Barrels
- ☐ Cardboard or wooden boxes
- ☐ Outdoor poles
- ☐ Plant containers
- ☐ Firewood
- ☐ Propane or oil tanks
- ☐ Trash cans
- ☐ Refrigerators/Freezers
- ☐ Storage sheds
- ☐ Shutters
- ☐ Storm/Screen doors and windows
- ☐ Window awnings
- ☐ Outdoor furniture
- ☐ Other

Building Materials

- ☐ Bricks/Cinder blocks
- ☐ Cement mixing tubs
- ☐ Lumber
- ☐ Roofing materials
- ☐ Tools and toolboxes
- ☐ Workbenches
- ☐ Skidsters/Forklifts
- ☐ Pipes
- ☐ Other

Yard and Garden Items

- ☐ Dog houses, rabbit sheds, chicken coops, etc
- ☐ Barbecue grills
- ☐ Carts
- ☐ Cold frames
- ☐ Fencing
- ☐ Garden tillers
- ☐ Yard decorations
- ☐ Garden tools
- ☐ Backhoes
- ☐ Lawnmowers
- ☐ Signs and posts
- ☐ Storage sheds
- ☐ Tractors and trailers
- ☐ Trees, shrubs and plants
- ☐ Other

Children's Playthings

- ☐ Play houses
- ☐ Kiddie pools
- ☐ Bicycles, scooters
- ☐ Sandboxes
- ☐ Other

Checklist for Residents Living in Spotted Lanternfly Quarantine Areas

IMPORTANT: Before you move outdoor items from the quarantine area, check for spotted lanternfly egg masses, adults, and nymphs. Make sure all items are pest free before you move them. Help keep this pest from spreading.

If you find any of these life stages of the Spotted Lanternfly, remove, devitalize, place in a sealed bag, and dispose of bag in the garbage.

Adult Spotted Lanternfly, present in autumn months.

Spotted Lanternfly nymphs, present in spring and summer months. (Images from Park et al. 2009)

Fresh Spotted Lanternfly egg mass (outlined in red). Egg masses are present in autumn and winter months, blending in with their surroundings.

By signing this checklist, I am confirming that I have inspected my vehicle and those items I am moving from the Spotted Lanternfly quarantine area, and do not see any egg masses or insects in or on anything I am moving.

Signature _____ Address _____ Date _____

Please sign, date, and keep this checklist in your vehicle with you – use it each time you need it.

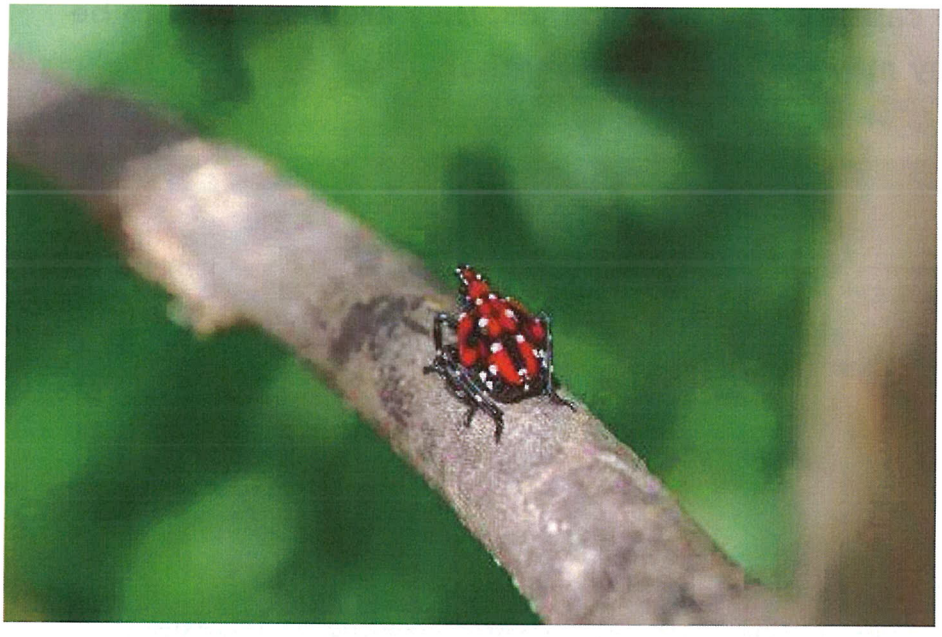
For more information, visit the Pennsylvania Department of Agriculture website:
www.pda.state.pa.us/spottedlanternfly

