Management Options for the Emerald Ash Borer in Mission Hills

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KANSAS COMMUNITY FORESTRY

Don't Move Firewood!

Forest Health Threats often spread by way of human movement of wood products!!!

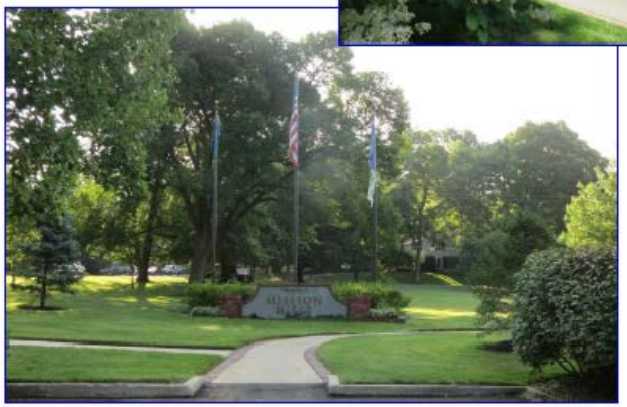

STOP

COMMUNITY FORESTRY PROGRAM
CITY OF MISSION HILLS, KANSAS

INVENTORY RESULTS AND MANAGEMENT RECOMMENDATIONS
Summer 2013





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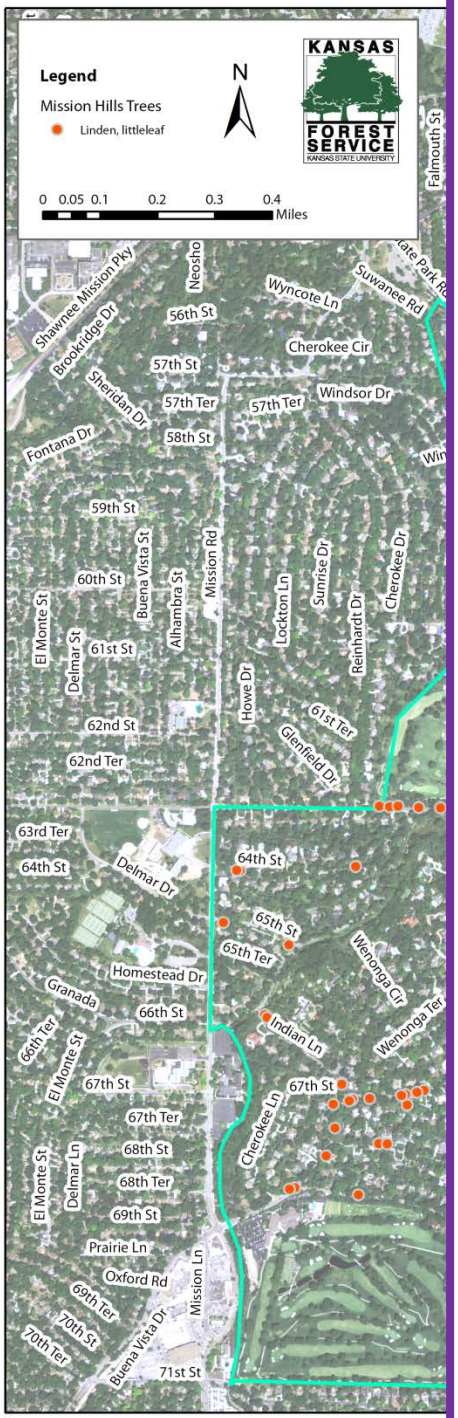
Legend
Mission Hills Trees
Linden, littleleaf
N
