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Spotted Lanternfly Management for Landscape Professionals

Photo Credits: CAES

Introduction

Spotted lanternfly (SLF), *Lycorma delicatula*, is an invasive planthopper that was first detected in North America in 2014 in southeastern Pennsylvania. It is native to parts of Asia. SLF is found throughout the state of CT and in many other states. SLF feeds on economically important crops such as grapevines, hops, and several tree species. Heavy SLF feeding has contributed to the death of grapevines, the invasive tree *Ailanthus altissima* (tree-of-heaven, or TOH), and black walnut saplings. SLF feeding can stress plants, cause localized branch damage, and may contribute to the long-term weakening of established plants and trees, it has not been seen to directly kill other plants. In ornamental landscapes, SLF is currently considered to be primarily a nuisance pest. To protect vulnerable plants and industries, it is important to avoid spreading SLF to new areas. Many affected states, including Connecticut, have enacted quarantine orders to prevent or slow accidental human assisted spread of SLF. The quarantine orders require any items being moved from known infested areas be inspected and SLF destroyed before shipment. The quarantines affect all residents and businesses. Movement of materials from within an SLF restricted area by a nursery or other business should be under permit or compliance agreement. Homeowners and moving companies should use the checklist available on the CAES SLF webpage. Complying with the quarantine requires businesses to inspect and take actions to prevent accidental spread. While there are some costs to inspect items being shipped, costs for controlling SLF in plant production nurseries, vineyards, shipping facilities, and other businesses, could be significant.

Identification and Life Cycle

There is one generation of SLF per year in Connecticut (Figure 1). The eggs are laid in the fall (September to November) and hatch

***This fact sheet is based on the text and template produced by Penn State Extension in collaboration with the Pennsylvania Department of Agriculture and the United States Department of Agriculture. Portions edited, rewritten, and updated for Connecticut. Material used with permission.**

in the spring (late April to June). Egg masses are laid on many surfaces (trees, decks, houses, outdoor equipment, rocks, etc.) and

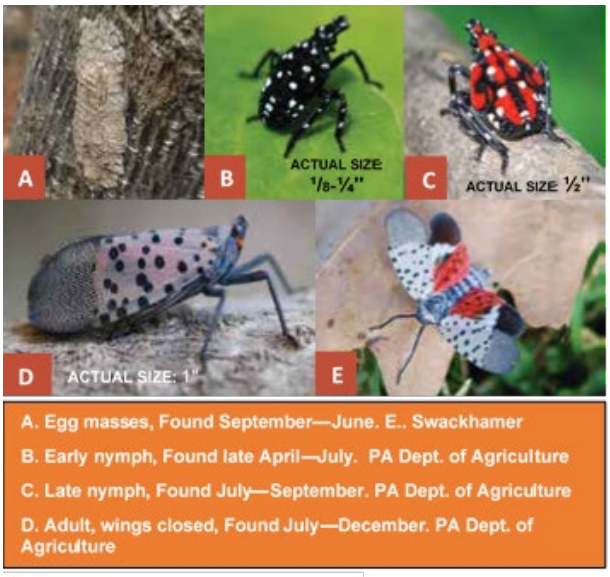

Figure 1. The life stages of SLF.

protected with a mud-like covering. Each egg mass contains an average of 35 to 40 individual eggs. After hatching and before reaching adulthood, SLF goes through four nymphal stages called instars. Newly hatched nymphs are small (~1/8 inch) and can be hard to find, often being mistaken for small ticks or spiders. With each molt to the next instar, the nymphs roughly double in size. The first three instars are black with white spots. The last (fourth) instar is red with white dots and black stripes and roughly 1/2 inch long. SLF nymphs and adults are strong jumpers. In Connecticut, SLF adults begin to emerge in July and remain active as adults until they are killed by the first hard freeze in the late fall. Adults are the most obvious and easily detectable stage because they are large (about 1 inch) and highly mobile. Adults have black bodies. Their forewings are gray with black spots, and the tips are black with gray veins, while their hindwings are red, black, and white. Only the adults have wings and can fly. However, because SLF adults walk more than fly, their wings often remain closed, leaving only the forewings visible. This makes them more difficult to identify in low numbers, from a distance, or when they are high in a tree.

