



From the U to You...Studies Funded by the MTGF

EMERALD ASH BORER

By JEFFREY HAHN

Assistant Extension Entomologist, University of Minnesota

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..."

ty. Woodpecker attacks on ash could also indicate the presence of Emerald Ash Borers. Vertical splits in the bark due to callous tissue forming over old galleries may also be seen.

All species of ash are attacked, including all ash species found in Minnesota: green (*F. pennsylvanica*), black (*F. nigra*), and white ash (*F. americana*). Mountain ash (*Sorbus. spp.*) is not a true ash and is not attacked. Emerald Ash Borer attacks ash of different sizes from as small as one inch diameter to large mature trees. They commonly attack stressed and unhealthy trees first, similar to the native bronze birch borer and two-lined chestnut borer. However, unlike these insects, EABs will also successfully attack vigorously growing trees. Once an ash is attacked by EABs, it will be killed.

Keep in mind there are other problems that can cause an ash tree to decline. Go to What's Wrong With My Ash? for help in diagnosing an ash problem.

What can I do to help?

First, don't transport firewood when you go camping or are buying it for home use, even if it is within Minnesota. Just buy the wood you need at local sites or at the campgrounds you are visiting. 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 and other wood products or nursery stock.

Next, be aware of what an EAB looks like as well as the symptoms of an EAB infested tree. Report any suspect insects or declining ash trees (see "What Can I Do If I Suspect I Have Found EAB?"). There have been many cases where the public was the first to find an initial infestation in an area.

What can I do if I suspect I have found EAB?

First, use the diagnostic page [PDF] to see if you can clearly rule out EAB. If, after you have gone through this page, you can not easily rule out EAB, then you will be asked to contact the Forest Resources Extension and Outreach to find an EAB First Detector near you. They will help you determine whether your situation needs to be examined more closely. You can also contact the Minnesota Department of Agriculture on their Arrest the Pest Hotline at 651-201-6684 or 1-888-545-6684 to report your suspicions.

Should I be planting or removing Ash?

Because of the overabundance of ash in urban landscapes and other sites, it is strongly recommended not to plant additional

ash. Consider the other woody plant options that are available to Minnesotans. However, if you have an ash in your yard and it is healthy, there is no reason to remove it. As long as it is a low maintenance plant, keep it in your landscape.

Should I be treating my ash?

There are insecticides that are available to protect ash from EAB. However, the odds of any given tree becoming infested with EAB are very low.

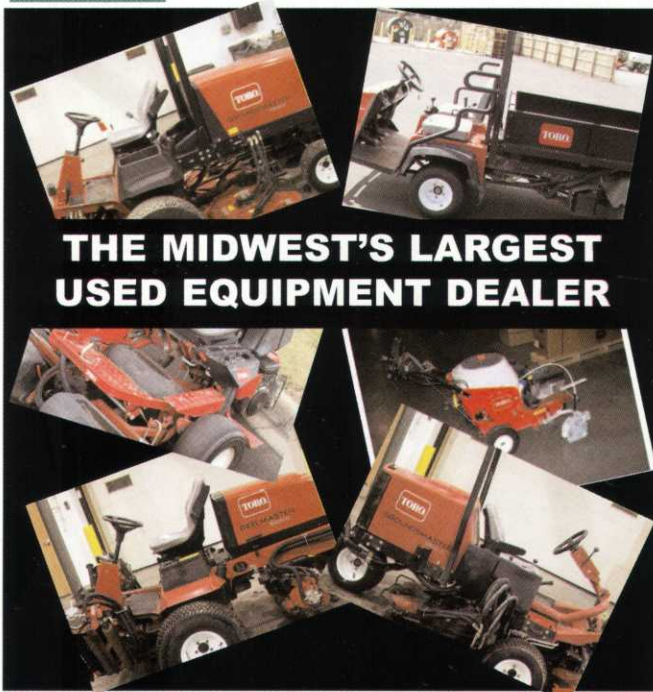
It is true that infestations in other states usually have gone undetected five years or more before they are discovered, which might also be the case in Minnesota. However, EAB does not kill every tree in an area overnight. University experts throughout the EAB-infested states do not advise insecticide treatments without a confirmed infestation within 12 to 15 miles.

This advice is based on the probability of a tree becoming infested with Emerald Ash Borer. There will be enough time to decide whether to treat your trees once EAB is actually found in Minnesota. Some of the chemicals used to protect trees from EAB can be highly effective but such treatments in the absence of a confirmed infestation are very likely to add years of unnecessary applications and expense.

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