



Recommended Best Management Practices For the Forest Products Industry Related to Spotted Lanternfly and Other Potential Forest Pests in Pennsylvania



The forest products industry in Pennsylvania is committed to doing everything possible to minimize the threat and reduce the risk of spreading Spotted Lanternfly (SLF), as well as any other potential forest invasive insect such as Asian Longhorned Beetle (ALB). To that end, all members of the forest products industry in Pennsylvania are strongly encouraged to voluntarily comply with the following best management practices, within and outside the quarantine areas. Note: These BMP recommendations will no doubt be modified and adapted as more information is learned and conditions change. This document is dated: March 21, 2018

Companies:

It is important to have all employees trained to identify Spotted Lanternfly egg masses, nymphs (or instars) and adults with training regarding egg mass removals and processes to minimize the movement of living insects during the summer and fall. Employees should be trained to watch for signs at the company but also their homes and other properties. They should also be trained to recognize Asian Longhorned Beetle as well (see page 14). There has been no known outbreak of ALB in Pennsylvania but it is in New York, Ohio, and Massachusetts. Massive eradication efforts are ongoing in those areas, and have been successful in Illinois and New Jersey. It is imperative if this insect is found, that it be reported immediately. In addition, employees should feel empowered to report to their supervisors a pest they do not recognize, in case it is a new invasive species.

Companies may contact Penn State Extension, the PA Hardwoods Development Council, Regional Hardwood Utilization Groups, DCNR Bureau of Forestry, County Conservation Districts, and the PA Department of Agriculture to request available staff to assist in training employees in the forest products industry.

BMP's are recommended for everyone but especially in quarantine zones.

CONTENTS:

BMP's for Company Management	page 2
BMP's for Forest Resource Workers	page 2
BMP's for Primary Processors	page 5
BMP's for Secondary Processors	page 9
Egg Mass Identification	page 11
Directions for Egg Mass Removal	page 13
For More Information	page 13
Asian Longhorned Beetle Pest Alert	page 14
Tree-of-heaven (Ailanthus) Treatment	page 16
Dept. of Agriculture Regional Supervisors	page 18
Contact Information for Trainers	page 19

BMP's for Company Management

- Take SLF and other invasive insect threats seriously. If your sawmill becomes infested with SLF, it could have serious economic impact and severely restrict your operations.
- If your sawmill is in a quarantine zone or if you are receiving logs or lumber from the quarantine zone, you must sign compliance agreements to ship your products out of the quarantined area and permits will be required for drivers and employees in the quarantine zone. At least one employee must be trained by authorized trainers through the Department of Agriculture and then that person trains other employees. Contact the Regional PDA staff listed on Page 16 for compliance agreements, testing and permits.
- If your sawmill becomes infested with swarming SLF, it may require limiting operation for period of times and impact operations that are outside. It is imperative that egg masses not be moved and the likelihood of moving adults and/or egg masses becomes much greater with higher populations.
- Demonstrate to all employees that you take SLF BMP's seriously.
- Train all employees to look for signs of SLF and other invasive insects including egg masses and various life stages of the insects. Require them to report any sign of the insect to company leadership.
- Employees working in the quarantine area must be trained and given permits which are mirror hangtags for their vehicles issued by the Department of Agriculture giving them permission to work in the quarantine zone.
- Work with logging and forestry crews and inform them you expect compliance with all safety BMP protocols.
- Communicate your dedication to safe product your commitment to ship only product that is SLF free with your customers.
- Notify the Hardwoods Development Council of your company's decision to implement these BMP's for invasive insects. This information will be extremely helpful to demonstrate the strong commitment of the forest products industry in Pennsylvania to USDA and other states as additional quarantines are considered if conditions worsen. Email Wayne Bender, Executive Director: dbender@pa.gov

BMP's for Forest Landowners and Forest Resource Workers

BMP's for Forest Landowner's

- Monitor information about SLF in your county and neighboring counties, especially if your property is in the quarantine area.
- Learn to identify SLF and egg masses and watch for potential egg masses on smooth bark trees, rusty metal, outdoor furniture and covers, recreational vehicles, lawn tractor and mowers, mower decks, grills and covers, tarps, mobile homes, tile, stone, siding, pool liners and covers, play equipment, deck boards, or anything stored outside, etc. If found, remove all egg masses if possible.

