Preparedness for EAB

What is an effective approach?

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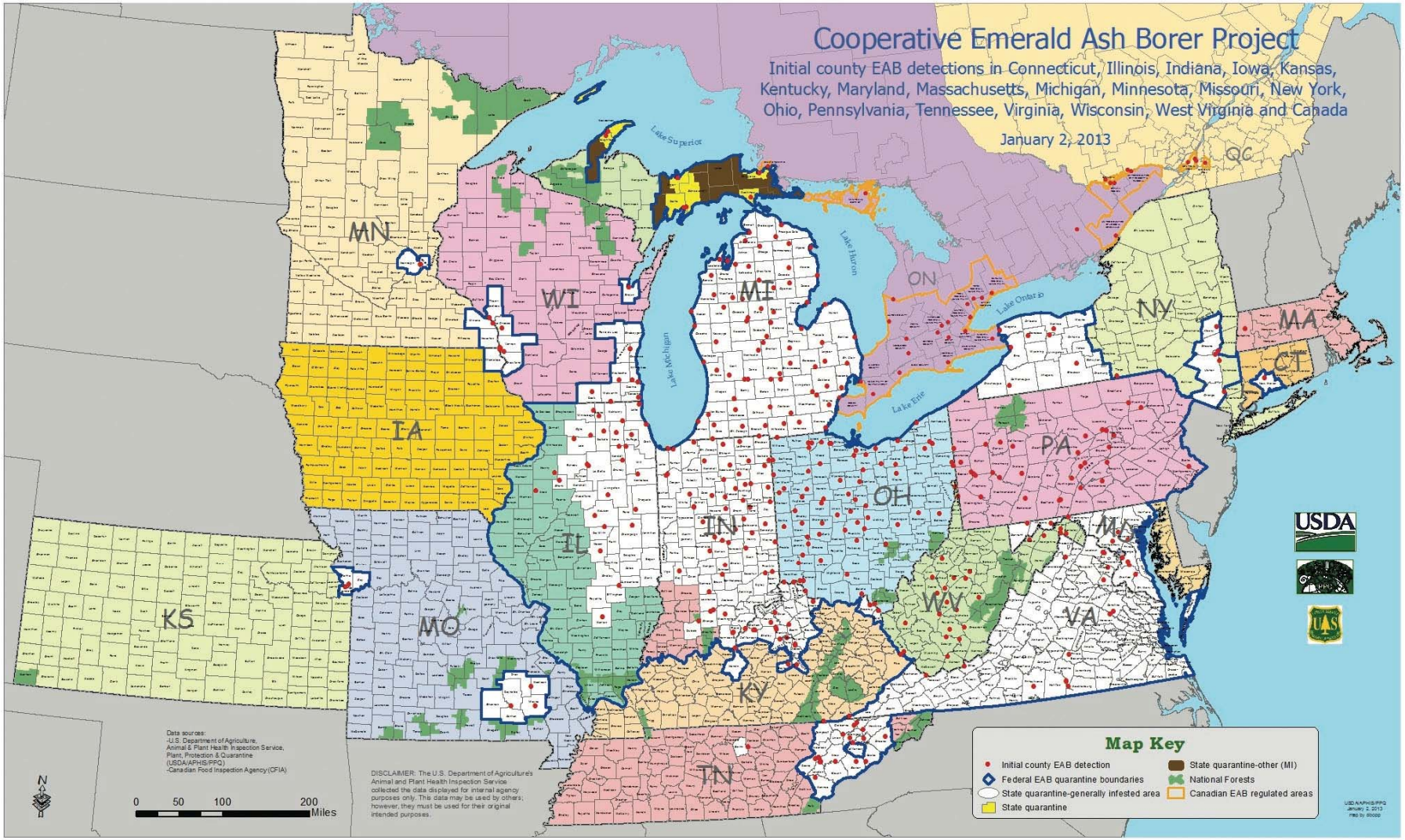
History and Scope

- Likely arrived from China in wood packing material ~15-20 years ago
- First discovered near Detroit (2002 June)
- Subsequently thereafter found in Windsor, Ontario, Canada, OH, IA, IN, IL, PA, WV, MD, MN, MO, and WI

