

Spotted Lanternfly

- Generalist herbivore that has been identified in four counties in Indiana
- Easily capable of infesting over 100 species of plants, but closely associated with tree-of-heaven
- Cryptic portions of life cycle make them difficult to detect

Where did they come from?

- Native to Asia, but uncommon in home range
- Arrive on imported stone products
- First detection: 2014
- Rapidly spreading


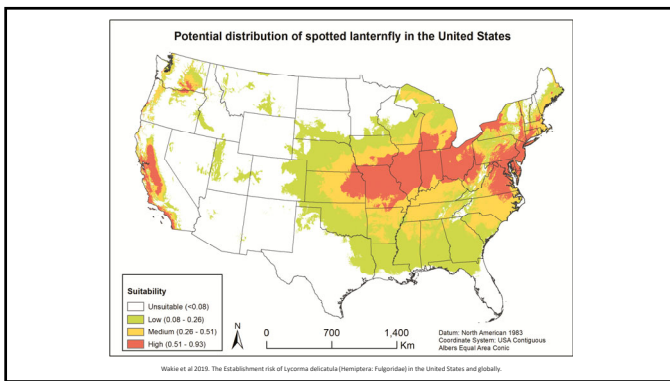
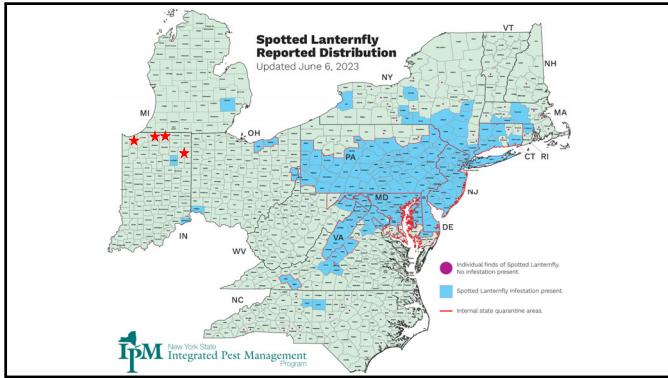


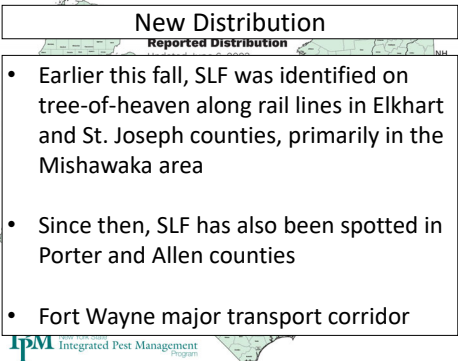
Image credit: PennState Extension



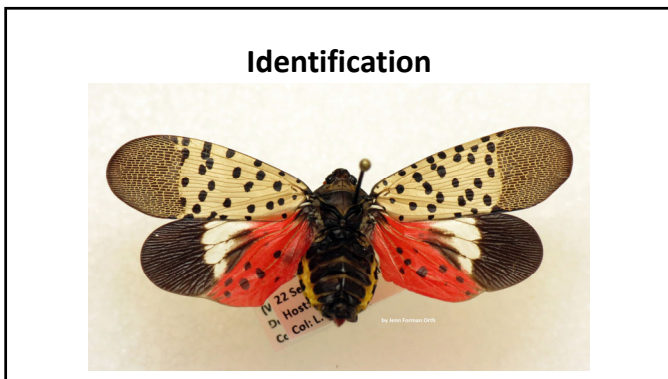


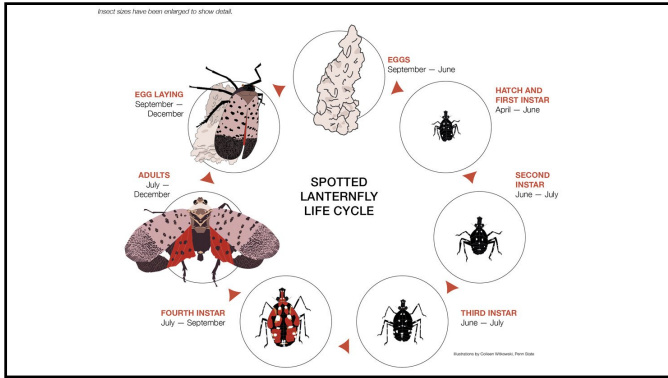
New Distribution
Reported Distribution

- Earlier this fall, SLF was identified on tree-of-heaven along rail lines in Elkhart and St. Joseph counties, primarily in the Mishawaka area
- Since then, SLF has also been spotted in Porter and Allen counties
- Fort Wayne major transport corridor



