MDAR
MASSACHUSETTS DEPARTMENT OF AGRICULTURAL RESOURCES

SPOTTED LANTERNFLY:

Management Guide for Infested Areas

BACKGROUND: Spotted lanternfly ("SLF", scientific name *Lycorma delicatula*) was accidentally introduced into the United States around 2014, on shipments of crushed stone sent to a business in Pennsylvania. Since then, this pest has been unintentionally spread to other states in many ways, including by hitchhiking on vehicles, nursery stock, and sheds and other outdoor equipment.

FOUR THINGS YOU NEED TO KNOW ABOUT SPOTTED LANTERNFLY (SLF):

1. SLF is an invasive pest that can harm agriculture and make it unpleasant to be outside
2. SLF does not bite, sting, or otherwise harm people or pets
3. If you are in an area with a known infestation of SLF:
   - Check your property for SLF and its favorite host plants, tree-of-heaven and grape
   - Consider setting up traps, hiring someone to treat for SLF, or whether removing the tree-of-heaven on your property is possible (see **LIVING WITH SLF** below for details)
4. If you see SLF outside of a known infested area, take a picture and click the "Report" button at https://www.mass.gov/slf (Not sure? Check this map: https://bit.ly/SLFDashboard)

WHAT TO LOOK FOR:

Spotted lanternfly's appearance changes over the course of the year. Here's what to look for:

EGG MASSES *(September-June)*



Flat, gray masses, about an inch long, usually covered with a gray or beige waxy coating, and containing rows of tiny eggs. Can be found on trees or any other flat or smooth surface outdoors.

YOUNG NYMPHS *(May-July)*



Tiny, wingless insects that are black with white spots. Also called "early instar" nymphs.

OLDER NYMPHS *(July-September)*



Small, red, wingless insects with black and white spots. Also called "late instar" nymphs.

ADULTS *(August-December)*



Look for large insects, at least 1 inch long, that have grayish wings with black spots, and a set of hindwings underneath marked with a large red patch.

A hard freeze kills off any remaining SLF at the end of the year, but their egg masses will survive to hatch the following spring. Typical New England winters are not cold enough to harm SLF egg masses.

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IMPACTS OF SPOTTED LANTERNFLY

AGRICULTURE: Because grapevines are a preferred host plant for SLF, the biggest impact from this pest is expected to be in vineyards or natural areas where there is a lot of wild grape. Spotted lanternfly adults have also been observed to swarm in large numbers in fruit orchards, causing problems during harvest and impacting operations at pick-your-own orchards. Nymphs have been observed feeding on nursery plants and other agricultural crops.



Wine grapes infested with SLF

GARDENING AND THE NATURAL ENVIRONMENT: Spotted lanternfly is a sap-feeding insect that feeds on over 100 different plant species. The plants most at risk are its preferred host: grapevines, black walnut, and tree-of-heaven. Grapevines can be killed by as little as one season of SLF feeding, while the impact to black walnut and tree-of-heaven is only severe when they are small saplings. The long-term impact on other plants varies from species to species, and is still being studied.



Heavily infested tree covered with honeydew and fungal growth

QUALITY OF LIFE: Heavy infestations of spotted lanternfly may discourage you from spending time in your yard or visiting natural areas, especially while the adults are swarming in late summer. The sticky waste product produced by these insects, known as honeydew, accumulates all over plants, vehicles, yards, and anything else underneath where SLF is feeding. Honeydew is extremely difficult to wash off, attracts stinging insects, and leads to the growth of a fungus known as sooty mold, which can stunt plant growth if it covers the leaves and is slippery on flat surfaces. SLF honeydew has also been found to cause the growth of other fungi and bacteria that have a bad odor.

People often ask if spotted lanternfly bites, stings, or is otherwise dangerous. SLF cannot sting and is not known to bite or attack people or animals. While it is best to avoid letting your pet consume a large number of any insect found in the wild, there is no scientific evidence that spotted lanternflies are poisonous if ingested. Consult with your pet's veterinarian if you have additional concerns.

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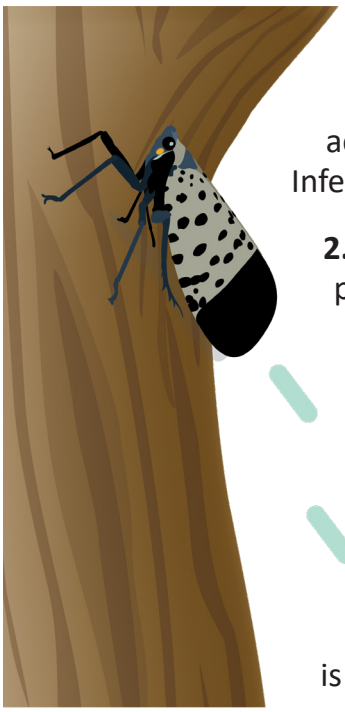
STATE EFFORTS TO DEAL WITH SLF