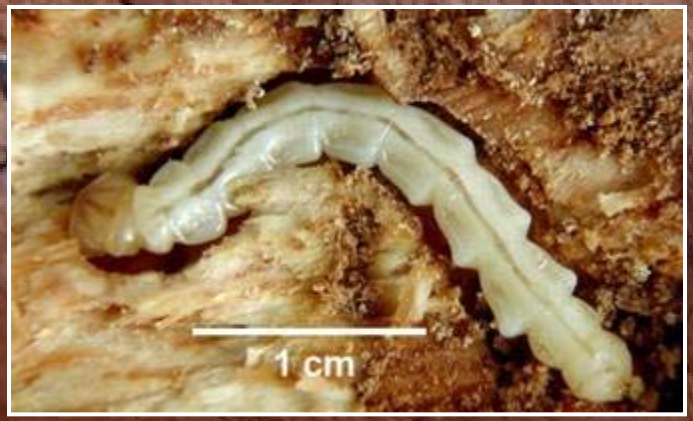
Native Range

- Northeastern China
- Mongolia
- Korea
- Japan
- Siberia
- Taiwan

Known locations of the Emerald Ash Borer



Agrilus planipennis **(Fairmaire)**



Life History

- EAB is similar in many ways to native ***Agrilus* spp.**
  - Bronze birch borer (*A. anxius*)
  - Two-lined chestnut borer (*A. bilineatus*)

EAB Adult

- **Emerald, metallic green**
- 10-13 mm (3/8-1/2 in) long

EAB Larvae

- Legless larva
- ~ 3.8 mm (1½ in) long
- 10 segmented body, cream-colored, with distinct bell-shaped abdominal segments

Life Cycle

June – September

Early June – October

November – late May

Late May – September

Host Plants

- Attacks **Ash (*Fraxinus spp.*)**
  - Green ash (*F. pennslyvanica*)
  - White ash (*F. americana*)
  - Blue ash (*F. quadrangulata*)
  - Black ash (*F. nigra*)
  - European ash (*F. excelsior*)
- Mountain ash (*Sorbus* spp.) is NOT attacked!

Host Impact:

- Larvae feed just under bark destroying conductive tissues (i.e., xylem and phloem) ultimately disrupting flow of water and nutrients
- EAB attacks both vigorous or “healthy” as well as stressed trees of nearly any size (1/2”->40” DBH)
  - Most other wood boring insect primarily attack stressed trees (often secondary pests)

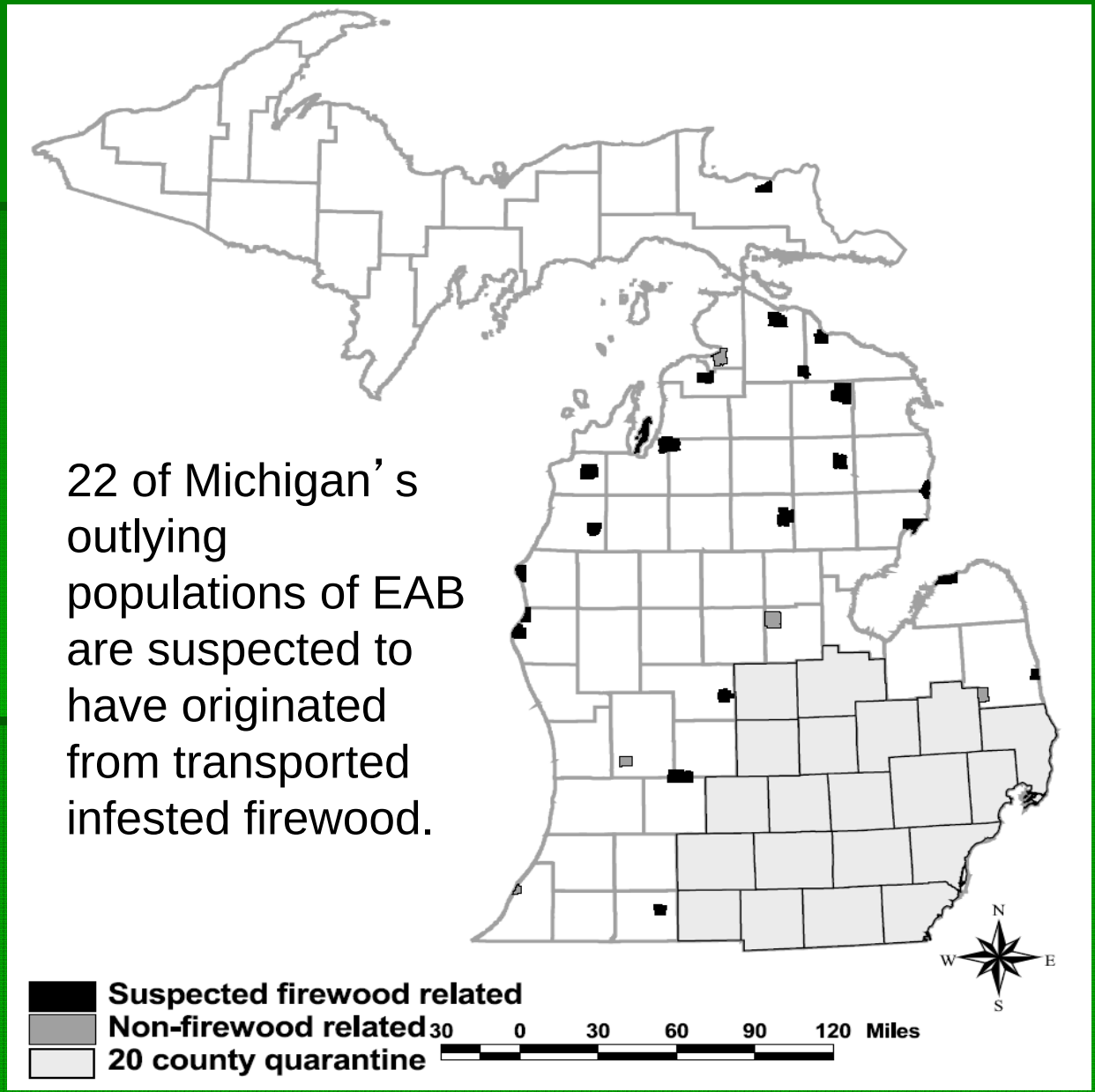
Extensive larval feeding damage (galleries) packed with frass just under the bark surface

