

## Get Your Ash Out of Town

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Back in 2003 we had the big shake up with the introduction of the destructive emerald ash borer, which was accidentally brought into Maryland. The Maryland Department of Agriculture took aggressive action by destroying the infested trees and any ash tree within a half-mile radius. They placed sentinel trees in the area and examined them. They declared in 2005 that it appeared Maryland was emerald ash borer free. In 2006 they found ash trees near the original infestation site in a wooded area that had an infestation of emerald ash borer. One 10-inch caliper tree had 17 galleries and 12 larvae present in the galleries. There were no emergence holes in this tree. MDA representatives issued an official press release on August 22, 2006. MDA issued a Quarantine Order (#06-01) that prohibits anyone from moving ash trees or any hardwood firewood into or out of Prince George's County until further notice. Over the next two months the Department of Natural Resources and MDA will survey the area south of Route 4 to locate all ash trees.

In the Midwest, the emerald ash borer has changed the landscape and forest dramatically. The survival of ash trees in landscapes and as a forest tree in the Midwest is being severely challenged. New invasive pest species and native pests are making it a more demanding task to keep ash trees healthy and thriving in urban settings. Don't get me wrong, green and white ash continue to be popular and are being installed in commercial and residential landscapes from the Midwest and up and down the East Coast. Hopefully ash species will continue to be valuable in landscapes but it just may take attention to detail to keep them healthy. MDA and the University of Maryland Cooperative Extension need your help in keeping this problem from spreading in the state by reporting in any suspicious small D-shaped holes on the trunk and rapid dieback on the tree.

Ash trees have been a big seller for nursery managers for the last 25 years. In Dirr's book on woody plants, he listed green ash as "a worthwhile tree for difficult situations." Dirr also calls it the "everyman's tree" (this should be updated to "every person's tree"). If you desire a large-sized shade tree with a 40- to 50-foot canopy spread, it is hard to beat the green ash (*Fraxinus pennsylvanica*) or white ash (*Fraxinus americana*). One of the most popular glossy-leaf, male green ash is the 'Marshall Seedless'. It has lost some popularity in the past couple of years because the overall shape is not as uniform as some would like it. Many nursery managers are now growing the cultivar 'Patmore', which is a hardier male selection with upright branches and more uniform outline. The summer foliage color is dark green and the fall color is a great golden yellow. The white ash cultivar 'Autumn Purple' has been popular for years.

The sales of ash liners for nurseries has dropped off tremendously on a national basis since emerald ash borer has been found in the Michigan, Ontario, Ohio, and Maryland. Maryland nursery managers are still planting green and white ash but most have reduced the numbers being planted each year. This may be the nail in the coffin of the green and white ash market.

### **New and Exotic Pests:**

Maryland has experienced a plethora of exotic pests over the years, but none have the potential for destruction as the tiny green colored beetle called the emerald ash borer, *Agrilus planipennis*. This beetle can devastate ash trees in Maryland in as short a time period as one season. If this pest becomes well established in Maryland, many landscapes will be ravaged and the forest dramatically changed forever. This pest was accidentally introduced into Michigan and discovered in 2001 in the Detroit/Windsor area. In July of 2002 the beetle was found in Ontario. The beetle was found in Ohio in 2002 and in Maryland and Northern Virginia in 2003. The emerald ash borer attacks green, white, black and purple ash.

### **How serious is this pest?**

Ash trees make up to one-third of the forest in the Midwest states such as Ohio, Michigan and Illinois. Ash trees are a major component of the forest in the northeastern forest. The Emerald ash borer has the potential to dramatically change the forest mix if it becomes established. It could move ash out of favor for use in landscapes. In Maryland white ash is in the mix but we are dominated by oak and maple forest. Unfortunately, in the landscape, green ash has been used heavily over the last 30 years.

### **It is knocking at our door – again.**

Officials thought it would be years until we experienced the beetle in Maryland but it leaped-frogged to our state via a nursery tree shipment from Michigan to a nursery in Prince George's County. Now it has moved out of the original infested site to adjacent wooded areas. Back in 2003 a Maryland nursery purchased nursery trees that were shipped from Michigan and the trees were infested with larvae of the beetle. The plants were left in the nursery during the adult emergence time in June and the beetles infested additional trees. Some of these infested trees were moved into Maryland and Northern Virginia landscapes.

