Emerald Ash Borer (EAB)

The Iowa Outlook…

What are the facts and what should we being doing to protect our trees!

Iowa Department of Agriculture & Land Stewardship
Robin Pruisner, State Entomologist
Iowa Department of Natural Resources
John Walkowiak, Forestry Bureau Chief

Increase Awareness, Detect and Contain

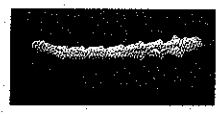
Where is EAB from?

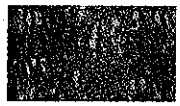
Origin: Northeast China, Korea, Japan

Pathway: Solid Wood Packing Material, and domestically via firewood and nursery stock

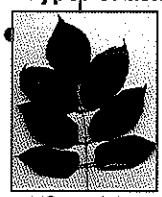
What is EAB?

- EAB adults are slender beetles(1/16 inch wide) and are approximately ¼ to ½ inch in length. They are a unique bronze to metallic green in color. They are visible from mid June to mid August.
- EAB larva are a white to cream colored 10 segmented worm that reaches 2/3 to 1 ¼ inch in length and feed in the cambium region just underneath the bark. Their feeding produces characteristic S-shaped galleries that disrupt the trees transport of nutrients and water causing the tree to wilt and die.
- Adult beetles emerge through the bark and leave characteristic D=Shaped holes.

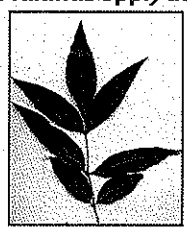




Types of ash (*Fraxinus* spp.) attacked by EAB:



Green ash



White ash

Blue ash

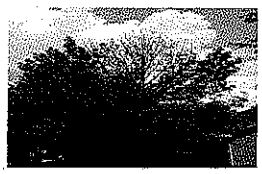
Black ash

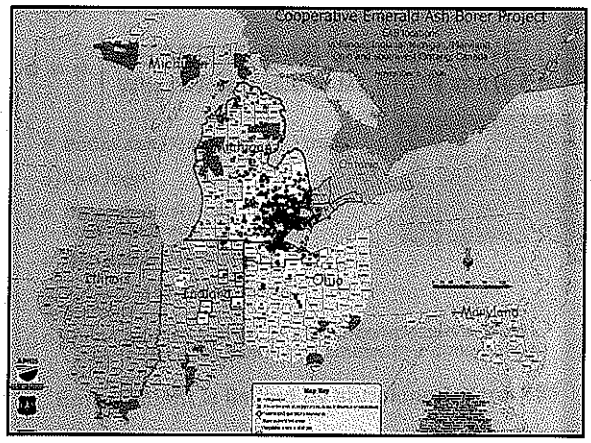
and *all horticultural cultivars* of these species.

In large populations EAB aggressively attacks ash trees, first those trees under stress than killing even healthy trees in several years by burrowing under the bark of trees and cutting off critical flow of water and nutrients.

Damage to Date

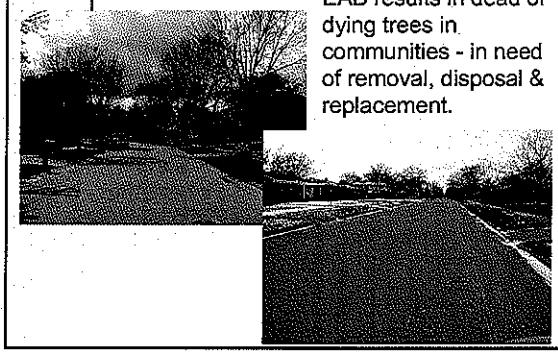
- Lower Peninsula of Michigan, parts of Ontario, Canada, Ohio, Indiana, Ohio, Illinois and Maryland.
  - 25 million ash trees dead/dying





Impact...

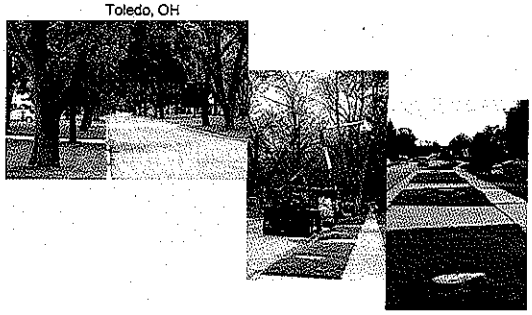
EAB results in dead or dying trees in communities - in need of removal, disposal & replacement.



