Background

Tree-of-heaven, commonly referred to as ailanthus, is a rapidly growing deciduous tree native to a region extending from China south to Australia. 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)

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.

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 September) 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.

Prepared by David R. Jackson, forest resources educator.

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Code EE0218 05/18pod

Systemic insecticides work best when applied in the early summer (July) before the more mobile adults emerge. However, systemics can also be applied to kill adults later in the season, depending on the application method.

There are four main methods to apply insecticides: tree injection (applied by professional applicators), bark sprays, soil drenches, and direct sprays (can be applied by homeowners). The Pennsylvania Department of Agriculture and the U.S. Department of Agriculture are currently using the systemic insecticide dinotefuran as injections or bark sprays on tree-of-heaven to kill SLF. Both methods work well and have residual activity that lasts from several weeks to several months. Property owners should consider hiring a certified pesticide applicator to make insecticide applications. Professional applicators have specialized training and equipment to treat trees. Hiring a professional may reduce your risk of pesticide exposure and save time, but it may cost more than doing the application yourself.

Some insecticides available at your local garden or hardware store can be used as soil drenches, bark sprays, or direct sprays. Direct sprays of contact insecticides are applied to surfaces where SLF feeds and walks, which can include the base of a tree, such as tree-of-heaven, where spotted lanternflies are abundant. They can also be applied directly to SLF nymphs and adults. Systemic insecticides can be applied using any of the methods above, but keep in mind that systemics take time to move into the tree. Systemic pesticides should only be applied to trees actively growing, so they should not be applied in late fall or winter. You may apply systemic insecticides using a soil drench around the base of the tree, as a bark spray on the trunk of the tree, or as a direct spray on the leaves of the tree. Systemic insecticides can also be injected into a tree, but this requires special equipment by tree care professionals. Bark sprays have been shown to work well for SLF control, but some of these products also require being mixed with a penetrant, which allows the insecticide to penetrate the bark and move into the tree. There are penetrants available to homeowners, including Pentra-Bark. You must read the label of the insecticide you purchase to determine whether it should be used as a soil drench, bark spray, or direct spray.

Soil drenches of systemic insecticides are applied into the soil around the trunk of the tree. The insecticide is taken up by the roots and moved into the rest of the tree. Ideally, soil drenches work best when applied in the early summer to trees that had high SLF populations in the past and are likely to have them again. To protect pollinators, soil drenches of systemic insecticides should be applied after a tree's flowers have faded. Soil drenches and bark sprays may take several days or weeks to move within the entire tree, so you should not expect immediate results, as with contact sprays. Depending on the product and rates used, soil drenches and bark sprays have the advantage of longer residual activity (several weeks to several months) over contact insecticide applications.

In the table on the previous page, the name of the product is listed, along with the mode of exposure, legal use, activity ranking against SLF, and residual activity (how long it stays active). Specific products listed are not an endorsement. Please note that most currently available products are not registered for use on SLF. It is legal to use them as long as you follow the label instructions, but these products and/or their manufacturers are not liable for results when used against SLF. Research is ongoing to identify the insecticides that are most effective on SLF while posing the least risk to humans, pets, beneficial insects, and the environment. Additional field trials are being conducted to test the efficacy and residual activity of a wider range of the insecticides that are available to homeowners. We have not yet evaluated nontarget effects of listed insecticides on beneficial insects, including pollinators. We do not recommend treating your entire property since these insecticides are not specific to SLF and beneficial insects may be affected as well. Only treat areas where SLF is abundant.

These recommendations are current as of September 20, 2018, and may change as we learn more. We encourage you to stay up to date by visiting our website. Check the version of this fact sheet (listed below following the publication code number) and always look for the most up-to-date information. When using any pesticide, follow the pesticide label for directions, application rates, methods, and appropriate protective equipment.

Prepared by Heather Leach, spotted lanternfly extension associate; David Biddinger, tree fruit research entomologist and research professor; and Greg Krawczyk, extension tree fruit entomologist and research professor.

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

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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.

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This publication is available in alternative media on request.

Produced by Ag Communications and Marketing

Code EE0225 Rev80M10/18mpc

PennState Extension

Spotted Lanternfly Management for Homeowners

E. Smyers

Introduction

Spotted lanternfly (SLF), *Lycorma delicatula*, is an invasive planthopper, native to Asia, that was first detected in 2014 in southeastern Pennsylvania. It feeds voraciously on many plants, including economically important crops like fruit trees, grapevines, hops, hardwoods, and ornamentals. If you think you have SLF, do not panic! First, make sure the insect you are seeing is the spotted lanternfly. Second, learn about its life cycle and habits. Third, determine what plants it is infesting and what it is not. Fourth, employ management strategies at the proper time of the year.