Current Distribution and Reporting

Spotted lanternfly has been found throughout CT and in many other states. **If you suspect you have found a SLF, snap a picture of it and file a report at [Connecticut Spotted Lantern Fly (SLF) Reporting (arcgis.com)]** The reporting portal may be reached by scanning the QR code above. You will be able to include your contact information, and upload photos, but you will not be contacted. All reports are confidential. Businesses should use the SLF checklist (slf-check-list.pdf (ct.gov) if moving items out of a regulated area to ensure no insects accompany the move.

Feeding Damage

SLF feeds on plant sap (which is contained in the phloem tissue) using a piercing-sucking mouthpart. They acquire nutrients from the plant sap and also rely on associated bacteria in their guts to support their nutritional requirements. The sap they ingest contains high amounts of carbohydrates (sugar), which is not completely digested by the insect. They excrete the excess as a waste substance called honeydew, which can build up below the feeding insects. On sunny days, honeydew can be seen falling from trees, resembling a light rain. Honeydew is attractive to ants, wasps, bees, and other sugar-loving insects. As the honeydew accumulates, it is often colonized by sooty mold (fungi). Sooty mold does not directly

harm plants or the surfaces on which it grows, but it does block photosynthesis in affected plant leaves. With dense groupings of SLF, understory plants may die because of the sooty mold buildup on their leaves. Sooty mold frequently stains objects such as tree trunks, decks, patios, and vehicles that are underneath affected trees. These stains can be very difficult to remove. Consequences of direct feeding damage by nymphs and adults to the host trees vary greatly by host species, numbers of SLF feeding, and environmental conditions. Death of some TOH and branch dieback on other ornamental trees has been reported in cases of high infestation levels. Some physical damage beneath the bark on branches following heavy feeding has been observed. Based on experiments in Pennsylvania in 2019 and 2020, high levels of adult SLF feeding were found to reduce the photosynthetic activity of some trees. It is possible that after heavy feeding, multiple years of sustained damage, or in particularly dry years, SLF may cause significant damage to ornamental and shade trees.

Seasonal Host Phenology

SLF has an extremely broad host range and has been recorded feeding on over 70 different plant species. Conifers are generally not considered to be good hosts for SLF. Despite their broad host range, some plants appear to be more favorable to SLF than others, and host preference has been linked to life stage. Numerous variables appear to determine the attractiveness of a particular plant, the most important being what plants species are available or absent in the nearby landscape. Additional factors include the health of the plant, time of year, the SLF population size, and how long SLF has been present in the area. Nymphs have an especially large host range that includes perennials and any new and tender plant growth, whereas adults seem to depend more on certain hosts, primarily woody stems of trees and mature vines. **Not every tree needs to be treated.** Researchers have repeatedly observed strong host preference for specific tree species, though the exact trees will be dependent on the surrounding landscape. In 2020, more than 200 trees were assessed for SLF in a 0.1-square-mile shopping center in Pennsylvania. While only 31 percent of the trees were red maples, they held over 94 percent of the SLF population. **Scout the area first and then consider treating if high populations are found and persist.** Table 1 represents the key plant hosts of SLF and the time at which they are most likely to be found on these hosts; it does not represent a comprehensive list of what SLF feeds on, but rather the patterns of SLF feeding that have been observed through the season. As plants begin to senesce at the end of the growing season, they are less likely to serve as hosts for SLF. The patterns of host use may change with varying weather conditions, by region, or due to yet unknown factors. Please note that while TOH (*Ailanthus altissima*) is a strongly preferred host, it is not a required host in the development of SLF. However, preliminary evidence suggests that access to TOH may speed SLF development time and improve fitness. Access to multiple host plant species rather than a single host species, regardless of TOH availability, has also been shown to improve fitness.

Table 1. Key plant hosts of SLF throughout the growing season.

Host	Nymphs			Adults		
	May	June	July	August	September	October
Rose (cultivated, multiflora, etc.)						

Grape (wild and cultivated)						
Tree-of-heaven						
Black walnut, butternut						
River birch						
Willow						
Sumac						
Silver/red maple						

Population Fluctuations

In newly infested areas, SLF populations tend to increase steadily over several seasons, and preferred individual host plants tend to remain consistently favored from year to year. However, observations of populations near the original introduction indicate that numbers can drastically drop or rebound from season to season. It is believed that population density, host fitness, natural enemies, and weather conditions play a role in these fluctuations, but further research is needed. Unfortunately, after a season of low population numbers, it is not uncommon to see an increase in population the following year. In some cases, population numbers may not increase until the late fall in a particular neighborhood, just prior to egg laying, making preemptive treatment timing very difficult. Distance traveled by individual insects in the course of a season is not yet known, but it is suspected to be miles.