pennsylvania
DEPARTMENT OF AGRICULTURE

Using Traps for Spotted Lanternfly Management

If you have spotted lanternflies, you can wrap sticky bands around tree trunks to stop them. This fact sheet will tell you how to make or where to purchase sticky traps, how to install them, and ways to avoid bycatch.

ARTICLES | **UPDATED: APRIL 24, 2019**



Introduction

Spotted lanternfly (SLF), *Lycorma delicatula*, is an invasive planthopper, native to Asia, that was first detected in southeastern Pennsylvania in 2014. It feeds on and damages many plants, including economically important crops such as fruit trees, grapevines, hops, hardwoods, and ornamentals. If you have SLF on your property, you can use traps to kill them and possibly reduce damage to your trees. Currently, the most effective trap for SLF is a sticky band wrapped around the trunks of trees. SLF nymphs and adults are trapped in the sticky barrier as they crawl up from the ground onto the trunks and move upward to feed on the tree. Sticky bands are a non-chemical method of killing, they are relatively easy to install, and they can be a good option for residential landscapes. However, there are several important things to consider when installing a sticky band, especially how to avoid catching unintended, non-target creatures (e.g., bees, butterflies, and mammals), often referred to as bycatch. There is no way to prevent SLF from moving on to your property, and using traps alone may not eliminate SLF. Consult the Penn State

extension Spotted Lanternfly webpage for additional recommendations on management of this pest.

Installation

Only use tree banding where you see SLF feeding on trees or observe SLF crawling up the trees. Banding is not effective on bushes or most vines because they don't have a large enough diameter for the banding tape. Place the bands about 4 feet from the ground and tightly secured against the tree. Gaps below the band allow the SLF to crawl under the band and avoid being trapped. Secure bands by wrapping the material tightly, stapling it into the tree, or using pushpins. Bands on trees with deep grooves in the bark may not be as effective as bands on trees with smooth bark. We suggest banding infested trees as soon as SLF hatches (late April–June). While adult SLF can be captured by sticky bands, they are less likely to be trapped by some bands or they may avoid them altogether.

Figure 1. SLF nymphs stuck at the base of a sticky band.

How to Obtain Sticky Bands

Homemade Traps

There are some options to make your own bands. This includes using duct tape wrapped backward (sticky side out) and using pushpins to secure the duct tape. While this option might be cheaper, it tends to be less effective because it loses its stickiness quickly, especially if it rains. Another option is to wrap your tree in a thin (3-5 inches wide) plastic or water-resistant paper, secure it with pushpins or staples, and cover the paper with a sticky substance like commercially available products made of gum resins (e.g., petroleum jelly). If using petroleum jelly, take caution to not get it on the tree, as it may discolor the bark of the tree.

Purchased Traps

Sticky bands and tree banding glue are available commercially. They can be purchased online or at your local garden center or hardware store. To date, we have not found that any commercially available band is better than another.

Avoiding Bycatch

When banding for SLF, it is possible that you may accidentally trap nontarget animals, including beneficial insects, small mammals (bats, squirrels, etc.), small birds, and lizards. There are several practices you can use to try to reduce the risk of capturing these non-targets, especially the larger creatures. One option is to reduce the width of the band, thereby reducing the surface area that a non-target animal encounters (Figure 2A). This involves cutting commercially available bands in half or in thirds. Because SLF are trapped on the bands from the bottom up, this method can capture the same amount of SLF and will help your supply of banding material last longer.