- If you are in a quarantine county, do not move firewood off your property unless you inspect each piece of firewood for egg masses. Do not move firewood (or anything) from properties with active high populations. The risk of moving adults is too great.
- Consider Ailanthus control options for your property. Recommend removal of all female trees and reduction of male Ailanthus trees, which a few can be used as “trap” trees if necessary. Various herbicide applications are available depending on the size of the tree. Simply cutting Ailanthus will result in many root sprouts. It is best if herbicide treatments are done early July – mid-October, and cutting occurs 30 days later after herbicide treatments are given time to work. See “Invasive Plant Species Management – Tree-of-heaven” (pages 16-17) in the appendix for effective treatment.
- Remove all female Ailanthus trees from property. Female Ailanthus trees are easy to identify in the late summer when the seed clusters can be easily seen clinging to the female trees. These trees are generally located along the tree line of forested areas or highway right of ways where the soil has been disturbed.
- Monitor male Ailanthus trees for early signs of SLF. Treatment information for herbicide and insecticide applications may be found at www.agriculture.pa.gov/spottedlanternfly.
- You may want to band Ailanthus trees or other high risk trees (Maple, Walnut, Apple) with adhesive tree bands – May to August. This will also help in identifying if SLF is present, and can kill all walking life stages in infested areas.
- Park in areas away from the tree line if possible and always leave windows up. Kill any SLF that you find in your car before leaving the area.
- **Report** to the Department of Agriculture any finds of SLF in counties OUTSIDE the current quarantine area. Collect a specimen and/or take a picture and report to the Invasive Species Hotline at 866-253-7189 or badbug@pa.gov.

BMP's for Foresters

- Monitor information about SLF in your work areas, especially if your clients are in the quarantine zone.
- Learn to identify SLF and egg masses and watch for them when doing initial surveys of properties.
- If Ailanthus is on the property, monitor current conditions and note if SLF is present. Recommend the removal of the female Ailanthus trees and reduction in the male trees using herbicide treatments from July 1 – October 15. A few male “trap” trees may be helpful. See Tree-of-heaven management appendix on pages 16-17.
- If SLF or egg masses are identified, and the county is not currently quarantined, consider yourself a mandatory reporter to the PA Department of Agriculture. Collect a specimen and/or take a picture and report to the Invasive Species Hotline at 866-253-7189 or badbug@pa.gov.
- Inform property owners of the presence of SLF and suggest options to minimize the spread of SLF, as well as treatment methods to eradicate SLF on the property. Refer them to www.agriculture.pa.gov/spottedlanternfly for treatment protocols.
- Always be prepared by carrying egg mass scrapers (the size of a credit card) and train all staff to identify and destroy egg masses during the months of October – April.

- Be vigilant for signs of SLF on Ailanthus, Walnut, Maple, and Apple trees. Egg masses are also likely to be on young Black Birch and young Black Cherry. ALB will also be mostly likely on Maple, Poplar, Ash among others.
- Monitor forest for signs of SLF in or near orchards, vineyards, or near fields where hops are grown.
- If SLF is found, then recommend harvesting during December to March when egg masses can be clearly identified and removed from every log. All sides of the log must be examined and may not move out of the quarantine zone without proper certification from PA Department of Agriculture.
- Park in areas away from the tree line if possible and always leave windows up. Kill any SLF that you find in your car before leaving the area.

BMP's for Loggers

- Before bidding on properties survey for signs of SLF. If found, determine what level engagement you will support to be sure that you do not move SLF.
- Compliance agreements and are required for all forest product companies working in a quarantine zone, and employees need permits in their vehicles. At least one company staff person must be trained by the Department of Agriculture on SLF.
- You must notify the Department of Agriculture Regional Bureau of Plant Industry Supervisor four weeks in advance regarding any harvest in the quarantine zone. (see page 18)
- Compliance forms must be signed by your company and all actions must be followed in the compliance agreements. Make sure the paperwork has the proper stamp and is present on site and with those transporting the logs. All employees working in the quarantine zone must be trained, tested, and issued permits to work in the quarantine zone.
- If the forest land has high populations of SLF then do not harvest during July – November when SLF adults are active.
- If egg masses are found on the property, every log must be inspected prior to moving the log off the property. Every log should also be inspected on all four sides at the receiving log yard as a secondary defense. If found, the egg masses must be manually destroyed. Do not assume the log debarkers will kill all egg masses. If egg masses are moved to sawmills, the potential that the sawmill will become infested in subsequent summers is high and could significantly impact the sawmill economically.
- Follow BMP's for foresters in addition to BMP for Loggers.
- Offer to remove or cut all female Ailanthus trees on the property only after they have been treated with a herbicide for a minimum of 30 days. See Tree-of-heaven management appendix on pages 16-17.
- During the months of July-December, equipment and vehicles must be monitored for adults which might fall into crevices and move out of the area. Look before you leave. This is imperative action before moving to a new site.
- Windows of vehicles should remain closed while parked in the quarantine zones.

BMP's for Truckers from the Forest to the Mill

- All truckers working in a known quarantine zone must be trained and issued permits to work in the area. The vehicles must have on display the mirror hangtag permits.
- Confirm if loggers or foresters working on site have seen any signs of SLF. If so, inspect all the logs before loading them on the truck to be sure living insects and egg masses are removed and remove any the loggers may have missed. If not, inspect the logs a second time for signs of egg masses or insects.
- If you see *Ailanthus* nearby, inspect those trees for signs of SLF. If so, inform the logger and landowner. If not in the quarantine area, report the sighting to the Department of Agriculture: Invasive Species Hotline at 866-253-7189 or badbug@pa.gov.
- If you see instars/nymphs or adults on the property, do not move the logs until you see that compliance agreements have been completed and proper stamps are on the required paperwork.
- Do not move logs from the property if high populations or swarming activity is observed because it will be impossible to move the logs without moving adults in the logs or in your truck or equipment.
- Inspect your truck tires and truck body for egg masses or other life stages before leaving a site, and be sure you are not moving SLF inside the cab of the truck. Take the time needed to move safe pest-free logs and equipment.
- Check your own clothing and body for SLF before leaving the area. Be sure to kill all SLF.