Quick Facts

- SLF is a **destructive invasive pest**, threatening agricultural, timber, and ornamental industries, and the plants in your backyard.
- SLF is currently under **quarantine** in 13 counties in Pennsylvania.
- SLF **does not bite or sting**.
- **Stop the spread** of SLF by checking your car and any outdoor equipment (grills, mowers, firewood, etc.) when going in and out of the quarantine zone.
- Manage SLF on your property by **scraping eggs**, **banding trees**, removing the favored host (**tree-of-heaven**), and using **chemical control** when appropriate.

Identification and Life Cycle

There is one generation of SLF per year. The eggs are laid in the fall and hatch in the spring. Egg masses are laid on hard surfaces (trees, decks, houses, outdoor equipment, rocks, etc.) and protected with a mud-like covering. Each egg mass contains 30–50 eggs. After hatching and before reaching adulthood, SLF goes through four nymph stages. Nymphs are small (¼ to ½ inch) and can be hard to find. The first three stages (instars) are all black with white spots, and the last instar is red with white dots and black stripes (Figure 1). SLF adults emerge in July and are active until winter. This is the most obvious and easily detectable stage because they are large (~1 inch) and highly mobile. Adults have black bodies with brightly colored wings. Only the adults can fly. Because SLF adults jump more than fly, their wings often remain closed. SLF wings are gray with black spots, and the tips of the wings are black with gray veins.

Figure 1. The life stages of SLF, including an egg mass on a tree.

Current Distribution and Reporting

An SLF quarantine is currently in effect for 13 counties in Pennsylvania (Figure 2). If you find a spotted lanternfly, kill it and report it immediately with our online reporting system at **extension.psu.edu/spotted-lanternfly** or by calling 1-888-4BAD-FLY (1-888-422-3359).

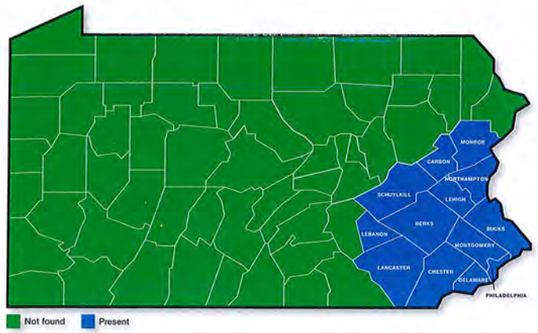

Figure 2. The distribution as of September 20, 2018, of SLF in Pennsylvania, indicated in blue. Check the Pennsylvania Department of Agriculture's website for updated distribution information.

Feeding Damage

SLF is capable of causing serious damage to its host, including oozing sap from the trees, wilting, leaf curling, and even death. SLF feeds using a piercing-sucking mouthpart tapped into the plant like a straw. When SLF feeds, it also excretes honeydew, or sugary water. This creates a sugary surface on and around plants that encourages the growth of black sooty mold. This mold is harmless to people but can cause damage to the plant. If you see black sooty mold or sticky areas on a plant or tree, it may be infested by SLF, but it could also be aphids, leafhoppers, planthoppers, or scale insects. Therefore, it is important to identify the cause of the mold, as control measures may differ for pests other than SLF. There is no way to prevent SLF from moving onto your property. Be aware that SLF is very mobile and management actions must be continuous to keep them controlled.

Management

Stop the Spread

When you travel in and out of the quarantine zone, check your car and outdoor equipment (grills, outdoor furniture, landscaping supplies, mowers, etc.). Check for SLF egg masses from late fall to early spring. Remember that egg masses may be underneath your car or in your wheel well. During all other times of the year, check for nymphs and adults, and keep your windows rolled up when you park. Don't store things or park under infested trees, and don't move firewood.

1. Stop the spread
2. Scrape eggs
3. Band trees to catch nymphs
4. Remove tree-of-heaven
5. Apply insecticides

Egg Scraping

Walk around your property to check for egg masses on trees, cement blocks, rocks, and any other hard surface. If you find egg masses on your property from September to May, you can scrape them off using a plastic card or putty knife (Figure 3). Scrape them into a bag or container filled with rubbing alcohol or hand sanitizer. This is the most effective way to kill the eggs, but they can also be smashed or burned. Remember that some eggs will be laid at the tops of trees and may not be possible to reach.

PA Department of Agriculture

Figure 3. Scraping SLF egg masses from a tree.