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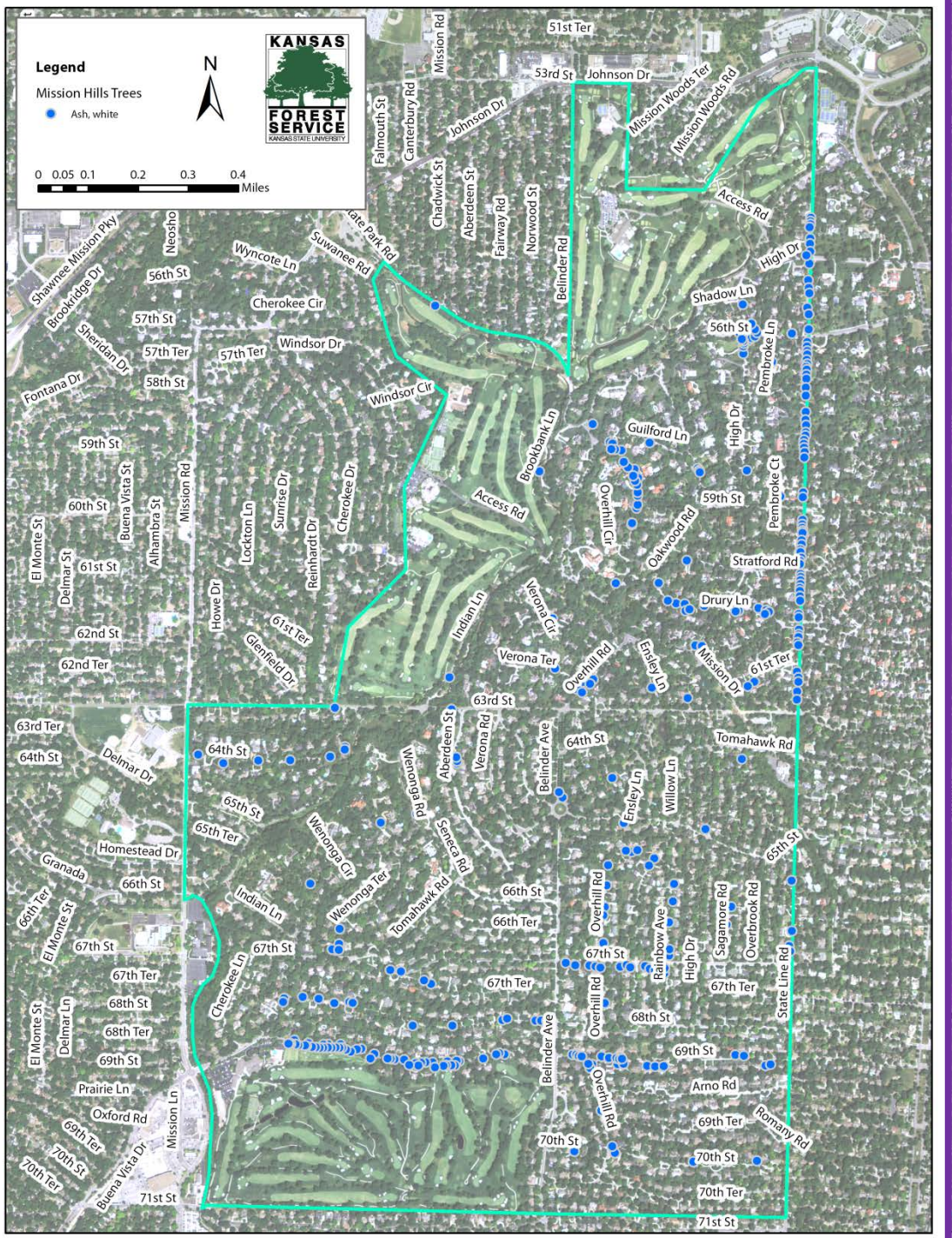
Legend
Mission Hills Trees
Ash, white
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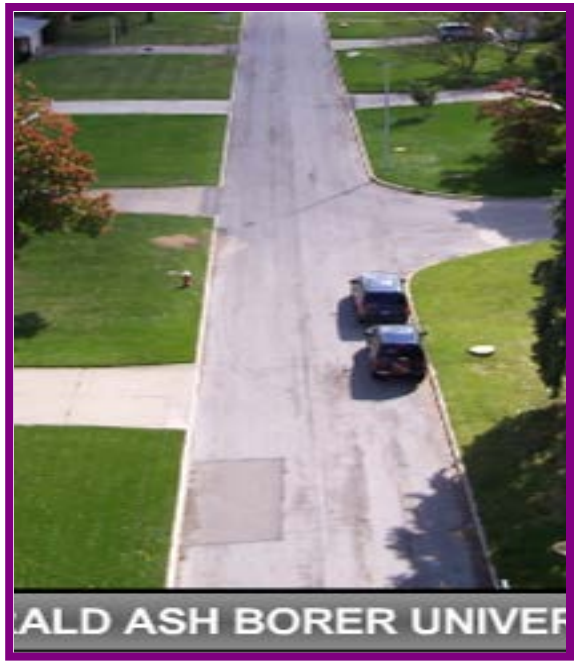


What's At Risk?

2006

2009

Ash trees lining a street before (left) and after (right) they were decimated by EAB.

Life Cycle: Typically 1 Gen/Year

Adults breed within 7 to 10 days

Adults: May – July

Hatch in 7-9 days. Females mate several times. Avg. 77 eggs laid in crevices.

Eggs: May – July

Larva: June – Oct.

Prepupa: Oct – April

Pupa:

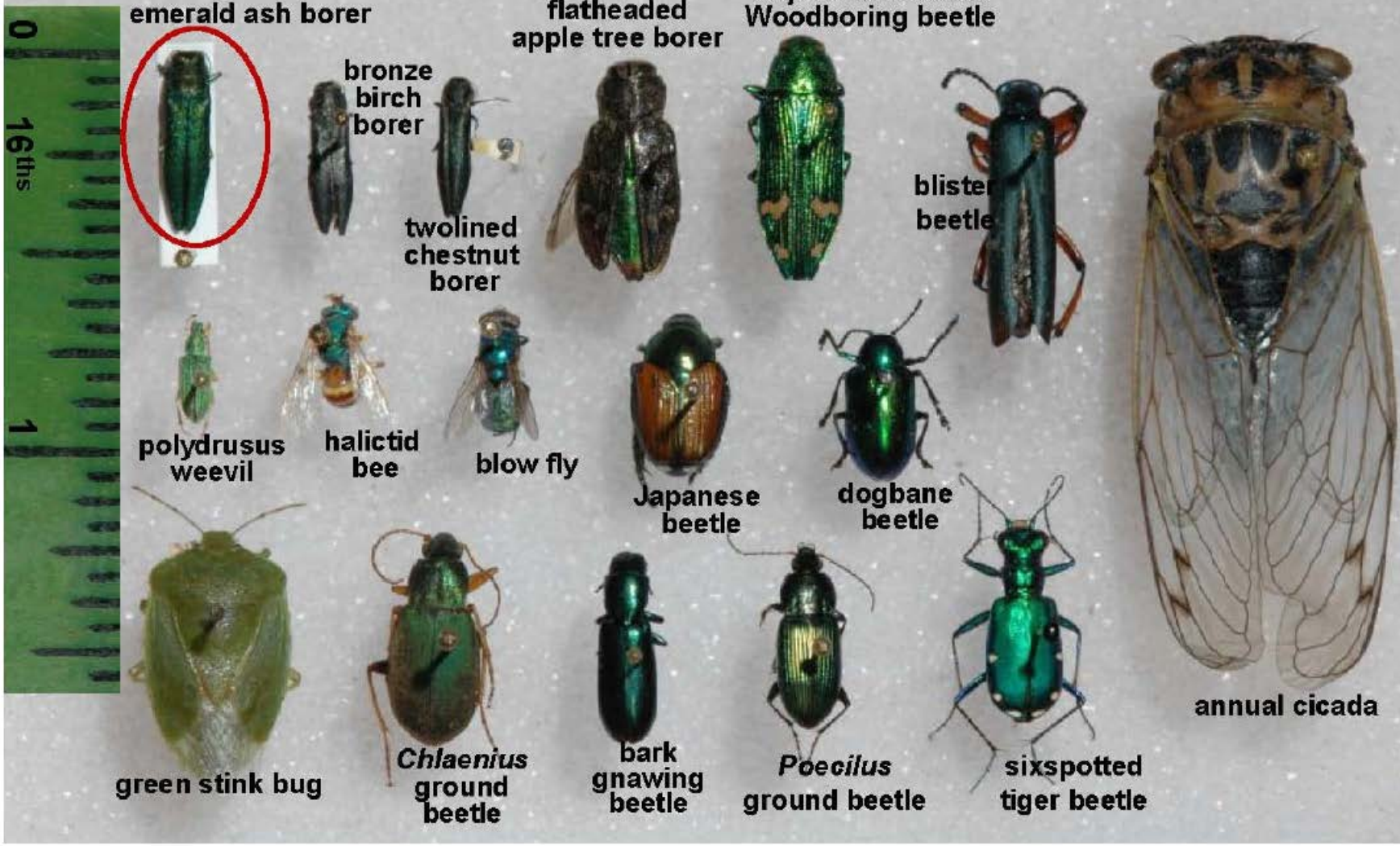
April – June

EAB Adult

Insects in Kansas That May Be Confused With Emerald Ash Borer

Jeff Hahn, University of Minnesota Extension
Val Cervenka, Minnesota Department of Natural Resources

Kansas Department of Agriculture



Emerald Ash Borer

- Adult beetles feed on ash foliage- little damage.
  - Metallic green color, about ½ inch long.
  - Purple segments under the wing.
- A good flyer (0.5 to 4.0 miles in 24 hours) – usually fly about ½ mile.
- Larvae feed on the phloem and outer sapwood.
  - Larvae create S-shaped galleries – usually packed with frass.
  - Larvae is white, legless and bell shaped.
- Will colonize trees from 1/2-inch caliper or higher.
- May be present 7+ years before detected.