Another option it to build a guard over the band out of wire (fencing, such as chicken wire, or mesh, such as window screening) to prevent larger animals from contacting the sticky surface (Figure 2B). Both of these methods have worked well to reduce bycatch. More detailed instructions on these methods can be found in the how-to video at " Spotted Lanternfly Banding ." The petroleum jelly method (described above) is not known to capture mammals. There is also a commercially

available band that uses a white fiber material to hold the inward-facing sticky side of the band away from the trunk of the tree. This creates a protected sticky surface, which reduces the potential of catching birds and other animals.

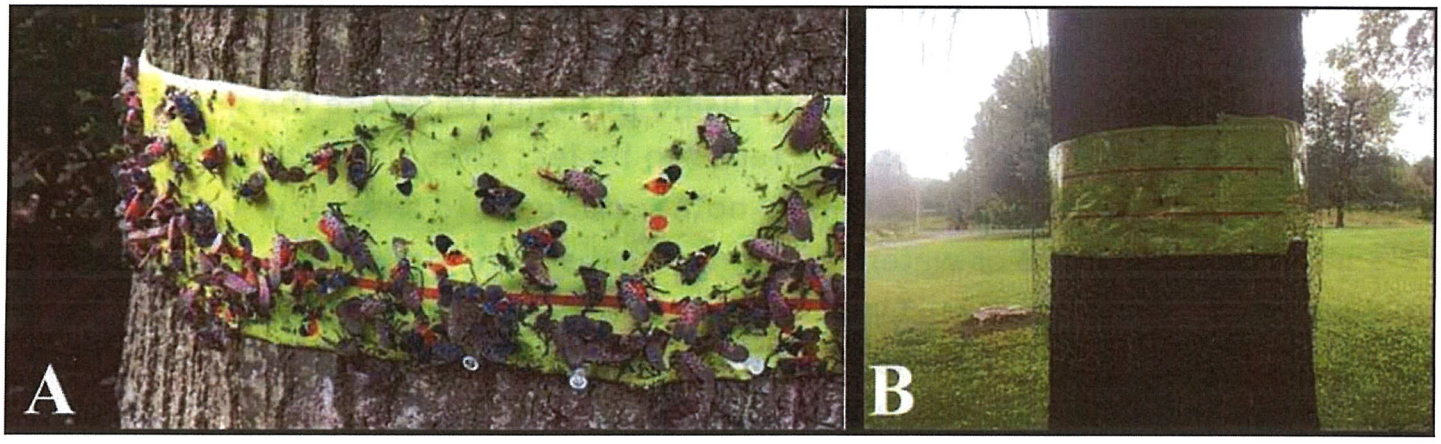


Figure 2. (A) A sticky band that has been cut in half to reduce the surface area and risk of vertebrate bycatch and (B) a sticky band that has been covered in a chicken-wire caging to prevent vertebrates from getting stuck on the band.

If you decide to use sticky bands, check them regularly (once per week). If you capture an animal, do not attempt to free it by yourself. You may put the animal and yourself in danger. If you wish to try to save the animal, cover any exposed sticky material with plastic wrap or paper to reduce additional entanglement, remove the band from the tree as carefully as possible, and take the animal to a wildlife rehabilitation center. Find a center at the Pennsylvania Association of Wildlife Rehabilitators website.

Note: Several different methods of killing and trapping SLF are being researched. Stay up to date on new and approved methods by visiting the Penn State extension Spotted Lanternfly webpage or contacting your county extension office.

This fact sheet was produced by Penn State Extension in collaboration with the Pennsylvania Department of Agriculture and the United States Department of Agriculture.

Background

Tree-of-heaven, commonly referred to as ailanthus, is a rapidly growing deciduous tree native to both northeast and central China, as well as Taiwan. It was first introduced into the United States in the Philadelphia area in 1784. Immigrants later introduced tree-of-heaven to the West Coast in the 1850s. It was initially valued as an urban street tree and was widely planted in the Baltimore and Washington, D.C., area. From these areas, tree-of-heaven has spread and become a common invasive plant in urban, agricultural, and forested areas.

Description

Size: Tree-of-heaven has rapid growth and can grow into a very large tree, reaching heights of 80 to 100 feet and up to 6 feet in diameter.