BMP's for Primary Processors

BMP's for Parking

- Herbicide and remove *Ailanthus* trees from near parking areas according to recommended treatments on page 16-17. Park personal vehicles as far away from the tree line as possible and leave windows up. Inspect your vehicle for the presence of any life stages of SLF and kill them before leaving the parking lot.

BMP's for Log Yard workers

- Be aware if any logs coming into your facility are from quarantine zones. If so, ask truck driver to see paperwork with the proper certification stamps that gives permission for the logs to leave the quarantine zone. Check vehicle for permit hangers on their rear-view mirror.
- For all logs from a quarantine zone: inspect all four sides of every log for egg masses or signs of living SLF. If live insects are found, attempt to kill all if possible, and refuse any more shipments from that supplier or site until December or after two hard freezes. If egg masses are found, scrape and destroy. Report the finding to the company and to the Department of Agriculture if you are outside the quarantine zone.
- Be vigilant regarding all logs arriving at your site. Watch for any sign of invasive species. If SLF or ALB or other new pests are found outside a quarantine area, report to the Department of Agriculture. Note where the logs came from as precisely as possible.

- Have aerosol insecticides available for use if live insects are found. Attempt to kill all.
- Do not assume that debarking will kill all egg masses. Additional requirements and a compliance agreement are needed for mulch production. Grindings should be handled with care.

BMP's for De-Barkers and Sawyers

- Watch for egg masses or adult bugs. If found, stop production until Log Yard workers and others in the supply chain can be notified and informed to inspect more carefully.
- If you notice large bore holes deep into the wood, inspect for possible ALB.

BMP's for Green Line Workers

- Watch for egg masses or adult bugs. If found, stop production until Sawyers and others in the supply chain before you can be notified and informed to inspect more carefully.

BMP's for air drying

- If you are not in a quarantined area, proceed with air drying storage as normal but constantly monitor your property for signs for Spotted Lanternfly.
- Be sure to remove all Ailanthus from near your sawmill drying yards.
- If you are in a quarantine area (but not a hot spot where insects are heavily active) then monitor closely for any signs of the insects. If found, then attempt to move as much product indoors as possible. Try to keep product away from tree line of property. Inform lumber graders on the dry line and the kiln operators to watch for signs and to remove egg masses.

BMP's for Kiln Operators

- Do not leave kilns open allowing insects to enter the kiln before or after the kiln drying.
- Observe if kiln drying is killing the egg masses. It may not kill all egg masses because species of wood have different kiln schedules with higher/lower temperatures and shorter/longer exposure to the kiln. Check with the Hardwoods Development Council when there is more conclusive science regarding mortality of egg masses from kiln drying.
- Watch for egg masses or adult insects. If found, stop production until green line operators and log yard workers are informed and improve their inspection methods.
- Inspect exterior of kilns for egg masses. They like to lay eggs on smooth and rusting metal.

BMP's for Lumber Graders

- Lumber graders on green line are unlikely to see egg masses or adult insects. However, if you do, stop the production line and inform all those in the production line ahead of you to inspect more carefully. Also, inform those on down the line to inspect more carefully.
- Lumber Graders on the dry line (after kiln drying) should be much more vigilant looking for egg masses on all four sides of every board. If you are in an area with swarming SLF, it is

imperative that you not miss any egg masses. Once you have inspected every board and verified there are no egg masses or live insects, then the bundle of lumber should be shrink wrapped allowing no insects to enter the bundle. Pallets (both sides) and other runners or dunnage materials must also be inspected for egg masses before it is used and wrapped.

BMP's for Dry Line Workers:

- Before stacking lumber on any pallets or runners, inspect them for potential egg masses on top and underneath the pallet.
- Pallets should not be stored outside in quarantine zones from July through November or until second hard frost.

BMP's for Forklift Operators and Storage

- If you are in a quarantine zone, try to store as much product inside as possible. Try to keep doors closed as much as possible.
- Do not load containers if your mill is in a highly populated area and insects are swarming.
- Inspect the inside of the container before you start to load it. Remove any egg masses. If found, report to the supplier of the container that it was removed from a quarantined zone inappropriately.
- Inspect exterior of the container, including the top for egg masses. This is 100% of the time, whether or not you are in a quarantine zone. The container may have previously been in a quarantine area. Philadelphia port is currently in a quarantine zone.

