



Emerald Ash Borer (EAB), *Agrilus planipennis* Fairmaire, is an exotic beetle that was discovered in southeastern Michigan near Detroit in the summer of 2002. The adult beetles nibble on ash foliage but cause little damage. The larvae (the immature stage) feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients. Emerald ash borer probably arrived in the United States on solid wood packing material carried in cargo ships or airplanes originating in its native Asia. Since its discovery, EAB has:

- Killed hundreds of millions of ash trees in North America.
- Caused regulatory agencies and the USDA to enforce quarantines and fines to prevent potentially infested ash trees, logs or hardwood firewood from moving out of areas where EAB occurs.
- Cost municipalities, property owners, nursery operators and forest products industries hundreds of millions of dollars.

The Signs and Symptoms of an EAB Attack

The symptoms of an ash tree shows when it is infested with emerald ash borer are similar of symptom caused by other ash pests or diseases. For example, crown dieback can occur to due to EAB damage, but can also be a result of drought, stress, soil compaction or verticillium wilt, just to name a few. Therefore, it is important to look for a combination of at least two symptoms or signs when trying to figure out of emerald ash borer is in your ash tree.

Symptoms

Crown dieback: Dieback of the upper and outer crown begins after multiple years of EAB larval feeding. Trees start to show dead branches throughout the canopy, beginning at the top. Larval feeding disrupts nutrient and water flow to the upper canopy, resulting in leaf loss. Leaves at the top of the tree may be thin and discolored. An example of this is shown below.

Epicormic Sprouting: When trees are stressed or sick, they will try to grow new branches and leaves wherever they still can. Trees may have new growth at the base of the tree and on the trunk, often just below where the larvae are feeding. An example of this is shown in the picture above, where small branches are growing on the trunk, about 6 feet off the ground.

Bark splits: Vertical splits in the bark are caused due to callus tissue that develops around larval galleries. Larval galleries can often be seen beneath bark splits.

Woodpecker feeding: Woodpeckers eat emerald ash borer larvae that are under the bark. This usually happens higher in the tree where the emerald ash borer prefers to attack first. If there are large numbers of larvae under the bark the woodpecker damage can make it look like strips of bark have been pulled off of the tree. This is called "flecking." An example of this is shown below.

Signs

D-shaped emergence holes: As adults emerge from under the bark they create a D-shaped emergence hole that is about 1/8 inch in diameter. An example of this is shown below.

S-shaped larval galleries: As larvae feed under the bark they wind back and forth, creating galleries that are packed with frass (larva poop) and sawdust and follow a serpentine pattern. An example of this is shown below.

Larvae: Larvae are cream-colored, slightly flattened (dorso-ventrally) and have pincher-like appendages (urogomphi) at the end of their abdomen. By the time larvae are done growing they are 1 1/2 inches long. Larvae are found feeding beneath the bark.

Adults: Adult beetles are metallic green and about the size of one grain of cooked rice (3/8 - 1/2 inch long and 1/16 inch wide). Adults are flat on the back and rounded on their underside.