All species of ash (*Fraxinus* spp.) attacked by EAB

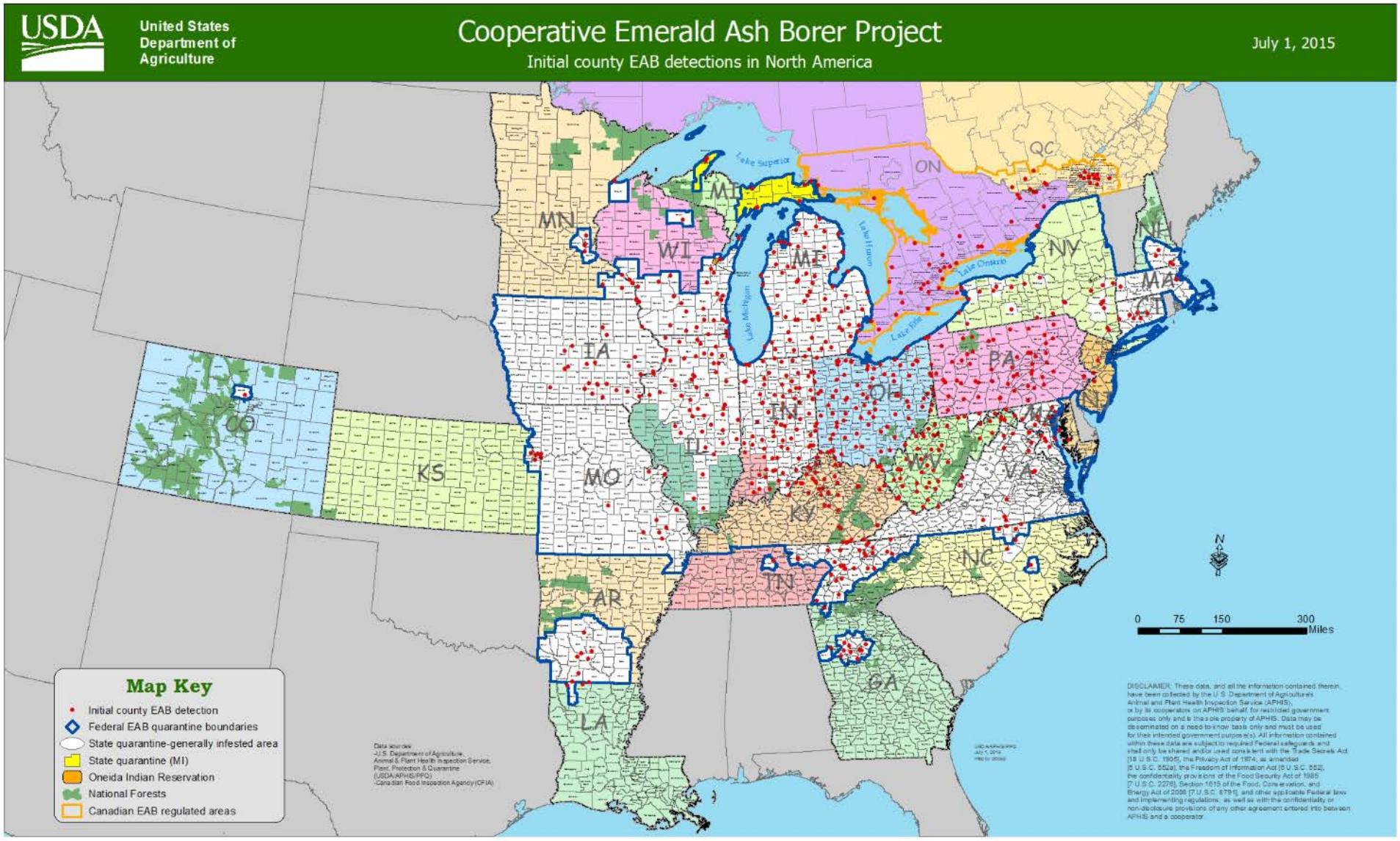
White ash

Green ash

Blue ash

Black ash

and *all horticultural cultivars* of these species.



25 States. Initial detection in SE Michigan near Detroit, Summer 2002
Wyandotte, Johnson, and Leavenworth counties (2012–2014)

Symptoms of EAB

Look for:

- ❑ Deadwood development at top of tree that continues through tree – third to half of canopy dead in one year
- ❑ Yellowing leaves
- ❑ S-shaped tunnels under bark
- ❑ Epicormic sprouts at base of tree
- ❑ D-shaped exit holes 1/8" in size
- ❑ Cracked or vertically split bark
- ❑ Woodpecker damage

To Treat or Not To Treat?

Chemical Considerations

- ~~Has the insect been detected in an **adjacent county** or **within 15 miles?** Don't apply chemicals "just because!"~~
- What is the health of the tree today?
  - ***Focus treatment on healthy trees that are most important to a particular landscape*** – not all ash trees can or should be protected.
  - If tree is unhealthy or damaged, missing 25%-50% of its canopy, tree is not a good candidate for chemical application.
- Treatments should be preventative – after phloem is damaged by larvae, difficult for chemical to diffuse through the tree to where larvae are feeding.

Other Considerations

- Only highly valued trees in excellent condition should be considered for treatment.
- Trees with defects, such as decay, poor branching or in decline, should not be treated.
- Treatment should be considered a lifetime commitment. Depending on the method of treatment, you must treat every year or two, for the total life of the tree. One-time treatments do not work against EAB!
- Properly applied treatments are highly effective in controlling EAB.