Bark: The bark of tree-of-heaven is smooth and green when young, eventually turning light brown to gray, resembling the skin of a cantaloupe.

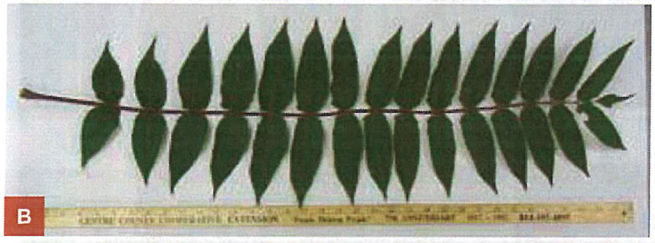
Leaves: Tree-of-heaven leaves are pinnately compound, meaning they have a central stem in which leaflets are attached on each side. One leaf can range in length from 1 to 4 feet with anywhere from 10 to 40 leaflets. The leaflets are "lance" shaped with smooth or "entire" margins. At the base of each leaflet are one to two protruding bumps called glandular teeth. When crushed, the leaves and all plant parts give off a strong, offensive odor.

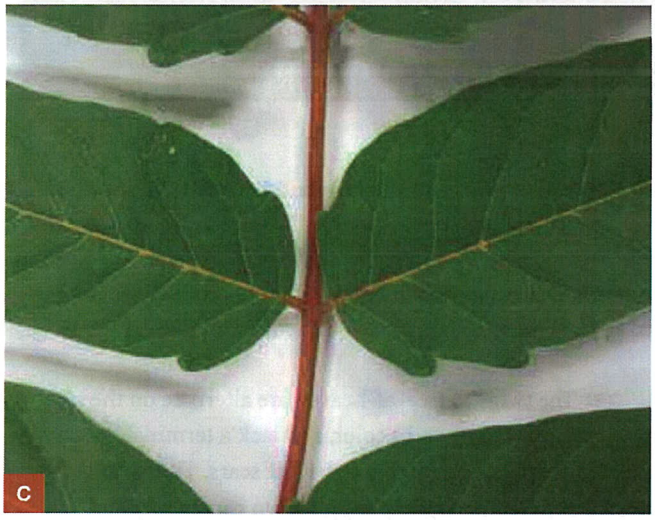
Twigs: The twigs of tree-of-heaven are alternate on the tree, stout, greenish to brown in color, and lack a terminal bud. They have large V- or heart-shaped leaf scars. The twigs easily break to expose the large, spongy, brown center, or pith.

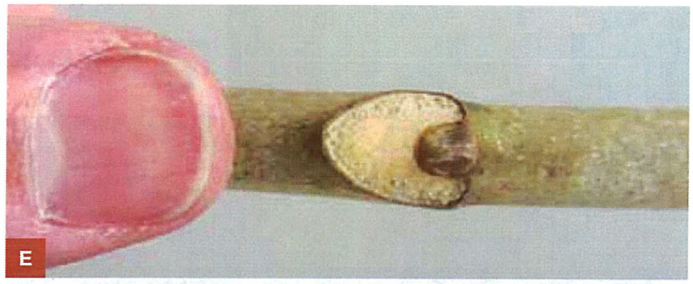
Seeds: Seeds on female trees are a 1-to-2-inch-long twisted samara, or wing. There is one seed per samara. The samaras are found in clusters, which often hang on the tree through winter.

Dispersal

Tree-of-heaven is dioecious, meaning a tree is either male or female, and typically grows in dense colonies, or "clones." All trees in a single clone are the same sex. Female trees are prolific seeders with the potential to produce more than 300,000 seeds annually. The single-seeded samaras are wind dispersed. Established trees continually spread by sending up root suckers that may emerge as far as 50 feet from the parent tree. A cut







A. Bark
B. Leaf
C. Leaf margin
D. Brown spongy pith
E. Leaf scar
F. Seeds (samaras)
G. Close up of seeds (samaras)

Photos by Dave Jackson

or injured ailanthus tree may send up dozens of root sprouts. Sprouts as young as two years are capable of producing seed. Tree-of-heaven produces allelopathic chemicals in its leaves, roots, and bark that can limit or prevent the establishment of other plants.

