CITY OF SIOUX CITY EMERALD ASH BORER MANAGEMENT PLAN

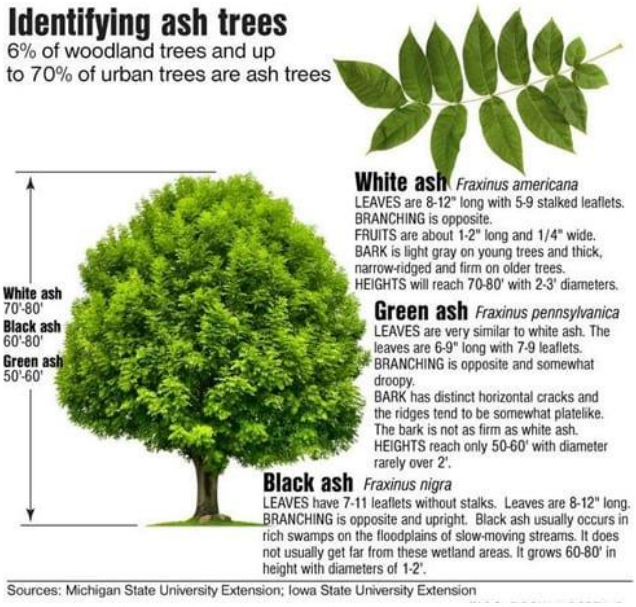
TABLE OF CONTENTS

Questions? Email: treesforsc@sioux-city.org

INTRODUCTION

The **Emerald Ash Borer** or **EAB** is a destructive wood boring pest that is native to Asia. It was first discovered in the United States in 2002 near Detroit, Michigan. Some estimates place its arrival in the United States ten years prior to 2002. EAB inhabits Ash Trees (Fraxinus spp. Green, Blue, White, Black) for its life cycle. More recently there have been discoveries that it may also be finding a host in Fringe Trees. Since its initial detection in Michigan, EAB has spread to most of the States east of Colorado.

Since the initial finding of EAB, Sioux City Parks and Recreation staff have been monitoring the threat and movement of EAB. In preparation for its arrival, staff ceased planting ash trees in 2005 and began planting a more diverse mix of trees. The importance of tree diversification has been a priority within the Parks Department along with the community's support to tree diversification through the *Trees for Siouxland* program.



To better understand the EAB risks, Parks staff attended seminars at Iowa State University, along with conferences and educational opportunities, that focus on EAB management. It has been through this training staff has been able to prepare an EAB management plan to educate other staff, City Council and citizens of the potential hazards of EAB on Sioux City.

(Ash trees are most easily identified by: 1) opposite branching pattern, buds, and leaf scars (two branches come off the main stem, one on each side and directly opposite each other) 2) compound leaves with 5-11 leaflets (depending on the species of ash). Leaflets are moderately toothed and may be stalked or sessile 3) many small dots on leaf scars, and 4) thick, diamond-patterned bark.)

The City Council has taken strong interest on the treat of EAB and in 2019 the approved to revise the ordinance that addresses Dutch Elm Disease to add EAB as a known pest. Next, the City Council approved allocating funding in the CIP budget to establish an EAB Management Program. These actions supported the hiring of two staff members to assist with tree evaluations, removals, and plantings. Along with the development and execution of a city-wide EAB Management Plan.

How to Identify Emerald Ash Borer (EAB)

Adult

larvae stage

The **adult** EAB is a small beetle that is bronze, golden, or reddish green with darker metallic green wings. The underside is metallic purple-red. The adult will easily fit on a penny being approximately 3/8" long. The adult will emerge in late May through mid-July depending on the heating days. After emerging, the adult beetles will feed on the ash leaves before mating and laying their eggs. EAB in the **larvae stage** can be identified as white or cream colored flat headed borers, ranging in size from 1-2.5 cm. During the larvae stage, they can be found below the bark feeding and creating S shaped galleries. The larvae and galleries can usually be seen year-round. If these signs are present, further examination may show the D shaped exit holes created by an adult, along with S shaped galleries created by larvae under the bark.

S-shaped galleries beneath bark

D-Shaped exit hole

Adults emerging

Some of the external signs a tree can exhibited when it has been taken over by EAB are epicormic shoots at the base or lower trunk and crown die back.

(An epicormic shoot is a shoot growing from an epicormic bud, which lies underneath the bark of a trunk, stem, or branch of a plant.)

(Crown die back Is the dying back of branches and branch tips generally in the upper and outer portions of the tree crown).

