Urban trees: Pests, Diseases, and Solutions

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Insect Pests

- Invasive insects
- Caterpillars → Lepidoptera
- True bugs → Hemiptera
- Beetles → Coleoptera
Asian Longhorned Beetle

• Anoplophora glabripennis
• Adult - ¾ to 1.5 inches long
• Larvae girdles tree stems and branches
• Introduced in wood packing materials

Asian Longhorned Beetle

• Prefers maple species (Acer spp.), horsechestnut, willows, elms, birches and poplars
• Infestations in Illinois, Ohio, Massachusetts, New York, New Jersey, and South Carolina

Information
- Bugwood - https://www.invasive.org/browse/subinfo.cfm?sub=2178
- Warnell School of Forestry and Natural Resources https://www.warnell.uga.edu/sites/default/files/publications/Asian%20Longhorned%20Beetle_Infographic.pdf
Spotted Lanternfly

- *Lycorma delicatula* – a planthopper
- **Hosts**: tree-of-heaven, apples, plums, cherries, peaches, nectarines, apricots, almonds, pine, oak, walnut, poplar, and grapes.
- **Damage**: sucking sap from stems and leaves; feeding can cause the plant to ooze or weep; possible honeydew

Spotted Lanternfly

- **Where To Look:**
  - Gathered in large numbers on host plants
  - Easiest to spot at dusk or at night - migrating up and down the trunk of the plant.
  - Daytime - clustered near the base of the plant
  - Egg masses - on smooth surfaces on the trunks of host plants and on other smooth surfaces
Laurel Wilt Disease

• *Xyleborus glabratus* - vector
• *Raffaelea lauricola* – pathogen
• Both species are native to Asia
• First detected in Georgia 2002
• Vascular wilt disease – clogs vascular tissue
• Affects – redbay, sassafras, silkbay, camphor tree, avocado, northern spicebush, pondberry, and pondspice

Contact GFC if you suspect laurel wilt in your area.
Photos: Cameron Walters, Westervelt Company

RAB attacks trees

Wood staining

RAB galleries and fungi

Foliage turns purple to brown
Laurel Wilt Management

- Sanitation
- “Don’t move firewood”
- Insecticides??
- Fungicides propiconazole preventative

ARCGIS laurel wilt dashboard
https://gfcgis.maps.arcgis.com/apps/opsdashboard/index.html#/d43391c8fdb741b597e6ccf1236d2a02
Emerald Ash Borer

- First found in Michigan in 2002
- Introduced from Asia in wood packing material
- Metallic green beetles
- About 1/2-inch long
- Attacks ash trees (Fraxinus spp.)
- **Quarantined in numerous states**

Emerald Ash Borer

- Killed > 25 million trees
- Nation-wide loss of $20-60 billion if all ash trees die
- Pathways: infested ash trees, limbs, firewood, logs, and untreated lumber
Ash Symptoms

Chemical Control

- Foliage sprays
  - Carbaryl (Sevin)
  - Permethrin

- Systemic
  - Basal drench
  - Trunk injections
  - Trunk sprays

- Systemic
  - Imidacloprid
  - Dinotefuran
  - Emamectin benzoate
Fall Webworm

• *Hyphantria cunea*
• Glistening webs in treetops
• Can defoliate entire trees
• Hundreds of hosts: pecan, hickory, walnut, sweet gum, river birch

Fall Webworm

• White moth with dark wingspots, 1.4 – 1.7 in wingspan
• Up to 5 generations each year
• Two color forms: red-headed and black-headed

Gerald J. Lenhard, Louisiana State University Agricultural Center, Bugwood.org
Black-headed

Red-headed

Fall Webworm

• Females begin laying eggs in spring
• Caterpillars develop in web
• Mature caterpillars leave the nest to feed
• Return to nest before daybreak
• Populations naturally controlled by parasites and predators
  • Birds, spiders, wasps, small mammals
Fall Webworm