Management

Cultural Control
Removing Preferred Host Plants

Tree-of-heaven (*Ailanthus altissima*) is an invasive plant that is common in landscapes and disturbed areas, such as along the sides of roads. This is a preferred host tree for SLF, and removing it or using it as a trap tree by treating it with insecticide can be part of SLF management. Tree-of-heaven grows rapidly; it can reach up to 100 feet tall and 6 feet in diameter. This tree can be mistaken for other native species, including black walnut, hickory, and staghorn sumac. For help identifying and controlling this plant, a tree-of-heaven identification fact sheet is available on the CAES website. While removal of SLF and other host plants to manage populations of SLF is unclear, tree removal can prevent honeydew and sooty mold accumulation on property beneath infested trees. SLF aside, removal of TOH is suggested when practical because it is invasive in the United States and has other negative environmental effects. If removing trees, some male TOH can also be left alive as trap trees and treated with a systemic insecticide to kill SLF as they feed. TOH is a dioecious plant, meaning there are separate male and female trees. Keeping and systemically treating only the male trees where possible can prevent females from reseeding the area. When removing TOH, use a herbicide to kill the root system. However, removal of TOH or other host plants is unlikely to consistently reduce SLF numbers.

Don't Spread SLF

When you travel in and out of restricted areas, don't forget to check your truck and any equipment used (landscaping supplies, mowers, etc.). Check for SLF egg masses from September through June. Remember that egg masses may be underneath your truck or in your wheel wells. 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.

Using Traps

Traps can capture and kill SLF on individual trees. Trapping is a mechanical control method that does not use insecticides. You may catch a

lot of SLF with a trap, but because they move around in the landscape, **trapping will not prevent more SLF from coming to that tree.** Also, because we do not yet understand how different amounts of SLF feeding affect the health of specific trees, there is currently no way to determine if trapping SLF will have a significant protective effect.

This method will probably not significantly reduce the greater population of nymphs outside of the trap area, nor will it likely reduce the number of adult SLF you see later in the year.

Traps are used to intercept SLF nymphs and adults as they crawl up the tree trunk. We suggest setting traps as soon as SLF hatch (late April through June). Traps can capture large numbers of nymphs. While adult SLF can also be captured by tree traps, they may avoid them, resulting in less effectiveness later in the season. Two types of traps are often used to capture SLF: sticky bands and a funnel-style trap called a "circle trap."

Figure 2. Late stage SLF nymphs. Photo credit: Victoria Smith, CAES

Sticky Bands

Sticky bands capture SLF in sticky material as they move up the tree (Figures 2, 3). Several types of sticky bands are available for purchase online or from your local garden center. **Sticky bands have a major drawback: the sticky material can capture other insects and animals**, including birds, small mammals, pollinators, butterflies, and more. To reduce the possibility of bycatch, a wildlife barrier of vinyl window screening or other protective material must be installed (Figure 3). A barrier made of chicken wire is not as effective because it can allow beneficial insects and small birds to pass through. Secure the screening to the tree above the sticky band with pushpins and leave it open at the bottom. It should extend several inches above and below the sticky band and be close to the tree at all points to prevent larger creatures from flying or climbing underneath. If you decide to use sticky bands, check them regularly (daily if possible). If an animal is captured, do not attempt to free it by yourself—you may put the animal and yourself in danger; consult a wildlife rehabilitator (see the Connecticut Wildlife Rehabilitators Association website, home - CWRA (cwrawildlife.org). There does not appear to be any differences in efficacy between commercially available sticky bands at catching SLF. 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 that reduces the potential of catching birds and other animals. Homemade bands using products like duct tape or petroleum jelly on water-resistant paper are less effective than commercially available sticky bands because they lose their stickiness easily and can allow SLF to escape.

