

## **BIOLOGY AND MANAGEMENT OF THE EMERALD ASH BORER**

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### **Significance:**

A new exotic beetle feeding on ash (*Fraxinus* sp.) trees was discovered in southeastern Michigan in June 2002 and was identified as the emerald ash borer (*Agrilus planipennis* Fairmaire). This is an Asian beetle that has not been found previously in North America or Europe. Larvae feed by excavating galleries (e.g. tunnels) in the inner bark and outer sapwood on the tree trunk and large branches. These galleries girdle and may kill the tree two to three years after the tree is first infested. Unlike most native *Agrilus* borers, the emerald ash borer attacks and kills healthy ash trees, as well as stressed and declining ash trees. All species of ash that commonly occur in southeastern Michigan have been killed by this exotic pest.

Evidence suggests that the emerald ash borer has been in Michigan from 5 to 10 years. It may have been introduced from Asia on solid wood packing material (e.g. crating, pallets) or dunnage (green lumber used to stabilize cargo containers) off-loaded from cargo ships. To-date, the emerald ash borer is established in six Michigan counties (Wayne, Oakland, Washtenaw, Macomb, Livingston and Monroe) and in southwest Ontario around Windsor. Surveys are continuing and additional populations could be discovered.

The current and potential impacts of emerald ash borer in Michigan are severe. Tens of thousands of ash trees in urban settings and woodlots have been killed or are dying in southeastern Michigan. Ash is arguably the most widely planted street tree in urban and suburban areas of southeastern Michigan. Ironically, ash trees often replaced American elms that were killed by the exotic Dutch Elm Disease pathogen in many communities. In addition, many ash trees have been planted in the past 12-15 years because gypsy moth, another exotic pest, will not feed on it. Ash, particularly white ash, is also a valuable lumber species. Black, white and green ash all provide seeds, cover and habitat for a wide range of wildlife species in forests and lowland natural areas throughout lower and upper Michigan.

Other states and Canadian provinces are deeply concerned about the potential expansion of the emerald ash borer infestation. A quarantine has been imposed to prevent transportation of ash trees and logs out of quarantined counties. Nursery trees that may be infested cannot be planted within or outside the regulated area. These regulations have already had major economic impacts on some nursery growers. A substantial amount of ash lumber is harvested in this area, particularly in Oakland County, and the regulations are affecting the loggers and mills. Townships and municipalities are facing staggering costs for tree removal and destruction, and for replanting.

### **Biology**

All ash species grown in Michigan are hosts. The emerald ash borer adult is dark metallic green from about 7.5-13.5 mm long. Females are larger than males. Larvae are 26 to 32 mm long, cream-colored and flattened somewhat like a linguini noodle.

In southern Michigan, the emerald ash borer seems to have a one year life cycle. Adult emergence is from about mid-May to late July. Females lay eggs on the bark of trunks or branches. Eggs hatch in 7-10 days. Larvae tunnel into the cambium, where they create S-shaped feeding galleries, packed with fine frass. Larvae are creamy white in color and are found under the bark. They grow rapidly in July and August, pupating in late fall or spring. Adult beetles create a D-shaped exit hole when they emerge from the trunk, mostly in June and early July.

Look for D-shaped exit holes (about 3-4 mm in diameter) on branches and the trunk. The canopy of an infested tree thins out and branches die from the top down due to girdling by larvae feeding under the bark. Watersprouts may form on the trunk at the juncture of live and dead tissue. Infested trees usually die after several years of heavy tunneling.

**Management:** This pest is under quarantine in Michigan. Efforts are being made to limit its spread, and track locations where it is found. Send any suspect samples from outside the known area of infestation to MSU Diagnostic Services for positive identification by an expert. In general, treatments will be similar to those used for bronze birch borer. Next spring we will be evaluating the use of imidacloprid (Merit) as a soil injection and imidacloprid and bidrin as trunk injections to protect healthy trees in the infested areas. Consult your local extension agent for current recommendations.

For more information visit the USDA Forest Service website:  
[http://www.na.fs.fed.us/spfo/pubs/pest\\_al/eab/eab.htm](http://www.na.fs.fed.us/spfo/pubs/pest_al/eab/eab.htm)