

# **Recommendations for Managing Emerald Ash Borer in Boone County, Kentucky**

Prepared for the Boone County EAB Task Force  
by the Boone County Arboretum

Issued March 1, 2011

## Contents

Introduction.....	3
Purpose of This Document.....	3
Why This Is Important Now .....	3
Applying This Document.....	4
Agencies Responsible for EAB Response .....	4
Definitions.....	4
Monitoring for Emerald Ash Borer.....	5
The Monitoring Program .....	5
Signs and Symptoms .....	5
Reporting Procedure .....	5
General Information.....	6
Treatment Considerations .....	6
Ash Trees in Private or Commercial Landscapes .....	6
Ash Trees in Wooded Areas .....	7
Ash Trees in Utility Rights-of-Way.....	7
Disposal of Ash Debris .....	7
Utilizing Ash Wood .....	7
Canopy Replacement and Care.....	8
How to Locate Qualified Tree Care Contractors .....	8
Creating a Customized Plan.....	8
Steps to Creating a Plan: .....	8
Budgeting.....	9
Implementing the Plan .....	9
Reevaluate Annually .....	9
Boone County's Plan of Action.....	10
Public Parks .....	10
Public Rights-of-Way .....	10
Disposal of Debris.....	10
Communication and Education.....	10
Insecticide Treatment Options .....	11
Insecticides Labeled for Use on EAB .....	11
Improper Procedures Lead to Ineffective Treatments.....	11
Recommended Treatment Based on Tree Size .....	12
Relevant Contacts for Information on Emerald Ash Borer.....	13
Online Resources .....	14
Boone County Residential Ash Tree Care Agreement .....	15

## **Introduction**

### **Purpose of This Document**

The intent of this plan is to outline the objectives and approaches of Boone County in its response to Emerald Ash Borer (EAB), to offer suggestions for county residents in their response, and to mitigate the anticipated impact of the borer on the community and budget. Left unchecked, EAB has the potential to virtually wipe out the ash population of our area. All ash trees native to the United States are susceptible to the insect, and will die often in one to three years following infestation. The impending loss of tree canopy makes this the biggest threat to area forests since Dutch elm disease decimated the American elm population, and the impact to municipal budgets must be considered.

By forming these recommendations, Boone County is creating a blueprint of management options and recommendations that administrators and residents can follow with a high degree of confidence, rationality, and order. With a plan of action in place, costs of treatment or tree removal/replacement can be distributed over a manageable time period in order to lessen the aesthetic and economic impact to the community. This document will also allow the County to clearly communicate its EAB management strategy to the public.

### **Why This Is Important Now**

Trees not only provide beauty and firewood, but also provide 'services' with real monetary value. For example, they enhance the aesthetics of a landscape, which increases the property value. Deciduous trees placed near a building will provide shade during the summer (lowering cooling costs) and allow the sun to shine through during the winter (lowering heating costs). Trees absorb groundwater, slowing storm water runoff and lessening the strain on urban creeks and municipal sewer systems. Trees help absorb/contain pollution in the air, lessening the health effects on those with breathing problems. Trees provide habitat and food for wildlife and people. Ash trees in particular are often used to create consumer goods such as furniture, tools, and sports equipment.

As a new EAB population slowly becomes established, the number of declining trees in a neighborhood will increase gradually. Damage first appears high in the tree, but can be at a critical level within 2-3 years. By the time the problem is noticed, the tree may be too stressed to recover. Once the EAB population reaches a certain level, there will be a quick surge of insects and a sudden mass death of ash trees. The damage from EAB is permanent and hazardous – once a limb is dead, it will not regain living tissue and the wood quickly becomes brittle and hazardous for people and items below. Countless ash trees on private and public properties may die, becoming a liability risk if they are not removed, yet municipal and homeowner budgets may not be ready for the cost of suddenly removing many trees at once. The loss of all ash trees in a landscape could have detrimental effects on home values, quality of life and personal safety, particularly in neighborhoods with high percentages of ash.