Site

Tree-of-heaven grows almost anywhere, from mine spoil in full sun to fertile, partly shaded, alluvial soils along rivers and streams. Besides urban areas, tree-of-heaven is now found growing along woodland edges, roadsides, railways, fencerows, and in forest openings. Tree-of-heaven is intolerant of shade and cannot compete under a closed forest canopy but will quickly colonize disturbed areas, taking advantage of forests defoliated by insects or impacted by wind and other disturbances.

Management Calendar

The management calendar for tree-of-heaven emphasizes late season treatment to maximize control of the roots.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bud Break				■								
Flowering and Seed Ripening						■	■					
Foliar or Stem Treatment							■	■	■	■		
Cutting after Treatment	■	■	■	■							■	■

Treatment and Timing

Prescriptions for controlling tree-of-heaven stress proper timing of operations to maximize injury to the roots. Improper timing will result in treatments that provide "top kill" (shoot injury) but little control of the roots. Product names reflect the current Pennsylvania state herbicide contract; additional brands with the same active ingredients are available.

Treatment	Timing	Herbicide	Product Rate	Comments
Foliar Application	July 1 to onset of fall color	AquaNeat (glyphosate) plus Garlon 3A or Vastlan (triclopyr amine)	3 quarts/acre plus 2 quarts/acre or 1.5 quarts/acre	The combination of glyphosate and triclopyr provides a broad-spectrum treatment that is effective against tree-of-heaven and other woody species that should also be targeted during the operation. This is a nonselective mixture, but it has little soil activity and poses little risk to nontarget organisms, and both products have aquatic labeling. A surfactant (e.g., Alligare 90) needs to be added. If using a different glyphosate product, be sure to check the product label to see if a surfactant is needed (some come premixed).
Basal Bark	July 1 to onset of fall color	Pathfinder II or Garlon 4 Ultra (triclopyr ester)	Ready-to-use or 20%, 1:4 in basal oil	Pathfinder II is a ready-to-use oil-based formulation of triclopyr used for basal bark applications. Treat stems up to 6 inches in diameter by wetting the entire circumference of the lower 12 to 18 inches, without runoff; apply a shorter band to small-diameter stems. This technique is best suited for treating small infestations or as a follow-up to treat surviving stems after a foliar application. If stems are larger than 6 inches in diameter, use hack-and-squirt.
Hack and Squirt	July 1 to onset of fall color	AquaNeat (glyphosate) or Garlon 3A or Vastlan (triclopyr amine)	Use either product undiluted or 1:1 with water	Glyphosate or triclopyr in water are effective for hack-and-squirt treatments. It is essential to space the cuts, leaving intact bark between them. If the stem is completely girdled, the herbicide cannot translocate to the roots. A simple guideline for the number of hacks is one per inch of diameter, with a minimum of two. Spray herbicide solution into hacks immediately using a squirt bottle, filling the cuts. This treatment is best suited for low stem numbers and stems at least 1 inch in diameter.

Look-alikes

This species is easily confused with some of our native species that have compound leaves and numerous leaflets, such as staghorn sumac, black walnut, and hickory. The leaf edges of these native trees all have teeth, called serrations, while those of tree-of-heaven are smooth. The foul odor produced by the crushed foliage and broken twigs is also unique to tree-of-heaven.

Control

Due to its extensive root system and resprouting ability, tree-of-heaven is difficult to control. Treatment timing and following up the second year are critical to success. Mechanical methods, such as cutting or mowing, are ineffective, as the tree responds by producing large numbers of stump sprouts and root suckers. When cutting tree-of-heaven is necessary to remove potentially hazardous trees, it is best to treat with an herbicide first, allow 30 days for it to take effect, and then cut.

Hand pulling young seedlings is effective when the soil is moist and the entire root system is removed. Small root fragments are capable of generating new shoots. Seedlings can be easily confused with root suckers, which are nearly impossible to pull by hand.