• Often not noticed until considerable damage occurs
• Best to control webworm when caterpillars are younger
• Disrupting the web to allow natural enemies access is effective in smaller trees

Fall Webworm

• Webbing makes control more difficult
• Systemic insecticide is possible if known beforehand
• Or...just let kids play with the nest and enjoy learning about nature
Eastern Tent

- *Malacosoma americanum*
- Nests in the crotches of trees
- Attacks many *Prunus* species
- One generation each year
- Mostly aesthetic problem
- Chemical controls are usually not justified
- Contact insecticides at the right time if necessary

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Eastern Tent

- Can defoliate entire trees in outbreak
- Caterpillars leave tree to pupate
- Wandering caterpillars can be a nuisance
- Occurs earlier in season than fall webworm – most damage in May
Eastern Tent

- Larvae get up to 2.5 in and have black heads
- Striping along back, blue and black spots on the side
- Larvae spin cocoons, pupate, and emerge as adults
- Females deposit egg masses around twigs
- Eggs hatch the next spring
Overwinter as egg masses

Nests on shrub

Forest Tent Caterpillar

- Malacosoma disstria
- Deciduous hosts
- Do not make a noticeable nest
- Silken mats on trunks and large branches
- Molt and rest from feeding in the webbing
- May cluster on the trunk
Forest Tent Caterpillar

- Overwinter as eggs, attack in spring
- Larvae have blue lines on side and
- Shoeprint yellowish markings
- Adults are brown with two darker parallel lines

Forest Tent Caterpillar

- One generation per year
- Larvae overwinter within egg masses
- Hatching peaks earlier in spring
- Older instars can wander, becoming a nuisance
- Natural enemies important for population control
- Control is not warranted or easily implemented
- Can occur at outbreak levels
- Cyclical population cycles
- La and AL – annual outbreaks on water tupelo

- May outbreak every 6 – 16 years
- Outbreaks may occur for 2-4 years
- Trees are rarely killed

Forest Tent Caterpillar

Eastern Tent Caterpillar

Fall Webworm
Oakworms
Defoliating Insects

- Three most common species
  - Orange-striped oakworm, *Anisota senatoria*
  - Pink-striped oakworm, *Anisota virginiensis*
  - Spiny oakworm, *Anisota stigma*
- Voracious feeders and can quickly strip foliage
- Defoliation usually occurs late-summer to fall
- Does not usually harm the tree – minor economic impact
Bagworms

- Moth caterpillars
- Mostly an issue for conifers
- Make the bag after hatching
- Carry the bag around as they feed
- Males emerge from bags after pupating
- Mate with females who are still in their bags
- Females lay eggs and die
- Eggs hatch the next spring
- Pick off bags or spray early in the season

Bagworms
Leafminers

• Moths, beetles, flies, or sawflies
• Attack may different tree species.
• Blotch or serpentine leaf mines
• Feed between the top and bottom leaf surfaces
• Generally have little effect on plant health
• Control
  • Natural controls usually sufficient
  • Contact insecticides during egg laying
  • Systemic insecticides for some leaf miners

Gallmakers

• Each species makes a characteristic gall on specific plant parts
• Not economically important in forest stands
• Can be in issue in ornamentals and Christmas trees
Gallmakers

• Insects and mites can inject substances that causes abnormal plant growth (galls)
• Found on leaves, buds, stems, or roots
• Culprits are often – gall wasps (Cynipidae), gall midges (Ceccidomyiidae, and eriophyid mites (Eriophyidae)

Scales

• Suck plant fluids
• Many different species
• Not always a problem
• No simple control answers
Soft Scales

- Family Coccidae
- Approx. 1/4 inch long
- Smooth, cottony, or waxy surface
- Excrete sticky honeydew
- Associated with blackish sooty mold
- Usually 1 generation/year

Armored Scales

- Family Diaspididae
- Approx. 1/8 inch diameter
- Plate-like cover over body
- “Body” is underneath
- Do not produce honeydew
- The “armor” can make them hard to kill
- Usually many generation/year
Control Options

Should you control the scale?