EAB was found in Boone County for the first time in 2010. With the arrival of the borer, it is now time to take action and protect the ash trees that can and should be saved. Taking a proactive approach to the oncoming invasion will allow Boone County to evaluate, select, and implement appropriate management strategies, as well as address public needs in an efficient and effective manner. Likewise, it is important each property owner with ash trees create their own plan and take protective steps before it becomes too late.

## **Applying This Document**

The general recommendations in this document can be applied across all of Boone County Kentucky, and perhaps be adapted for other areas within the Midwest and Ohio Valley region. The specific plans contained herein apply on all county-managed public properties where ash trees are currently growing, as well as on private properties where deteriorating ash trees may negatively impact public rights-of-ways or other public or private properties.

## **Agencies Responsible for EAB Response**

EAB management is coordinated at the federal level by the U.S. Department of Agriculture, and at the state level by the Kentucky Office of the State Entomologist.

For publicly owned properties in Boone County, the County Administration, through the staff of the Public Works Department and Parks and Recreation Department, will be responsible for implementation and follow-up on the provisions of this plan within their jurisdiction. Likewise, the cities of Florence, Union and Walton will be responsible for properties within their jurisdiction. The Boone County Urban Forest Commission and Boone County Arboretum will serve as technical advisors, drawing on their knowledge of tree management issues.

For private and commercial properties, the responsibility will fall on the property owner. In the case of public safety code violations, the appropriate city or county agency may need to intervene, possibly assessing fines or fees for services performed.

## **Definitions**

**Emerald Ash Borer (EAB)**: An Asiatic insect (*Agrilus planipennis*) that was inadvertently introduced into the United States via shipping pallets from China. The first infestation was discovered near Detroit, Michigan in 2002. Since then, EAB has spread throughout many mid-west and north-east states. The natural spread of the insect is relatively slow, but unfortunately it can be transported long distances through firewood and nursery stock. This inadvertent transport has dramatically hastened its spread.

**Diameter at Breast Height (DBH)**: The diameter (in inches) of a trunk cross section at 4½ feet above the ground. This is usually measured through dividing the circumference in inches by 3.14, or through using a specially calibrated “diameter tape” around the tree. This figure is necessary to determine the amount of pesticide needed for control treatments.

**Compliance Agreement**: Official USDA Animal and Plant Health Inspection Service (APHIS) approval for moving regulated items outside of a quarantine zone.

**Quarantine Zone**: Designated area where the movement of regulated items is restricted.

**Regulated Items**: All ash wood, raw wood products, all non-coniferous firewood, and any materials determined to pose a risk of EAB transport.

**10-20-30 Rule**: When planting new trees, the plant composition of the area is to be no more than 10% of any species, 20% of any genus, and 30% of any family. This level of biodiversity helps prevent future insect/disease epidemics from wiping out the whole local urban forest.

# **Monitoring for Emerald Ash Borer**

## **The Monitoring Program**

The USDA APHIS and Office of the State Entomologist have been installing detection traps each year, focusing mainly on areas outside of quarantines. As a result, on the regional infestation map, the older infestation areas (sometimes entire states) may not be updated regularly or at all. The infestation in those areas may actually be larger than the map indicates. Boone County was quarantined in 2009, so trapping is no longer as extensive here. A separate monitoring program has been established with the help of concerned citizens. EAB was found in Boone County for the first time in 2010 (in three separate locations) in the north and north-east portion of the county.

Volunteers, instructed on proper identification of ash trees and emerald ash borer symptoms, are helping monitor for suspected and/or growing infestation sites. In addition, county/city employees and residents alike should keep a watchful eye on the ash trees on their property, and help watch other trees they encounter in their daily life. To report suspicious trees, call the phone number(s) listed in 'Reporting Procedure' at the bottom of this section.