BMP's for Domestic Sales and Transport

- Be aware of all quarantine zones for SLF and other invasive insects.
- Be sure the inside and outside of the truck is free of egg masses before it is loaded.
- Attempt to route trucks so they do not need to travel through quarantine zones.
- Be sure truck drivers have copies of certification stamps on paperwork issued by the Department of Agriculture, as well as mirror hangtag permits if they travel in or through a quarantine zone.
- Do not ship any products if your loading site is swarming with SLF. It will be impossible to load without transporting adults. Swarming activity is limited to a small window of time.
- Tell drivers not to stop (other than following normal traffic patterns) in a quarantine zone. Stopping for meals or rest breaks should be avoided in the quarantine zone, if possible.
- If your sawmill location is in a quarantine zone: Confirm compliance agreement are signed between the company and the PA Department of Agriculture and observe if compliance requirements are being met. If not, report to the company leadership and refuse to move the product. Watch for any signs of SLF insects or egg masses.
- If your sawmill is not in a quarantine zone but you must deliver to a quarantine zone, then remind those receiving the shipment that the product is SLF free and should be stored indoors July – December.
- If you travel through swarming SLF, do not stop! Before leaving a quarantined county, immediately inspect shipment and interior of truck and equipment and attempt to kill any hitchhikers.

BMP's for International Sales and Loading Containers

- Be aware of all quarantine zones for SLF and other invasive insects, as well as any restrictions imposed by USDA-APHIS or other countries regarding fumigation of product coming from SLF or other quarantine zones.
- If you are shipping with a container, the container should be thoroughly inspected inside and out for egg masses. This is imperative for the interior of the container. Exterior of the container should be inspected as well. Containers are popular materials for SLF egg masses.
- Refuse to load containers or shipments if you see SLF swarming in the area.
- If you are traveling through a quarantine zone or out of a quarantine zone make sure that proper certificates are on paperwork traveling with the shipments, and that the vehicle has a permit hangtag on its mirror.
- If your pick-up location is in a quarantine zone: Ask to see the proper certification issued by the PA Department of Agriculture and observe if compliance requirements are being met. If not, report to the company leadership and refuse to move the product. Watch for any signs of SLF insects or egg masses.
- If your pick-up location is not in a quarantine zone but you must deliver to a quarantine zone, then remind those receiving the shipment that the product is SLF free and should be stored indoors July – December.
- If you must travel through a quarantine zone to another location outside the quarantine, then avoid any lengthy stops within the quarantine zone. Stop lights, normal traffic patterns are not a concern. Stopping for meals or rest breaks should be avoided in the quarantine zone, if possible.
- If you travel through swarming SLF, do not stop! Before leaving a quarantined county, immediately inspect shipment and interior of truck and equipment and attempt to kill any hitchhikers.

BMP's for Truckers Driving Through Quarantine Zones

- If you must travel through a quarantine zone to another location outside the quarantine, then avoid any lengthy stops within the quarantine zone. Stop lights, normal traffic patterns are not a concern. Stopping for meals or rest breaks should be avoided in the quarantine zone, if possible.
- If you are traveling through a quarantine zone or out of a quarantine zone request to a copy of the compliance agreement with shipment, and drivers must have permit hangtags on the vehicle mirror.

BMP's for Company Grounds Keepers and other Employees

- Watch for egg masses anywhere on the property, and at your homes areas.
- Report any sightings of SLF egg masses, juvenile or adult insects to company management.
- Remove all Ailanthus from near the sawmill or property. Follow the recommend removal methods suggested at www.agriculture.pa.gov/spottedlanternfly.

BMP's for Secondary Processors

BMP's for Parking

- Herbicide and remove Ailanthus trees from near parking areas per recommended treatments on pages 16-17. Park personal vehicles as far away from the tree line as possible and leave windows up. Inspect your vehicle for the presence of any life stages of SLF and kill them before leaving the parking lot.

BMP's for those Receiving Shipments

- Be sure employees responsible for receiving shipments from sawmills in quarantine zone have followed compliance requirements made by the PA Department of Agriculture, and delivery vehicles have permits hanging on the rear-view mirror.
- Be sure employees have been trained to recognize all life stages of SLF and egg masses.
- Do not receive shipments from any hardwood primary suppliers during July – December if the company is declared in a highly populated area for SLF.

BMP's for Outdoor Storage

- If the lumber will be stored outside in a quarantine zone, then the lumber should be completely wrapped in shrink wrapped plastic to avoid eggs being laid on the lumber.
- If in a quarantine zone, attempt to store all products received for processing as well as all finished products awaiting shipment inside with doors closed.

BMP's for Ground Keepers

- Employees should be well trained to identify SLP life stages and egg masses, and be vigilant about SLF out breaks and quarantine zones.
- Employees should herbicide and remove all female Ailanthus trees from the property per recommended treatments on pages 16-17, and monitor nearby male Ailanthus trees for signs of SLF. If found it should be reported to the company leadership and the PA Department of Agriculture.
- Employees should watch for signs of SLF egg masses or insects throughout the property, including on equipment or other property outside. Watch for eggs masses on rusting metal and other smooth surfaces such as siding, vehicles tires, pallets,
- Inspect all pallets stored outside (top and bottom) for egg masses.