Table 2. Select management options appropriate for the time of year.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Don't move any life stage												

Scrape/smash eggs												
Use tree traps												
Contact insecticides[a]												
Systemic application imidacloprid[b]												
Systemic application of dinotefuran[b]												

[a]after hatch and avoid bloom; [b]Professional licensed application only

Figure 3. A banded tree covered in window screening to prevent mammal and bird bycatch. Note that the screening must remain open at the bottom to allow SLF to enter. *Photo by Elizabeth Finley.*

Figure 4. A funnel-style trap wrapped around a tree to capture SLF. *Photo by Emelie Swackhamer*

Emelie Swackhamer

Circle Traps

A circle trap consists of a funnel-shaped piece of screening material that directs SLF into a collection container at the top (Figure 4). Circle traps do not use any sticky material. **Much less capture of nontarget insects and animals has been observed in circle traps compared to sticky bands.** You can purchase circle traps or build them yourself. A detailed guide on how to build a circle trap is available at Penn State Extension. Some people have built similar traps devising a range of methods that work. Building these traps is a good project for anyone who wants to kill SLF while saving money by using materials they may already have on hand.

Installation

Traps work best on trees with smooth bark; bark with deep grooves may allow SLF to crawl underneath the trap. Place the trap about 4 feet from the ground and secure it tightly against the tree by wrapping the material tightly and using pushpins or staples to attach it to the thickest bark on the tree. Avoid using nails or anything that would wound the green, living tissue underneath the bark. Only set up traps on trees on your property or where you have permission to do so. Remember to remove all parts of the trap at the end of the season to reduce damage to the bark and eliminate pollution.

Chemical Control

Insecticides that are registered by the Environmental Protection Agency (EPA) and Connecticut may be used to treat SLF on your property. All EPA-registered insecticides have an EPA registration number and a label with instructions for safe, appropriate, and legal use at sites (vegetation) where SLF may be found. Some insecticides available in other states or over the internet may not be registered or legal for use in Connecticut. Home remedies should also not be used against SLF because they may be unsafe to humans, pets, and plants, ineffective, and could be illegal. Insecticides can kill insect pests on contact and/or by being present systemically in a plant on which they feed.

Ovicides to Kill Egg Masses

Some insecticide sprays have been found to kill SLF eggs with intact protective coverings. The most effective ovicides evaluated in Pennsylvania that are registered to use on ornamentals were horticultural and dormant oils. When oils were applied directly to the egg masses at a concentration of at least 3 percent, they were effective in killing up to 75 percent of treated eggs. The only plant-based oil tested was soybean oil, which had similar control of SLF egg masses when applied at a 50 percent concentration in one preliminary test. Studies in Pennsylvania suggest that registered insecticidal oils may provide some control of eggs if they are applied between February and April in high enough volumes to get excellent coverage. Oils not only offer a lower toxicity option but may provide some control for egg masses that are not accessible for scraping or smashing. However, for egg masses that are within a reachable area, scraping or smashing will provide greater efficacy than currently available ovicides.

Contact Insecticides

Many commonly available insecticides that kill insects on contact are effective against SLF. Insecticides must be used according to the directions on the product label, but generally are sprayed directly to SLF and surfaces where they feed and walk, which is often the base of a tree where spotted lanternflies are abundant. The duration of control after application (i.e., residual activity) varies depending on the type of insecticide used. If you are trying to control SLF for the entire season using only insecticides with contact activity, repeat applications may be needed because contact insecticides vary in their residual

effectiveness and new SLF will continue to move onto preferred plants. Efficacy and toxicity vary among insecticide products. In Table 3, the name of the active ingredients, representative product trade names, toxicity to birds, fish and bees, control, and residual activity (how long it stays active against SLF) are noted for most materials registered in Connecticut. Some insecticides that are available for general use may require a pesticide license depending on formulation and concentration. Specific products listed are not an endorsement and not all available products are listed or may be available at local outlets. Note that most available insecticides registered for use in Connecticut will not have SLF listed as a target pest on the label. If the intent is to treat ornamental plants and trees infested with SLF on a property, select insecticides specifically labeled for use on ornamental trees and shrubs. Connecticut law allows the application of an insecticide for control of a pest not listed if the site is included on the label. For example, similar sounding products may be labeled for just garden vegetables, grapes, fruit trees, or household insects, not ornamental trees and shrubs. Apply contact insecticides only after bloom is finished to protect beneficial pollinating insects.

