

Frequently Questions/Answers on Emerald Ash Borer (EAB) – Iowa

1. **What is the emerald ash borer?** It is a beetle. It is very small ($\frac{1}{2}$ inch long x $\frac{1}{8}$ inch wide; about the size of Mr. Lincoln's image on a penny). It is metallic green.
2. **What does EAB eat?** Hosts are any type of ash trees, *Fraxinus* species. Green, white, black, blue, pumpkin, Marshall seedless, Autumn Purple, Patmore, Summit, etc; Manchurian and 'Chinese' ash trees are primary hosts in its homeland [Eurasia].
3. **What size of ash tree does it attack?** EAB can colonize branches as small as 1 inch diameter to trunks exceeding 2 feet in diameter. Seedling ash trees 1½ to 2 inch caliper in Michigan were killed in field trials.
4. **Do adults and immatures feed on different plants?** No, both adults and larvae feed on ash, but it is the larval feeding that kills trees. Adults feed on the ash leaflets, cutting a notch out of the side of the leaflet. Larvae [creamy white, legless, flattened 'worms'; up to 1 inch long] feed underneath the bark in the living tissue (cambium). As the larvae feed, they cut off these 'pipelines' of nutrients, minerals, and water thus causing a 'slow' death to the tree.
5. **When is EAB active?** Adults emerge from host plants in a staggered fashion from May through August in Michigan. Adults feed in canopy, mate, then begin egg laying (60 – 90 eggs/female). A given adult may live 2-3 weeks. Larvae feed during the summer and fall and overwinter under the bark. Pupation occurs in the early spring.
6. **What technical prediction method is available for EAB emergence?** Accumulated heat units, also called degree days, is one way of predicting when EAB adults will emerge. Researchers in Michigan determined that 500 degree days (base 50 F) is when beetles begin to emerge. Peak adult emergence is around 800 degree days, and by 1100 degree days the beetles are finished emerging.
7. **How do degree days values for EAB emergence correlate with calendar dates?** Each year will be slightly different, since weather is different each year. Average values over several years show that 500 degree days occurs usually the first week of June, 800 degree days is later June, and 1100 degree days is the first week of July.
8. **Why should we be concerned about EAB?** It kills ash trees, usually in 2-4 years. In the Midwest, millions of ash trees have been killed by EAB since 2002.
9. **Where is EAB from?** This beetle is native to Asia and is found in China and Korea. It has also been reported from Japan, Mongolia, the Russian Far East, and Taiwan.
10. **Where is EAB at this time?** Minnesota, Wisconsin, Michigan, Missouri, Illinois, Indiana, Ohio, Pennsylvania, Kentucky, West Virginia, Virginia, Maryland, and New York. The states of MI, IL IN, and OH have been quarantined by the USDA; the other states have quarantined infested counties.
11. **What is the closest site to Iowa?** Victory, WI is the closed known infested area. This is approximately 1 mile from Iowa's northeast border.

12. **Has EAB been found in Iowa yet?** No, but it is like a finding a needle in a haystack. Ash trees have been declining in Iowa for several years (age, site problems, ash yellows, ash decline, etc) so EAB could be here and we're not seeing it. Site of interest is Elkader, IA in Clayton County – EAB larva in vial sent in to Iowa DNR
13. **Will EAB come to Iowa?** Yes, it is just a matter of time and how well we try to limit how the insect can be introduced into the state.
14. **Which counties in the state will be affected by EAB?** All 99 counties have some ash trees in urban or rural areas. Ash trees make up from 15-60% of the total street tree inventory in Iowa communities.
15. **How many ash trees are there in Iowa?** Estimates list 60 million in forests and another 30 million in urban settings. These numbers are based on USDA Forest Service Forest Inventory Assessments – satellite maps and computer estimations.
16. **Is there some kind of pheromone trap to detect EAB?** No. If these insects produce a sex pheromone, it has not been identified by scientists yet (and they have been looking).
17. **Is there any other kind of man-made trap to detect EAB?** Yes, there is an experimental trap designed by the USDA. It is purple in color, a triangular prism shape, and coated with Tanglefoot® glue. This trap needs to be placed in the tree canopy to be most effective. Iowa placed 656 traps, fitted with an attractant chemical, Manuka oil, during the 2009 season. Most of these were in extreme eastern Iowa, but the rest were placed across Iowa in campgrounds. Slides show the state distribution of the purple traps, then those in Allamakee County (closest to the Victory, WI infestation) and Clayton County (site of interest in 2009).
18. **So how are agency partners looking for EAB in Iowa?** Combination of visual surveys of ash trees in campgrounds (state, federal and selected private sites), sentinel trees, and USDA experimental traps. A sentinel tree is one that is attractive to boring insects because it is damaged or stressed in some way. We have used standing ash trees in federal and state campgrounds – double girdled the tree by Memorial Day, cut the tree down in September or October, and bark peeled the tree to note the insects present. In private campgrounds, we planted 1½ inch caliper potted trees in such a way as to stress them (too high, dropped ball from truck bed, didn't cover the ball with soil) and asked the manager not to water the tree. The sentinel trees for the 2009 season are shown in the accompanying state map.
19. **What are suspect trees?** These are trees that may harbor EAB based on the symptoms being displayed by the tree (see #23b). When permitted, these trees are cut down and bark peeled to determine if EAB is present. Unlike sentinel trees, suspect trees are not intentionally stressed or damaged.
20. **How long have you been looking for EAB in Iowa?** The collaborative survey process between ISUE, IDALS, IDNR, USDA Animal Plant Health Inspection Service (APHIS) – Plant Protection Quarantine (PPQ), and USDA Forest Service has been active since 2004. All 99 counties were visually surveyed in 2004 and 2005. Since firewood is the expected method that EAB will be introduced into Iowa, campgrounds have been targeted for EAB activities since 2006.