BMP's for Truckers and Shipping

- Be aware of all quarantine zones for SLF and other invasive insects.
- If you are shipping with a container, the container should be thoroughly inspected inside and out for egg masses. This is imperative for the interior of the container. Exterior of the container should be inspected as well. Containers are popular materials for SLF egg masses.
- Refuse to load containers or shipments if you see SLF swarming in the area.
- If your pick-up location is in a quarantine zone: Ask to see compliance certification between the company and the PA Department of Agriculture and observe if compliance requirements are being met. If not, report to the company leadership and refuse to move the product.

Watch for any signs of SLF insects or egg masses. The driver/vehicle must have a hangtag permit on their rear-view mirror.

- If your pick-up location is not in a quarantine zone but you must deliver to a quarantine zone, then remind those receiving the shipment that the product is SLF free and should be stored indoors July – December.
- If you must travel through a quarantine zone to another location outside the quarantine, then avoid any lengthy stops within the quarantine zone. Stop lights, normal traffic patterns are not a concern. Stopping for meals or rest breaks should be avoided in the quarantine zone, if possible. You must have a permit (mirror hangtag) to work in the quarantine zone.
- If you travel through swarming SLF, do not stop. Inspect shipment and interior of truck and equipment before leaving the quarantine zone for any hitchhikers.
- If you are traveling through a quarantine zone or out of a quarantine zone request to a copy of the compliance agreement with shipment. The driver must be trained, tested and issued a permit.

BMP's for Company Management

- Take SLF and other invasive insect threats seriously. If your secondary processing mill becomes infested with SLF, it will have serious economic impact and restrict your operations severely.
- If your facility is in a quarantine zone, you must sign compliance agreements in order to continue operation.
- Your facility must also have at least one employee trained by the Department of Agriculture (or their approved trainers) who is then responsible for training company employees on SLF and compliance obligations for the quarantine zones. That person will be tested and responsible for giving permits to other employees.
- If your facility becomes swarming with SLF, it may require limiting operation for period of times and severely impact operations that are outside. It is imperative that eggs masses not be moved and the likelihood of moving adults and/or egg masses becomes much greater.
- Demonstrate to all employees that you take SLF BMP's seriously.
- Train all employees for signs of SLF and other invasive insects including eggs masses and various life stages of the insects. Expect them to report any sign of the insect to company leadership.
- Work with your lumber suppliers and inform them you expect compliance with all safety BMP protocols before product arrives at your facility.
- Communicate with customers of your product your commitment to ship only product that is SLF free.

EGG MASS IDENTIFICATION



Egg masses are laid September till early winter, or until typically two hard frosts occur. The egg masses can be found on smooth surfaces such as some smoother tree bark; fence posts; outdoor equipment such as ATVs, trailers, boards, lawn tractors, grills and covers, etc.; pool covers and tarps; tile; smooth stone; deck boards; and rusty metal or siding.

The egg masses resemble 1-2 inch long gray mud smears with 30-50 brown eggs beneath the gray matter. They often appear waxy.



Later the egg masses will turn dark brown and appear cracked and scaly or like dried mud. The young nymphs will hatch in the spring (May) and feed on various plants. It is imperative that egg masses be removed whenever you see them and properties should be inspected early winter and again in early spring before the eggs hatch.

EGG MASS IDENTIFICATION FOR SPOTTED LANTERNFLY HEMIPTERA: FULGORIDAE: *Lycorma delicatula* (WHITE)



In the photo to the left
you can see:

← Covered Egg Mass

← Adult Spotted Lanternfly

← Uncovered Egg Mass

EGG MASS IDENTIFICATION FOR SPOTTED LANTERNFLY
HEMIPTERA: FULGORIDAE: *Lycorma delicatula* (WHITE)



Here is an example of an unfinished egg mass.

Note: You can see seed-like eggs in loose columns poking out the top.

The Spotted Lanternfly lays columns of eggs side by side. There can be as many as 30 to 50 eggs per mass. The eggs are then covered in a grey putty-like covering.

The covering is slightly tacky and will wear away over the course of the year.



EGG MASS IDENTIFICATION FOR SPOTTED LANTERNFLY
HEMIPTERA: FULGORIDAE: *Lycorma delicatula* (WHITE)



This is an egg mass from the previous season. You can see that the Spotted Lanternfly will lay several vertical rows of eggs.

The grey putty like covering you see on fresh egg masses is missing. A few eggs are also missing.

The overall length of an egg mass is about 1 inch.



For more information, go to the Department of Agriculture website: www.agriculture.pa.gov

For Egg Identification Tips go to:

[http://www.agriculture.pa.gov/Plants Land Water/PlantIndustry/Entomology/spotted_lanternfly/program-information/Pages/default.aspx](http://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/Entomology/spotted_lanternfly/program-information/Pages/default.aspx)

TO REMOVE EGG MASSES:

Scrape egg masses into a plastic bag from trees and other surfaces with a knife, credit card, or egg mass scraper (provided by the Department of Agriculture). You should double bag the eggs and throw away in the garbage. You may also place them in alcohol or hand sanitizer to kill the eggs.