## **Signs and Symptoms**

Emerald Ash Borer attacks only ash tree species, starting at the top of the tree first, with direct evidence remaining out of sight for the first year or two of infestation. Adult beetles begin to emerge in mid-May (about the time black locust is blooming), and females usually begin laying eggs about 2 weeks after emergence. The eggs hatch in about 2 weeks, and the larvae crawl under the bark and begin feeding on the cambium and phloem tissues. As the feeding larvae destroy these tissues, the first noticeable symptoms will be general canopy dieback, sometimes with “watersprouts” forming along the living portion of branches or trunk. Increased woodpecker damage may be seen as the birds discover a new source of food (the borer larvae) inside the tree.

As the infestation continues pushing down the tree, or branches fall from the top, direct observations can be made. The larvae are segmented, with each segment more-or-less bell shaped. The larvae carve out winding serpentine tunnels directly under the bark. The tunnels are usually filled with the larvae's excrement. The larvae overwinter in place and pupate (change to adult form) in the spring. When the adult borer exits the tree in the late spring, they create D-shaped holes (native ash tree borers all leave circular holes). Adult beetles begin to emerge in mid-May through August, but are most numerous in late May to early-June with numbers dropping off sharply. Very few adult beetles can be found in August.

Not all EAB-infested trees will show all these symptoms, and many of these symptoms can have multiple causes. It is important to notify the Emerald Ash Borer hotline of suspected infestations, and let the USDA representatives make the official determination.

## **Reporting Procedure**

Report all suspected infestations to the USDA APHIS Emerald Ash Borer Hotline (866) 322-4512, or to the Office of the State Entomologist of Kentucky (859) 257-5838.

## **General Information**

### **Treatment Considerations**

Each tree should be considered individually, since the appropriate course of action will be different from one tree to the next. There are limited options available, each with its own advantages and disadvantages: remove, replace, treat with insecticides, or do nothing (which eventually results in removal anyway).

Before jumping directly to the removal option, consider that removal may decrease aesthetics of the area and cause additional negative impacts to the environment. This would include compaction of soils from trimming/logging equipment or disruption and damage to other non-target native species of plants and animals. In addition, soil disturbances from the removal process may increase erosion issues and/or create areas for invasive plant species to become established. For healthy trees in good locations, preventative treatments are preferred over removal. In some cases, the cost of treatment may actually be less than the cost of removal, especially for trees in tight or difficult areas. Observations from areas already well into a treatment program indicate that for the average urban landscape tree, it takes approximately 9 years of treatment to equal the cost of removal, and approximately 24 years of treatment to equal the cost of removal and replacement with an equivalent-size tree. Continuing research may provide better, less costly treatments in the future.

Trees already infested with EAB can still be treated and perhaps 'saved' if it hasn't yet lost 40-50% of its canopy. The tree may continue to deteriorate during the first year of treatment while the EAB infestation is being reduced and the vascular system is being repaired. In many cases, the tree will begin to improve in the second year of treatment. It is important to keep the tree on a treatment regimen, following label directions.

Those concerned about pesticide applications effecting on non-target species should review the document Frequently Asked Questions Regarding Potential Side Effects of Systemic Insecticides Used To Control Emerald Ash Borer, available at [www.emeraldashborer.info](http://www.emeraldashborer.info).

Relying on the natural predator wasps of EAB is not an option at this point, since they take many years to build to effective populations.

### **Ash Trees in Private or Commercial Landscapes**

If no preventative control measures are taken before or during the early stages of emerald ash borer attack, untreated trees are certain to die, causing a safety hazard for any person on that site. For most residential and commercial properties, dead trees should be taken down in a controlled manner by a professional ISA Certified Arborist. Depending on the number and location of ash trees on a given property, this process could be quite expensive for the property owner. With this in mind, private property owners are strongly recommended to consult with an ISA Certified Arborist regarding their particular situation before the arrival of EAB. In the absence of such a consultation, it is suggested that healthy ash trees important to the landscape should be given the best chance to survive through treatment with one of the available chemical control methods, preferably before EAB starts to attack. Marginal or poor ash trees deemed not worthy of the cost of treatment may need to be removed prior to infestation by EAB. Scheduled removals can be spaced over a period of time and will have an overall smaller impact on the household or business budget.