Questions? Email: treesforsc@sioux-city.org

City Ordinance and City Council Action

Ordinances 17.40.080 and 8.56.070 address the maintenance of ROW trees in a residential area and the abatement of nuisances which was revised January 28, 2019 to include EAB (subsection 8.72.080 (16).

7.40.080 Maintenance of Trees, Shrubs, and Flowers on Parkways in Residential Areas.

All responsibility for the care, maintenance, removal and replacement of trees, shrubs, and flowers on the parkways in a residential zone shall be at the abutting property owner's expense. The abutting property owners shall prune the trees and bushes on the parkway and on their own property so that all branches will be at least fourteen (14) feet above the surface of the street and eight (8) feet above the sidewalk. The abutting property owner shall remove broken branches from trees and shrubs and remove fallen trees from the parkway and from their own private property. If the abutting property owner fails to properly prune or otherwise maintain the trees and shrubs on the parkway or on their private property, then the City Manager or his designee will prune or maintain as necessary and assess all costs to that property owner pursuant to Section 17.40.070.
(Ord. 2018-0540; 2001-0191; 88/T-6351)

8.56.070 Abatement of Nuisances.

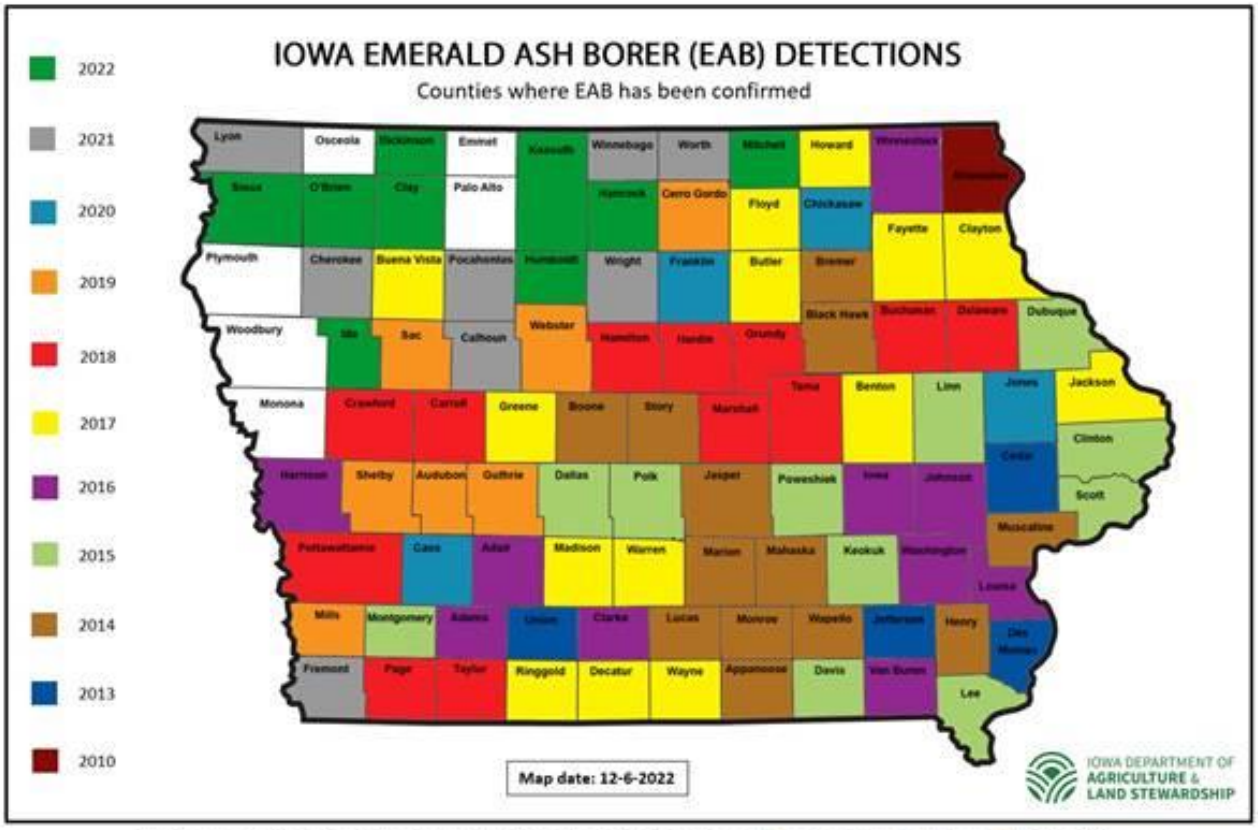
1. If the city forester upon inspection or examination, in person or by some qualified person acting for him determines that any public nuisance as defined in Section 8.56.040 exists in or upon any public street, alley, park or any public place, including the strip between the curb and the lot line of public property, within the city, and that the danger to other elm trees within the city, is imminent, he shall immediately cause it to be removed and burned or otherwise abate the same in such manner as to destroy or prevent as fully as possible the spread of Dutch elm disease or the insect pests or vectors known to carry such disease fungus.