Systemic Insecticides

Systemic insecticides are translocated through the plant after application via the plant's vascular system. This process provides efficacy by killing feeding insects that are exposed to the insecticide in the tissues and sap. The duration of efficacy is generally much longer than that of contact insecticides, but it does not expose nontarget organisms that are not feeding on the plant to the insecticide. Four application methods are used to apply systemic insecticides to be taken up by the plant: trunk injection, trunk spray, soil drench and injection, and foliar application. Not all products are labeled for all application methods. Insecticide residue can contaminate flowers, so it is important to apply systemic insecticides only after bloom is finished to protect pollinators and other beneficial insects. To control adult SLF in landscapes, systemic insecticides containing either dinotefuran or imidacloprid are best for high-value trees and in areas with high SLF populations. Always read the label and apply the pesticide according to the directions. Certain products and/or applications may have restrictions on the cumulative amount of pesticide applied per designated timeframe or acreage. It is illegal to exceed limits of product use that are specifically stipulated by the label. This is true even if adequate control has not been achieved. Table 4 includes systemic products for spotted lanternfly adults. Most systemic insecticides are in a group called neonicotinoids that include imidacloprid and dinotefuran. These are restricted use chemicals in Connecticut.

Trunk Injection

SLF death has been observed in less than 24 hours after injecting a tree with dinotefuran. Injections of imidacloprid have also been successful but take longer to become effective. Trunk injection can provide the most accurate dosing of a tree, often with the least amount of material used, as very little material is lost to the environment outside of the tree. Products labeled for trunk injection may not have restrictions of volume of active ingredient amount per acre per year and can allow more trees per acre to be treated without violating the label restrictions. Be sure to follow the insecticide label and equipment manufacturer's instructions. As with other application methods, the environmental conditions and vascular health of the tree can greatly affect the translocation speed of the insecticide.

Table 3. Contact insecticides to control egg masses or nymph and adult SLF.

Active Ingredient	Representative trade names	Chemical class	Toxicity	Comments
Acephate	Orthene Turf, Tree, & Ornamental Acephate 97 WDG	Organophosphate	Bird M Fish N - S Bee H	Wide uses crops, nursery plants, public health
Azadirachtin	Azatrol, Azatin, Azamax,Safer BioNeem	Insect growth regulator (IGR)	Bird N Fish M Bee N	Neem-based, OMRI listed. Some professional use only, SLF data needed
Beta-cyfluthrin	Tempo SC Ultra BioAdvanced (several)	Pyrethroid	Bird M Fish H Bee H	Excellent control and residual (up to 2 weeks) activity
Bifenthrin	Bifen Select, Ortho Max, GardenTech	Pyrethroid	Bird M Fish H Bee H	Many labels restricted or professional use only; excellent control & residual
Buprofezin	Talus 70DF, Centaur WDG IGR	Insect growth regulator (IGR)	Bird - Fish - Bee -	Contact IGR, for landscape ornamentals, target nymphs SLF data needed
Carbaryl	GardenTech, Bonide and other Sevin labels	Carbamate	Bird S Fish N Bee H	Excellent control, good residual activity for several days
Essential/botanical oils	Many products with diverse ingredients	Oil	Bird N Fish N Bee N	Under evaluation, efficacy varies widely
Insecticidal soaps	M-Pede, Safer, Bayer Advanced Natria	Potassium salts of fatty acids	Bird N Fish N Bee N	Good control, poor residual activity
Malathion	Malathion, Ortho, Bonide	Organophosphate	Bird M Fish H Bee H	Excellent control, poor residual activity
Natural pyrethrins	PyGanic, Pyrenone, Garden Safe	Pyrethrin	Bird N Fish H Bee M	Excellent control but poor residual activity
Neem oil	70% NEEM Oil, Natria Neem Oil	Oil	Bird N Fish S Bee N	Good control, poor residual; some products allowed organic production
Paraffinic oil or horticultural spray oil	JMS Stylet Oil, Volck Oil Spray	Mineral oil	Bird - Fish - Bee -	Good control, but poor residual for N, A; fair control egg masses
Soybean oil, Canola oil	Golden Pest Spray Oil Natria Multi-Insect Control	Oil	Bird N Fish N Bee N	Fair control egg masses
Spinosad	Conserve SC Turf & Ornamental, Ortho Tree & Shrub Conc.	Spinosyns	Bird S Fish S Bee H	Not all products labeled for trees or ornamental vegetation
Tau-fluvalinate + tebuconazole	Bayer Bioadvanced 3-in-1	Pyrethroid + fungicide	Bird H Fish H Bee N	Excellent control, poor residual activity; some products commercial use only
Zeta-cypermethrin	Amdro Quick Kill Outdoor Insect Killer Concentrate	Pyrethroid	Bird S Fish H Bee H	Excellent control, poor residual