Potential for Spread

- Adult flight
- Firewood
- Nursery stock
- Ash products

Firewood in Michigan

22 of Michigan's outlying populations of EAB are suspected to have originated from transported infested firewood.



Life History

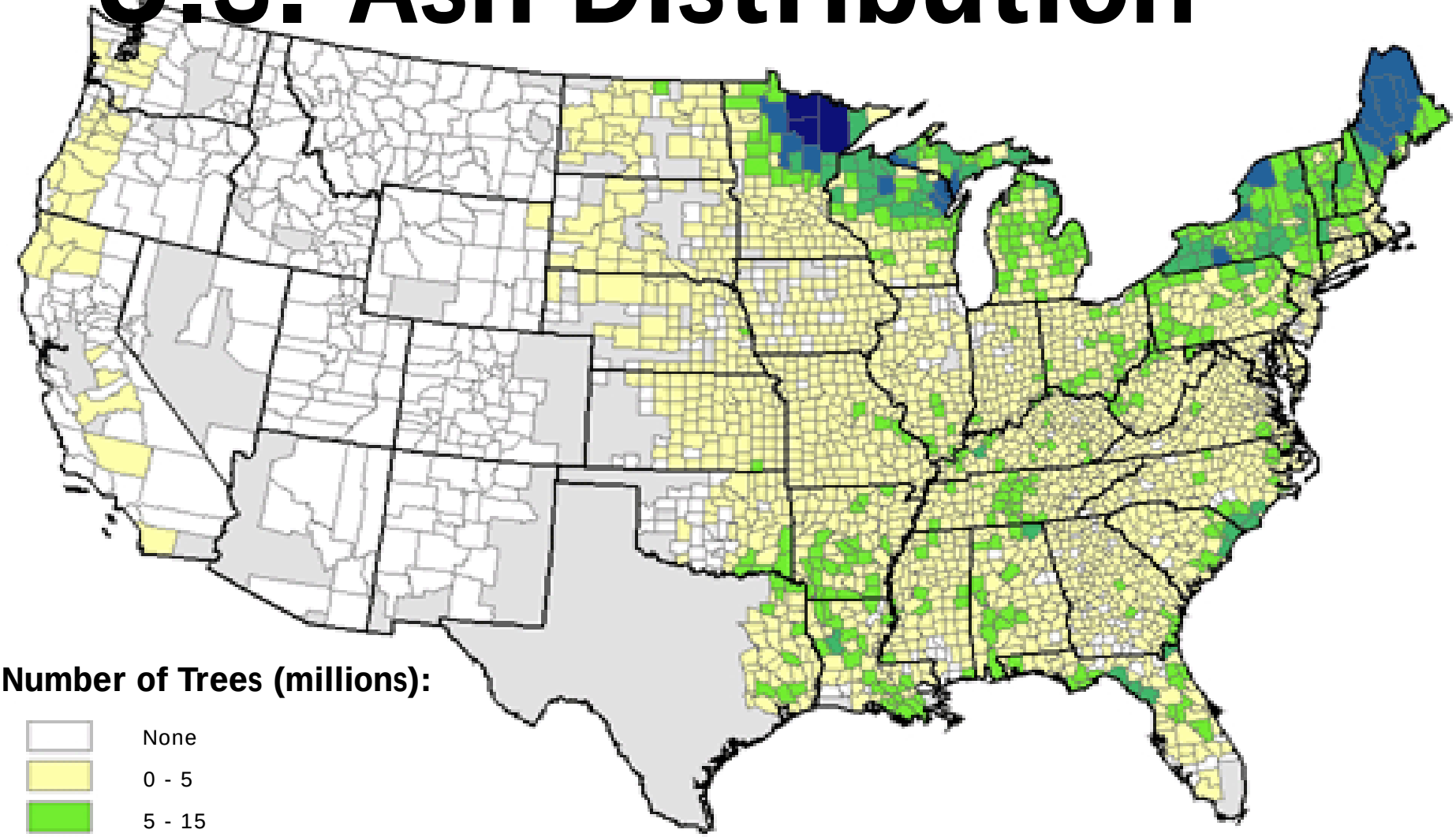
- **EAB prdominantly attacks ash trees in open settings and woodlots**
- Initial attacks occur in the upper canopy along trunk and main branches
- Succeeding attacks found on main trunk

