EMERALD ASH BORER

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The emerald ash borer (EAB), Agrilus planipennis, is a very destructive insect pest of ash trees (Fraxinus spp.), the only known hosts of this borer in the United States. This exotic borer is a native of Asia with its natural range including China, Japan, Mongolia, Korea, the Russian Far East and Taiwan.

It was first discovered in North America in southeast Michigan in June, 2002, although it was likely introduced at least 10 years earlier. It has since been found in the U.S. states of Ohio (2003), Indiana (2004), Maryland (2006), Illinois (2006), Pennsylvania (2007), West Virginia (2007), Wisconsin (2008), Missouri (2008) and Virginia (2008). It has also been found in the Canadian provinces of Ontario (2002) and Quebec (2008). In May 2009, it was discovered in St. Paul, Minnesota.

Why is this insect important?

This destructive beetle has killed tens of millions of ash trees where it has been discovered. There are about 870 million ash trees in Minnesota, one of the largest concentrations of ash of any state in the country. Not only are these trees abundant in our forests, but they are also an important component of our urban landscapes. Research has not found any resistance in our native ash. We could lose much of this resource.

How do I recognize this insect?

EAB is a slender, elongate insect about 1/3 - 1/2 inch long. It is widest just behind the head, gradually tapering back to the abdomen. It is a bright iridescent green to copper-green color, often with a copper-colored area behind the head. Its body underneath the wings is a purplish-magenta color.

This borer is a type of metallic wood-boring beetle (family Buprestidae) and is closely related to the bronze birch borer and the two-lined chestnut borer, both native insects in Minnesota. EAB, however, is a bit larger and much more brightly colored than these species.

Not every green insect you see is an EAB. There are several common insects that look similar, especially the six-spotted tiger beetle and the polydrusus weevil. A six-spotted tiger beetle is a similar size, about 3/8 - 1/2 inch long but with a conspicuous, large head and eyes. It is also a different shape with the abdomen being wider than the head. The polydrusus weevil is a small, 1/4- inch long, oval insect with a short snout. It has a black body covered with pale metallic green scales.

Also, not every insect you find attacking ash is an EAB as there are many native ash borers present in Minnesota. The most common are redheaded ash borer, bark beetles and clearwing borers.

Biology

EABs generally have a one year life cycle although that can be extended to two years in a vigorous host. These insects overwinter as fully grown larvae in chambers constructed under the bark of ash trees. They pupate in early spring and emerge as adults, leaving characteristic D-shaped emergence holes. Depending on where you live in Minnesota, expect adults to emerge any time from late May to August.

After feeding on leaves, adults mate and females lay eggs on the bark or in small cracks in it. Eggs hatch in 7 to 10 days. The whitish larvae, called flatheaded borers, tunnel under the bark, creating a series of winding, S-shaped galleries in the phloem and outer sapwood. These tunnels girdle the trunk and branches, interrupting the flow of water and nutrients. The larvae feed until fall then overwinter as prepupal larvae.

Symptoms and Damage

Trees typically are killed in two to four years. When trees are first attacked by EABs, the symptoms are inconspicuous and hard to notice. By the end of the second year, thinning foliage and dieback in the crown begins to be apparent. By the third year, there is severe dieback and little foliage. Ash can tolerate small numbers of EAB larvae but trees are girdled and killed when populations become more numerous.

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When the adults emerge, they create small, 1/8 inch D-shaped exit holes that are characteristic of this insect, although they can be hard to see. If you were to remove the bark on the trunk of a tree showing these symptoms, you should also find the larval galleries. Epicormic sprouts may form on the lower trunk and major branches as the tree responds to Emerald Ash Borer activity.

"On its own, EAB will generally move only about 1/2 mile a year from infested sites. But with help from people, it can travel hundreds of miles when carried in firewood,..."