Courtesy Johnson County Extension website

0%

10%

20%

30%

40%

50%

60%

70%

80%

90%

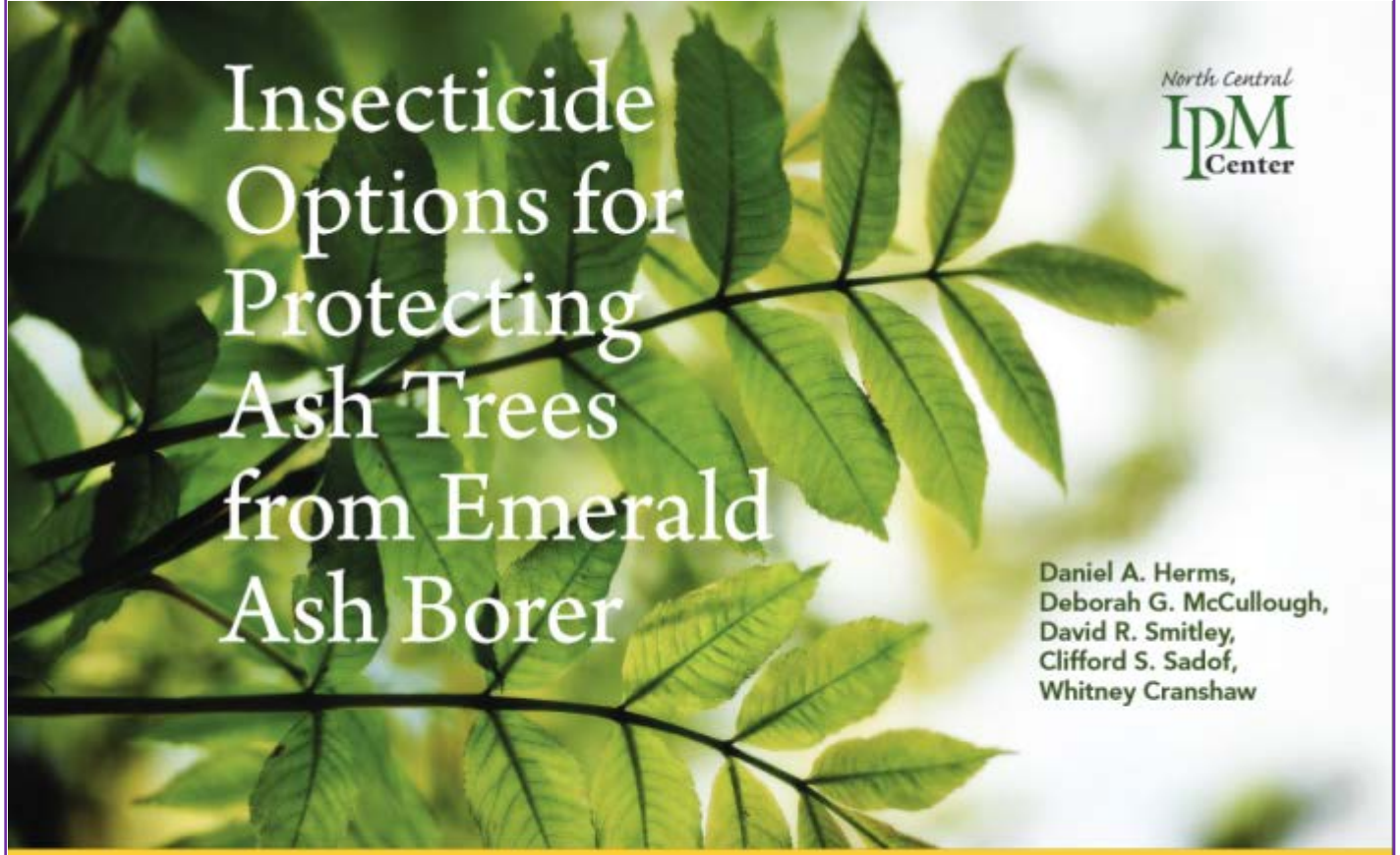
100%

When treating any tree with
≥30% canopy thinning and/or dieback
tree condition may compromise treatment effectiveness

Photos by: Dave Smitley, Michigan State University

Chemical Categories

- Contact/Cover
- Systemic
  - Soil injections
  - Soil drenches
  - Trunk injections
  - Basal trunk sprays
  - Bark sprays



Insecticide Options for Protecting Ash Trees from Emerald Ash Borer

North Central IPM Center

Daniel A. Herms,
Deborah G. McCullough,
David R. Smitley,
Clifford S. Sadof,
Whitney Cranshaw

The Ohio State University
College of Food, Agricultural, and Environmental Sciences

Michigan State University

Purdue Extension | Local Faces Countless Connections

Colorado State University Extension

Table 1. Insecticide options for professionals and homeowners for controlling EAB that have been tested in multiple university trials. Some products may not be labeled for use in all states. Inclusion of a product in this table does not imply that it is endorsed by the authors or has been consistently effective for EAB control. Additional imidacloprid products may be available in your area. See text for details regarding effectiveness.