Signs and Symptoms

- Canopy dieback
- Epicormic shoots (suckers)
- Woodpecker activity
- Bark splitting
- Serpentine larval galleries
- D-shaped exit holes

“D” Shaped Exit Holes

U.S. Ash Distribution



Number of Trees (millions):

- None
- 0 - 5
- 5 - 15
- 15 - 30
- 30 - 60
- 60 - 120
- No Data

"At risk: more than 7.5 billion ash trees growing in 40 states" - USA Today, Nov. 13, 2004

USDA

Planning and Education

- Conduct a Comprehensive Tree Inventory
  - Determine number of trees and species composition
  - Assess trees for size and quality (rating)
- Survey and Monitor for EAB
  - EAB traps
  - Visual surveys
- Develop a Strategic Plan (specific to you)
  - Examples of various plans are available at www.emeraldashborer.info
- Implement your EAB Plan!

Survey Tactics

- **Detection** and **Destructive** sampling

Purple Prism Trap
(aka "Barney Trap")

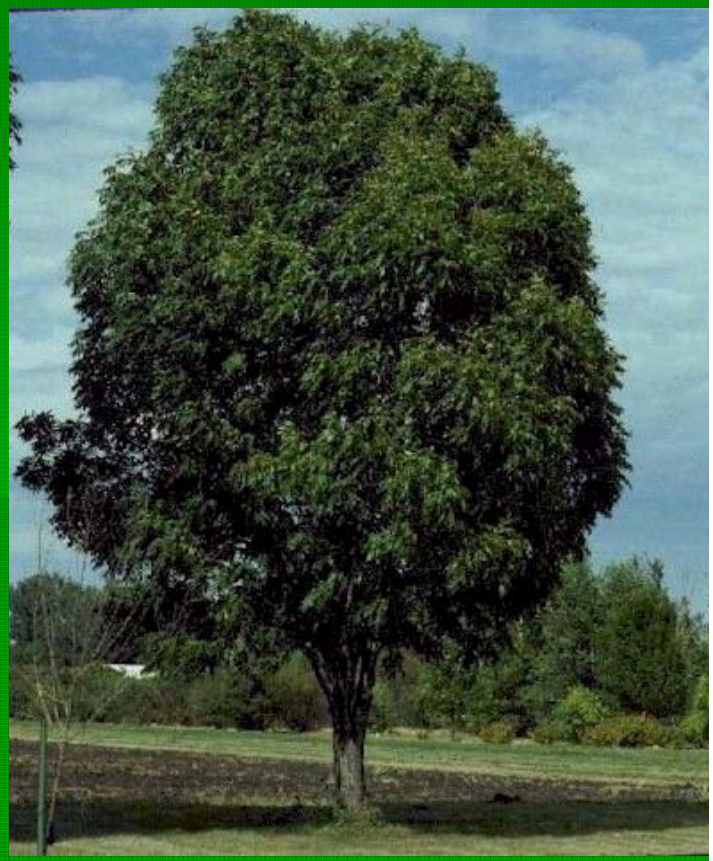
- Adults are active from 700 to 1,000 DD_{50}
- 90% of beetles caught in full sun, thus **trapping is optimal in open, sunny areas**

