



## Emerald Ash Borer: Options for Landowners

*Authored by Eric R. Day and Scott Salom, Department of Entomology, Virginia Tech; Lori Chamberlin, Katlin Mooneyham and Meredith Bean, Virginia Department of Forestry; and Jason Fisher and Adam Downing, Virginia Cooperative Extension*

### Introduction

Emerald ash borer (EAB) is found in all regions of Virginia. Some areas have established populations with a high level of ash tree mortality and other areas are seeing it for the first time. With a wider spread of infestation many forest landowners are seeking methods to protect their ash trees.

### Options For Landowners

**Salvage:** For landowners with larger numbers of sizeable ash trees, a salvage timber harvest may be considered. The feasibility of getting a salvage harvest done depends on many factors to include: Volume of wood available, ease of access, level of decline and markets. Landowners considering this should, as is always recommended, work with a professional forester.

**Control before infestation:** Non-infested ash trees can be treated to avoid infestation. Since most counties are already infested, it is suggested that if you have a non-infested ash tree that you wish to save, don't wait for signs of damage. Once trees are heavily infested and displaying more than 30% crown dieback, insecticides have limited impact and control may not be successful.

Treat individual trees with a systemic insecticide in mid to late spring after trees have leafed out, applying as a soil drench, basal bark spray, or an injection at the base of the tree (figure 2). Systemics need to be applied April through June when active uptake from the roots is occurring. It is strongly encouraged that this treatment is applied before the trees show signs of infestation. Contact insecticides used for branch and trunk sprays need to be applied in early May and early June. Always refer to the label for the specific pesticide product being used.



Figure 1. Stands of dead ash trees along the Staunton River in Halifax County, Virginia. Photo by Jason Fisher, Virginia Cooperative Extension



Figure 2. Trunk injection at base of tree. Photo by Lori Chamberlin, Virginia Department of Forestry.

Use one the products labeled below. Contact your local Extension Office or Virginia Department of Forestry (VDOF) for information on applying insecticides labeled for use in forest settings on ash trees.

<b>Systemic Insecticides</b>	<b>Contact Insecticides</b>
<b>Imidacloprid</b> <b>Dinotefuran</b> <b>Emamectin benzoate</b> <b>Azadirachtin</b>	<b>Permethrin</b> <b>Bifenthrin</b> <b>Carbaryl</b> <b>Cyfluthrin</b>

**Cost Share:** The VDOF offers a cost-share program that provides financial assistance for landowners to treat healthy specimen ash trees. This cost-share program will reimburse landowners up to 50% of the cost of treatment in 2020 and 2021 for injection treatment only. Contact your local VDOF area forester for more information and learn more about the program here: <https://arcg.is/P945r>. You can also contact a Certified Arborist for advice and assistance in tree treatment and removal at <https://www.treesaregood.org/findanarborist>.

**Control after infestation:** Once trees are heavily infested and displaying more than 30% crown dieback, insecticides have limited impact and control may not be successful. Tree removal becomes the best option. The entire state of Virginia is quarantined; therefore, it is not illegal to leave an ash tree in place after it dies, but it can become a hazardous tree as limbs or the entire tree may fall and endanger humans and property. It is best to remove and destroy infested ash trees on site. Landowners with large stands of ash should contact a Forester for possible sale of the logs, but this should be done before the trees become heavily infested and lose their timber value. Homeowners with limited numbers of trees should contact an arborist or tree service company for safe removal of the tree.

**Biological Control:** Ongoing research involves the release and evaluation of parasitoid wasps imported from China, the native habitat of EAB. EAB is the only known suitable host for these wasps. The wasps are being released on public lands and are not available for sale commercially.

**Do Nothing:** Not only is it impractical, it's impossible, to save every tree. This is especially true in forest settings. Aside from the occasional specimen tree, ash trees in the woods will most likely be left for wildlife habitat or salvaged for wood. Standing dead trees (snags) are very beneficial to many wildlife for both shelter and food (insects). Landowners with an interest in wildlife management are routinely encouraged to leave 2-3 snags per acre where there will not be damage when the snag falls.