You may also identify trees that likely will have egg masses from the honeydew fungus that may cover the trunk of ground area near the tree. The fungus is a mold that grows on leaves, bark, the ground caused by the sweet excrement of the insects. The mold will be dense enough to not allow sunlight to the leaf or ground

http://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/Entomology/spotted_lanternfly/program-information/Pages/default.aspx

FOR MORE INFORMATION:

The Pennsylvania Department of Agriculture website: www.agriculture.pa.gov will be updated regularly with information about Spotted Lanternfly. This will include the latest information about the quarantine zones, egg mass identification tips, SLP Inspection tips, time of year management charts, what to do if you find SLF on your property, frequently asked questions, etc. There are also tips for landowners on how to Eliminate or Control Spotted Lanternfly Adults with how to identify Ailanthus, kill Ailanthus, and use of insecticides.

You can also contact Penn State Extension in each county for more information.

You can also contact the Department of Natural Resources in each State Forest.

Pest Alert

Asian Longhorned Beetle (*Anoplophora glabripennis*): A New Introduction

The Asian longhorned beetle (ALB) has been discovered attacking trees in the United States. Tunneling by beetle larvae girdles tree stems and branches. Repeated attacks lead to dieback of the tree crown and, eventually, death of the tree. ALB probably travelled to the United States inside solid wood packing material from China. The beetle has been intercepted at ports and found in warehouses throughout the United States.

This beetle is a serious pest in China, where it kills hardwood trees in roadside plantings, shelterbelts, and plantations. In the United States the beetle prefers maple species (*Acer* spp.), including *boxelder*, *Norway*, *red*, *silver*, and *sugar maples*. Other preferred hosts are *birches*, *Ohio buckeye*, *elms*, *horsechestnut*, and *willows*. Occasional to rare hosts include *ashes*, *European mountain ash*, *London planetree*, *mimosa*, and *poplars*. A complete list of host trees in the United States continues to be refined (<http://na.fs.fed.us/pubs/detail.cfm?id=5268>).

Currently, the only effective means to eliminate ALB is to remove infested trees and destroy them by chipping or burning. To prevent further spread of the insect, quarantines are established to avoid transporting infested trees and branches from the area. Early detection of infestations and rapid treatment response are crucial to successful eradication of the beetle.

The ALB has one generation per year. Adult beetles are usually present from July to October, but can be found later in the fall if temperatures are warm. Adults usually stay on the trees from which they emerged or they may disperse short distances to a new host to feed and reproduce. Each female usually lays 35-90 eggs during her lifetime. Some are capable of laying more than that. The eggs hatch in 10-15 days. The larvae feed under the bark in the living tissue of the tree for a period of time and then bore deep into the wood where they pupate. The adults emerge from pupation sites by boring a tunnel in the wood and creating a round exit hole in the tree.

For more information about Asian longhorned beetle in the United States, visit these U.S. Department of Agriculture Web sites:

www.AsianLonghornedBeetle.com

www.aphis.usda.gov

www.na.fs.fed.us/fhp/alb/



If you suspect an Asian longhorned beetle infestation, please collect an adult beetle in a jar, place the jar in the freezer, and immediately notify any of these offices in your State:

State Department of Agriculture:

- State Plant Regulatory Official
- State Entomologist

County Cooperative Extension Office State
Forester or Department of Natural Resources

U.S. Department of Agriculture:

- Animal and Plant Health Inspection Service,
Plant Protection and Quarantine
- Forest Service

Call 866-702-9938 toll free.



Forest
Service

Northeastern Area
State and Private Forestry

Animal and Plant Health
Inspection Service

NA-PR-01-99

Revised April 2015

Asian Longhorned Beetle: What to look for?



1. **Adult beetles.** Individuals are $\frac{3}{4}$ to $1\frac{1}{4}$ inches long, with jet black body and mottled white spots on the back. The long antennae are $1\frac{1}{2}$ to $2\frac{1}{2}$ times the body length with distinctive black and white bands on each segment. The feet have a bluish tinge.



2. **Oval to round pits in the bark.** These egg-laying sites or niches are chewed out by the female beetle, and a single egg is deposited in each niche.



3. **Oozing sap.** In the summer, sap may flow from egg niches, especially on maple trees, as the larvae feed inside the tree.



4. **Accumulation of coarse sawdust** around the base of infested trees, where branches meet the main stem, and where branches meet other branches. This sawdust is created by the beetle larvae as they bore into the main tree stem and branches.



5. **Round holes,** $\frac{3}{8}$ inch in diameter or larger, on the trunk and on branches. These exit holes are made by adult beetles as they emerge from the tree.