The Mass. Department of Agricultural Resources (MDAR) has a team of inspectors that monitor high risk pathways, survey areas where SLF has been found, and respond to reports from the public. When a new population is found, these teams carefully survey the area to determine the extent of the infestation. If you or someone near you find SLF, you may see survey crews from MDAR, their partners at the U.S. Department of Agriculture (USDA), or the Massachusetts Department of Conservation and Recreation (DCR) checking trees in your area. Surveyors have the regulatory authority to inspect for SLF (**M.G.L. c. 128, Section 24**), but will ask for permission before entering a property. If property owners are not home at the time of the survey, the team will typically leave information at the door and then check the property for signs of SLF. MDAR may also ask permission of property owners to set up traps to monitor for SLF.

Property owners should review the **LIVING WITH SLF** section below to determine how best to manage SLF infestations on their own property. State resources are limited, but for certain high-priority infestations, MDAR may assist with management efforts, including monitoring, pesticide treatments, tree removals, and/or training of property owners to prevent SLF from leaving the area. Even if we cannot fully eradicate spotted lanternfly, slowing the spread of this pest allows more time to develop better management methods, and gives us the chance to lower the impact if SLF becomes established throughout Massachusetts.

LIVING WITH SLF

Dealing with SLF on your property can be challenging, depending on how heavy the level of infestation gets and how much tree-of-heaven you have on or near your property. Practice the following three steps to minimize the impacts of this pest:



1. **INSPECT:** Check trees and any other items on property that could have SLF adults, nymphs, or egg masses. Avoid parking under infested trees, and inspect your vehicle before leaving your property, so that you do not accidentally spread SLF to new areas. Use our Checklist for Residents In or Near Infested Areas (**https://bit.ly/SLFResidentGuide**) for a detailed inspection list.

2. **MONITOR:** Identify any preferred host plants of spotted lanternfly on your property. For all SLF life stages, this includes tree-of-heaven, grape, and black walnut. For the nymph stages, you should also check poison ivy and Asiatic bittersweet. In the fall, the adults may also gather on maple and birch trees. Use the "What to Look For" chart on page one of this guide to know which stages to look for at which times of the year.

3. **MANAGE:** There are several options for managing an SLF infestation, depending on the level of infestation, the resources you have available, and whether you have host plants on your property. A detailed description of the choices you have available is provided in the **TOOLS FOR MANAGING SLF** section below.



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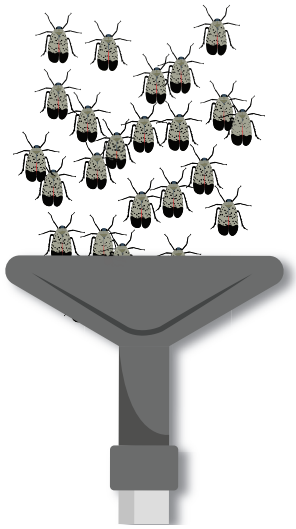
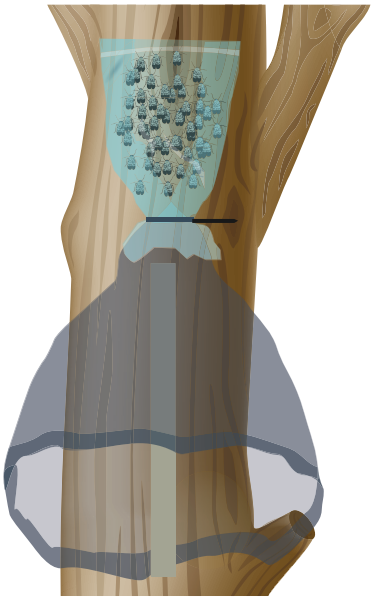
TOOLS FOR MANAGING SLF

NON-CHEMICAL MANAGEMENT



Vacuuming: SLF can be removed from an area using a shop vacuum or other type of canister vacuum. Vacuum the spotted lanternflies off the surfaces they are resting on, being careful not to damage delicate leaves or new plant growth. Although most of the spotted lanternflies will be killed by the vacuuming process itself, some may survive. Leaving them in the canister for a day or two before emptying will ensure that they are all dead. Make sure to empty and clean the vacuum shortly after that, otherwise the dead lanternflies may start to rot and smell, especially in high temperatures. You can also transfer the contents of the vacuum into a trash bag, seal it, and place it in a freezer for at least 24 hours to euthanize any SLF that are still alive.



Circle trap

Traps: There are two main types of traps used to catch spotted lanternfly: circle traps and sticky bands. Both traps are placed on trees and use the natural movement of SLF up and down the tree over the course of the day to catch the insects. If you decide to use sticky bands, be sure to place a raised guard of mesh wire around it to prevent birds, bats, and other nontarget animals from being caught on the sticky surface. You can learn how to build both types of traps here: https://bit.ly/SLFTrapping.