21. **How is EAB spread to areas outside the current infested states?** Firewood, ash branches, ash logs, and nursery stock. The Iowa Nursery and Landscape Association (INLA) has a voluntary moratorium on ash nursery stock east of the Mississippi River, but Iowans do buy nursery stock from Illinois. And, in 2007 IDALS stopped a shipment of ash trees from Indiana. Fortunately, high fuel prices have discouraged or eliminated out of state shipment of ash logs.
22. **Do people really bring firewood with them when visiting Iowa?** Yes. Even though the cost of buying firewood is relatively inexpensive (\$3-5/bundle), people still load up enough for several campfires. In 2007, a Michigan camper with 24 bundles of firewood atop a camping trailer was intercepted thanks to a sharp Iowa citizen; fortunately no evidence of EAB was found. Moving firewood out of EAB quarantined areas can result in significant fines (e.g. a minimum fine of \$500 for the Illinois quarantine).
23. **What can be done if a suspected EAB-infested tree is spotted or reported?** Spend a few moments learning about the situation. Ask the following questions:
- a. **What type of tree is involved?** Use a field guide or Internet site, such as <http://www.extension.iastate.edu/pages/tree/key.html> to identify the tree in question. If the tree is not an ash species, EAB should not be suspected as a causative agent of the observed symptoms.
 - b. **What are the symptoms of EAB colonizing an ASH tree?**
 - i. **Thinning or dying crown**
 - ii. **Water sprouts (epicormic growth) on trunk**
 - iii. **Adult feeding notches on leaflets**
 - iv. **Woodpecker feeding sites**
 - v. **S-shaped feeding galleries under bark**
 - vi. **D-shaped exit holes** ($\frac{1}{8}$ inch diameter)
 - c. **What samples should you provide?** The following are suggested as samples to help identify EAB off-site:
 - i. **Larvae** – Gently pull off tree bark in the affected area and look for **flat**, white legless ‘grubs’/worms. Put larvae in alcohol or alcohol-based hand sanitizer in a screw cap bottle/vial.
 - ii. **Adults** – Put suspect adult beetles in alcohol or alcohol-based hand sanitizer in a screw cap bottle/vial.
 - iii. **Photographs** – Use a digital camera to take images of the affected tree. Distance shots, close up of symptoms seen, and close up of insects found. Send these to mshour@iastate.edu or ljesse@iastate.edu .
 - iv. **Firewood** – any suspicious firewood can be taken to ISU Entomology (109 Insectary) or to your district forester with IDNR.

d. **Who do you call at Iowa State Extension with an EAB question?**

Dr. Mark Shour or Dr. Donald Lewis at ISUE Entomology – (515) 294-1101 or
Dr. Laura Jesse at the Plant & Insect Diagnostic Clinic – (515) 294-0581.