Northeastern Area
State and Private Forestry
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Tree-of-heaven (*Ailanthus altissima*)

Description

- Tree-of-heaven is commonly known as 'ailanthus'.
- Refer to the DCNR Invasive Plants page and the ailanthus page (http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_010311.pdf).
- Fast growing, weak-wooded, clonal (root suckering) tree.
- Dioecious – male and female flowers on separate plants.
- Individual stems are typically short-lived, but they can reach heights of 80 ft.
- Grows in dense clones where ailanthus stems occupy all layers, from understory to canopy.
- Native to East Asia, imported as an ornamental and urban street tree in the late-1700's.
- Grows almost anywhere, from sidewalk cracks or spoil in full sun to fertile, shaded alluvial soils along rivers and streams.

Management Keys

Due to its size and vigor, and extensive spreading root system, ailanthus can be difficult to control. As long as you are willing to invest the up-front effort and treat at the proper time, it can be successfully suppressed.

Be Persistent

There are two phases of invasive species management – control and maintenance. The control phase for ailanthus takes two seasons, and would ideally include two applications the first season and a rigorous follow-up treatment the second year.

After your control efforts have nearly eliminated the ailanthus, you need to periodically monitor the sites and treat any signs of new growth to prevent re-infestation.

Target the Roots – Timing is Key

To control ailanthus, you have to injure the root system. This is most effectively done with systemic herbicides, when the plant canopy is exporting sugars to the roots for growth and storage.

Systemic herbicides are most effective when

applied later in the growing season (Figure 1). For ailanthus, we recommend waiting until July 1 to initiate treatment. This is when the foliage is sending sugars produced through photosynthesis back to the roots. Systemic herbicides are moved in the same direction through the plant as the sugars.

Applications made too early in the season do not translocate effectively to the roots, and only injure the aboveground growth.

Mechanical Operations

Cutting ailanthus is often necessary to remove potentially hazardous stems, but it is not useful as a control measure. In situations where you want to remove ailanthus stems, it is better to cut *after* herbicide treatment has taken effect.

Herbicide Applications

Ailanthus can be effectively treated with foliage or stem treatments. Tall, dense growth is best treated with a high volume ('spray to wet') application, while smaller stems can be treated with a low volume foliar or stem treatment approach.

Effective stem treatment methods include basal bark and 'hack and squirt'. Basal bark treatments use a concentrated mixture of herbicide in oil, applied to the complete circumference of the lower 12 to 18 inches of the stem. The 'hack and squirt' method uses concentrated herbicide solution applied to *spaced* cuts around the perimeter of the stem. It is critical that the stem cuts are spaced so the applied herbicide can translocate to the roots. If you completely girdle the stem, the herbicide can only move up in the stem, and you will not injure the roots or the stem below the girdle.

Dense, or extensive infestations should be treated initially with a foliar application. This will eliminate the small, dense growth. The 'clean-up' application can be stem treatment, or foliar, depending on the size of the remaining stems. Large, tall plants are easier to treat with stem treatment, while smaller stems are easier to treat with a foliar application.

Recommended Herbicides

There are many herbicides available that are very



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effective against ailanthus, but we recommend using *glyphosate* or *triclopyr*. They are both effective, have no or little soil activity, and are available as aquatic-labeled products. For foliar applications, we recommend mixing them together (Table 1). Either herbicide can be used for hack-and-squirt treatments, and *triclopyr* is available in oil soluble formulations for basal bark applications.

What about Stump Treatment?

If you need to cut down ailanthus for immediate safety reasons, by all means do so and treat the stump. However, cutting the stems and treating the

stumps does not provide effective control of the roots. When you remove the top, there is no more downward flow of sugars to the roots. Stump treatment of ailanthus will keep the stump free of sprouts, but it will not prevent root suckering.

If you want to cut ailanthus, treat it first, and then wait until the dormant season to cut it. You should cut it before the next growing season because standing dead ailanthus decays quickly. If you leave it stand too long, you may be faced with considerable hazard while trying to remove the ailanthus.

Figure 1. The management calendar for ailanthus emphasizes late-season treatment to maximize injury to the roots.

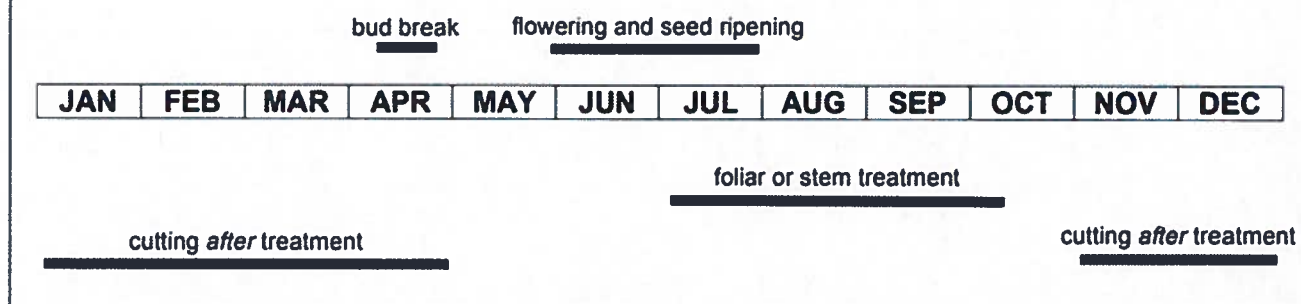


Table 1. Prescriptions for controlling ailanthus stress proper timing of operations to maximize injury to the roots. Improper timing will result in treatments that provide 'topkill' (shoot injury) but little net effect. Product names reflect the current PA State Herbicide Contract.

