

How Homeowners Can Protect Ash Trees From the Emerald Ash Borer in Southeastern Michigan

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- *A more detailed research report on insecticides for control of emerald ash borer is available at emeraldashborer.info.*

Ash (*Fraxinus* spp.) is a common landscape tree. In the past 30 years, it was planted heavily in landscaping sites such as parking lots and between sidewalks and streets. It is also abundant in yards, along roadsides and in woodlots. But things are changing. More than 6 million ash trees are now dead or dying in southeastern Michigan. There, homeowners, city foresters, golf course superintendents, landscapers and arborists are trying to decide whether to treat ash trees with insecticides to protect them from the emerald ash borer.

Some factors to consider: First, only ash trees in the current EAB core zone, or in the proposed addition to EAB core zone should be considered for insecticide treatment (see Figure 1). It is not necessary to treat ash trees around the eradication sites outside of the infested area at this time (Figure 1). Trees more than 2 miles away from a known infestation are not at risk and do not need insecticide treatment. (For more detailed information on outlier sites go to the MDA web site at www.michigan.gov/mda, then use key word – “emerald ash borer”).

Second, only ash trees will be attacked. These do not include mountain ash, which is not a true ash. If you are not sure that you can identify green and white ash, contact your local MSU-Extension office and ask for bulletin E-2892, “Distinguishing Ash From Other Common Trees.” You can also use field guides or Internet resources. For example, <http://forestry.msu.edu/uptreeid/> can help you learn to identify ash trees.

Third, insecticide treatments may or may not save injured trees. Although research tests clearly show that the insecticide treatments outlined below will protect ash trees against emerald ash borer, we do not yet know when it is too late to use them. Ash trees that had obvious canopy dieback last summer and fall may not be able to transport adequately the systemic insecticides (imidacloprid and bidrin) used in soil injections and trunk injections (Figure 2). Trunk and foliage sprays may be more effective for compromised trees. However, there is a limit to how much damage an ash tree can recover from. At this time, we don't know at what point it is too late for insecticide treatments. The insecticide products listed below work best as **preventive treatments to healthy ash trees**. Also, ash trees **must be treated each year** with an insecticide. The alternative is to let them become infested and eventually die from emerald ash borer. At this time, most infested ash trees are dying within 1 to 3 years after the tops become thin as a result of borer attack.

Insecticide Treatment Options: Pros and Cons of Each Choice

1) *Soil injection or soil drench with imidacloprid (Merit or Bayer*

Advanced Product). This nicotine-like insecticide can be applied to soil as a drench or applied by professionals using a high-pressure soil injection system. The insecticide is absorbed by the roots and moved up to the branches in about 4 to 8 weeks. We know that mid-April is a good time for a soil injection or soil drench with imidacloprid. We are now testing early November and early June applications as alternatives to mid-April, but we won't have the results until fall 2004. The homeowner product is Bayer Advanced Garden Tree and Shrub Insect Control.

Pros: The chemical could persist (remain active) for several months in the tree. No wounds or injury to the tree. One product is registered for general use application and can be purchased and applied by homeowners. Imidacloprid is relatively safe to non-target organisms such as mammals, birds and some groups of insects (e.g., caterpillars).

Cons: It is best applied in April or May because it usually takes 4 to 8 weeks to move through the soil and up the tree. Current research indicates that it has little effect on adult beetles -- it works by killing larvae tunneling under the bark. Borer control levels with imidacloprid applied as a soil injection or soil drench in research tests were not as consistent as those achieved with trunk and foliage treatments. High-pressure soil injections must be done by an arborist or landscape professional.

2) *Trunk injections of imidacloprid (Imicide, Pointer).*

Imidacloprid can be formulated into Mauget capsules (sold as Imicide) and injected around the base of the trunk by professional applicators. Alternatively, it can also be applied using a hand-held device called a Wedgle to inject imidacloprid (sold as Pointer) into the trunk.

Pros: Imidacloprid is likely to persist for several months once it moves through the tree. With trunk injections there is no spray drift. Imidacloprid is relatively safe to non-target organisms such as mammals, birds and some groups of insects (e.g., caterpillars). Our research tests have shown that trunk injections of imidacloprid in late May provide good protection against emerald ash borer. (Imicide is being used in the Asian longhorned beetle eradication programs in New York and Chicago.)

Cons: Homeowners must hire a professional for trunk injections. The product generally requires 2 to 3 weeks to move through the tree, so optimal timing may be early to mid-June. Imidacloprid may be more expensive than bidrin. Borer control levels with trunk injections in research tests were not as consistent as for trunk and foliage treatments.