In Connecticut, product may be used if the product is registered for the site and purpose of use listed in the label (e.g., vegetable garden versus ornamental trees). Efficacy and residual activity based on available trial data in Pennsylvania. Toxicity notes: N = nontoxic, S = slightly toxic, M = Moderately toxic, H = Highly toxic, - data not available. Note: The listing of any products is not an endorsement or specific recommendation of the product or company. Other products with the same active ingredient should work the same way, but they may have different rates or formulations.

Table 4. Restricted or professional use insecticides for landscape professionals to control nymph and/or adult SLF. Note, some materials in Table 3 can be professional use only depending on product formulation and concentration.

Active Ingredient	Representative trade names	Chemical class	Stage	Comments
Acetamiprid	TriStar 8.5 SL	Neonicotinoid	N, A	Restricted; applied foliar spray, basal bark treatment, or tree injection depending on label
Azadirachtin	Azatrol, Azatin, Azamax	Insect growth regulator (IGR)	N	Neem-based insecticide, OMRI listed. Some require tree injection by licensed applicator
Bifenthrin	Menace, Onyx Pro, Talstar	Pyrethroid	N, A	Many labels restricted or professional use only; excellent control
Carbaryl	Carbaryl 4L, Sevin 4F, Sevin XLR PLUS, etc.	Carbamate	N, A	Excellent control, good residual activity; Mentioned labels for commercial use only
Clothianidan + bifenthrin	Aloft GC G, Aloft LC SC	Neonicotinoid + pyrethroid	N, A	Restricted; turf and landscape ornamentals
Dinotefuran	Scorpion 35 SL, Venom, Safari 20 SG, Transtect 70 WSP (24c)	Neonicotinoid	A	Restricted; foliar spray, soil drench, trunk spray, or trunk injection, July to September, Excellent control
Flonicamid	Aria	Pyridine	N, A	Professional use only
Imidacloprid	Xytect 2F, Merit 2 F	Neonicotinoid	A	Restricted, foliar, soil drench, or trunk injection
Tau-fluvalinate	Mavrik Aquaflow	Pyrethroid	N, A	Commercial use only, excellent control

In Connecticut, all neonicotinoid insecticides are restricted use. Product may be used if the product is registered for the site and purpose of use listed in the label (e.g., vegetable garden versus ornamental trees). For the stage: N = nymph, A = adult. Efficacy and residual activity based on trials in Pennsylvania. Note: The listing of any products is not an endorsement or specific recommendation of the product or company. Other products with the same active ingredient should work the same way, but they may have different rates or formulations.

Trunk Spray

Trunk sprays (also referred to as "bark banding" or "bole sprays") with dinotefuran have also been successful. Observed death of SLF may take longer by trunk spray than with injected applications but is still likely to occur within a few days of treatment. If the label requires a bark penetrant as a spray adjuvant, be sure to include it in your application. It is important to properly dose the trees based on size measurement, not simply "spray until runoff." It is often necessary to pause the application to wait for the material to be absorbed before resuming the application so that the full dose dictated by tree diameter at breast height (DBH) may be applied without runoff. Large trees with exfoliating bark, such as mature silver maples, may be difficult to properly treat with this method because the bark can reduce the penetration of the insecticide into the living tissue. Additionally, trees that are wounded and have a compromised vascular system may not be able to translocate the insecticide.

Treating an entire property is not suggested since these insecticides are not specific to SLF. Only treat areas where SLF is abundant.