2. If the city forester upon inspection or examination, in person or by some qualified person acting for him determines with reasonable certainty that any public nuisance as defined in Section 8.56.040 exists in or upon private premises and that the danger to other elm trees within the city is imminent, he shall cause the same to be abated and the collection of any costs incurred in the manner provided in Chapter 8.72 of the Municipal Code of Sioux City, Iowa.

3. If the city forester is unable to determine with reasonable certainty whether or not a tree in or upon private premises is infected with Dutch elm disease, he is authorized to remove or cut specimens from said tree, and obtain a diagnosis of such specimens.

Ordinance 17.040.080 designates the maintenance of trees in the public Rights-of-Way (ROW) to the abutting property owner. Prior to 2000, the City had two tree crews assigned to the removal and trimming of trees in the public ROW. Due to department budget reductions, these positions were eliminated and staff was reassigned to other departments. As a result, this left a void in tree care throughout the city. The tree staff

lead tree trimming program was replaced with a written notification program that issued notices to homeowners of properties that needed tree upkeep. The notification program is both administrative and labor intensive for the parks department staff; however, the compliance rate from homeowners remains high which has eliminated the need for staff to perform the tree service and bill the owner.



Iowa Department of Agriculture & Land Stewardship, Entomology & Plant Science Bureau, Entomology@IowaAgriculture.gov, 515-725-1470

EMERALD ASH BORER ACTION PLAN

Emerald Ash Borer (EAB) infestation requires an active management plan administer by a municipal jurisdiction. This plan is only applicable to ash trees located within city-owned and/or maintained properties and ROWs managed by the City of Sioux City. This plan does not apply to ash trees located on federal, state, municipal and private property within Sioux City-Woodbury County.

To flatten the curve, an action plan has been developed. EAB action plans can take many forms and will vary from City to City. Local funding, ash tree population dynamics, and the date of the first detection versus initial infestation weigh into the decisions for management tactics. The City of Sioux City Emerald Ash Borer Management Plan provides a strategy to minimize the growth and spread of EAB that proposes to effectively manage the impact of EAB on city-owned and/or managed properties.

A Press Release was issued on January 19, 2023, by the Iowa Department of Agriculture and Land, announcing emerald ash borer had been discovered in Sioux City, Woodbury County.

❖Management Strategies

When EAB is identified in Sioux City, the area of discovery will need to be evaluated to determine the size of the EAB infestation. If the area is small, a perimeter of no less than ½ mile will be set. Within this perimeter, all ash trees will be removed as quickly as possible to slow the spread. An exception would be to not remove ash trees during the EAB adult emergence period. This would keep the adults localized and keep them from moving the 1-2 miles they are capable of to nest in a new host tree.

Some ash trees could be left as host trees for one year to slow the spread. In wooded areas, the topography may not allow for removal and cleanup. If the trees in these areas can be cut down, it may be beneficial; however, they may also serve as host trees. If EAB is discovered in a large area or multiple areas, widespread removal and treatment should start immediately. All ROW ash trees will have to be removed by the homeowner.

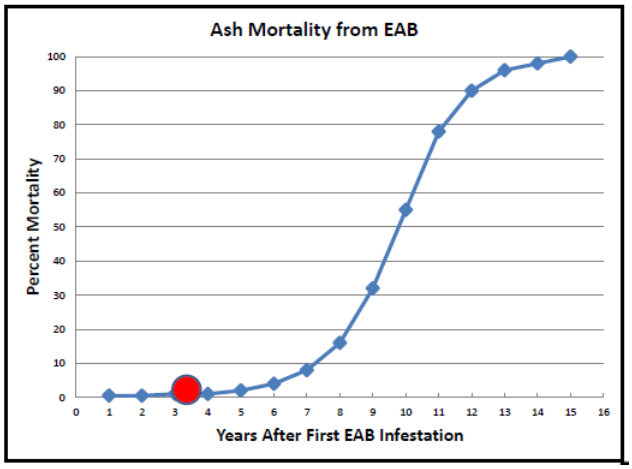
The EAB Action Plan involves Parks staff continuing to remove ash trees from maintained City properties and the ROW. By lessening the removal criteria and removing more ash trees now, it will lessen the future workload. This also allows for the replanting and diversification of the tree canopy prior to a large tree loss.

