Emerald Ash Borer

Emerald Ash Borer, *Agrilus planipennis*

The emerald ash borer (EAB) is a destructive wood-boring insect that has killed millions of ash trees in North America. It was first discovered in Detroit, Michigan in 2002, and it likely came from wood packaging material imported from Asia. It has become widely established in 35 states and five Canadian provinces. As of April 2021, it has not been detected in Montana. Unfortunately, it is easily transported on firewood so Montana is always just one visitor's mistake away from EAB establishing here. This fact sheet provides information on the EAB biology and damage symptoms, what you can do right now, management recommendations if the EAB is found in Montana, other ash pests or non-EAB ash issues, and EAB look-alike insects in Montana.

Emerald ash borer, *Agrilus planipennis*[1]

Green ash[2]

What's at Risk in Montana?

Ash are the most commonly planted trees in many Montana communities east of the Continental Divide. Ash species represent more than 40% of all publicly-owned trees in 20 Montana communities. The pest is also easily transported through infested firewood. Emerald ash borer can also naturally spread by flying approximately 2 to 12 miles per year. Ash trees that are killed by EAB become particularly brittle and liable to breakage, which then threatens property and public safety.

Trees at Risk

Emerald ash borer attacks all true ash species (*Fraxinus* sp.) and the white fringetree, *Chionanthus virginicus*. Mountain-ash trees are not true ash trees and they cannot become infested with EAB. Proper identification of true ash trees is critical. Ash trees have opposite, compound leaves with short-stalked leaflets. Leaflet margins may be smooth or toothed.

Green ash leaves.[3]

Detection

Detection is difficult, so study the symptoms and be alert. The upper canopy of trees is attacked first, making it difficult to notice early stages of an infestation. Other factors can mimic symptoms of EAB. Ash trees in Montana may show evidence of decline and dieback for a variety of factors, none of which has yet been linked to EAB. The pest is often in the tree for up to four years before symptoms are visible. Green and purple prism traps are not yet proven effective for early detection nor mitigation of emerald ash borer.

Damage

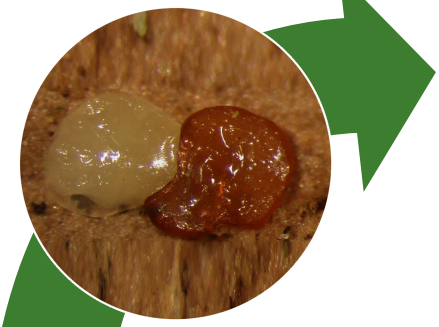
The juvenile stage (larva) damages the tree by feeding in the phloem and cambium, which interferes with the tree's ability to transport nutrients and water. Ultimately, the branch and the trunk are girdled, causing dieback, canopy loss, and death of the tree. Infested trees will usually die within two to four years if left untreated.

EAB Life Cycle (1-2 years)

1. Eggs[4]

Eggs laid on outer bark and fissures on trunk and larger branches, mid-June to August

Eggs hatch in 14 days



2. Larvae[5]

Larvae enter the bark and feed on phloem

Overwinter as larvae in outer sapwood or outer bark

3. Pupae[6]

Pupate during April and May

4. Adults[7]

Adults emerge late May to June and mate

They live 3 to 6 weeks

Adult[8]

- Metallic green
- ½ inch long
- Slender, bullet-shaped

Larva[9]

- Flat-headed borer
- Up to 1 ½ inches long
- Bell-shaped abdominal segments

Common Issues in Montana Ash Trees Not Caused by EAB

Topped ash trees [10]

Dieback of ash trees (environmental)[11]

Physical damage from mowers, cars, etc. [12]

Sudden branch drop[13]

Prevention & Mitigation

- Diversify tree species in the community in both new plantings and regular replacement trees.
- Remove unhealthy trees.
- Don't bring out-of-state firewood into Montana.

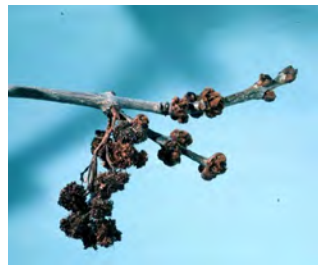
DONTMOVEFIREWOOD.org

Other Ash Pests

Ash trees in Montana are commonly stressed by various pests and conditions including lilac/ash borer, western ash bark beetle, cankers/disease, drought, frost, herbicides, and mechanical damage. Homeowners can usually rule out these common issues prior to submitting samples.

Damage from lilac/ash borer[14]

Damage from Western ash bark beetle[15]



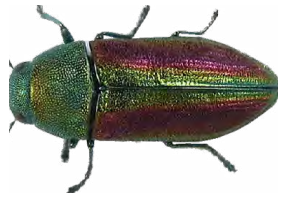
Ash flower gall mite[16]

Oystershell scale[17]

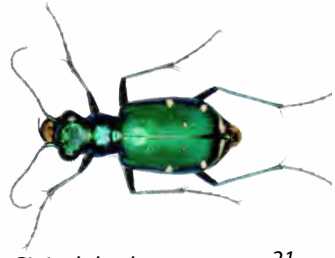
EAB Look-Alikes

Buprestis confluenta[18]

Chrysobothris sexsignata[19]



Chrysophana placida[20]



Cicindela decemnotata[21]

Symptoms of EAB Infestation

Damage from woodpeckers feeding on EAB larvae[22]

Thinning in upper canopy[23]

D-shaped exit holes in trunk[24]

Bark splitting from EAB infestation[25]

Serpentine galleries under the bark[26]

Epicormic branches and shoots at base of tree[27]

What to Do if You Suspect Emerald Ash Borer:

If your ash tree exhibits dieback, refer to all possible biotic and abiotic issues in this guide.

For further help, contact a certified arborist in your area. If you suspect EAB on your property or have a suspected EAB insect sample, contact your local extension agent, the Schutter Diagnostic Lab at Montana State University (406-994-5704), or the Montana Department of Agriculture (406-444-3790).

Treatment

- It is unnecessary to do preventive chemical treatments until EAB is confirmed within 30 miles.
- Work with a certified arborist if infestation is suspected. Remove confirmed infested trees promptly.
- Chemical treatments can be effective when properly applied (see table below).

Active Ingredient	Application Method	Applicator Type	Control
Emamectin benzoate	Micro-injection	Licensed professional only	2-3 years; 99% reduction in adults
Imidacloprid	Soil injection or drench	Licensed professional and homeowner	1-yr control; 58-80% mortality of adults and 57-68% reduction in larval densities
Dinotefuran	Soil injection or drench, trunk spray	Licensed professional and homeowner	1-yr-control; 58-80% mortality of adults and 57-68% reduction in larval densities
Azadirachtin	Trunk injection	Licensed professional and homeowner	1-2 years; affects EAB reproduction and development of young larvae
Pyrethroids (permethrin, beta-cyfluthrin, bifenthrin)	Trunk, branch, foliage spray (preventive)	Licensed professional only	1-yr control; two applications, 4 weeks apart

DISCLAIMER: These recommendations are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. Due to constantly changing labels and product registration, some of the recommendations.

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