3) *Trunk injections of bidrin (Injecticide-B)*

This is an organophosphate insecticide that is formulated into Mauget capsules and injected around the base of the trunk by professional applicators.

Pros: This product moves rapidly through the tree (usually in 2 to 3 days). Recent research shows that bidrin is highly effective in controlling adults for at least 3 weeks after injection. With trunk injections, there is no spray drift. Injecticide-B is usually less expensive than other trunk injection products.

Cons: Homeowners must hire a professional for trunk injections. Bidrin generally does not persist as long in the tree as imidacloprid. Borer control levels in research tests were not as consistent with this product as they were for trunk and foliage treatments. Bidrin could affect other insects that feed on treated ash trees. Bidrin is relatively toxic to mammals and birds if exposure occurs. This means that applicators must stay on location to remove injection capsules after uptake is complete.

4) *Trunk and foliage spray with cyfluthrin (Tempo or Bayer Advanced Garden Multi-Insect Killer)*. Spray trunk and foliage when beetles first emerge (early to mid-June) and again 4 weeks later. Be sure to wear gloves, long pants, a long-sleeved shirt, shoes and socks when applying any insecticide. Avoid getting spray mist on your skin or inhaling it. Follow all label directions for mixing and applying the insecticide. The homeowner product is Bayer Advanced Garden Multi-Insect Killer.

Pros: Cyfluthrin trunk and foliage sprays were effective and consistent in preventing galleries in ash trees. Homeowners can purchase and apply this insecticide as Bayer Advanced Garden Multi-Insect Killer.

Cons: The best timing for sprays is probably early to mid-June, when adult beetles are first emerging, and again 4 weeks later (two applications). Homeowners will need a hose attachment to spray ash trees up to 30 feet tall. Trees larger than this must be sprayed by professionals. Exposure, drift and related issues can be a concern. Cyfluthrin is toxic to beneficial insects that feed or contact treated leaves or bark.

5) *Trunk-only spray with bifenthrin (Onyx)*. Spray ash trunks with bifenthrin when beetles first emerge, in early to mid-June, and again 4 weeks later. Apply bifenthrin as directed on the Onyx label for borers.

Pros: Bifenthrin trunk and foliage sprays were very effective and consistent in preventing galleries in ash trees. A single application of Onyx was nearly as effective as 2 applications.

Cons: This product is not available to homeowners. The best timing for sprays is probably early to mid-June, when adult beetles are first emerging, and again 4 weeks later (two applications). Bifenthrin is toxic to beneficial insects that feed or contact treated bark.

6) Trunk-only spray with *Beauveria bassiana* fungal spores (Botanigard).

At this time, this is the only microbial control product being promoted as an alternative to insecticides for protecting ash trees. Research tests have shown that spraying trunks with *Beauveria* causes infection and death of emerging emerald ash borer beetles (up to 50 percent). At this time, however, we do not have test data to show how well this product protects trees from emerald ash borer attack.

Pros: A non-toxic alternative to insecticides. This product is very safe for mammals.

Cons: At this time we don't know how well it works to protect ash trees from emerald ash borer. Other insects contacting or ingesting spores may become infected and die.

7) Wait and see

Some property owners may elect to do nothing at this time. If ash trees in your area are not showing any signs of decline, you may be able to wait another year or two before treating them with insecticide. It is rarely practical to treat woodlot trees with insecticides.

Pros: There will be no immediate expense and no problems with drift or exposure to non-target organisms.

Cons: Soil and trunk injections are not as effective once trees have become heavily infested because the insecticide cannot be transported through the tree. Protecting uninfested or lightly infested trees is likely to be more successful than treating trees that have already begun to decline. Trees that become infested with emerald ash borer generally die within 2 to 4 years after the first symptoms are observed.

Which treatments work best? Test results from 2003 indicate that 2 applications of a trunk and foliage spray of Tempo or Sevin, or 1 or 2 applications of a trunk-only spray of Onyx gave the highest level of control, and the most consistent results. Soil injections or drenches with imidacloprid (Merit), trunk injections of imidacloprid (Imicide or Pointer) and trunk injections of bidrin (Injecticide B) also gave very good control but were less consistent.

Do insecticide treatments work well enough to protect ash trees? As long as the ash trees are relatively healthy, it appears that all the treatments listed above will provide good enough control to keep ash trees healthy under most conditions.