Parks staff still removes trees in the ROW (not on private property) if the tree meets certain criteria for removal. These tree removals are mostly done in the winter and, as time allows, in the summer months as well. Annually, Parks staff removes 125-150 trees as a service to the community. Upon the arrival of EAB this tree removal service will not be available beyond the current level. Additionally, the City will no longer be able to provide removal and stumping of ash trees in the ROW as the workload is anticipated to be exceedingly unmanageable. Parks staff will continue to remove ash trees from City Parks and City-owned properties, along with non-ash trees in the ROW.

Under certain circumstances, City staff will perform emergency tree removals on private property by authority of Ordinance 8.56.070. This process will require interdepartmental coordination between Parks and Recreation and Community Development Inspection Services to document, issue notices, tree removal by contractor if necessary, and cost recovery for services.

City staff will also monitor the disposal of a removed ash trees by a homeowner. To slow the spread of EAB, all ash trees will need to be disposed of at the 28th Street Transfer Station to be burned or processed in a manner that prevents EAB from spreading. See Ordinance 8.56.070 for authorization details.

Upon the arrival of EAB a distinct curve is established as the EAB population grows exponentially over time. As the chart above shows, there is not an immediate loss of ash trees but an exponential increase until all ash trees are affected. During the beginning years of EAB's arrival, management may appear to be simple and easy; however, it will be imperative to flatten the curve so the amount of work remains achievable with the available resources.



To manage EAB within Sioux City, the following action plan will be utilized:

Natural or Unmaintained Areas

- In natural areas owned by City, County, or the State where the likelihood of personal injury or property damage are limited, ash trees will be left to become host trees for EAB.

- Where there are designated trails or City facilities near ash trees, trees will be abated by the City to lessen any potential liability.

- If there are no limiting factors, ash trees will be left to follow the natural lifecycle of growth to decay. It may be reasonable to include private property of greater than one acre in this action plan, with the Urban Forester or designee having the discretion to allow it on private property.

Maintained Public and Private Property

- The City will manage the ash trees on City-owned properties and facilities, including but not limited to municipal road right-of-way, parks, cemeteries, and wooded areas on City-owned parcels.

- In Parks, City properties, and ROW (until EAB is identified), removal of ash trees will be removed. By increasing the removal rate now, it will lessen the amount of removals needed later. This will also lessen the amount of funding and staffing needed to keep pace with ash tree death.

- With an increased removal rate, it will be necessary to increase the number of trees being planted in the community.

Chemical Treatment

- The third action is to chemically treat viable and valuable ash trees. The recommended method of treatment is Trunk Injection. This recommendation comes from studies that show trunk injection protects the tree for at least two years from all life stages of EAB. The timing of the application is not a factor as there are less environmental concerns and regulations.

- Cons against Chemical Treatments: Basal or Soil Drench treatments can lead to ground water contamination from rain wash. It is also possible to affect plants that are pollinated by bees causing pollinator decline or death. The concentration of chemicals needed for soil drench is often higher than what can be purchased by citizens. Any tree larger than 15" Diameter at Breast Height (DBH) would require an applicator license due to the concentration of the chemical needed. When using Imidacloprid as a soil drench, the amount and concentration needed would exceed the recommended amount per acre. Imidacloprid is used for grub control in turf application already and adding more uses for it would push the concentration beyond the recommended amount per acre.

- The selection of public property trees to treat is a decision the City Forester *(Parks Staff)* or their designee will make. There are some ash trees within City parks that will need to be treated to preserve them.

- Homeowners may want to treat their trees if they have value, are currently healthy, and less than 30" DBH (ash trees that are greater than 30" DBH should not be candidates for treatment due to their size and age). If a homeowner chooses to treat an ash in their ROW, it should be coordinated with the City Forester *(Parks Staff)* or designee. By the mutual selection by the homeowner and the Forester, the best ash trees can be saved through treatment.

- When choosing to treat a tree, it will be a long- term commitment for continued treatment, not just one or two treatment solutions. The exception to this would be if the treatment was chosen to help spread out the removal workload.

- Most chemical treatments should be done by trained and certified pesticide applicator. Many of the chemicals needed to treat ash trees are regulated due to the type of chemical or the concentration needed for treatment. To be a certified applicator you must hold a license issued by the Iowa Department of Land Stewardship (IDALS). Regulation of the applicators is done by the IDALS. For more information regarding an Applicator Certification or Company License: https://iowaagriculture.gov/pesticide-bureau/applicator-licensing-certification or contact the Iowa Pesticide Bureau at 515-281-8591.