## Biological information on the Emerald Ash Borer, *Agrilus planipennis* Fairmaire

**Description of Damage:** Emerald ash borer (EAB) attacks all species of ash trees that grow in Virginia. Only Asian species of ash trees have shown resistance to this pest. The first indication of damage by the emerald ash borer is canopy dieback. Tunneling by the larvae cause girdling and death of branches and the trunk. Early feeding damage by EAB will be difficult to detect because trees show

few symptoms. As the infestation progresses the trees starts to thin out and branches in the top sections of the tree start to die. Many trees will have a large number of new shoots on the trunk called epicormic branching. Often these branches occur at the junction of the live and dead sections of the trees. Epicormic branching may also occur at the base of the tree after the tree has died. EAB can live in twigs as small as 1 inch in diameter but can also breed in trunks of fully mature trees. It usually takes 2-5 years for the EAB to kill the tree.

**Identification:** Practically speaking, the correct identification of damage can indicate EAB without ever seeing the insect. If more than one ash tree in your woods dead or dying, it is quite likely a result of EAB damage. Woodpeckers will often visit infested trees and leave large jagged holes after they have fed on the EAB larvae. Bark flecking or “blonding” is caused by woodpeckers stripping the bark as they hunt for EAB larvae (figure 3). Unfortunately, they do not provide sufficient control of this pest, although field research has indicated as much as 40 percent of the larvae can be preyed upon by woodpeckers.



Figure 3. “Blonding or damage to ash trees by woodpeckers removing bark to find EAB. Photo by Lori Chamberlin, Virginia Department of Forestry.

Adult beetles are about 1/2-inch-long and bright metallic green in color (figure 4). When the wings are spread, the exposed abdomen is purple-red in color. The larvae are creamy white and have a tan head. At the end of the abdomen is a pair of pincher like projection. EAB can also be identified by its damage. As the adult beetle exits its gallery from

under the bark it leaves a characteristic “D” shaped exit hole about 1/4 inch in diameter. Removing the dead bark near the exit hole will reveal numerous “S” shaped tunnels under the bark in the cambium area. Woodpeckers will often visit infested trees and leave large jagged holes after they have fed on the EAB larvae. Bark flecking or “blonding” is caused by woodpeckers stripping the bark as they hunt for EAB larvae. Unfortunately, they do not provide sufficient control of this pest.

**Life History:** The emerald ash borer has a one to two-year life cycle. The adult beetles start emerging in May and early June and beetle activity peaks between mid-June and early-July. It is possible to see beetles as late as August. Beetles live from about 3-6 weeks, feed on foliage by making small notches on the outer edge. The female usually lays between 50-100 eggs one at a time in bark cracks and crevices. Eggs hatch in about a week and the newly hatched larvae bore through the bark down into the cambium layer under the bark. Larvae feed under the bark during the summer and they are usually done by fall but stay in the larval stage until spring when they pupate. Newly molted adults remain under the bark for a few weeks until emerging to start their life cycle again. If degree day information is available, EAB adults start emerging at about 500 degree days (base 50 degrees F) and the peak is at about 1000 degree days.



Figure 4. Bark of tree girdled and killed by emerald ash borer. Note “S” shaped tunnels and adult emerald ash borer. Photo by Eric R. Day, Virginia Cooperative Extension.

**Ash Tree Identification:** While not every woodland has ash trees, many do. In 2016, ash made up about 2% of our hardwood forests statewide (Brandeis, et.al. 2018). Where ash is present, it tends present in large numbers. However, it's not uncommon on many properties to find at least a few ash trees. Many land owners may not know if they have ash or not.

Many resources exist to help landowners identify ash trees. They are often confused with Tulip Poplar (*Liriodendron tulipifera*) or Black Walnut (*Juglans nigra*). There are easily distinguishable features with the leaves, twigs & bark for the moderately observant. The Virginia Tech Dendrology website (<http://dendro.cnre.vt.edu/dendrology/factsheets.cfm>) or the app (vTree, available for iPhone or android) is a good place to go to help you determine the species of tree you think may be an ash (*Fraxinus* spp.)

**Remarks:** EAB is native to Asia and was first detected and identified in Michigan in 2002. It is not known how it was brought into this country, although it is believed the borers arrived in untreated ash hardwood packing material (pallets) used at that time for shipping purposes. The first infestation in Virginia in 2003 was eradicated. The beetle was detected again in 2008 and survey showed it had spread to many areas in Northern Virginia making eradication impossible. It is now found in all counties in Virginia except for the far Southeastern Counties and Cities.

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