Emerald ash borer infested trees were found in Prince George's County in Maryland and Northern Virginia. A trace was conducted and the trees sold from the nursery have been located. All of these trees have been destroyed by MDA and the Virginia Department of Agriculture. All of the ash trees within a half-mile radius of the infested trees from the nursery were cut down and ground up to half-inch chips. Work conducted in Michigan and Ohio found that chipping wood to a 1-inch radius destroyed all larvae. Choosing a small chip size may be overkill but it reassures one that the larvae have been destroyed. MDA moved aggressively to keep this pest from becoming established in Maryland. The new federal requirement may be expanding the area that ash trees must be destroyed.

Sentinel trees were planted around the area where the infestations were found. Based on work conducted in Michigan where they found that ash trees that were physically girdled were highly attractive to emerald ash borer adults, MDA planted sentinel trees around the perimeter of infested sites. These single trees were examined this fall by MDA and found to be free of Emerald ash borer activity. On revisiting the original infestation sites, some very young ash trees that were not destroyed on the first go around were quickly destroyed. Hopefully, the problem, as it appears at this moment, is solved.

**Monitoring:**

The emerald ash borer beetles do not produce any long range pheromones so the use of pheromone traps is impossible. The use of girdled ash trees is probably the best trap method near known infestations. Keep in mind that even with all of the aggressive destruction of damaged plants, the beetle could slip through the drag net. We need your help to make sure this pest is stamped out. As landscape managers we need you to stay alert for problems with green and white ash.



Emerald Ash Borer Larva



Emerald Ash Borer Adult

**Life Cycle:**

Adult beetles start to come out in June, peak in late June and trail off by mid-July (in Ohio). Adults feed for 10 to 14 days before mating and females oviposit onto trunks. They prefer to lay eggs on larger trees but have been found in trees as small as ½ inch diameter. Females lay eggs one at a time, but lay up to 50 eggs over their lifetime. Larvae feed in the phloem and scar the xylem. The xylem is the part of the tree involved with water uptake. The scarring causes a rapid development of scar tissue under the bark, causing the bark to split, one of the first symptoms seen. Since larvae are just under the bark, woodpeckers will feed on the infested trees. High woodpecker activity among ash trees is a good indicator of an infestation. The downy and hairy woodpeckers are the two woodpeckers most commonly found feeding on infested trees in the Midwest. An infested tree will have round funneled holes from the woodpecker feeding and D-shaped holes for the emergence of the adult beetles. The larvae feed in S-shaped galleries and pack the galleries with frass. As an infestation becomes established the S-shaped galleries cross over many times.

**Here is what to look for:**

1. Look for D-shaped holes in the trunks of green and white ash
2. Rapid dieback of ash tree and formation of witch's brooms
3. S-shaped galleries under bark that are packed with frass
4. Presence of small, slender, green-colored beetles with a brassy underside

If you see these signs or symptoms contact MDA (410-841-5920) or an Extension office and alert them about the site. We cannot over-emphasize the importance of destroying this pest rapidly and preventing this pest from becoming established in Maryland.

### **Resistance to Emerald Ash borer**

Asian ash trees are resistant to emerald ash borer. There is a Manchurian ash that has been shown to be very resistant. Plant breeders are looking at these Asian ash trees for a possible long term solution to developing ash trees with resistance to this pest.

### **Chemical Control:**

This is a quarantine pest. All infested trees and trees within a half-mile radius will be destroyed so chemical control is not a real option.

Trials in Michigan by David Smitley and others evaluated several chemical controls with trunk injection, soil drenching and foliar sprays. Here is what they found:

### **Foliage applications in June**

#### **Chemical Control**

Orthene (single application)	30 %
Tempo	55%
Orthene (2 application day)	57%
Sevin (single application)	69%
Onyx	84%
Onyx (2 applications)	87%
Tempo (2 applications)	88%
Sevin (2 applications days)	95%

#### **Trunk Injection**

Imicide – Mauget capsule	60-96% at all sites
Pointer (Wedel System)	6 -60%
Bidrin applied in June	had variable results
Bidrin trunk injected in mid-July and early September	gave 82% and 77% control

#### **Soil Injection**

Imidacloprid applied with Kioritz	33%
Imidacloprid applied with high pressure	86%

**What is important to note is that none of the materials or treatments provided 100% control which means chemical control will not keep emerald ash borer from becoming established.**

### **Summary:**

Ash, both green and white ash, are beautiful trees and worth keeping in the landscape mix, but keep in mind that you will need to monitor these plants closely and keep the emerald ash borer (EAB) and Asian longhorned beetle (ALB) from becoming firmly established in Maryland. For the native pests like the banded ash clearwing, timed chemical applications may be necessary to control the insect borers that can attack these trees. Meanwhile, those ginkgo trees, tree lilac, hackberry and dogwood trees are looking pretty good. This pest may create new needs for replacement trees.