Impact...

Damage to communities...

Toledo, OH



Impact...

Damage to communities...

Cook County, Illinois

Impact to Iowa...

- Recent Iowa Forest Inventory = 50 million ash trees
- Urban Estimated Inventory = 10-20 million

Approximately $650 to remove & chip an ash tree with total costs to local governments of $6.5 to $7 billion !!!

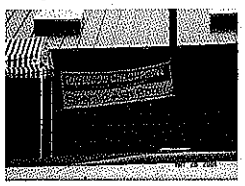
How does EAB spread?

- Natural flight movement is less than 1 mile per year.
- Movement via firewood, nursery stock and green lumber products.
- 65% of all Iowa campers to our state parks bring their own firewood.

Mitigate Amount of High Risk Trees

- Implement a local government cost-share program to ID high risk EAB trees now, contract for removal and disposal along the main interstate corridors.
- Require replanting with native trees.

Encourage local firewood use

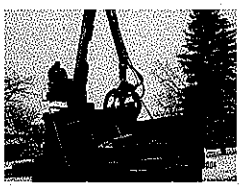


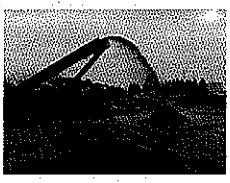
- Work with high risk sites to find alternate local sources of safe firewood for campers
- Develop firewood concession opportunities
- Require out of state campers to public parks to buy firewood from approved venders.
- When out of state firewood is found replace and then burn all of it.

CONTAIN...

On a local level...

- Once EAB is confirmed implement ICS.
- Survey all ash trees within a 1-2 mile radius of the find.
- Emergency funding of will be needed to work with local, state and federal agencies.
- Remove and chip all ash trees within 1 mile of infestation to contain infestation.
- Dispose or utilize wood residue.

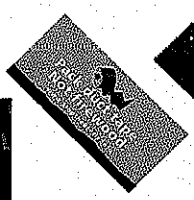




Why invest in EAB Management now?

- Researchers are learning more and more about EAB – and are getting closer to more effective detection tools, treatment and management.
- EAB damage would be as costly to state and local governments as Dutch elm disease was in the 1960's
- Loss of native ash would impact shade tree values/energy conservation in cities and water quality/wildlife habitat values in our forests.

Questions?



Emerald Ash Borer: Update on the potential impact on Iowa

Emerald Ash Borer *Agrilus planipennis*, a new pest of trees from Asia was discovered in July 2002 feeding on ash trees (Fraxinus spp.) around the Detroit area of SE Michigan.

The larvae of the emerald ash borer, or EAB, feed in the cambium between the bark and wood, producing galleries that eventually girdle and kill branches and entire ash trees.

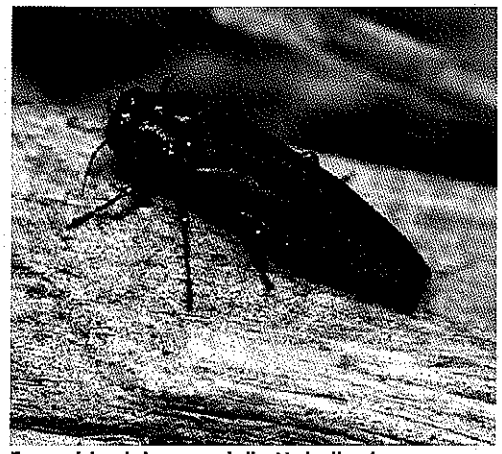
Evidence suggests that EAB has been established in Michigan for a 15+ years prior to detection. As of December 1, 2006, all of Ohio, Indiana, Illinois and Michigan (except the Upper Peninsula) are under federal EAB quarantine. In Michigan alone, more than 25 million ash trees are dead or dying from EAB. Windsor, Ontario, is also fighting the insect, as well as Maryland. Despite federal and state quarantines prohibiting movement of ash firewood, new populations of EAB are continually being discovered. Illinois was declared infested in 2006 – putting EAB within striking distance of the Iowa border.

Emerald ash borer is native to Asia and is known to occur in China, Korea, Japan and Mongolia, eastern Russian, and Taiwan. In North America, EAB has been found feeding only on green ash, white ash and black ash. These ash species are common in native Iowa forests and green ash is a predominant species in our communities.