Tree Banding

When the nymphs first hatch, they will walk up the trees to feed on the softer new growth of the plant. Take advantage of this behavior by wrapping tree trunks in sticky tape and trapping the nymphs. Any tree can be banded, but we recommend only banding trees where SLF are abundant (Figure 4). Tape may be purchased online or from your local garden center. Push pins can be used to secure the band. While some bands may catch adults, banding trees is most effective for nymphs. Be advised that birds and small mammals stuck to the tape, while rare, have been reported. To avoid this, you can cage your sticky bands in wire or fencing material wrapped around the tree. Alternately, try reducing the width of the band, so that less surface area is exposed to birds and other mammals. Both of these methods will still capture SLF effectively. Check and change traps at least every other week (or more often in highly infested areas).

PA Department of Agriculture

Figure 4. A banded tree with SLF nymphs stuck at the bottom.

Host Removal

Tree-of-heaven (*Ailanthus altissima*) is an invasive plant, but it is common in landscape plantings and disturbed areas, such as along the sides of roads. This is the preferred host for SLF, and current management efforts are focused on removing this tree. Apply herbicide to the tree from July to September and wait at least 30 days before removing the tree. Failure to apply herbicide will result in new growth from the stump; even when treated, multiple applications may be necessary over time to completely kill the tree. These trees can get very tall, so seek the help of a tree care service if necessary. Tree-of-heaven is named because of its rapid growth; it can reach up to 100 feet tall and 6 feet in diameter. The bark of tree-of-heaven is similar to the outside of a cantaloupe. When crushed, the leaves put off a foul odor that many describe as rotten peanut butter. They spread by seed and will also produce "clones" by their roots. This tree can be mistaken for other native species, including black walnut, hickory, and staghorn sumac. For help identifying and treating this plant, visit **extension.psu.edu/spotted-lanternfly**. While tree-of-heaven is a preferred host, SLF feeds on a large variety of plants, including many of the trees in your backyard. Removing these may not be preferred; refer to the next section for further guidance.

Chemical Control

Only use insecticides that are registered by the Environmental Protection Agency (EPA) to treat any insect on your property. All EPA-registered insecticides have an EPA registration number and a label for appropriate and legal use. Home remedies should not be used against spotted lanternfly because they may be unsafe to humans, pets, and plants and could be illegal.

Insecticides can kill insect pests on contact and/or by being present systemically in a plant that the insect pests eat. The duration of control that remains after application (i.e., residual activity) varies depending on which type of insecticide is used. Contact insecticides kill SLF when the chemical contacts the insect as a direct spray or when the insect walks over a surface with insecticide residue on it. Systemic insecticides are absorbed by tree roots, bark, or leaves and are moved through its vascular system to other parts of the tree. When systemic insecticides are used, SLF is killed as it feeds on any part of the tree, even if it was not sprayed directly (e.g., spraying the lower part of the tree will protect the tree tops).

Active Ingredient	Mode of Exposure	Available Products	Legal Use	Activity Against SLF	Residual Activity
bifenthrin	contact	Talstar P	ornamental and landscape plants and trees	excellent	excellent
carbaryl	contact	Garden Tech Sevin Ready-to-Spray Bug Killer (note: new formulation is sold with zeta-cypermethrin)	vegetable and ornamental plants and trees under 10 feet tall	excellent	good
dinotefuran	systemic/contact	Safari 20SG, Transect 70 WSP, Zylam Liquid	ornamental and landscape plants and trees	excellent	excellent
insecticidal soaps*	contact	Garden Safe Insecticidal Soap	vegetables, fruit trees, ornamentals, shrubs, flowers, and gardens	good	poor
malathion	contact	Spectracide Malathion Insect Spray	flowers and bushes, fruit, and vegetables	excellent	poor
natural pyrethrins	contact	Garden Safe Multi-Purpose Garden Insect Killer, Natria Insect Mite and Disease Control	vegetables, ornamentals, trees, shrubs, and flowers	excellent	poor
neem oil*	contact	Bonide Neem Oil	flowers, ornamental trees and shrubs, fruit, nuts, and vegetables	good	poor
spinosad*	systemic	Bonide Captain Jack's Deadbug Brew	outdoor ornamentals, fruit, and vegetables	fair	poor
tau-fluvalinate, tebuconazole	contact/systemic	BioAdvance 3 in 1, Insect, Disease and Mite Control	nonedible plants only, groundcovers, vines, ornamentals, shrubs, and trees	excellent	good
zeta-cypermethrin	contact	Amdro Quick Kill Outdoor Insect Killer Concentrate	lawns, trees and shrubs, roses, and flowers	excellent	excellent

*Recommended for organic production.