Insecticide Formulation	Active Ingredient	Application Method	Recommended Timing
Products Intended for Sale to Professional Applicators			
Merit® (75WP, 75WSP, 2F)	Imidacloprid	Soil injection or drench	Early to mid-spring or mid-fall
Safari ™ (20 SG)	Dinotefuran	Soil injection or drench	Mid- to late spring
Transect™ (70WSP)	Dinotefuran	Soil injection or drench	Mid- to late spring
Xylam® Liquid Systemic Insecticide	Dinotefuran	Soil injection or drench	Mid- to late spring
Xytect™ (2F, 75WSP)	Imidacloprid	Soil injection or drench	Early to mid-spring or mid-fall
Azasol™	Azadirachtin	Trunk injection	Mid- to late spring after trees have leafed out
Imicide®	Imidacloprid	Trunk injection	Mid- to late spring after trees have leafed out
TREE-äge™	Emamectin benzoate	Trunk injection	Mid- to late spring after trees have leafed out
TreeAzin®	Azadirachtin	Trunk injection	Mid- to late spring after trees have leafed out
Safari™ (20 SG)	Dinotefuran	Systemic bark spray	Mid- to late spring after trees have leafed out
Transect (70 WSP)	Dinotefuran	Systemic bark spray	Mid- to late spring after trees have leafed out
Zylam® Liquid Systemic Insecticide	Dinotefuran	Systemic bark spray	Mid- to late spring after trees have leafed out
Astro®	Permethrin	Preventive trunk, branch, and foliage cover sprays	Two applications at 4-week intervals; first spray should occur at 450-550 degree days (50°F, Jan.1); coincides with black locust blooming
Onyx™	Bifenthrin		
Tempo®	Cyfluthrin		
Sevin® SL	Carbaryl		
Products Intended for Sale to Homeowners			
Bayer Advanced™ Tree & Shrub Insect Control	Imidacloprid	Soil drench	Early to mid-spring
Optrol ™	Imidacloprid	Soil drench	Early to mid-spring
Ortho Tree and Shrub Insect Control Ready to Use Granules®	Dinotefuran	Granules	Mid- to late spring

Caution: If you already use products with imidacloprid or dinotefuran, be aware of use limits per acre!

Control Options for Emerald Ash Borer in Colorado

Colorado State University Extension

Introduction – Some Common Questions Related to the Control of Emerald Ash Borer

www.eabcolorado.com

Table 1. A Summary of Control Options Used for Emerald Ash Borer Control

Method of Application	Active Ingredient	Trade Names	Optimum Timing*
Soil drench, soil injection	imidacloprid	Merit®, Criterion®, Xytect®, Zenith®, Bandit®, several retail formulations	Around bud break
Soil drench, soil injection	dinotefuran	Safari®, Zylam®Transtect®	A few weeks after bud break, often m late May
Systemic bark spray	dinotefuran	Safari®, Zylam®, Transtect®	A few weeks after bud break, often m late May
Trunk injection	emamectin benzoate	TREE-Age®	Typically when adu are starting to emerge and lay eggs. However, lo residual activity allows considerabl latitude in applicati timing.
Trunk injection	azadirachtin	TreeAzin®	Typically when adu are starting to emerge and lay eg (May).
Trunk injection	imidacloprid	Ima-Jet®, Imicide®, Pointer®, Xytect® Infusible	Typically when adu are starting to emerge and lay eg (May).
Residual bark, foliage spray	bifenthrin, permethrin, cyfluthrin	Onyx®, Astro®, Tempo®, many other formulations	Applied to bark wh adults lay eggs an egg hatch. Applications to foliage can kill adu when they feed aft emergence.

* The target life stages of the emerald ash borer with systemic insecticides (soil injections, soil drenc injections) are adults that feed on leaves after emergence and young larvae under the bark. The targ with pyrethroid insecticides (bifenthrin, permethrin, cyfluthrin) are primarily adults when they are on t they enter trees. Application to the foliage can kill adults feeding on foliage before eggs are laid.

Soil Applications of Systemic Insecticides

Two insecticides that can move systemically in plants can be applied to the soil and will subsequently move in the plant to help manage emerald ash borer. Imidacloprid is most widely available, including formulations available through retail outlets. Dinotefuran is marketed solely to commercial applicators. A summary of the available products for soil treatment use is in Table 1 (above).

Table 2. Systemic insecticides used for control of emerald ash borer that are applied to the soil. Percent active ingredient is in parentheses ( ). Rates of use are specified on the label directions and all insecticides must be used only in a manner that is consistent with specified label uses. Links to the labels of commercially marketed formulations are provided (links tested January 10, 2014).