! EAB has not been detected in Iowa to date, however, EAB to be the most serious threat to Iowa's native forest and urban ash tree population in Iowa since the Dutch elm infestation 30+ years ago.

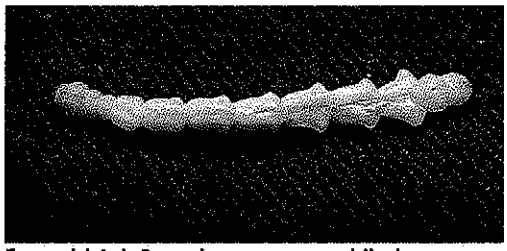
IDENTIFICATION

EAB adult beetles are generally larger and a brighter green than the native species of Agrilus or ash borers in Iowa. EAB adults are slender (1/16 inch wide) and are approximately ¼ to ½ inch in length. EAB male beetles are smaller than females. Color varies but beetles are a unique bronze to golden green overall, with darker, metallic emerald green wing covers.

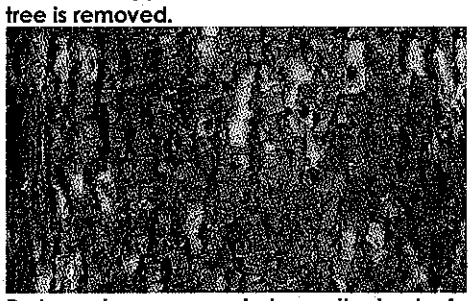


Emerald ash borer adult. Note the bronze head and thoracic area and the emerald green wing covers.

Characteristic S-shaped galleries made by larvae are apparent when the bark of a host tree is removed.



Emerald Ash Borer larvae are a white to cream colored 10 segmented flat worm that reach 2/3 to 1 ¼ inch in length.



D-shaped emergence holes on the trunk of host trees. Native borers infesting ash produce round-shaped emergence holes.

EMERALD ASH BORER BIOLOGY

EAB have a one year life cycle with adult beetles begin emerging in early June and live for about 3 weeks; field records indicate adults are present into mid-August. EAB beetles are active during the day, particularly when conditions are warm and sunny. Adults feed on ash leaves producing small irregularly-shaped notches along the leaf margins.

EAB females can mate several times. Approximately 60-80 eggs are deposited individually in bark crevices on the trunk and branches. After 7 to 10 days, EAB larvae chew through the bark and into the cambial region. Larvae feed on phloem and the outer sapwood for several weeks. The S-shaped feeding galleries become progressively wider as the larva grows. Galleries are packed with fine, sawdust-like frass.

Feeding is completed in the fall and the larvae over winter in shallow chambers in the outer sapwood. Pupation begins in late April into May. Adult EAB beetles emerge head first through a D-shaped exit hole that is 1/8 inch in diameter.

EMERALD ASH BORER DAMAGE

Damage by EAB populations typically go undetected until ash trees show symptoms.

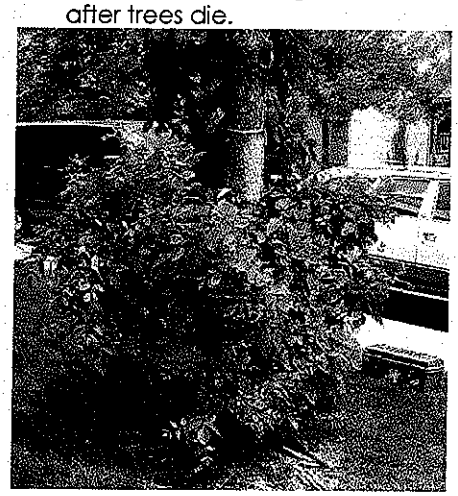
Larval feeding interrupts the transport of nutrients and water within the tree during the growing season. Tree leaves wilt and the canopy thins as branches die. Infested trees lose more than 30% of the canopy after 2 years of infestation and trees often die after 3-4 years of EAB activity.

IOWA STATE UNIVERSITY
University Extension

Thinning and branch dieback in an ash tree infested with emerald ash borer.

Symptoms to look for in EAB infested trees:

- Jagged holes excavated by woodpeckers.
- D-shaped exit holes left by the emerging adult EAB beetles on trees infested for one year.
- Vertical bark splits above larval feeding galleries.
- S-shaped, frass-filled larval tunnels etching the sapwood when bark is removed from an infested tree,
- Epicormic sprouts along the tree's trunk below larval feeding.
- Dense root sprouting can occur after trees die.