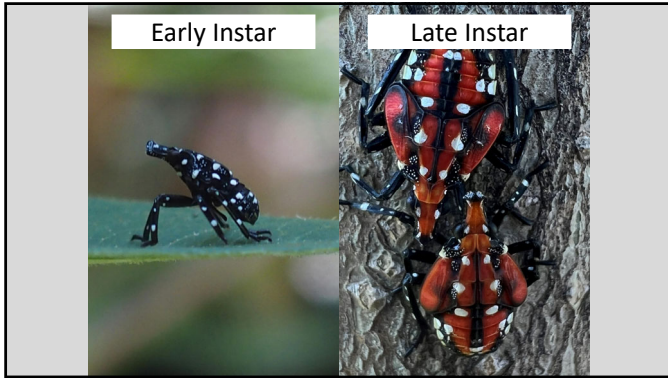
IPM Integrated Pest Management Program















Spotted lanternfly eats...



Image credit: Spot Lanternfly, rabbit, elara on flickr, F. D. Richards, G. Zeno, Robert Burns, Andrew Beckstein

+ At least 100 more

Impact on Trees and woody plants

- Starting to see signs of stress
- General loss of resilience
- Indications of crown death
- Moist, sticky substance on surface
- May reduce growth or kill



Image credit: PennState Extension

Indirect Damage



Image credit: USDA Photo by Lance Cheung



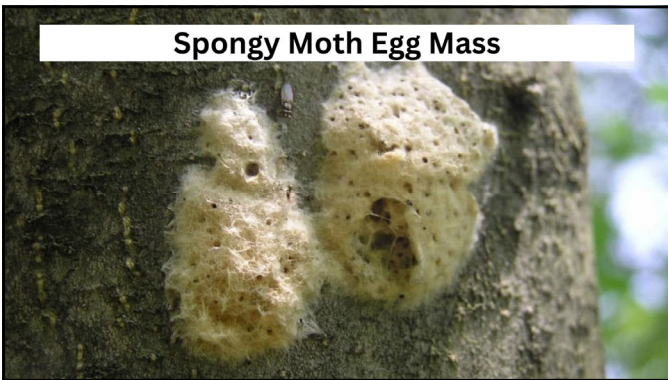


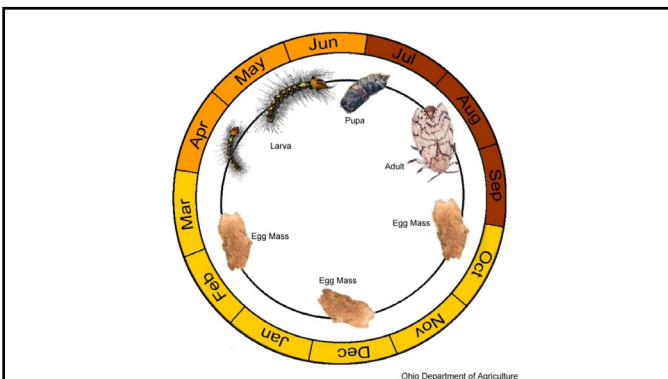


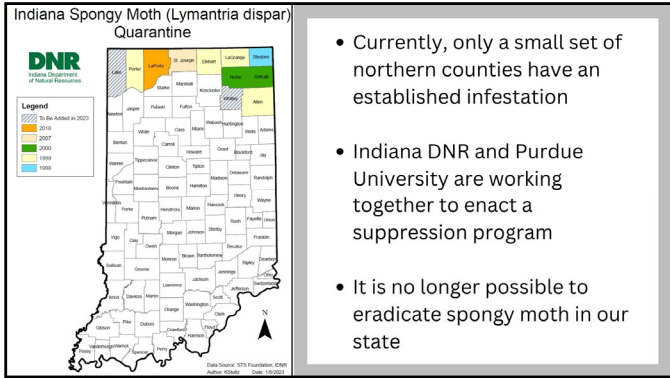
Spongy Moth Larvae



Spongy Moth Egg Mass











Where did it come from?

- Native to Asia, including Japan, Korea, China, and portions of Russia
- Initial spread was originally recorded in Germany in 2006
- Has since been identified in Toronto, Ontario, and Michigan, and it is potentially present in other states
- Specializes on boxwood and represents a major threat

European Invasion

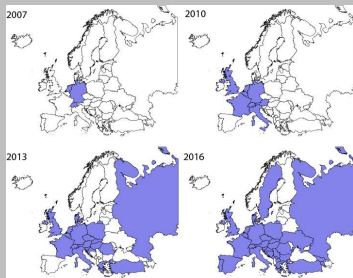


Photo Credit: Penn State Extension, modified from Bras et al. (2019) and EBTS (2020)

Boxwoods already have a few issues...