Imidacloprid-containing insecticides sold for use by commercial applicators

Criterion® 2F (21.4%) www.backedbybayer.com/lawn-and-landscape-management/insecticides/merit-2-f/label_and_sizes
Criterion® 75WSP (75%) www.backedbybayer.com/lawn-and-landscape-management/insecticides/merit-75-wsp/label_and_sizes
Lesco Bandit® 2F (21.4%) www.backedbybayer.com/lawn-and-landscape-management/insecticides/merit-2-f/label_and_sizes
Lesco Bandit® 75WSP (75%) www.backedbybayer.com/lawn-and-landscape-management/insecticides/merit-75-wsp/label_and_sizes
Merit® 2F (21.4%) www.backedbybayer.com/system/product/product_label_pdf/52/Merit-2F-432-1312-1-gal-110519AV1-SRL.pdf
Merit® 75WSP (75%) www.backedbybayer.com/lawn-and-landscape-management/insecticides/merit-75-wsp/label_and_sizes
Merit® 75WP (75%) www.backedbybayer.com/system/product/product_label_pdf/32/Merit-75-WP.pdf
Prokoz Zenith® 2F (21.4%) www.backedbybayer.com/lawn-and-landscape-management/insecticides/merit-2-f/label_and_sizes
Prokoz Zenith® 75WSP (75%) www.backedbybayer.com/lawn-and-landscape-management/insecticides/merit-75-wsp/label_and_sizes
Xytect® 2F (21.4%) www.treecarescience.com/pdf/Insecticides/Xytect-2F_Specimen_Label.pdf
Xytect® 75WSP (75%) www.treecarescience.com/pdf/Insecticides/Xytect-75-WSP_Specimen_Label.pdf

Imidacloprid-containing insecticides sold through retail outlets

Bayer® Advanced 12 Month Tree & Shrub Insect Control Concentrate (2.94%)
www.bayeradvanced.com/tree-shrub-care/products/12-month-tree-shrub-insect-control-landscape-formula/sizes
Bayer® Advanced 12 Month Tree & Shrub Protect & Feed (1.47%)
www.bayeradvanced.com/tree-shrub-care/products/12-month-tree-shrub-protect-feed/sizes
Bayer® Advanced 12 Month Tree & Shrub Protect & Feed Concentrate II (0.74% + 0.37% chlothianidin)
Bonide® Annual Tree and Shrub Control (with Systemaxx) (1.47%) www.bonide.com/lbonide/backlabels/l609.pdf
Ferti-lome® Tree and Shrub Systemic Insect Drench (1.47%)
www.fertilome.com/ProductFiles/10206%20Tree%20Shrub%20Systemic%20Insect%20Drench%20Approved%2003-26-12.pdf
Ortho Bug B gon Year-Long Tree & Shrub Insect Control (1.47%) www.scotts.com/smg/goprod/ortho-bug-b-gon-year-long-tree-and-shrub-insect-control/prod10700018/ (Note: This link is not the label, which is apparently unavailable on-line)

Dinotefuran-containing insecticides sold for use by commercial applicators

Safari® 20SG (20%) www.valent.com/Data/Labels/2012-SAF-0001%20Safai%2020%20SG%20-%20form%201510-D.pdf
Zylam® Liquid (10%) www.gordonsprofessional.com/pdfs/ZylamLiquid-SL.pdf
Transtect® 75WSP (75%) www.treecarescience.com/pdf/Insecticides/Transtect_Specimen_Label.pdf

Rates of use vary depending on the size of the tree. The diameter of the tree at breast height (DBH) is normally used as the measure of tree size and all formulations marketed for commercial application have label uses directions for amount to apply that is based on DBH. (DBH measurements are generally measured at 4.5 feet above the ground.) Most commercial formulations of imidacloprid (2F, 75WSP formulations) allow higher rates of use on larger trees (greater than 15 inches diameter). These higher rates are usually required to get consistent EAB control on large trees, which have a proportionately greater canopy and trunk volume than do small diameter trees.

Cost to Treat

- Generally, $12 to $15 per diameter inch.
- Remember, reputable companies will not have time to go door-to-door looking for business! Do not be pushed to make a decision now to get a good price.
- Ask why they think your tree has EAB and why they recommend their course of action.
- KAA and ISA Certified Arborists
- Commercial Pesticide Applicators

