By Katharine D. Widin

Emerald Ash Borer

With an estimated 20 million ash trees already killed, the emerald ash borer, *Agrilus planipennis*, has the potential to devastate trees in the Upper Midwest. Known by the acronym "EAB," the emerald ash borer is native to eastern Russia, northern China, Korea, and Japan. Related to the bronze birch borer and two-lined chestnut borer, the emerald ash borer was found in 2002 in southeast Michigan, which is still the hardest hit area. Scientists believe it came to North America in ash wood used in packing crates. It has infested counties in lower Michigan, is in neighboring parts of Ontario, Canada, and has also been found in Ohio, Indiana, Michigan's Upper Peninsula, Illinois, Pennsylvania, Maryland, and West Virginia.

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Emerald ash borers have not been found in Minnesota yet.

In most cases where emerald ash borer has been discovered, the infestations appear to have been established for at least several years. Chances are good that this insect is also present in other locations, but has not yet been detected. It attacks only ash trees and all species of ash found in North America are apparently susceptible. Quarantines are in effect to regulate the shipment of ash nursery stock and ash logs from infested areas to uninfested areas. Removal, disposal, and utilization of the dead trees have been difficult issues for states as they battle the pest.

The emerald ash borer adult is a slender, elongate, dark metallic green beetle, approximately ½ inch long and ⅛ inch wide. The tips of the elytra (hard outer wing covers) are rounded with small teeth on the edges. Larvae are off-white in color and flattened in appearance. The mouthparts are the only portion of the head that protrudes from the body. The abdomen has 10 segments and there is a pair of brown pincer appendages on the last segment.

This insect overwinters as a larva in a sapwood chamber. Adult beetles emerge from D-shaped exit holes between mid-May and late June. They are active during the day and have the ability to fly. Adults can fly at least ½ mile from their emergence point, but can travel even greater distance in infested logs. Adults feed on leaves, making irregular, jagged holes in foliage. After mating, the females lay up to 90 individual eggs on bark of trunks and branches. Larvae hatch from eggs within seven to 10 days, and young larvae chew through bark into the phloem and make serpentine feeding galleries that are packed with frass or droppings. Larval feeding galleries are often found after woodpeckers attack the tree to consume the larvae. Research indicates that EAB can have a one or two year life cycle.

Symptoms of emerald ash borer attack are often not evident until major damage has occurred to the tree. Canopy dieback, which starts at the top of the tree, is often the first symptom noticed. Callus tissue, produced as a response to larval feeding, causes vertical splits in the bark. D-shaped exit holes and serpentine tunnels filled with fine, sawdust-like frass are also signs of infestation. Infested trees can lose 30 to 50 percent of their branches in one year and are usually killed within two to three years after first attacked. Many small shoots arise on the trunk where live and dead tissues meet. Infestation is fatal, and both street trees and woodland trees have been attacked in Michigan. All ash species are susceptible, but green ash is the favorite host. If trees are showing less than 50 percent branch dieback, treatment with a systemic insecticide could be attempted, but sanitation (removal of infested trees before adult emergence) is the best control measure at this time. Insecticide treatment of ash trees is not recommended in areas where EAB has not yet been confirmed. Because this pest colonizes ash wood, it can easily be transported in firewood. An important part of management of this pest is to limit the spread of firewood infested with EAB.

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The snake-shaped feeding galleries indicate an emerald ash borer infestation.

As of this writing, emerald ash borer has not yet been found in Minnesota, but, considering the estimate of 867 million ash trees, it is one of the biggest threats to trees in the state. The states of Wisconsin and Minnesota have been proactive in preparing for this pest, both in methods to detect the insect and in how to deal with it once it is detected. Several universities are doing research regarding how to control the insect and limit tree losses. Minnesota has an EAB Readiness Team, which includes representatives from universities, state agencies, local governments, private business, industry, and non-profit groups. This group has created a state response plan for emerald ash borer. The Minnesota Department of Agriculture is the lead state agency on early detection and first response to this pest. In association with the Minnesota Department of Natural Resources and the Minnesota Department of Transportation, counties, municipalities, and other state and federal agencies, the agriculture department has implemented EAB detection surveys throughout the state for several years. Several thousand more ash trees will be sampled to look for EAB this year.

Learn to recognize the signs and symptoms of this insect. The threat of EAB does not mean that ash should not be planted anymore; however, diversity of tree species in yards, along streets, and in woodlots is always a good idea to help prevent widespread loss of trees to insects and diseases.

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Report EAB Infestations

If you see signs of emerald ash borer, call the Arrest the Pest hotline at **651-201-6684** (metro) or **1-888-545-6684** (statewide), or contact your local municipal forester, extension office, DNR, or USDA Forest Service office. E-mail notification can be sent to ***Arrest.The.Pest@state.mn.us.*** Early detection is critical in managing insects like emerald ash borer and minimizing losses of ash in Minnesota. For more information on emerald ash borer, check out ***www.mda.state.mn.us/invasives/eab.***