### **Ash Trees in Wooded Areas**

The sheer number of ash trees in the local forest makes treatment unrealistic and out of range for most budgets. However, property owners should still be vigilant about the condition of the canopy and carefully remove hazardous trees as needed.

### **Ash Trees in Utility Rights-of-Way**

Should EAB become established in ash trees around utility lines, there is high potential that falling ash tree debris may cause a disruption in utility service. Therefore, utility companies are encouraged to remove (rather than trim) all ash they encounter within their woodland easements as part of their normal line clearance operations, preferably notifying the property owner before the trees are removed. For healthy trees in urban settings, the utility company should communicate the risk to the property owner and strongly suggest removal or treatment of the ash trees before they become a hazardous situation. Creation of a doorknob card describing the situation might be appropriate.

### **Disposal of Ash Debris**

While new EAB larvae need living tree tissue to feed upon, older larvae and pupae can survive several months in cut (dead) wood such as firewood. Debris from removing an ash tree can potentially contain living borers, which can later escape to start a new infestation in a new location. It is imperative that debris be disposed of in such a way as to prevent the further spread of the borer. Individual property owners must develop a plan for wood debris disposal that will comply with the USDA and Office of the State Entomologist's regulations for handling regulated materials. Large-diameter sections can be processed into lumber or other uses (a compliance agreement may be required). Otherwise, debris should be shredded to less than one inch in two dimensions, or burned. During peak borer fly time of March-November, debris should be quickly processed on-site. Other times, debris might be able to be taken away to an off-site processing location (a compliance agreement may be required) but it must be processed before March 1<sup>st</sup>.

### **Utilizing Ash Wood**

Trees that are cut down as a result of EAB can be used for more than woodchip mulch and firewood. Ash is well structured for use in building products such as cabinets, flooring, furniture, mill-work, tools, athletic equipment, and so on. Ash trees that are being cut down as a result of an EAB infestation may be used to create into useful products, potentially with a significant cost savings. For example, the city of Cincinnati, Ohio was able to create modular bookshelves and cabinets for use in their school system.

Woodlot owners and woodworkers are encouraged to contact the local saw mills to see if an arrangement can be made to reclaim and utilize ash wood that would otherwise just be destroyed. Often times, lumber mills may need the logs in the longest lengths possible, so it is important to contact your local lumber processing facility before the trees are actually cut down. The logs can be processed on-site with portable saw mills, or transported raw (with correct authorization during the proper time of year) to be processed at the mill.

Resources include:

<http://www.ca.uky.edu/forestryextension/woodindustries.php>

<http://www.harvestingurbantimber.com>

## **Canopy Replacement and Care**

As budgets permit, it is recommended that all removed ash trees be replaced with non-host species (trees other than ash) that will enhance the planting site, are appropriate for the planting site, and add to the diversity and general health of the urban forest. All new trees shall be planted in accordance with proper tree planting protocol, and conform to the "10-20-30" species diversity rule. The Boone County Arboretum, Boone County Cooperative Extension Office, Boone County Urban Forestry Commission, International Society of Arboriculture, and Northern Kentucky Urban & Community Forestry Council have publications about tree selection and installation.

## **How to Locate Qualified Tree Care Contractors**

For any tree care company that is hired, it is absolutely essential that they be insured and bonded against accidents. Otherwise the property owner is legally and financially responsible for any accident that may occur. In addition, contractors shall be required to follow proper tree care techniques as published by the International Society of Arboriculture (ISA), and also follow USDA APHIS and State Entomologist guidelines for disposal. It is highly recommended that the tree care workers be ISA Certified Arborists. A list of local certified arborists can be found on the ISA web site: <http://www.treesaregood.com/findtreeservices/FindTreeCareService.aspx>.