Sticky band with mesh guard



Adult/Nymph Removal: If you see small numbers of SLF adults or nymphs, especially on vehicles or on materials being moved out of an infested area, squish or smash the insects to destroy them. Hand removal of insects is not effective to control larger infestations.

Egg Mass Removal: Egg masses can be destroyed by scraping them off the surface you find them on, using a plastic card or putty knife. Press down and squish the eggs as you scrape them, pressing until they pop to ensure you've crushed them. Or scrape the egg masses directly into a plastic bag or other container filled with rubbing alcohol or soapy water, and leave them for at least 24 hours before disposing of them. Be sure to check any flat surface for egg masses, not just trees.

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MORE ABOUT MANAGEMENT

HOST TREE REMOVAL



Tree-of-heaven (Ailanthus altissima)

Property owners often ask whether it makes sense to cut down tree-of-heaven or other SLF host plants, especially because tree-of-heaven is itself an invasive species. Removing host plants can have benefits, such as decreasing the accumulation of honeydew and sooty mold, but is not likely to permanently reduce levels of SLF on your property. Tree-of-heaven can also be difficult and costly to kill, so this may not be an option for all property owners.

If you do decide to remove tree-of-heaven, an herbicide must be used to kill the root system. One cost-saving option would be to target only female tree-of-heaven for removal, to prevent additional seed production. Any male plants that remain can be treated with a systemic insecticide (see **CHEMICAL CONTROL** section below) that will kill SLF as it feeds. An experienced company with licensed herbicide applicators is typically needed to assist with tree-of-heaven removal, especially if the trees are growing against buildings or other tricky places. If you decide to try to remove tree-of-heaven on your own, take care to avoid getting the sap of this plant on your skin. For detailed instructions on dealing with tree-of-heaven, see this guide from Rutgers University Extension: **https://bit.ly/TOHremoval**

CHEMICAL CONTROL

MDAR recommends that residents only use chemical treatments in areas with heavy infestations of spotted lanternfly, and in cases where no other management techniques would be effective.

Pesticide applications to kill spotted lanternfly are best done by a trained and licensed pesticide applicator. Ensure any company you hire has licensed individuals making the application. If you decide to use a pesticide on your own property, be sure to read and follow the label directions carefully. This will help to ensure the product is effective and being used in a safe manner. All applications, whether done by you or someone you hire, should be done in accordance with state law and regulations (see **https://www.mass.gov/law-library/333-cmr**).



There are several types of pesticide applications that can be conducted, depending on the life stage of SLF and the time of year:

TREATING SLF ADULTS OR NYMPHS

- **Contact insecticide:** Products containing the following active ingredients have all been shown to effectively kill SLF when the insect comes into contact with the pesticide:
  - **Bifenthrin** (pyrethroid)
  - **Beta-cyfluthrin** (pyrethroid)
  - **Carbaryl** (carbamate)
  - **Natural pyrethrins**
  - **Zeta-cypermethrin** (pyrethroid)

  Some products may have residual activity, where any SLF that come into contact with the treated area will be killed for up to 2 weeks after an application. Contact insecticide should be applied to plants after they have flowered, and may have limited effectiveness if applied after October, when insect activity decreases.

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MORE ABOUT MANAGEMENT

CHEMICAL CONTROL, cont'd

- **Systemic insecticide:** Products containing active ingredients like **dinotefuran** or **imidacloprid** (both neonicotinoids) can be applied to plants or to the soil around the plants and are taken up by the roots, stems, and leaves, so that any SLF that feed on the plants are killed. Systemics typically last longer than contact products but take time to move through a plant, especially larger trees, and should only be applied when the plants are actively growing but have finished flowering (in Massachusetts, typically July through September). Products that contain dinotefuran and imidacloprid must be applied by a licensed pesticide applicator.

TREATING SLF EGG MASSES

- **Contact ovicide: Horticultural oils** (either petroleum-based products or vegetable-derived products containing soybean or other oils) applied to egg masses in late winter or very early spring have been shown to have some control of SLF, and may be useful to treat egg masses in cases when it is too difficult to scrape them off. Oils are often a less toxic option compared to other pesticides, but must be applied at a high volume and in correct weather conditions to be effective. These products are best applied by a licensed professional and anyone using them should take care to follow the instructions on the label.

For detailed information about treatment options, see this guide from Penn State Extension: **https://extension.psu.edu/spotted-lanternfly-management-guide**



SLF egg masses on a birch tree



SLF egg masses may be hiding on any flat surface. Check outdoor furniture, playground equipment, and vehicles.

HAVE QUESTIONS?

Latest Massachusetts SLF info: **mass.gov/slf**
For other questions, email **slf@mass.gov**

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Credits: Portions of this guide are based on the Spotted Lanternfly Management Guide from Penn State University Extension (**https://extension.psu.edu/spotted-lanternfly-management-guide**). Additional images are from PSU Extension, USDA APHIS-PPQ, and MDAR staff.