Photo Credit: MN Dept. of Agriculture

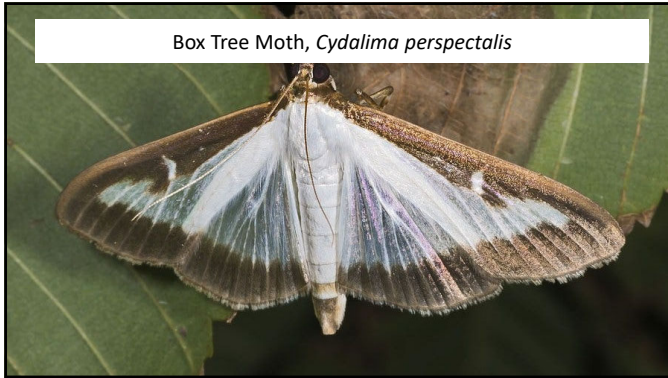
Boxwood Decline

- Combination of several fungal pathogens, including *Paecilomyces*, *Volutella*, *Macrophoma*, and *Phytophthora*
- Also believed that several environmental factors play a part, including temperature, soil chemistry, and nutrition
- Typically expresses as thin plants with spindly growth, dead or dying branches, yellowing leaves and premature leaf drop

Arthropod Pests

- Boxwood leaf miner – invasive fly spread across US, larvae will form tunnels within leaf that resembles blistering
- Boxwood mite – relative of the two-spotted spider mite, this mite feeds on the underside of the leaf, scraping away surface tissue and causing leaf loos
- Boxwood psyllids – small insect that is very common on boxwoods, causes leaf cupping





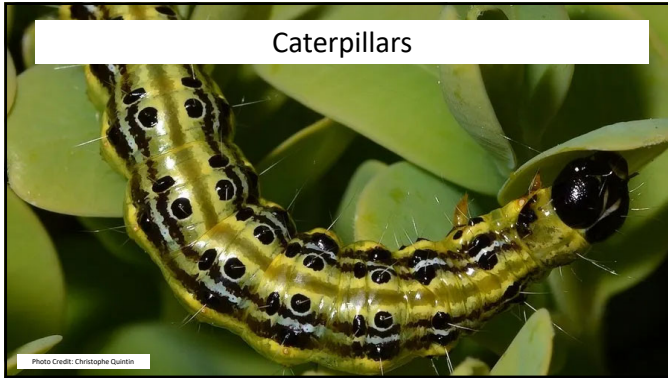
Life Cycle

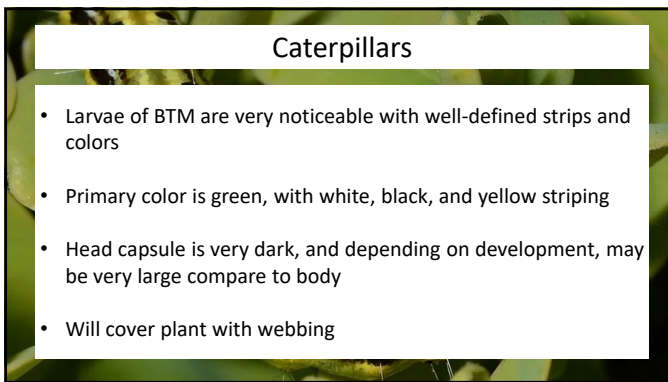
- Eggs are laid on the underside of boxwood leaves, hatching in approximately three days (temperature dependent)
- Caterpillars immediately begin feeding on leaf tissue, developing into adults in approximately 14 days
- Total time to reproductive capacity = ~17 days
- Possible to have several, concurrent generations in a single season

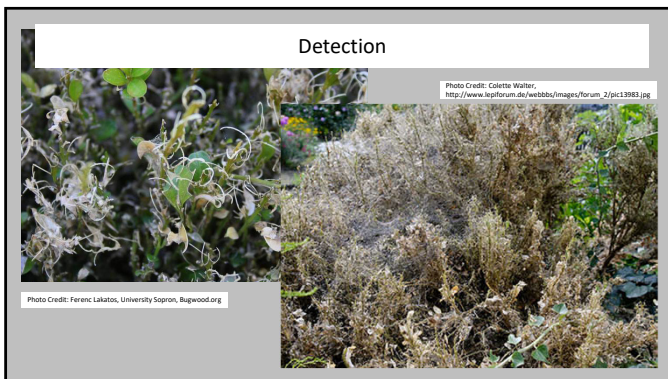
Eggs

BTM Eggs on leaf underside
Photo Credit: Walter Schlie

Close-up of BTM Eggs
Photo Credit: Walter Schlie







Damage

- Damage to boxwoods is unique as this is the only caterpillar that attacks this plant
- Will strip leaf tissue away from midrib, leaving the unique, spindly appearance to remainder
- Plant will also be covered in thick webbing, far more than would normally be produced by a spider or spider mite