❖ Citizen Engagement

As EAB arrives, citizens of Sioux City will need to have information to make educated decisions to address this issue. When EAB arrives, each homeowner will have to make the commitment to treat or remove their ash tree(s). Untreated ash trees will eventually die from EAB infestation. These trees will pose a potential safety hazard and should be removed prior to mortality. Not only are dead trees significantly more difficult and expensive to remove, EAB killed ash trees have been shown to undergo structural failure at the base and lower stems. These trees pose a significant safety risk to the public even during eventual removal. ***Waiting is not an option as EAB is 100% fatal to ash trees***.

The following ***Questions*** and ***Answers*** will assist citizens on how to best manage their ash tree(s).

Q & A - Choosing to treat or remove an Ash tree.

Q. What is the age or size of the tree?
A. If the DBH is greater than 30" treatment is not as effective. Removal may be necessary. If less than 30" DBH treatment is an option.

Q. What is the overall health of the tree?
A. Healthy trees can be treated. Trees below average health should be a removed.

Q. What is the value to the property? Does the tree provide energy efficiencies for the property?
A. Trees that add value may be treated while those that could be removed and replaced should be.

Q. Is there value to the homeowner or landscape? Is there a personal interest or an addition to the landscape?
A. Treatment may be an option otherwise removal is suggested.

❖Choosing a Tree Removal Contractor or Applicator

The City of Sioux City is unable to recommend companies that are licensed and certified to treat ash trees for the Emerald Ash Borer (EAB) to support a fair and balanced market. However, we can provide general guidance on how to find certified applicators and methods for conducting your research.

Once the decision to treat or remove is made the information to hire a removal contractor or applicator is needed. To aid in this selection process the following criteria can be used:

1. Get several estimates with a concise explanation of what services will be performed, how they will be performed, and if applicable, what chemicals will be used.

2. Ask for proof of insurance, liability coverage, and workmen's compensation.

3. Ask for references! Make sure there is a method to follow-up if there are any problems. Understand, not all out of the area contractors will be bad and not all local contractors will be good.

4. Work with your neighbors to seek discounts for multiple removals or treatments.

5. Ask to see their licensing credentials.

    - Chemical applicators must have an IDALS license which can be accessed on the IDALS website. To check if a company has a license or certification go to: https://iowapestapplicators.secure.force.com/lookup

    - If a removal contractor claims arborist credentials (certified arborist), these credentials can be verified on the International Society of Arboriculture (ISA) website: https://www.isa-arbor.com. Arborists are tree professionals and can determine if the tree is a good candidate for treatment and suggest pruning to keep the tree in good condition.

    - For a list of certified pesticide applicators in our area search the Certified Pesticide Applicator Database: http://www.kellysolutions.com/ia/Applicators/index.asp

6. Beware of:
    - Persons going door to door soliciting business unless they a known local business
    - Persons that want an immediate decision for work based on their opinion of the tree
    - "Pop-up" contractors that appear after a storm or an EAB story is in the media
    - Any payment required before the work is completed
    - Any contractor lacking quality tools and equipment

All removed ash trees should be disposed of at the 28th Street transfer station and/or a City staff approved disposal site. All ash trees will have to be burned, chipped, or disposed of in a manner that meets Federal APHIS guidelines. It would be allowable to create a private site for the purpose of chipping the ash wood but only if approved and supervised by City staff. All trees removed by City/ County/ State staff would go to the City's disposal area while contractors and citizens would utilize the 28th Street transfer station. The best option is finding a reuse for the ash trees that would provide a benefit over open burning.

Removals should be done between September 1 and April 30. This is outside the active season for emerald ash borer and prevents infestation of new trees during the insects' typical mating and feeding time – May through August.

Again, if contracting with a private arborist always ensure they are reputable, insured (property, liability, worker's compensation), competitively priced, and a certified arborist. The more informed and educated the homeowner the more likely the right contractor will be selected.

❖Ash Tree Replacement Program

Trees are an important natural resource that provide shade, reduce wind speeds, filter the air, help sequester rainwater, prevent erosion, and provide character to communities. The replacement trees will be composed of a greater diversity of trees to prevent such widespread tree losses in the future as new invasive species or pathogens are discovered.

- **Public Property**: In 1991, 33% of all trees in Sioux City were identified as being ash trees. This was most likely due to Dutch Elm Disease (DED) which affected the American Elm. DED caused a sudden and large canopy loss, and ash trees were used to fill the void left from removals as it is a hardy and fast-growing tree. The most recent survey estimates the ash tree population has dropped to 28%. This drop can be attributed to the removal of ash trees overtime, as well as, the diversification of trees being planted over the past fifteen years. As the number of ash trees have been removed, the question of how to manage the canopy loss arises.