• Systemic insecticides – neonics, acephate
• Horticultural oil
• Insecticidal soap
• Contact insecticides - carbaryl (Sevin), dimethoate, bifenthrin, esfenvalerate
• Insect growth regulators - pyriproxifen
• Best method depends on the scale insect

Lecanium Scales

• Soft scale
• Shade trees and woody ornamentals
• Oaks, Maples, Birch
• Imidacloprid, dinotefuran
• Contact insecticides: crawlers
Wax Scales

- Ceroplastes spp.
- Soft scale
- Japanese, Florida, Indian
- Hollies, boxwood, spirea, barberry, citrus, jasmine...
- Start checking in May
- Control – oil, contact, systemic

Sycamore Lacebug

- *Corythucha* ciliata (Hemiptera: Tingidae)
- Nymphs and adults feed on leaves
- May cause chlorotic spots on upper leaf surface
- Cast nymphal skins and frass may be visible on underside of leaves
- Several generations per year
- Nymphs are dark colored
- Adults have broad, transparent, lacelike wing-covers
- Natural enemies usually effective control populations
- Chemical control for high value trees
Sycamore Lacebug

- Usually very small
- Can cause damage in hardwoods
- Decomposers of dead/nearly dead pine trees
- Use the tree to grow their
- Larvae eat the fungi

Ambrosia Beetles
Ambrosia Beetles

• Many species
• Some are native
• Many non-natives – redbay ambrosia beetle, black twig borer
• Mostly attack stressed trees
  • Forests
  • Nurseries
  • Urban areas

Black Twig Borer

Dead twigs in an otherwise healthy canopy
Black Twig Borer

- Small hole in the twig
- Gallery with beetle

Elm Leaf Beetles and Larger Elm Leaf Beetles

- Charles Todd, Jasper County Extension, UGA
- Greater Elm Leaf Beetle: M. Huston, BugGuide.net
Elm Leaf Beetles

*Pyrrhalta luteola*

- 6-7 mm
- Native to Europe
- Has a longitudinal stripe on elytra
- Can have 2 (3?) generations per year
- Skeletonizer
- Can defoliate elms, usually does not cause tree death

[Image of Elm Leaf Beetles]

Larger Elm Leaf Beetles

*Monocesta coryli*

- 10 – 16 mm
- Native to United States
- 1 generation per year
- Defoliates elm trees
- Skeletonizer
- Systemic insecticide early in the year
- Do not do whole canopy sprays

[Image of Larger Elm Leaf Beetles]
Black turpentine beetles
*Dendroctonus tenebrans*
- Feed on injured/stressed trees
- Lower 1-2 meters of the trunk
- Scattered/patchy pine mortality
- Accumulated attacks over numerous years

Engraver Beetles
*Ips avulsus*, *grandicolis*, *calligraphus*
- Isolated occurrence (usually)
- Colonize stressed trees, branches, slash
- Secondary
Engraver Beetles
- *Ips avulsus*, *grandicolis*, *calligraphus*
- Colonize stressed trees, branches, slash
- Secondary
- Usually isolated occurrence

Pennsylvania Department of Conservation and Natural Resources

Ambrosia beetles
*Xyleborus* spp., *Xylosandrus* sp., *Platypus* sp.
- Small (approx. 2mm)
- Usually attack only dead/dying trees
- Part of the decomposition process
- Fungus-feeding beetles
  - Dig tunnels in trees to grow fungi
  - Fungi is their main food source
  - Beetle brings their fungi to the tree
  - Cannot survive on plant tissues alone
- Managed with permethrin or bifenthrin if problematic on live trees

Wayne Brewer, Auburn University, Bugwood.org
Roundheaded Wood Borers

- Longhorned beetles (Cerambycidae)
- Pine sawyers *Monochamus* spp.
- 1-3 yr life cycle
- Can tunnel into heartwood and sapwood
- Attack weakened/dying trees

Questions?

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