24. **Are there native borers that help recycle dying ash trees?** Yes, several. Exit holes from native borers are usually round or oval and larger ($\frac{1}{4}$ to $\frac{1}{2}$ inch diameter) compared to EAB ($\frac{1}{8}$ inch diameter). Common borers in Iowa include the redheaded ash borer, ash/lilac borer, banded clearwing borer, and flatheaded appletree borer. Visit www.emeraldashborer.info and <http://www.extension.iastate.edu/pme/EABGallery/NewGalleryPage.html> to find pictures.
25. **Are there native insects that look like the emerald ash borer?** Yes, flatheaded appletree borer, click beetles, tiger beetles, ground beetles, dogbane beetle, the Japanese beetle, cuckoo wasps, and the bronze birch borer have been mistaken for emerald ash borer. A fact sheet on ‘look alike’ insects is posted at www.emeraldashborer.info.
26. **What are the control measures recommended by ISU?** Refer to ISUE PM 2084 “Emerald Ash Borer Management Options”.
- Candidate trees are those which are healthy & vigorously growing and are valuable to your landscape.
 - Keep in mind that treatments must be done each year for the life of the tree. And, know that a treatment may not be effective due to past injuries to the tree, age of the tree, soil moisture, soil compaction, and other site and environmental factors.
 - Preventive treatments are most effective. If your tree already is infested with EAB and there is less than 40% dieback of the crown, a curative treatment may stop the infestation.
 - Preventive treatments for EAB are NOT recommended until a confirmed EAB site is 15-20 miles away. Treatment outside this risk zone is not prudent
 - Even if a person has treated their ash tree(s) for years before EAB arrives in Iowa, this does not guarantee the tree(s) will be spared from eradication cutting operations by regulatory agencies.
 - Systemic insecticides require time and active tree growth for distribution in the ash tree. Most products will need to be applied in early spring to be effective, and a fall treatment may also be required for larger trees.
 - Canopy sprays are not recommended by ISUE because of limited effectiveness, the need for specialized equipment, spray drift, and possible adverse effects to nontarget organisms.
27. **What is Tree-äge?** This is an insecticide with the active ingredient emamectin benzoate. Special permission was been granted for its use against EAB in MI, IN, OH, and WV. A new national label is expected July 2009. It is the only EAB treatment effective for more than one year (up to 3 years?). The downside of Tree-äge is currently it must be injected into the tree via “1/4” inch drilled holes, resulting in potential injury to the tree
28. **If I am contacted by a pesticide applicator to treat their ash trees for EAB at this time, what course should I take?** IF you live within 15-20 miles of a confirmed EAB infested site, get their estimate for the treatment. Try to obtain at least one additional estimate before any work is done. IF you live outside the risk zone, thank them for their interest and keep their information on file for future use.

29. **If I have been contacted by a private company about a state-ordered EAB tree removal project, what course should I suggest?** Record the person's name and contact information, then ask them to leave the property. Pass this information to the State Entomologist Office at (515) 725-1465 or the Iowa Attorney General Office at (515) 281-5164.
30. **Is there any known natural resistance in ash trees to the emerald ash borer?** No. In its native range, EAB is not considered a major pest of ash trees; this may be related to natural enemies and limited host resistance. Research in Michigan that compared American species/cultivars with Manchurian ash observed fewer EAB larval tunnels on Asian species, but the number of larvae feeding on a tree was still high enough to kill the tree.
31. **Are there any natural enemies of the emerald ash borer?** Yes, three tiny 'stingless' wasps have been identified from EAB's homeland. Two develop in EAB larvae, while the third develops in EAB eggs. The USDA released the wasps in Michigan in 2007 and 2008 as potential biocontrol agents. It should be noted, however, that years will be required for the wasps to significantly impact EAB populations. Native parasitic wasps attacking the egg or larval stages of EAB in the USA have been observed, but numbers are very low. A fungus (*Beauveria bassiana*) has also been tested as an adult beetle "natural insecticide"; tentative results have showed moderate success.
32. **What can I do to keep my ash tree healthy?** Minimize known stressors (parking vehicles on the tree's root zone, construction projects affecting tree or tree's roots, mechanical damage by lawn mowers or string trimmers, and landscaping around the base of the tree – adding extra soil, blocks, hostas or other plants, etc.). Provide water for the tree during very dry periods
33. **Should I avoid planting an ash tree in my yard?** Yes. There are other trees you can choose to plant that are not susceptible to EAB. Visit www.emeraldashborer.info or <http://www.extension.iastate.edu/pme/EAB%20other%20forms/ShadeTreeAlt07.pdf> for ideas.
34. **When EAB comes to Iowa, is there some plan to manage/contain this pest?** Yes, a detailed plan has been developed by collaborative agencies. This plan provides the stepwise actions to be taken to contain the pest, and the agencies responsible for the various anticipated actions. The plan was modified from work done in Michigan, Illinois and Wisconsin. The EAB Response Plan and other current Iowa information about EAB are given at: <http://www.extension.iastate.edu/pme/EmeraldAshBorer.html>
35. **Where can I find current information about EAB on the Internet?** There are two sites to gather current information about this exotic pest:
- a national site: www.emeraldashborer.info
 - an Iowa site: <http://www.extension.iastate.edu/pme/EmeraldAshBorer.html>