Will I have to treat my trees every year? For right now, the answer is yes. In the future we may find treatments that last more than one year. But until we do, you will have to treat your trees every year to be sure they are adequately protected.

For more information see: emeraldashborer.info.

February 3, 2004

Emerald Ash Borer Infestations Outside the Core Zone January 14, 2004

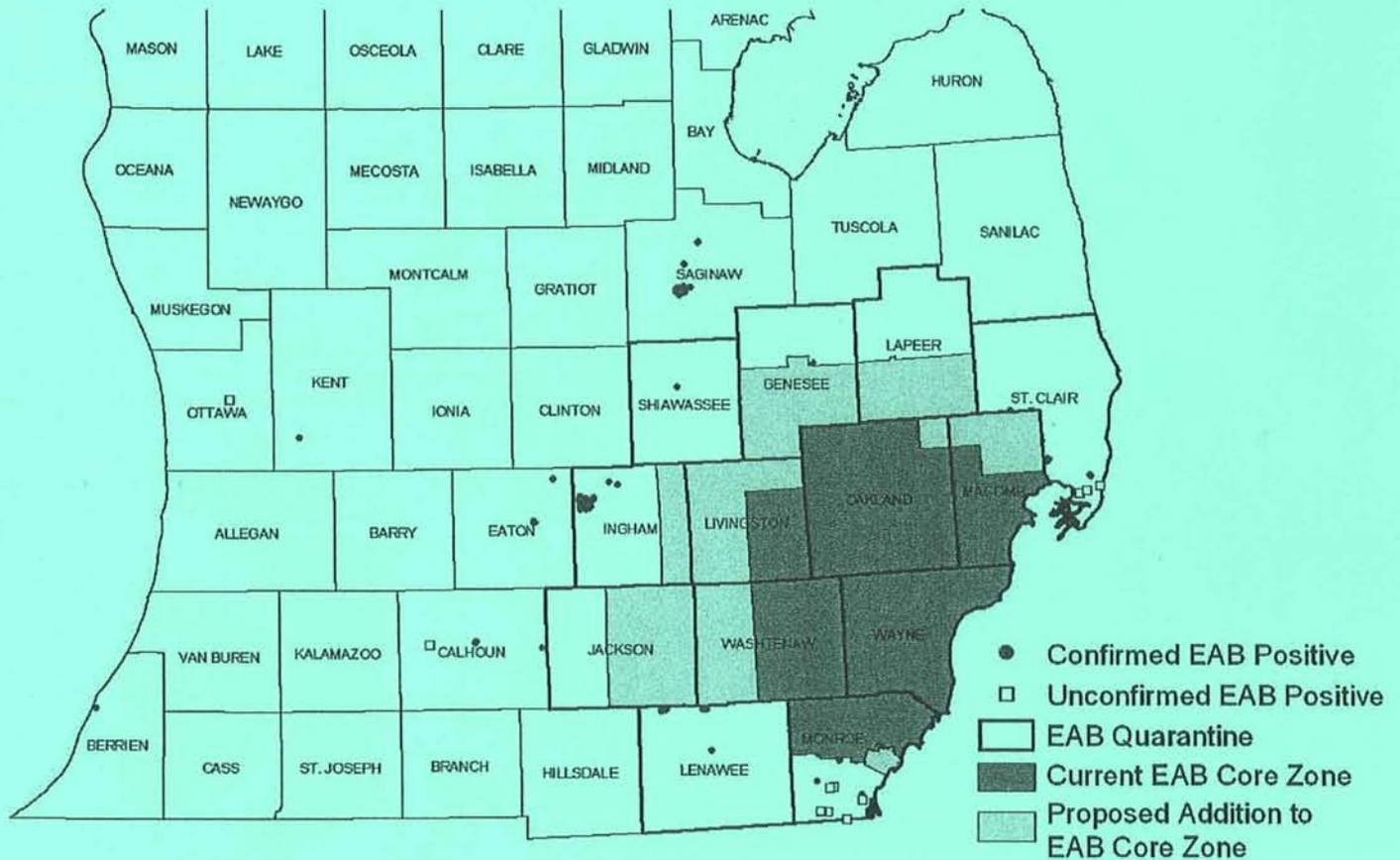


Figure 1. Core infestation map of emerald ash borer in Michigan from the Michigan Department of Agriculture. The shaded areas are considered generally infested. Any infestations outside of the core area should be reported to the Michigan Department of Agriculture on their hotline number: 866-325-0023.