To control tree-of-heaven, target the roots with systemic herbicides applied in mid- to late summer (July to onset of fall color) when the tree is moving carbohydrates to the roots. Herbicide applications made outside this late growing season window will only injure aboveground growth. Following treatment, repeated site monitoring for signs of regrowth is critical to prevent reinfestation.

Herbicides applied to foliage, bark, or frill cuts on the stem are effective at controlling tree-of-heaven. Cut stump herbicide applications encourage root suckering and should not be utilized. Apply all treatments no earlier than July 1 up until the tree begins to show fall colors. There are many effective herbicides available for use on tree-of-heaven, including dicamba, glyphosate, imazapyr, metsulfuron methyl, and triclopyr. For most treatments we recommend using herbicides containing the active ingredients glyphosate or triclopyr.

Foliar herbicide sprays are used where tree height and distribution allow effective coverage without unacceptable contact with nearby desirable plants. Treatments are applied in mid- to late growing season with equipment ranging from high-volume truck-mounted sprayers to low-volume backpack sprayers.

For dense or extensive infestations, treat initially with a foliar application to eliminate the small, low growth. Then follow up with a bark or frill application on the remaining larger stems. The initial foliar application will control most of the stems, while the follow-up stem treatment controls missed stems or those too tall for adequate coverage.

Basal bark applications provide a target-specific method for treating tree-of-heaven that in general is less than 6 inches in diameter. Using a low-volume backpack sprayer, a concentrated mixture of herbicide containing the ester formulation of triclopyr in oil is applied from the ground line to a height of 12 to 18 inches, completely around the stem. To maximize translocation to the roots, apply herbicides from mid- to late summer.

Frill herbicide applications, called hack-and-squirt, are highly selective with a concentrated herbicide solution applied directly into the stem. For effective hack-and-squirt applications, apply the herbicide solution to spaced cuts around the circumference of the stem. Leaving uncut living tissue between the frill cuts allows the herbicide to move to the roots. Again, make applications in mid- to late summer.

Well-established tree-of-heaven stands are only eliminated through repeated efforts and monitoring. Initial treatments often only reduce the root systems, making follow-up measures necessary. Persistence is the key to success.

Human Health Concerns

Tree-of-heaven can affect human health. The tree is a very high pollen producer and a moderate source of allergy in some people. In addition, a few cases of skin irritation or dermatitis have been reported from contact with plant parts (leaves, branches, seeds, and bark) and products. Symptoms often vary and depend on several factors, including the sensitivity of the individual, the extent of contact, and the condition of the plant or plant product. There are rare reports of myocarditis (inflammation of the heart muscle) from exposure to sap through broken skin, blisters, or cuts. People who have extensive contact with the tree should wear protective clothing and gloves and be careful to avoid contact with the sap.

Prepared by David R. Jackson, forest resources educator, and Art Gover, research support associate, Wildland Weed Management Program.

extension.psu.edu

Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

Where trade names appear, no discrimination is intended, and no endorsement by Penn State Extension is implied.

This publication is available in alternative media on request.

Produced by Ag Communications and Marketing

Code EE0218 R15M02/19mpc

Pocono District, Pike County Office

514 Broad Street
Milford, PA 18337

570-296-3400 Phone
570-296-3406 Fax

PikeExt@psu.edu
Extension.psu.edu/pike

REGISTER NOW!

NPDES VIRTUAL WORKSHOP

for engineers

Friday, May 7, 2021
10:00am - 3:00pm
$15 per person

PDH CREDITS AVAILABLE

To register:
Visit the *Pike County Conservation District* or *Monroe County Conservation District* website to download registration form and payment link.
Email completed form and proof of payment to monroecd@ptd.net

Pike County
Conservation District
presents:

May 11th, 2021
4:00pm - 5:00pm
via Zoom

JAPANESE KNOTWEED 101

A FREE WEBINAR

TO REGISTER, GO TO
WWW.PIKECONSERVATION.ORG
OR SCAN THE QR CODE

Instruction for property owners, homeowners, and nature advocates on how to eradicate Knotweed.