  As a City, we are close to planting a tree for every tree we remove using allocated City funding. This method is the first part of the canopy replacement and diversification is the second. We learned from the overplanting of ash trees the best management practice is to not plant more than 10% of one genus of species. By taking this approach, when there is a pest or disease, we will be able to reduce the impacts of the tree population and make potential threats more manageable.

- **Private Property:** Replacement of trees on private property can be a challenge, but there are potential resources to overcome this challenge. Quite often outside funding for trees is directed towards public property, and the private properties get left out. In past years, a successful planting program for private property was the "Plant Some Shade" program that was funded by MidAmerican Energy and administered through the IDNR and members of the Siouxland Chamber of Commerce Trees for Siouxland Committee. The program allowed Iowa residents, who were MidAmerican customers, to purchase two trees at a subsidized cost. During that time, *Trees for Siouxland* was involved, and up to 400 trees were sold annually. Unfortunately, this program has been discontinued.

It is the City's intention to use this model and create a program of our own for Sioux City residents. Depending on the amount of internal and external funding available to support this effort, we would create a similar program like "Plant Some Shade" that would allow all Sioux City residents with removed ash trees to purchase a replacement tree at a reduced cost.

Ash Tree Replacement Voucher Program

1. The City will compile a list of acceptable trees available through local vendors. *Tree listing pending.*

2. Upon the homeowner's request, City staff will verify the removal of an ash tree and issue the homeowner a voucher for a 50% cost share (up to $75 dollars) per tree.

3. The homeowner will submit the voucher to the participating vendor for payment along with their portion of the cost.

4. Vendors will submit the vouchers to the Parks Department for reimbursement. Depending on the available funding to support this program, the number of vouchers issued per household, may be adjusted annually. *Vendor list pending.*

SAMPLE TREE VOUCHER

SIOUX CITY

Tree Planting Program

Discount Tree Voucher

Applicable towards the purchase of a tree (in stock) at *See Vendor List*.

This voucher shall be used towards the purchase of a live tree only of equal or greater value.
See tree selection list. Hedges and bushes are not applicable.

This voucher has a value of $75.00 and can only be redeemed at a participating vendor.
Expires: (Date)
City of Sioux City Parks and Recreation Department
550 Expo Center Drive, Sioux City IA, 51106 : 712-279-6126 : www.siouxcityparksandrec.com

Iowa Department of Agriculture and Land Stewardship Press Release

Emerald Ash Borer Confirmed in Monona, Osceola and Woodbury Counties

Ash tree-killing insect now confirmed in all but three of Iowa's 99 counties

January 19, 2023, 10:01 am |

Contact: Don McDowell, Iowa Department of Agriculture and Land Stewardship, 515-326-1616, don.mcdowell@iowaagriculture.gov

DES MOINES, Iowa – Emerald ash borer has been discovered in Monona, Osceola and Woodbury counties for the first time. Since its original detection in 2010, the invasive, ash tree-killing insect from Asia has now been confirmed in all but three of Iowa's 99 counties.

Insect samples were collected by Iowa Department of Agriculture and Land Stewardship staff from ash trees in rural Blencoe (Monona County), Melvin (Osceola County) and Sioux City (Woodbury County). Federal identification confirmed these samples positive for EAB.

EAB is a significant threat to native ash tree species, typically killing a tree within two to four years after becoming infested. The cumulative damage by the larvae (immature stage) feeding on the inner bark eventually kills ash trees. The feeding cuts off the tree's ability to transport water and nutrients.

Indicators of an infestation may include canopy thinning, leafy sprouts shooting from the trunk or main branches, serpentine ("S"-shaped) galleries under the bark, bark splitting, woodpecker damage and 1/8-inch, D-shaped, exit holes.

While adult beetles can disperse locally by flying, long-distance spread of this insect is attributed to people moving infested material, including firewood. People are encouraged to use locally sourced firewood where it will be burned to help limit the spread of EAB.

Now is the time to decide a course of action for ash trees at risk of EAB attack (within 15 miles of a known infestation). Landowners and managers can wait and see what happens, remove declining ash trees and replace them with other species, or use preventive insecticide treatments to preserve and protect valuable and healthy ash trees. The best time to treat for EAB is in the spring, from mid-April to mid-May. Insecticides are most effective when the ash tree is actively growing and uptake is at its peak. Tree service companies can apply insecticide trunk injections through the summer if soil moisture is available.

