



Watch Out For Yet Another Potentially Destructive Insect Pest!

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Sometimes it seems as if every time we turn around, yet another insect pest is discovered. The emerald ash borer, *Agilus planipennis* Fairmaire, is no exception! In May and June of 2002, adults of the emerald ash borer (EAB) were collected from ash (*Fraxinus*) trees in the Detroit area of southeastern Michigan. This finding was quickly followed by the discovery of EAB in neighboring Ontario, Canada. It is suspected that the EAB entered into the United States and Canada via wood pallets from Asia. As a result, we are again faced with the challenge of managing yet another potentially destructive insect pest.

Origin and Native Range

The EAB is an exotic forest pest that is native to China, Japan, Korea, Mongolia, Russia, and Taiwan.

Identification

EAB is a Coleopteran (i.e., beetle) from the *Buprestidae* family (i.e., same as bronze birch borer). The adults are slender, elongate beetles approximately 1/4 - 9/16 inch long. They are metallic, emerald-green in color (Figure 1). Larvae are white, flat, slender, and have a pair of brown pincher-like appendages on the last abdominal segment. Fully-grown larvae reach approximately 1 - 1 1/4 inches in length. Compared to the thorax and abdomen, the head is relatively small, and retracted inside the thorax (Figure 2).

Hosts

It is understood that the only host of EAB is ash (*Fraxinus*). In Michigan and Ontario, EAB has only been discovered in ash trees including *F. americana*, *F. nigra*, and *F. pennsylvanica*.

Biology

Unfortunately, the biology (i.e., life cycle, behavior, habits, etc.) of this important insect pest is vague at best. Based on the nominal information that is available, EAB typically completes one generation per year in northeastern China; however, some individuals may require two years to complete development. Adult EAB activity has been reported from mid-May through July. The adults appear to lay their eggs on the bark surface, inside bark cracks and crevices, typically from early-June through late-July. EAB larvae actively feed in the cambial region of the trunk from mid-June through mid-October. Thereafter, they overwinter as fully

developed larvae in pupal cells constructed in the outer sapwood or in the bark. The following spring, late-April and May, the larvae pupate within the tree, and adults begin emerging approximately two weeks later. In climates where the larvae do not fully mature by fall, they will overwinter in the cambial region and initiate feeding again in April, completing their life-cycle later in the summer.

Damage Patterns and Symptoms

It appears that the EAB does not discriminate between "healthy" and "unhealthy" trees, nor does it discriminate against tree size. In China, EAB most often attacks ash trees that are growing



Figure 1. EAB Adult



Figure 2. EAB Larva



Figure 3. D-shaped adult exit



Figure 5. S-shaped larval feeding gallery



Figure 4. EAB damage

tions are difficult to diagnose the first year, since eggs are laid deep inside bark cracks and larval feeding occurs under the bark. It is not until the following year that D-shaped exit holes appear, providing the first positive evidence of an EAB infestation (Figure 3).


Typical damage symptoms occur over a three-year period. Year 1 shows a little crown dieback. Year 2 includes less development of foliage and crowns appear thinner (Figure 4), 2) the sapwood forms callus tissue around the larval galleries from the first year, which can result in longitudinal bark splits 2 - 4 inches in length, and 3) "sprout" development along the main trunk and on some branches. When EAB larval populations are high, branches typically turn brown prematurely in late summer and characteristic S-shaped larval galleries (Figure 5) can be seen through cracks in the bark. These galleries are most common along the upper trunk in the first year of attack; however, they can be found throughout the trunk in succeeding years. In Year 3, many branches are dead, little foliage is present, bark splits are common, and exit holes are present throughout the trunk.

Action

Because an outbreak population of EAB is less than 200 miles from

Wisconsin, ash trees are commonly grown here, and numerous imported products are shipped into Wisconsin on wood pallets, it is essential that we be on the lookout for this important insect pest. Should you suspect an EAB infestation or discover EAB specimen (adult or larva), be sure to contact the USDA-APHIS regional office immediately (in Wisconsin 608-231-9545).

All photos are courtesy of Michigan State University (Drs. McCullough and Roberts) ♻


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in the open or along the forest edge; however, entire tree stands can be killed during outbreaks. EAB appears to initiate attack along the upper trunk and lower portions of main branches, with succeeding years of attack being concentrated along the lower trunk. Generally, tree death typically occurs in 3 years; however trees can die within 1 - 2 years when EAB populations are at outbreak levels. In Michigan and Ontario, EAB has reportedly infested apparently "healthy" ash trees ranging in size from 11/2 inches - 3 feet in diameter. Like most boring insects, EAB infesta-