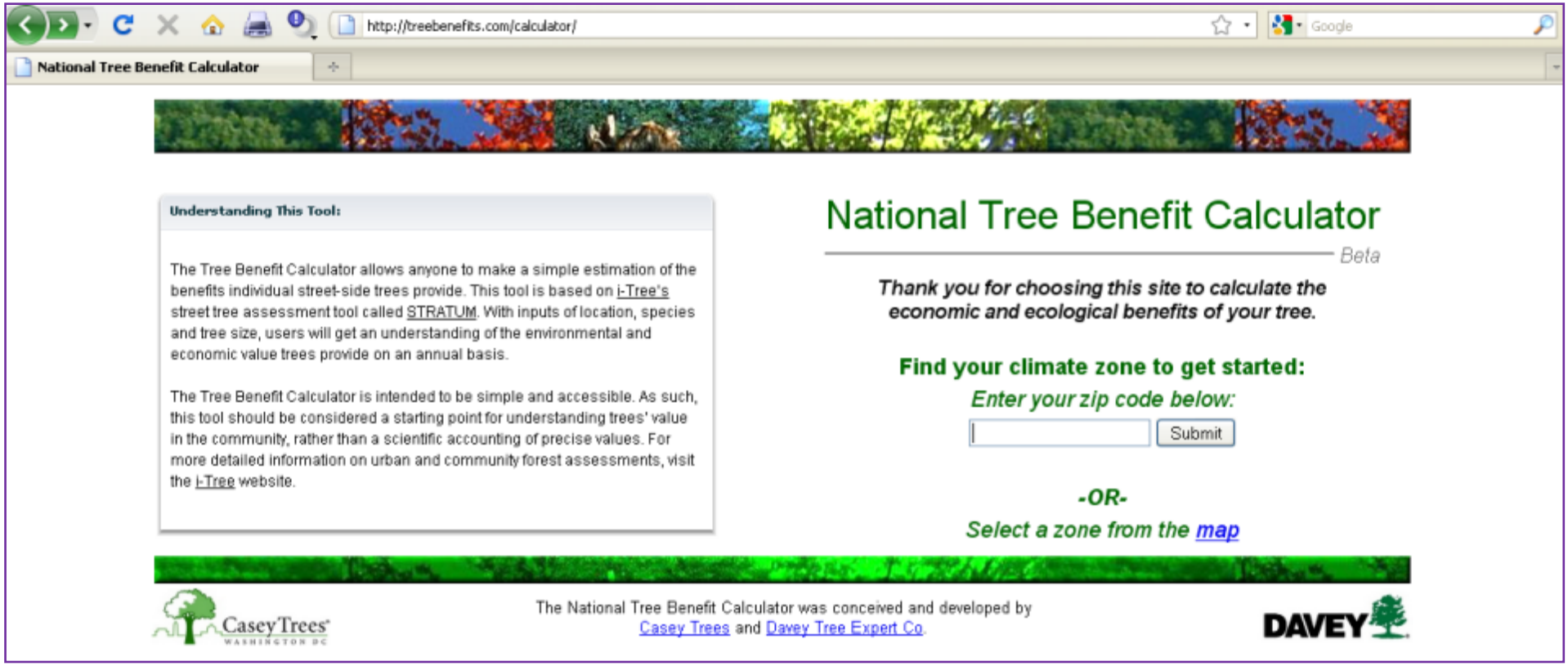
On a Related Note

- "Pruning, watering, and mulching will minimize risk of your ash tree becoming infested. "
- "EAB disease prevention"
- Dieback in tree canopy, New sprouts forming from the tree's base, "D" shaped exit holes (1/8") Woodpecker damage

Why is it Important to Replant?

A loss of canopy will:

- Add stress to stormwater systems
- Increase erosion and sedimentation along streams/stream channels, rivers; affect public drinking supplies
- Reduce the amount of carbon dioxide and air pollutants that are captured by tree canopies and carbon dioxide stored in trees
- Increase water contamination
- Increase heat island effects in cities
- Increase ground-level ozone in metro communities
- Increase private and public utility usage and costs
- Harm the economic and social appeal of the community
- Reduce property values



"For Every $1 invested in Urban/Community Forestry, $2.70 is returned"

General EAB Resources

- National EAB website: http://emeraldashborer.info
- Kansas Department of Agriculture:
  - Plant Protection and Weed Control. http://agriculture.ks.gov/divisions-programs/plant-protect-weed-control/emerald-ash-borer
  - Pesticide Applicator. https://agriculture.ks.gov/divisions-programs/pesticide-fertilizer/pesticide-applicator
- Kansas Forest Service: http://www.kansasforests.org/forest_health/current_pests
- Johnson County Research and Extension:
  http://www.johnson.k-state.edu/lawn-garden/emerald-ash-borer.html
- Kansas Arborists Association Member Directory:
  http://kansasarborist.com/pdf/KAA DIRECTORY.pdf
- International Society of Arboriculture, Arborist Search:
  http://www.isa-arbor.com/findanarborist/arboristsearch.aspx
- USDA Animal and Plant Health Inspection Services (APHIS). Animal and Plant Health Inspection Service (APHIS):
  http://tinyurl.com/APHISPest (see also image gallery)
- OutsmartProject. Emerald Ash Borer ID. Found online at
  http://www.youtube.com/watch?v=wXCynbvf4Lc
- YouTube - Offers other EAB media. Found online at:
  http://www.youtube.com/watch?v=WfeIszMuUgk

Treatment Options for EAB

- North Central IPM Center. *Insecticide Options for Protecting Ash Trees from Emerald Ash Borer,* 2nd Edition. Found online at http://www.emeraldashborer.info/files/multistate_EAB_Insecticide_Fact_Sheet.pdf
- Colorado State University. *Control Options for Emerald Ash Borer in Colorado.* Found online at http://bspm.agsci.colostate.edu/files/2014/02/EAB-control-options-February-11.pdf
- *Frequently Asked Questions Regarding Potential Side Effects of Systemic Insecticides Used To Control Emerald Ash Borer.* Found online at http://www.emeraldashborer.info/files/potential_side_effects_of_eab_insecticides_faq.pdf.