Soil Drench and Soil Injection

Soil drench application is commonly used for SLF, especially for systemic imidacloprid formulations that are widely available to home gardeners. Soil injection by plant health professionals with specialized equipment can provide more precise application than soil drenching, but it also relies on applying a water-soluble insecticide to the root zone of an individual plant. Little efficacy data from soil drench or soil injection applications of imidacloprid to control SLF is available. The insecticide needs time to be taken up by the tree roots, giving this method the greatest time delay until it begins to kill SLF. Dinotefuran soil drenches tend to be taken up, and provide efficacy, much faster and more consistently than imidacloprid due to its higher water solubility. In general, soil drenches and soil injections are less precise than trunk sprays or trunk injections. The amount of water needed to carry the insecticide into the tree is also very important. Postbloom applications of imidacloprid soil drenches are recommended in the spring, whereas dinotefuran should be applied midsummer through September to target adult SLF. Read the label carefully and follow the directions to achieve best results. Be aware that imidacloprid binds easily to organic matter, allowing it remain in some soil types for long periods of time; in some cases, this may mean trees are dosed with imidacloprid in successive years after an initial soil drench, which could contaminate flowers and affect pollinators. By contrast, dinotefuran and its degradate MNG are highly soil mobile, which provides for fast uptake but also increases the risk of water-table pollution, especially in areas of sandy soil or shallow water tables.

Foliar Application

Foliar applications with appropriately labeled systemic products can provide rapid efficacy for the control of SLF. Generally, this application method provides the lowest dose of systemic active ingredient to individual trees compared to the other methods discussed and thus also provides the shortest duration of residual efficacy. Foliar applications with systemic products have the greatest potential to impact nontarget organisms on the site being treated. Foliar applications cannot be made to blooming plants and have greater potential to drift off target. Foliar applications of systemic insecticides also have a greater risk of killing beneficial organisms, which can lead to unintended pest flareups.

Potential Nontarget Effects of Insecticides

Water Contamination

Every precaution should be taken to protect surface water and groundwater from pesticide contamination. Trunk injections pose the smallest risk to contaminating water because the insecticide is placed directly into the tree. Soil drench applications should only occur directly adjacent to the trunk of the tree, as directed on the label. Soil drenches should not be applied to sandy soils, where the water table is shallow, or near open water sources (ponds, lakes, streams). Soil injections should be made in accordance with the insecticide label and the equipment manufacturer's instructions. Both dinotefuran and imidacloprid and their breakdown degradants can persist in groundwater for extended periods. When exposed to sun, both of these compounds break down readily, but their degradants may persist for much longer.

Pollinators and Other Insects

Some trees on which SLF has been observed feeding in high densities are also pollinated by bees (e.g., maples). Additionally, many native insects (caterpillars, beetles, lady beetles, lacewings, parasitoid wasps, etc.) utilize these trees. Trees treated with systemic insecticides could have insecticide residue in their flowers and nectar the following spring. The effects of sublethal doses on nontarget insects are not completely understood. Neonicotinoid insecticides, in particular, have been associated with bee health decline. Pyrethroids can be damaging to beneficial insects and could cause populations of secondary pests, such as mites and scale, to flare up. Generally, systemic insecticides are considered to have a reduced impact on natural enemies compared to broad-spectrum foliar-applied insecticides. The effect of SLF treatments on pollinators and other beneficial insects is currently under investigation.

Summary

1. Spotted lanternfly is currently considered primarily a nuisance pest in ornamental landscapes.
2. Death of ornamental and shade trees has not been directly linked to SLF to date. SLF is considered a plant stressor. High infestation levels may reduce photosynthetic activity and energy storage.
3. **Always scout for spotted lanternfly first before deciding to make a treatment. Not every tree on any given property needs to be treated.** Nymphs move frequently within a landscape, feeding on a large variety of plant hosts. Be aware that SLF populations may fluctuate from year to year; do not assume what happened last year will happen in the coming year.
4. The active ingredients, methods, timing, and other treatment suggestions presented here are guidelines. Research is being conducted to refine these guidelines.
5. Always follow the label for any pesticide application you make.

Stay up to date by visiting:
https://portal.ct.gov/CAES-SLF

Spotted Lanternfly (psu.edu)

USDA APHIS | Spotted Lanternfly

This fact sheet is based on the professional SLF template produced by Penn State Extension in collaboration with the Pennsylvania Department of Agriculture and the United States Department of Agriculture; and elements, especially control and list of insecticides, revised for Connecticut by Dr. Kirby Stafford and Gerda Magana, CAES. Original © The Pennsylvania State University 2021 and used with permission. Penn State version revised May 2020 by Heather Leach, Emelie Swackhamer, Amy Korman, and Brian Walsh. Originally prepared by Heather Leach, David Biddinger, and Greg Krawczyk.

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