Tree Pests and Diseases in Ohio

OPRA Conference & Trade Show
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Goal: monitor, eradicate, and suppress forest pests as well as conduct outreach and education to increase awareness and knowledge of forest pest issues within the state

Cooperative effort with many agencies, groups, academic institutions:

- Ohio Department of Agriculture
- USDA Forest Service
- Ohio State University Extension
- USDA APHIS Plant Protection and Quarantine
- many others
Introduction

• A few major tree pests (insects and diseases) of concern in Ohio: EAB, ALB, HWA, TCD, GM
  – Biology/lifecycle
  – Identification
  – History
  – Status in Ohio

• Other notable tree pests

• Pests commonly encountered, but rarely detrimental

• Importance of **EARLY DETECTION** & RAPID RESPONSE
Emerald ash borer

- Family Buprestidae – metallic wood-boring lined chestnut bronze birch borer

Biology:
- Feeds on plants in the olive family (Oleaceae)*
- Typically 1 generation per year in Ohio
- Overwinter as pupae beneath bark
- Adults emerge in spring to mate
- Females oviposit on host plants in summer
- Larvae feed just beneath bark on phloem (tree nutrient conducting tissue) late summer-fall
Emerald ash borer

- **Identification:**
  - Adults iridescent green (~1/2”)
  - Larvae have bell-shaped segmentation
  - Serpentine larval galleries
  - D-shaped exit holes
  - Ash “blonding”
Emerald ash borer

• History:
  • Native to NE China, Korean peninsula, and E Russia
  • Discovered in 2002 near Detroit, MI
  • Probably imported to NA via shipping crates or pallets
  • Dendrochronological analyses show EAB was established in SE MI by at least the early 1990s and trees were killed by 1998
  • Has killed hundreds of millions of ash trees in NA
Emerald ash borer
Emerald ash borer
Emerald ash borer

- <1% of ash trees in heavily infested areas are surviving
- “Lingering ash”
- Genetics testing to determine resistance
- Reports of lingering ash in NW OH and SE MI: http://www.fs.fed.us/nrs/tools/ash/
Emerald ash borer

- Discovery of EAB in white fringetree in 2014 (Olive family – same as ash)
- Native to SE U.S. (and southern OH)
- 2016 – EAB can complete lifecycle in cultivated olive
- Further research needed
Emerald ash borer

emeraldashborer.info
Asian longhorned beetle

- Native to Asia (China, Korea, Taiwan)
- First discovery – 1996, NYC
- 5 other sites since – all unique introductions
- Goal = 100% eradication
- Feeds on 12 genera:
  - Maple, buckeye, willow, elm, birch, ash, golden raintree, poplar, planetree, horsechestnut, mimosa, mountain-ash, katsura

Photo: Joe Boggs
Asian longhorned beetle
Asian longhorned beetle

• What to look for:
  – Very large beetle
  – Branch breakage (trees may not show decline)
  – Round exit holes
  – Frass
  – Oviposition pits

• Larvae not unique
Asian longhorned beetle

- ALB in Ohio
  - Discovered in June 2011, Clermont County
Asian longhorned beetle

• Survey and removals ongoing
• As of 1/21/2017:
  • 2.18 million trees surveyed
  • 18,791 ALB-infested trees confirmed
  • 18,242 ALB-infested trees removed
  • 70,003 high-risk host trees removed
Asian longhorned beetle

- Special NRCS EQIP funding for restoration on private land
  - >1,300 trees planted
- ODNR DOF Tree Canopy Enhancement Program (TCEP):
  - Initiated fall 2012
  - >1,500 non-ALB host trees distributed to landowners
- USFS grant funding for additional ALB work by ODNR DOF
Hemlock woolly adelgid

- Tiny, aphid-like insect native to Japan (VA 1950s)
- Attaches to undersides of hemlock needles
- Woolly covering (<1/8” dia) October – June
- 2 generations/yr (100+ eggs laid per adelgid)
Hemlock woolly adelgid

- Killed millions hemlocks in Appalachians and New England
- Kills trees in 4-15+ years
- Spread by wind, wildlife (birds), people

Photo: Dave Apsley

Photo: USFS Southern Research Station
Hemlock woolly adelgid

![Map of Hemlock Woolly Adelgid Infestation](image)

Disclaimer: This map depicts counties with established HWA populations that are confirmed and reported by respective state forest health officials. The coarse nature of the map does not provide information below the county level and users should not assume that highlighted infested counties are entirely infested.