Management Options

- Manual removal is a great option to manage caterpillars and pupae
- Opportunities exist to use monitoring traps that are loaded with a sex pheromone specific to BTM
- Potential exists to use horticultural oils, insecticidal soaps, and biopesticides such as spinosad

Management Options

- As a moth, several options for pesticides exist to control BTM populations
- Several products (appropriately labeled) will impact BTM, primarily synthetic pyrethroids (bifenthrin, lambda-cyhalothrin, cyfluthrin, permethrin)
- Btk also appears to impact caterpillar populations

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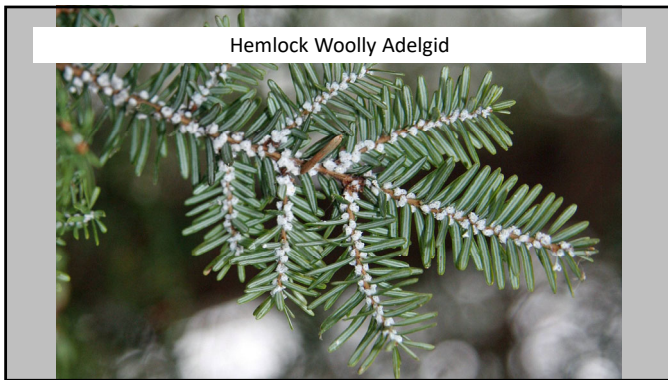


Flowers



Beneficials

<https://www.purdueplantdoctor.com>



Hemlock Woolly Adelgid Identification

- Hemlock woolly adelgid are difficult to see with the naked eye
- Infestation is normally detected by locating small wool-like egg masses and waxy secretions produced by adults
- Egg masses are typically found on the underside and the base of needles, and sometimes on the stem itself

Hemlock Woolly Adelgid Identification

- Hemlock woolly adelgid very closely resembles an aphid and feeds in similar ways using piercing/sucking mouthparts
- Like some species of aphid, they also have different body forms that have different purposes
- Some of those forms can't survive in NA; the host plant they need is not present



Symptoms & Damage

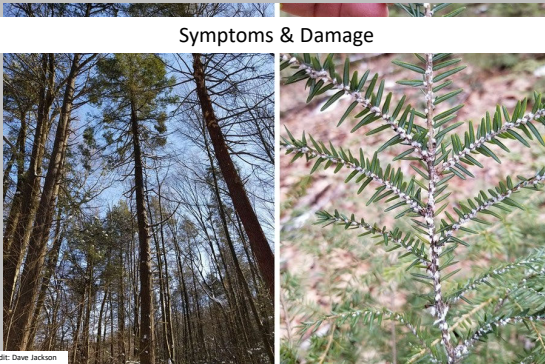




Photo Credit: Dave Jackson

Symptoms & Damage

- Like aphids, adelgids are sap-feeding insects and possess piercing/sucking mouthparts that resembles a syringe (rostrum)
- Damage will progress just like a heavy aphid infestation, but hemlocks have in NA have no defenses against the invader
- Branch dieback and associated damage from feeding, also based on temperature and moisture



- Branch dieback is an obvious symptom, typically progressing from lower branches upwards
- Progressed infestations will also have needle drop and reduced regrowth




- Easiest symptoms to find are the white filaments at the base of needles
- Insects difficult to find unless trained and with assistance, but waxy secretions will stand out
- Can be confused for scales

Where to Report

- <https://www.eddmaps.org>
- <https://www.gledn.org>
- 1-866-NOEXOTIC
- Email us!

Photo Credit: Penn State MG Program

SEEN ME? SAY SOMETHING!
Stop Spotted Lanternfly! Report at:
reportINvasive.com
1-866-663-9684



Contact information:
Bob Bruner, rfbruner@purdue.edu

Other Resources:

- reportINvasive on Twitter, Facebook, and Instagram
- Purdue Landscape Report
- Emerald Ash Borer University
- PennState Extension