Epicormic sprouts below EAB larval feeding tunnels on an infested ash tree.

WHAT'S AT RISK IN IOWA

EAB kills ash trees of various sizes and vigor. EAB larvae have developed in trees and branches ranging from 1 inch to 55 inches in diameter. Highly stressed ash trees are most vulnerable to EAB attach and decline/die very quickly.

At the present time, EAB treatment consists of complete tree removal and chipping within ¼ to 1 mile of the known infestation. The effort to contain EAB in the state of Michigan alone has cost more than $550 million (early 2006 estimate) and could reach over $20 billion. Iowa has 2.7 million acres of forests, with green ash being a regular component of floodplain areas, and white ash being found in our upland forests. A recent US Forest Service inventory indicates there are 50 million ash trees in Iowa's forests, plus an additional 12-20 million ash trees in urban settings. One in every 5 urban trees is an ash tree. All the ash trees in Iowa are at risk from EAB. **Initial estimates indicate EAB tree removal and replacement efforts could cost Iowa's local governments $7.5 billion!**

IS THERE EMERALD ASH BORER IN IOWA?

There are no known EAB infestations in Iowa. The Iowa Department of Agriculture and Land Stewardship (IDALS), Iowa Department of Natural Resources (IDNR), Iowa State University (ISU) and the USDA Animal Plant Health Inspection Service (APHIS) are working to survey and detect EAB populations in Iowa. For three years, trap trees (girdled or killed ash) have been used in Iowa to survey high-risk areas, such as campgrounds and parks. Though research is ongoing, neither traps nor lures have been successfully developed to date.

Iowa receives most of its landscape nursery stock from out-of-state wholesale nurseries. Since EAB was only found in recent years in states that supply a large segment of Iowa's wholesale nursery industry, there is a chance that EAB has arrived on infested nursery stock in Iowa.

Most importantly, the continued movement of out-or-state firewood to, and through Iowa poses the greatest EAB-threat to Iowa's ash trees.

WHAT ARE IOWA CITIZENS AND INDUSTRY DONE TO KEEP IOWA FREE OF EMERALD ASH BORER?

In 2004, the Iowa Nursery and Landscape Association (INLA) joined with IDALS and the DNR to participate in a voluntary moratorium on buying ash nursery stock east of the Mississippi River.

The spring of 2007 is the last year the DNR State Forest Nursery will sell ash trees for conservation plantings. DNR is encouraging all nurseries and garden centers to cease planting ash after the spring of 2007.

Since 2005 – ISU and DNR have established EAB trap trees in 15-25 high risk public and private campgrounds along major thoroughfares.

PLANTING SUBSTITUTIONS FOR ASH

- Native oaks such as red, white, bur, chinkapin, shingle or swamp white.
- Basswood and Little leaf lindens
- Native maples such as Sugar, Red, Black,
- Silver and hybrid Freeman maples such as Autumn Blaze, Autumn Fantasy, Celebration, Royal Red, October Glory, or Pacific Sunset.
- Hackberry
- River birch
- Native Hickories such as Shagbark, Shellbark and Northern Pecan
- Thornless and podless Honeylocust
- Kentucky Coffeetree
- Black Walnut
- Sycamore and London Planetree
- Black Cherry
- Serviceberry
- Disease resistant crabapples
- Katsura tree
- Hophornbeam
- Hornbeam
- Pagoda dogwood
- Japanese tree lilac
- Hybrid elms

WHAT RESOURCES IOWA NEEDS TO PROACTIVELY MINIMIZE EAB IMPACT

- Expanded general and focused public outreach efforts - $75,000
- Expanded detection using visual, trap trees and experimental traps in areas of high ash concentrations - $50,000.
- Implement a City Forestry Cost-Share Program to assist local governments in high risk areas to ID high stress ash trees, contract removal and replacement - $500,000.
- Emergency funds to deal with infestation - $250,000.

FOR MORE INFORMATION

- Robin Pruisner, Iowa Department of Agriculture & Land Stewardship, 515/725-1470 robin.pruisner@idals.state.ia.us
- John Walkowiak, Iowa Department of Natural Resources, (515) 242-5966 john.walkowiak@dnr.state.ia.us
- Mark Shour, Iowa State University Extension Entomology, (515) 294-5963 mshour@iastate.edu
- Visit the following web sites for more information:
- www.emeraldashborer.info
- www.michigan.gov/mda/
- www.na.fs.fed.us/spfo/eab/.