Note: The listing of products in this table is not an endorsement or specific recommendation of the product or the company. Other products with the same active ingredient should also work in the same way, but they may have different rates or formulations.

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.

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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

PennState Extension

Spotted Lanternfly: Tips for Handling Yard Waste in Quarantined Areas

The invasive spotted lanternfly has been found in counties in southeastern Pennsylvania. We are trying to contain and control this pest with the goal of future eradication. A quarantine order is in place that prohibits the movement of any living life stage of this insect to areas outside the quarantined area. For information about identifying the spotted lanternfly, where it is known to exist, the quarantine order, and compliance, go to **extension.psu.edu/spotted-lanternfly**.

Learn how to identify spotted lanternfly and report it. Report any capture, photos, or sightings of this insect to **extension.psu.edu/spotted-lanternfly** or 1-888-4BAD-FLY (1-888-422-3359).

Know which counties are included in the quarantine order. Additional counties will be added if new discoveries occur. Check **extension.psu.edu/spotted-lanternfly** for the current quarantine map.

Avoid moving this insect on woody plant debris (e.g., fallen trees or branches and tree trimmings) and any living plants, equipment, building materials, or other objects. Businesses may avoid possible fines by obtaining a spotted lanternfly permit through the Pennsylvania Department of Agriculture (PDA). To obtain a permit, complete 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.** Plant nurseries, nursery stock dealers, and mulch producers should contact their plant inspector for compliance information. In-person training and questions may be directed to SLFPermit@PA.gov.

Inspect yard waste and other items and destroy egg masses. Destroy egg masses by scraping and covering them in alcohol, crushing them, or burning them.

Noncommercial residents should use the compliance checklist when moving items from within the quarantined area to outside areas (see **extension.psu.edu/spotted-lanternfly**).

When working in the quarantined area, if possible chip all woody debris on-site to no larger than 1-inch pieces in each of two dimensions. Even within the quarantined area, moving chips is a better practice than moving larger woody debris. Movement of fallen leaves is not regulated under the spotted lanternfly quarantine, but please check for and destroy any egg masses on leaf bags and containers.

If you can, leave all chips or woody debris on-site. The next best option is to take chips or debris to an organic materials recycler within the quarantined area.

To kill viable insects or eggs in chipped material, the composting procedure below must be followed before moving material out of the quarantined area:

1. Compost piles must be a minimum of 200 cubic yards.
2. Internal temperature at a depth of 18 inches must reach 140°F (60°C) for four continuous days.
3. After the interior of the pile is successfully heat treated, the exterior of the pile needs to be rotated to the center. Using a front-end loader or a bulldozer, remove the outer layer of the compost pile to a depth of 3 feet.
4. Start a second compost pile using the recently removed cover material as a core.
5. Cover this second compost pile by moving the core material from the first compost pile as a cover at least 3 feet deep.
6. Allow the second compost pile to remain undisturbed until the temperature reaches 140°F (60°C) for at least four continuous days.
7. After the chips have been successfully composted according to these directions, the resulting composted material meets compliance requirements.
8. Mulch being offered for sale and moved out of the quarantined area must be certified by PDA. Contact your regional plant inspector for information.

Prepared by Emelie Swackhamer, horticulture extension educator.

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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.

This publication is available in alternative media on request.

Produced by Ag Communications and Marketing

 Code EE0233 20M09/18mpc

STOP THIS INVADER!

SPOTTED LANTERNFLY

Adult (with wings closed) can be found July–December

PA Department of Agriculture

Nymph (early stage) can be found late April–July

PA Department of Agriculture

Egg mass (fresh) can be found September–December

PA Department of Agriculture

Adult (with wings open) can be found July–December

PA Department of Agriculture

Nymph (late stage) can be found July–September

PA Department of Agriculture

Egg mass (older) can be found January–June

Emelie Swackhamer

THIS INVASIVE INSECT POSES A SIGNIFICANT THREAT to Pennsylvania agriculture, including the grape, tree fruit, hardwood, and nursery industries, which are collectively worth nearly $18 billion to the state's economy.

REPORT spotted lanternfly sightings at **extension.psu.edu/spotted-lanternfly**.

DESTROY all life stages that you find. Check your car and outdoor equipment before traveling.

SHARE your knowledge with others!

For more information, visit **extension.psu.edu/spotted-lanternfly** or call 1-888-4BAD-FLY (1-888-422-3359).

PennState Extension

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USDA United States Department of Agriculture

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Produced by Ag Communications and Marketing U.Ed. AGR 19-13 Code EE0231 rev1M10/18mpc