



Knox Soil & Water Conservation District

Ash Trees with Few or No Leaves-Emerald Ash Borer

The Emerald Ash Borer (EAB) is an exotic, wood-boring pest that is a small, metallic green beetle native to Asia. As with most invasive pests, this beetle was accidentally introduced on



Adult EAB

wooden pallets or solid wood packing material in the Detroit/Windsor area in the 1990's and was later identified in Ohio in 2003. Tens of millions of ash trees in forest, rural, and urban areas have already been killed, and many more are rapidly declining from this pest. EAB affects all species of native ash found in Ohio and approximately one in every ten trees in Ohio is an ash.

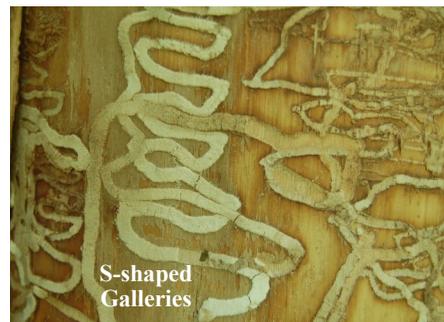
Adult EAB have dark, metallic emerald green wing covers and bodies which have a bronze, golden or reddish green color. They are only 1/2 inch in length and 1/8 inch wide, and fly from mid-May to September. The larvae reach a length of over an inch long and are



Emerald Ash Borer Larvae

white to cream in color. The brown head is mostly retracted into the prothorax, and only the mouthparts are visible. The abdomen has 10 segments, and the last segment has a pair of brown, pincer-like appendages. Larvae continually eat beneath the bark and are responsible for all the destruction and eventual death of the tree.

EAB generally has a 1-year life cycle. In the upper Midwest, adult beetles begin emerging in May or early June. Beetles probably live for about three weeks and are generally active during the day, particularly when it is warm and sunny. At least a few days of feeding are needed before beetles mate, and an additional one to two weeks of feeding may be needed before females begin laying eggs. Adult EAB beetles only nibble on ash foliage and cause little to no damage to the tree. Females can mate multiple times. Each female potentially lays 30-60 eggs during an average lifespan, but a long-lived female may lay more than 200 eggs. Eggs are deposited individually in bark crevices or under bark flaps on the trunk or branches, and soon darken to a reddish brown. Eggs hatch in seven to ten days.



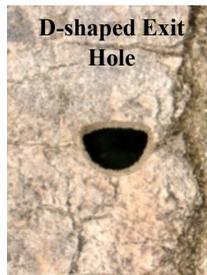
S-shaped Galleries

After hatching, EAB larvae chew through the bark and into the outermost layer of the tree's trunk. Larvae continue feeding for several weeks, creating serpentine (S-shaped) galleries packed with fine sawdust-like frass. As a larva grows, its gallery becomes progressively wider. Beetle galleries often reach the outer sapwood.

The EAB larvae feeds on the vascular tissue of the tree, which is responsible for carrying the water and nutrients from the roots underground up to and throughout the canopy of the tree to keep the branches and leaves fed and

watered. As damage increases to the vascular tissue from yearly feeding, less and less of the tree receives the vital elements that it needs for its survival, and within one to three years even the healthiest tree is unable to survive this attack.

EAB larvae develop into adult beetles and exit the tree the following spring. To exit the tree, adults chew holes from their chamber through the bark, which leaves a characteristic D-shaped exit hole and the cycle begins again.



D-shaped Exit Hole

This pest can be difficult to identify because ninety percent of the EAB life cycle occurs within the tree. The beetle typically begins its invasion of the tree at the top, where the more vigorous photosynthesis and rich nutrient content is located. This makes it very hard to detect whether the beetle has entered your tree. The upper canopy of the tree will start to show signs of stress as yellowing and or browning of leaves and premature leaf loss. Increased woodpecker activity would indicate the late stages of an EAB infestation along with die back of branches. As the tree struggles to survive, it will begin to sprout shoots around the base of the tree by trying to produce new replacement trees.

While the symptoms of EAB are like native ash borers the signs are very unique. The main signs are 1/8-inch, D-shaped exit holes and if the bark is peeled back, a serpentine pattern packed with sawdust will be seen. Beyond this point, the success of treatment becomes questionable.

The EAB is here in Knox County, however, there is hope. If your ash tree still



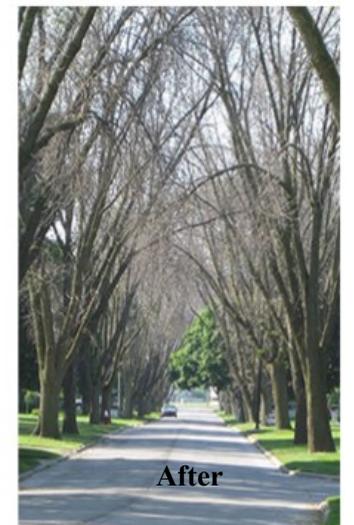
Ash Tree Damage

currently looks good and healthy, beginning treatments immediately can possibly save the tree. Treatment is a long term process and therefore very expensive. If more than half of your tree is already dead, then it is recommended to hire a professional to have the tree removed.

There are no longer quarantine regulations in place for the EAB within the state of Ohio because the pest has already become established. Despite the fact that the Ohio quarantine has been lifted state wide, to prevent the spread of EAB and other pests, it is still recommended to continue to exercise caution when moving firewood.



Before



After