Map Produced by
USDA Forest Service 1/26/2016
Eastern hemlock (*Tsuga canadensis*)

- Very long-lived (>800 years) and shade-tolerant
- Foundation species: regulate ecosystem processes of a community
- Ecological value: critical plant and wildlife habitat
- Great aesthetic, recreational value
Eastern hemlock in Ohio

Mapping by Nicole Stump and USDA Forest Service
HWA in Ohio

• What is being done?
• Goal = suppression, not eradication
• Insecticide treatments highly effective (>1,300 trees treated)
• When to treat?
• Biological controls (>3,700 released)
Hemlock woolly adelgid

- ODNR Hemlock Conservation Plan “ranks” hemlock stands
- What can you do?
- Look for HWA October – June
- Report any suspects to ODNR Division of Forestry
- Ohiodnr.com/hwa
Thousand cankers disease

- Fungal pathogen vectored by bark beetle, walnut twig beetle – effects walnuts (*Juglans* spp.)
- First observed on black walnut planted in western U.S.
- Discovered in east in 2010 in Knoxville, TN
- Formation of small cankers, girdle twigs
- Flagging, branch dieback, tree death (possibly >10 years)
Thousand cankers disease

- WTB discovered in Butler County in 2012
- Fungus confirmed in 2013
- Trapping effort: DOF - 35 traps statewide, ODA - >100 traps Butler County area
- No WTB caught since 2013 – cold winters?
- Known infested trees removed – USFS research

Jennifer Juzwik
Thousand cankers disease
TCD – Recent Findings

- Still many unanswered questions
- Recent research has shown trees in decline infested with TCD can recover (Griffin 2015)
- Work by J. Juzwik has shown other insects can carry Geosmithia fungus – roles as vectors need further research
- Cankers other than Geosmithia also contributing to tree decline
Gypsy moth

- Native to Europe
- Defoliates a wide range of plants (>300 spp)
- Oaks are preferred host
- Egg masses
- Slow the Spread Program
Other Pests of Concern: Spotted lanternfly

• Discovered in SE PA in 2014
• Planthopper native to Asia
• Egg masses likely imported on stone
• Fairly large (1”) and colorful
• Many known host plants (including *Ailanthus altissima*, grape, and various fruit trees)

Photos: USDA APHIS

Photo: USDA APHIS

Photos: Itchydogimages
Dutch elm disease

- Caused by 2 fungal pathogens native to Asia
- Studied by plant pathologists in Netherlands
- Vectored by European and North American elm bark beetles
- Has not eliminated elms, but significantly reduced prevalence
- Yellowing in crown
- Death in one to several years
- Tolerant selections
Viburnum leaf beetle

• Native to Europe
• Found in NE Ohio in 2002
• Favored hosts: Viburnums (arrowwood, highbush-cranberry, maple-leaf viburnum)
• Larvae and adults skeletonize leaves
• Characteristic egg sites on twigs

Photo: Curtis Young
Conifer Diseases

- Spruces:
  - Cytospora canker
  - Rhizosphaera needlecast
  - Spruce spider mite

- Pines:
  - Diplodia tip blight (*Sphaeropsis*)
  - Chlorosis
Beech leaf disease

What we know so far:

• Has been observed since 2012 in NE OH and 2016 in Crawford County PA

• Symptoms appear on leaves and buds of American and possibly European beech

• Initially, dark interveinal striping on some leaves

• Progresses to shriveled, discolored, deformed leaves and lack of bud production

• Some healthy-appearing foliage and branches may remain

• Mortality of saplings has been observed

Photos: John Pogacnik
Beech leaf disease

- Samples have been analyzed by various plant pathologists and laboratories (OSU, USFS, APHIS)
- No causal agent has been identified
- More testing planned
- Monitoring plots will be visited to determine geographic extent of BLD, describe symptom development, and document speed of symptom progression
Commonly Encountered, Usually Insignificant

- Stem and leaf galls
- Beech blight
- Aphid/sooty mold
- Bagworms
- Eastern & forest tent caterpillars
- Anthracnose
Don’t Move Firewood!

• Don'tmovefirewood.org
• Create custom messaging
Further information

• EAB: emeraldashborer.info
  • EAB University Webinar Series
• ALB: asianlonghornedbeetle.com
• HWA: na.fs.fed.us/fhp/hwa
• TCD: thousandcankers.com
• GM: gmsts.org/about

• Ohio specific info:
  • ODNR Division of Forestry: forestry.ohiodnr.gov
  • Ohio Dept. of Agriculture: agri.ohio.gov/plant
We need your help!

Earlier detection = More management options = Healthier forests
Thank you!

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Rosy maple moth  Elderberry borer  Dogbane leaf beetle