Management Approaches

- Removal and Replacement of ash trees with alternative species (i.e., Non-ash)
- Host Plant Resistance
- Insecticide Treatments

Host Plant Resistance

- Manchurian ash (Asian spp.) appears to be only tolerant
- NO evidence (so far) of inherent resistance in ANY ash species!



Are Insecticides Effective?

- 1) Eradication = **NO!**
- 2) Tree Protection = YES (in some cases)
  - Primarily for high-value, specimen, heritage or legacy ash trees
  - NOT for EAB infested ash trees with > 40-50% canopy thinning/dieback
  - NOT likely cost effective for woodlots or forested areas

Myth: Insecticide treatments do NOT work

- FACT: Insecticide treatments are effective against EAB!
- High success rate in healthy and lightly infested trees (< 50% canopy dieback)
- Products have been evaluated by numerous university researchers
- EPA requires efficacy data to register products for use against EAB

Myth: Only one effective EAB insecticide exists

- FACT: Three effective insecticides
- NO single treatment is the best choice in all cases
- Several factors influence products selection
  - Size of tree
  - Level of infestation (canopy dieback)
  - Location of tree

Myth: Insecticide treatment is "too expensive"

- FACT: Insecticide treatments are economical
- Treatment is often less expensive than removal and replacement
- Consider tree benefits
  - Property value (difficult to replace comparable tree size)
  - Environmental impact

Myth: Insecticide treatment is "dangerous"

- FACT: Insecticide treatments pose minimal risk
- EPA reviews product safety of all pesticides prior to registration

EAB Insecticide Approach:

- 1) Inside Quarantined Zone = Insecticide treatments are an effective management option
- 2) Outside Quarantined Zone = Insecticide treatments NOT suggested unless within < 10-15 miles from an EAB infested area

EAB Insecticide Management Options for Homeowners

1) Do it yourself
2) Hire a professional
3) Do nothing (guaranteed to result in complete loss of ash trees)

Insecticide Options

- Basal Trunk Sprays: dinotefuran
- Soil Injections/Drenches: imidacloprid or dinotefuran
- Trunk Injections:
  - Imidacloprid (IMA-jet, Imidcide, Pointer)
  - Emamectin benzoate (Tree-äge)
- Source: Herms DA, McCullough DG, Smitley DR, Sadof C, Williamson RC, and Nixon PL. 2009. Insecticide options for protecting ash trees from emerald ash borer. North Central IPM Center Bulletin. 12 pp.

Insecticide Options for Protecting Ash Trees from Emerald Ash Borer

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THE OHIO STATE UNIVERSITY EXTENSION OARDC

MICHIGAN STATE UNIVERSITY

PURDUE UNIVERSITY

UW Extension Cooperative Extension

Homeowner Products

1) Bayer Advanced Tree and Shrub Insect Control
2) Ferti-loam Systemic Tree and Shrub Drench
3) Gordon's Tree and Shrub Insect Killer
4) Green Light Tree and Shrub Insect Killer
5) The Max Tree and Shrub Insect Killer Optrol
6) Green Light Tree and Shrub Insect Control with Safari 2G (granular)