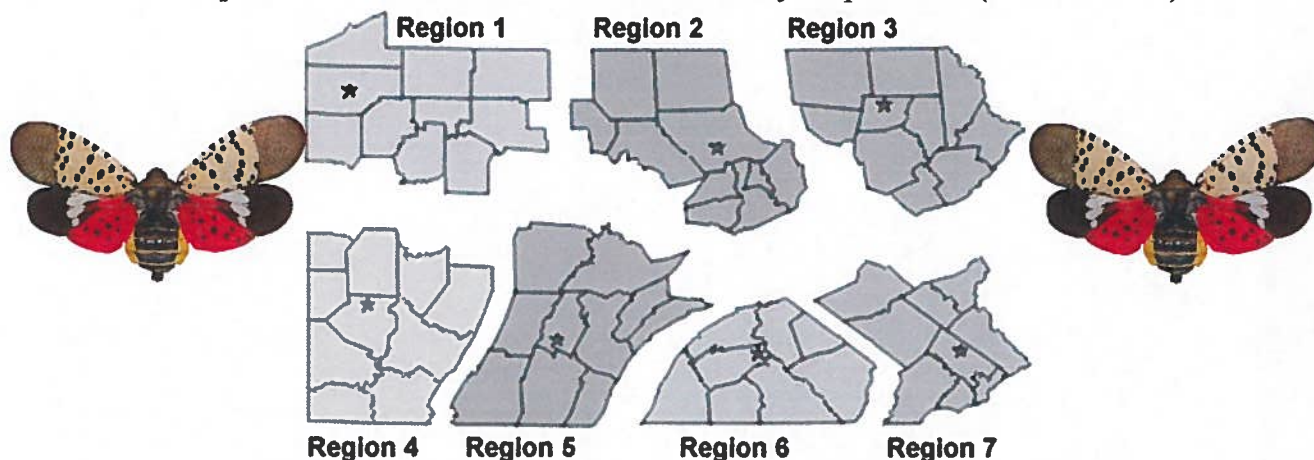
Treatment and Timing	Treatment	Product Rate	Comments
<i>Foliar Application</i> July 1 to fall color	'Rodeo' plus 'Triclopyr 3'	3 qts/acre plus 2 qts/acre	The combination of <i>glyphosate</i> and <i>triclopyr</i> provides a broad-spectrum treatment that is effective against ailanthus and other woody species that should be targeted as well during the operation. This is a non-selective mixture, but it has little soil activity, poses low risk to non-target organisms, and both products have aquatic labeling. A surfactant (e.g. 'Alligare 90') needs to be added. If the <i>glyphosate</i> product 'Glyphomate 41' is used instead (4.3 qts/acre), no additional surfactant is needed.
<i>Basal Bark</i> July 1 to fall color	'Pathfinder II'	ready-to-use	'Pathfinder II' is an oil-based formulation of <i>triclopyr</i> that can be used for basal bark applications. Treat stems up to 6-in diameter by wetting the entire circumference of the lower 12 to 18 inches, without runoff. You can apply a shorter band to small stems. This technique is laborious, and is best suited for treating small infestations or as a follow-up to surviving stems after a foliar application. If stems are significantly larger than 6-in diameter, use hack and squirt.
<i>Hack and Squirt</i> July 1 to fall color	'Rodeo' or 'Triclopyr 3'	Use either product undiluted or 1:1 with water	These are water-based formulations useful for hack-and-squirt treatments. It is essential to space the cuts so there is intact bark between the cuts. If you completely girdle the stem, the herbicide cannot translocate to the roots. A simple guideline for number of cuts is 'inches in diameter plus one'. This is a laborious treatment best suited for low stem numbers, and stems at least 1-inch in diameter. Treat immediately after cutting, filling the cut with herbicide mixture using a squirt bottle.

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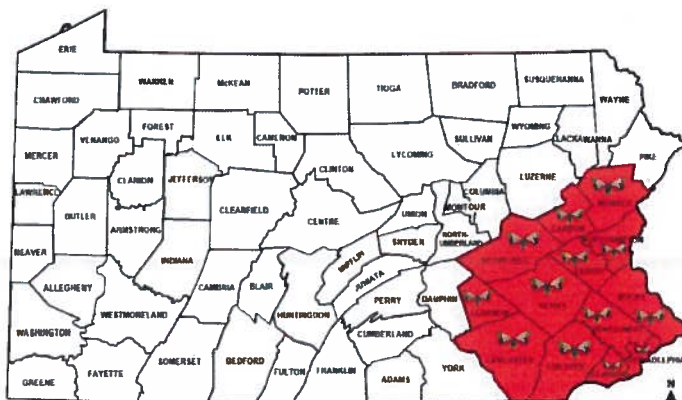
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