



Emerald Ash Borer

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Introduction

The emerald ash borer (EAB; Fig. 1) is a serious pest of all species of ash in North America. Only Asian species of ash have shown resistance to this pest. It attacks all ash found in Virginia and is widespread in the state. Emerald ash borer, *Agrilus planipennis*, is in the Family Buprestidae within the Order Coleoptera.



Figure 1. Emerald Ash Borer adult. (David Cappaert Bugwood.org)

Description of Damage

Early feeding damage by EAB can be difficult to detect because infested trees show so few symptoms. Usually the first sign is the development of cracks in the bark of branches high in the canopy, followed by canopy dieback (Fig. 2). EAB larvae attack the trunk and branches of ash trees. They can live in twigs as small as 1 inch in diameter. Larval tunneling in the cambium under the bark girdles the branches and trunk (Fig. 3). This damage cuts off the flow of nutrients and water to the upper parts of the tree. Gradually the canopy thins as the upper branches die. Many trees develop epicormic branching, with many new shoots on the trunk often at the junction of the live and dead tissues, as the tree tries to compensate for canopy loss (Fig. 2). Epicormic branching is also seen at the base of the tree after the trunk has died. It usually takes 2-5 years for noticeable damage to appear, soon followed by tree death.



Figure 2 Emerald Ash Borer damage, note dead branches and epicormic branching. (Eric Day, Virginia Tech)

Identification

Adult EAB beetles are about 1/2-inch-long and bright metallic green in color (Fig. 1). When the wings are spread, the exposed abdomen is purple-red in color. The larvae are creamy white and have a tan head. At the end of the abdomen is a pair of pincher-like projection.

EAB can also be identified by its damage. Adult beetles leave “D” shaped exit holes about 1/4 inch in diameter as they leave their galleries under the bark. Removing the loose bark reveals numerous “S” shaped tunnels near the exit holes (Fig. 3). Woodpeckers often visit infested trees to feed on EAB larvae, removing the outer bark to reveal lighter colored patches underneath. This light flecking of the bark in the upper canopy, also

known as “blonding”, can be an early indication of EAB infestation. Unfortunately, woodpeckers do not provide complete control of EAB.



Figure 3. Emerald Ash Borer damage from tunneling in the cambium (Eric Day, Virginia Tech)

Life History

EAB usually completes its life cycle in one year, but sometimes two years. Adult beetles start emerging in May-early June, with peak emergence between mid-June and early July. Some adults may emerge as late as August. Adults live 3-6 weeks, making small notches in leaf edges as they feed on foliage. Females usually lay between 50-100 eggs singly in bark cracks and crevices. Eggs hatch in about a week and the new larvae bore through the bark into the cambium layer underneath. Larvae feed under the bark during the summer, diapause as larvae during the fall and winter, and pupate in the spring. The new adults remain under the bark for several weeks before emerging to find mates and lay eggs. EAB adults begin emerging at about 500 Growing Degree Days (GDD, base 50° F), peaking at about 1,000 GDD.

Control

Infested trees rarely recover and need to be removed and destroyed or chipped as soon as possible. Non-infested ash trees can be treated to avoid infestation by using a systemic insecticide, applied as a soil drench at the base of plant in May or early June. It is important to treat before the tree is attacked. Your local Cooperative Extension office can also provide the most current information on chemicals labeled for control. Parasitoid wasps imported from China have been released in numerous locations. Their efficacy as a biological control agent is being assessed as releases continue in the hopes that they will contribute to EAB control in combination with other control tactics.

EAB has been found in firewood in the United States. It's important to remove and destroy infested ash wood on site and not contribute to the spread of EAB by moving it in firewood. When camping, leave firewood at home and purchase firewood from local sources at the campground.

See also: Emerald Ash Borer Control for Foresters and Landowners, Va Coop. Extension Publication: ENTO-76NP, <http://pubs.ext.vt.edu/ENTO/ENTO-76/ENTO-76.html>

Remarks

EAB is native to Asia. It is not known how EAB was brought into North America, but it was first found in Michigan in 2002. The first established population of EAB in Virginia was detected in 2008. By 2023, EAB has spread throughout Virginia except for a few southeastern counties.

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