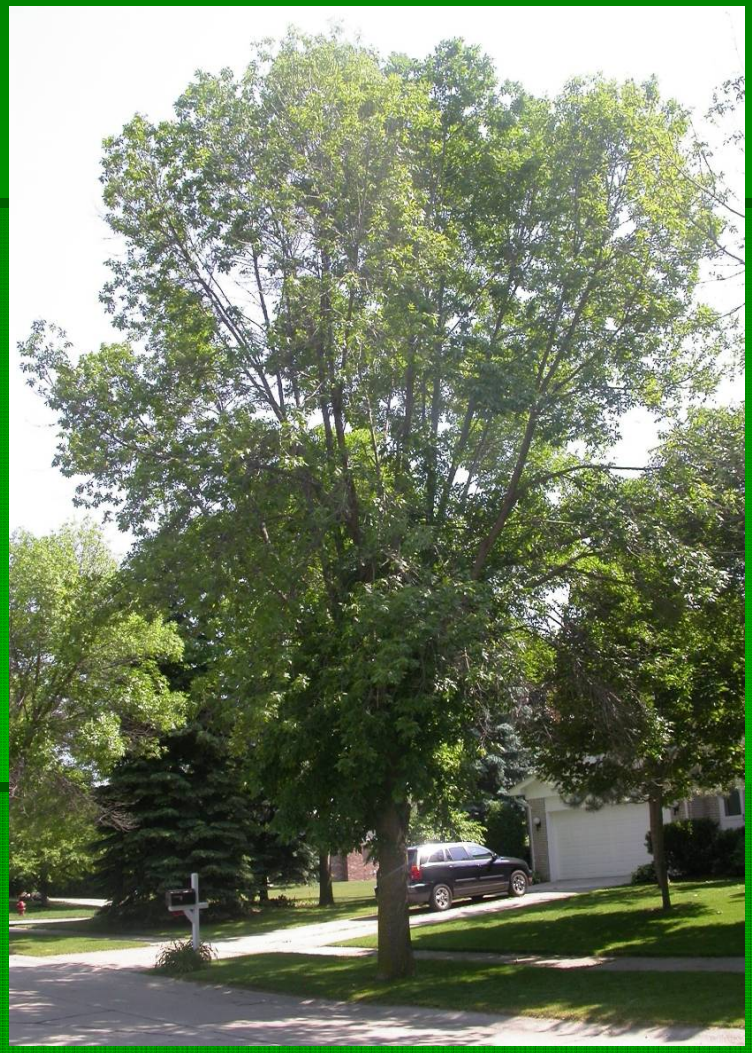
Professional Products

1) Merit (imidacloprid)
2) Xytect (imidacloprid)
3) Safari (dinotefuran)
4) Treeäge (emamectin benzoate)*

Can only be applied by a certified and licensed pesticide applicator by trunk injection

Canopy Dieback (D. Smitley, MSU)

Control



Imidacloprid treatment

Conclusions regarding insecticides:

EAB infested ash trees with > 50% canopy thinning/dieback should NOT be treated! (Remove and Destroy!)

Insecticides are NOT economical for large areas, especially woodlots or forested areas!

Primary Focus= High value, specimen, heritage or legacy ash trees

Long-term effectiveness of insecticides are unknown!
Research is ongoing…

NABB
Neighbors Against Bad Bugs
Act now. Save trees. Save $.

Managing Emerald Ash Borer: Decision Guide

DNR Indiana Department of Natural Resources · APHIS · PURDUE UNIVERSITY

Authors:
Annemarie M. Nagle and Cliff Sadof

Begin with an inventory of your ash trees
- How many?
- Where are they?

Do you want to save your ash trees from EAB?

Yes. → **Are some worth saving?**
- Valuable to landscape or owner?
- Healthy and few signs of EAB?
- Located in the right site?

Yes. → **Hire a Tree Care Professional**
- Get at least two estimates
- Hire a certified professional
- Ask for references and insurance

To find one in your area visit:
www.treesaregood.com

Team up with your neighbors and seek discounts for managing all your trees at once!

No. → **Ash trees will be killed and need to be cut down.**

Save money. Have unwanted ash removed before they die.

I don't know.
A professional can help.

No. → **Hire a Tree Care Professional**

Yes. → **Determine how big your trees are. Get DBH.**

Measure the distance around the trunk (at 4.5 ft. above the ground) and divide it by three to get Diameter at Breast Height.

Are they greater than ?

Yes. You will need professional pesticide treatment.

Ensure that drenches are applied to bare soil within 1 ft. of the trunk.

No. → **Homeowners can treat trees themselves.**

Use a soil drench containing imidacloprid. Treat trees between April 1st and May 15th. Always follow all pesticide label directions.

Protect your urban forest. Act Now. Save Trees. Save $!

Useful EAB Websites

www.entomology.wisc.edu/emeraldashborer

www.emeraldashborer.info

QUESTIONS?