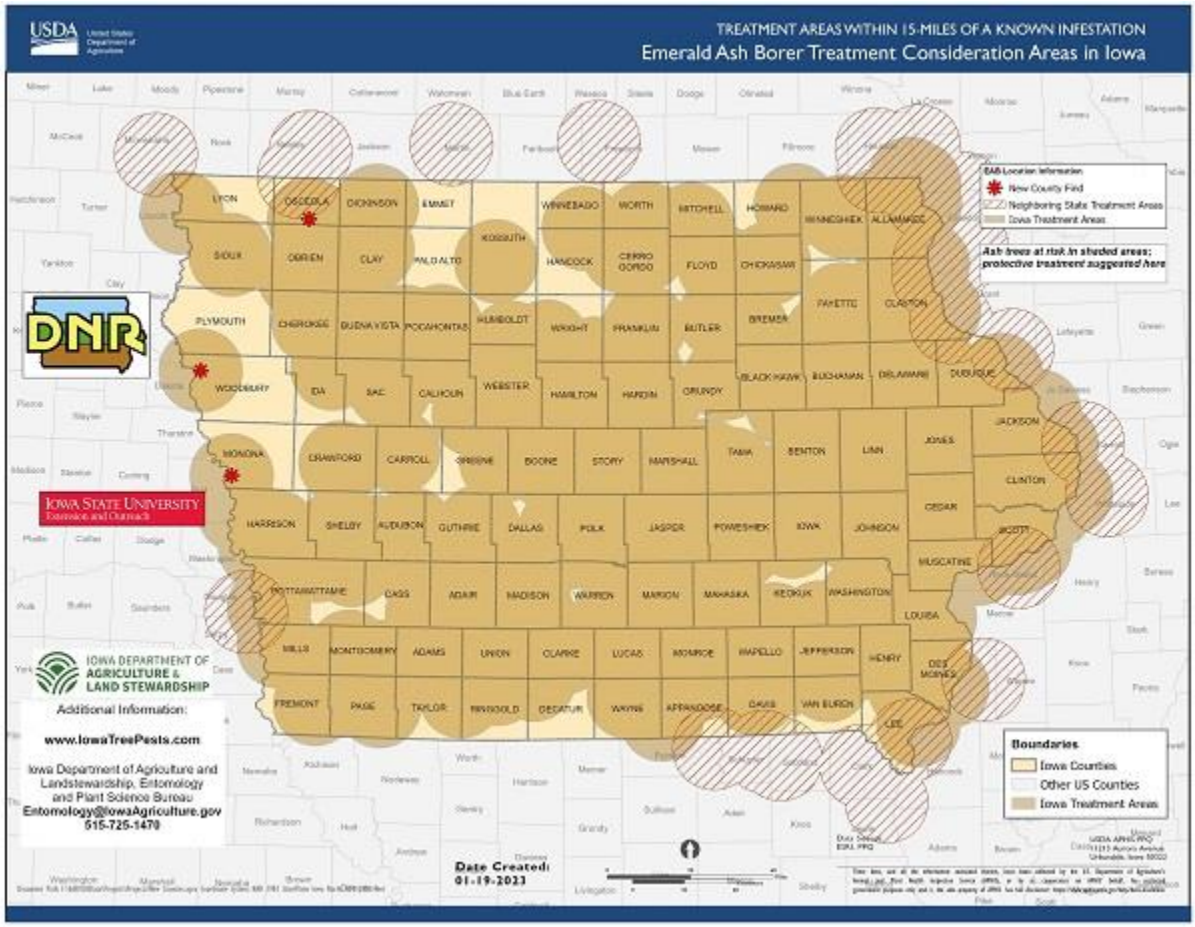
Iowa State University Extension and Outreach has produced a publication about EAB treatments. For more information, download Emerald Ash Borer Management Options.

The State of Iowa continues to evaluate the potential spread of EAB on a county-by-county basis. Before a county can be declared positive, a life stage of the insect must be collected and confirmed. Anyone who suspects an infested ash tree in a county not currently known to be confirmed with EAB is encouraged to contact one of the following:

- Iowa Department of Agriculture and Land Stewardship, State Entomologist Office, 515-725-1470.
- Iowa State University Extension and Outreach, Entomology, 515-294-1101.
- Iowa Department of Natural Resources, 515-725-8200.

