

Information about the Emerald Ash Borer for the Vestal CAC

The emerald ash borer (*Agrilus planipennis*) is an invasive beetle that weakens and kills all species of our native ash trees within its present range. This brief summary describes the features of the insect and its effects on ash trees, and it addresses the question of when the ash borer might affect our area.

A native of northeast China and Japan, the emerald ash borer (EAB) was first discovered in North America in 2002. It is now widespread in eastern Michigan. Sightings closest to our area are a disjunct population present in three counties around Pittsburgh. It has also been found in a small area of Maryland and along Lake Eric in Ontario. Presumably the first arrivals came as larvae in wood products. Natural spread of the beetle is slow, but the larvae can spread quickly with human traffic, such as when infested wood is taken to distant campsites to be used as firewood. For this reason, areas in which the beetle is found are placed under quarantine, making it illegal to move ash trees, logs, branches, wood chips, and bark, or any hardwood firewood out of the quarantined areas. No cost-effective pesticide treatment has yet been identified. Given the known distribution of the EAB, our climate does not appear to present a barrier to invasion.

In Michigan and Ontario, EAB has killed ash trees in open settings as well as inside woodlots. The attack begins along the upper trunk and lower portions of the main branches; attacks in succeeding years are concentrated along the lower trunk. Tree death usually occurs in 3 years, but it can occur earlier when EAB populations are extremely high. EAB has infested ash trees from as small as 2 inches in diameter to mature forest trees.

Adult emerald ash borers have narrow bodies about a half-inch long and a metallic blue-green color. Their kidney-shaped eyes are bronze or black. Adults feed on the foliage of the tree from which they emerge, creating irregular notches in the leaves, but this damage is minor. This local feeding and the fact that adults live only 2-3 weeks greatly limits the speed of natural dispersal. The real damage is done by the larvae.

Females lay 68-90 eggs in their lifetime. Eggs are laid singly along the trunk and lower portions of major branches at least an inch in diameter. Young larvae bore through the bark to feed on the inner bark and the outer sapwood, eventually forming flat, S-shaped galleries that are filled with a fine brown frass. Galleries are 4 to 10 inches long and increase in width from the beginning to the end. Callus tissue may be produced by the tree in response to larval feeding and may cause vertical bark cracks to occur over a gallery. Mature larvae are more than an inch long, flat and broad, conspicuously segmented, and creamy white. Pupation takes place at the end of a gallery just beneath the bark. After pupae transform to adults, the new adults chew their way out of the tree and emerge through D-shaped exit holes less than a quarter of an inch across. These holes are difficult to find but can confirm infestations where suspected from other symptoms.

Symptoms of EAB infestation appear in the following sequence. Little crown dieback occurs during the first year of attack. In the second year, less foliage develops and crowns appear thinner, the sapwood forms callus tissue around the larval galleries from the first year, which can result in longitudinal bark splits, and branches sprout directly on the main trunk and major

branches. The characteristic frass-filled, S-shaped larval galleries can be seen after removing the bark. The galleries are most common along the upper trunk in the first year of attack, but can be found throughout the trunk in succeeding years. By the third year of attack, many branches have died, little foliage is present, bark splits are common, exit holes are present throughout the trunk, and trunk branches are common, especially along the lower trunk and at groundline.

Ash is a common tree in both forests and neighborhoods in Vestal. What is the future for ash in our area? Eventually, the EAB will reach us. Dispersal by natural means alone could take decades. It is more likely to arrive with human assistance, which means it will appear first close to human habitation, rather than in the forests, making its early detection more likely. The speed of its arrival will depend on the effectiveness of quarantines and traffic patterns. Areas exchanging heavy traffic with an infested location are more vulnerable, therefore EAB is much more likely to move from Pittsburgh or Detroit to Buffalo, for example, than directly from those locations to Vestal.

With the greater awareness of the EAB threat, state and federal forestry agencies are actively monitoring the spread of this insect and biologists at Binghamton University and Cornell University will spot infestations early. It should be noted that other beetles with similar coloration occur in our area, so expert confirmation of the identify of suspect specimens is important.

Invasive species accumulate pathogens and predators with time, therefore the longer it take the EAB to reach our area, the less severe its effects may be. In addition, effective pesticides and biological control agents may be identified before EAB reaches our area.

Conclusions: The entry of EAB into our area is not imminent, and it could take many years. We can expect to have substantial warning of the approach of the pest, and once it arrives, it will take time for a local population to develop numbers capable of producing an outbreak. Planting new ash trees is ill-advised, but cutting trees based on the threat of emerald ash borer infestation is not justified at this time.

6/29/08
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