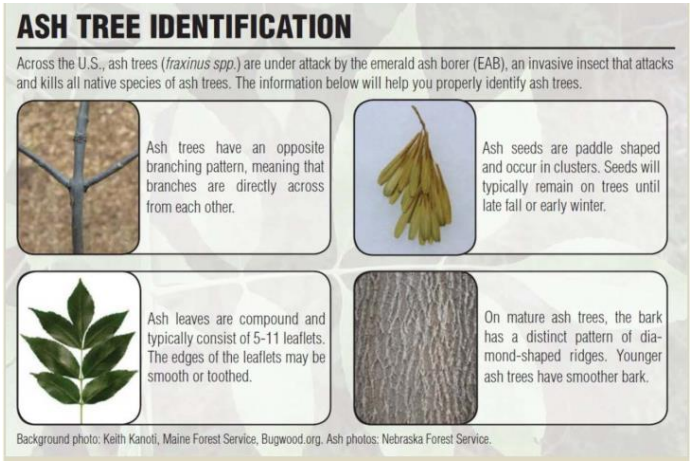
Additional information on EAB, including a county detection map, can be found at iowatreepests.com.

Shareable image: Emerald Ash Borer Treatment Consideration Areas in Iowa



Management Plan Definitions

Ash Tree - Compound leaves with 5 to 9 leaflets. Leaflets, buds, and branches growing directly opposite from one another. Diamond-shaped bark ridges on mature trees.



The Ash Tree Replacement Program – A voucher provided to property owners offering a 50% discount on the purchase of a new tree for each ash tree that is removed from their private property.

Basal (Soil) Drench - The process of adding diluted control products directly to the base of a plant. It provides deep, targeted treatment and is a useful way for professionals to apply insecticides to trees with pest infestations. It also can be a way to apply fertilizers to plants with specific nutrient needs.

City Forester - Manages and cares for **city** trees, which may be located along streets or in local parks. They must plan and manage the planting, pruning, and removal of any trees located in a public area.

Certified Arborist - To earn an ISA Certified Arborist credential, you must be trained and knowledgeable in all aspects of arboriculture. ISA Certified Arborists must also adhere to the Code of Ethics that strengthens the credibility and reliability of the workforce.

Crown dieback - The dying back of branches and branch tips generally in the upper and outer portions of the tree crown.

Diameter a Breast Height (DBH) - Diameter at Breast Height, or DBH, is a standard method of expressing the diameter of the trunk or bole of a standing tree. DBH is one of the most common measurements. Tree trunks are measured at the height of an adult's breast, which is defined differently in different countries and situations.

Dinotefuran - A neonicotinoid. This chemical is generally available as a bark spray or soil application.

Emamectin benzoate - Trunk-injected chemical. It has been reviewed by several research studies and is still, to date, the only chemical treatment with an effective residual greater than one year. This is also the most common insecticide for large trees (greater than 15" DBH).

Emerald Ash Borer or EAB - A small, metallic-green, invasive wood-boring beetle native to east Asia that attacks and kills ash trees.

Emerald Ash Borer, **Adult** - Approximately 1/4-inch long and 1/8-inch wide and emerge from beneath the bark through D-shaped exit holes from May through mid-July. They are most active on warm, sunny days. Adults are able to fly between 1 and 4 miles, depending on wind speed and direction. The average lifespan of an adult is estimated to be about 6 weeks from the time of emergence.

Emerald Ash Borer-Larvae (immature stage of EAB) - Larvae are white and slightly flattened and have a pair of brown pincher-like appendages on their last abdominal segment. Larvae will burrow and feed in a distinctive S-shaped pattern, which is one of the easiest ways to identify whether a tree is infested.

Epicormic Shoot - An epicormic shoot is a shoot growing from an epicormic bud, which lies underneath the bark of a trunk, stem, or branch of a plant.

Imidacloprid - A systemic insecticide applied to the soil or directly into the truck of a tree that acts as an insect neurotoxin and belongs to a class of chemicals called the neonicotinoids which act on the central nervous system of insects.

Licensed Pesticide Applicator Verification -
https://iowapestapplicators.secure.force.com/lookup or
http://www.kellysolutions.com/ia/Business/searchbyCity.asp

Non-host species- all tree species other than ash trees

Pesticide Applicator Application - https://iowaagriculture.gov/pesticide-bureau/applicator-licensing-certification

Right-of-way (ROW) - Publicly held land dedicated to public usage for roads, sidewalks, trails, and/or utilities. The width is defined by deed or historic usage.

Trunk Injection - Made in the bottom 18 inches of the tree, at intervals of around 6 inches apart. The depth for the **injection** is between 5/8" and 1 5/8" into the tree. A 10-inch diameter tree would receive approximately a 1.5-ounce **injection** for two years of protection.