## **Creating a Customized Plan**

### **Steps to Creating a Plan:**

- 1) Conduct an ash tree inventory, recording the location, size, condition, and potential hazard of each ash tree. Look for structural problems, disease and insect problems, percent of crown alive, and the vigor (rate of new growth) over the last few years. Rate each tree as good, fair, poor, or critical. 'Critical' ash trees are already mostly dead and pose an immediate safety threat. 'Poor' ash trees do not pose an immediate threat, but are only marginally healthy, not important to the landscape, or not in a good location. 'Fair' ash trees are mostly healthy, but have a few issues with location or structure. 'Good' ash trees are in good condition and are important to the landscape. Also list any special considerations a tree may have (such as if it is historically important, provides shade for a building, or is a landmark/specimen tree).
- 2) For each fair and good tree, define what would be 'success' - completely saving the tree by keeping all borers out, or simply prolonging its life for as long as possible perhaps until replacement trees are established. Use these goals with the tree inventory to determine which trees will be removed, and which will be treated and for how long. Things to consider:
  - Not every ash tree can or should be treated. Remember that EAB is not the only thing that can attack ash trees, and the pesticides used for EAB may not prevent other insects/diseases.
  - Removing ash trees will leave behind a smaller forest. Removing/replacing ash trees temporarily reduces the forest. Pesticide application saves the forest, conserves tree value, and buys time for the trees. Saving the large trees saves more biomass, but also costs more.
  - For property owners with large numbers of ash trees, strive to save at least 10% of the most common tree-size-class, and 1% of each of the other size-classes.
- 3) Determine a timeline for the removal and/or treatment program. Critical trees should be removed promptly. Poor trees should be removed before they become a critical situation. If a treatment program is desired for the fair and good trees, it should begin before EAB starts attacking the tree (if the borer is found within 15 miles of the site, the trees are considered at



risk and treatments should begin very soon). For other trees that will not be part of the treatment program, it may be beneficial to schedule removals ahead of borer infestation to prevent the cost of the removals from coming all at one time.

- 4) For each tree to be treated, list the pesticide options available, looking at length of time until it is effective, length of effective period, potential for drift, and potential effects on non-target organisms. Determine which would be best for each tree; the chosen product may be different from tree-to-tree. Treatments must follow pesticide labels, and must not exceed the maximum limit of pesticide per tree or per acre of ground. Some pesticides require pesticide applicator's license. See the pesticide options section for optimal timing of the approved pesticides. If seeking outside help for this process, look for a consultant such as a university extension agent or landscape consultant (preferably a Certified Arborist) who will not profit based on the final treatment decision and will be less likely to be biased exclusively to one option.

### **Budgeting**

Once the best-case-scenario plan is completed, identify funding sources and budget constraints. Determine the total cost estimate, which may include the following:

- Employment of (or contract with) an arborist to coordinate the EAB Program
- Proactive preventative treatment and ongoing care for the appropriate trees
- Tree and stump removal (in-house and/or professionally) for the less healthy trees
- Wood and brush disposal
- Replacement trees

Compare the available budget to the total cost estimate, and adjust the plan if needed.

### **Implementing the Plan**

If the borer is found within 15 miles of the site, the trees are considered at risk and treatments should begin very soon. Remember that damage from EAB can cause healthy trees to die within 2-3 years of first symptoms appearing, and most people will miss these first symptoms because they are so hard to detect. Develop a good knowledge of the local infestation and monitor it closely. Once the population becomes well established, it can increase in number and coverage area very quickly.

If using contractors to apply the pesticides, make sure the contract includes the products, rates, amounts, price-per-dbh-inch, and hours. Insist on viewing the bill of sale, the unopened containers, and watch them mixing the tank.

### **Reevaluate Annually**

Each year, prior to treatment, look at changes in tree condition and local EAB population pressure. Based on these new observations, reevaluate the treatment 'tools' – the appropriate treatment for the upcoming period might be different from what was used in previous years. The tree inventory may need to be updated periodically, and the list of priority trees may occasionally change. A spreadsheet or database and map may aid in keeping track of the inventory, treatments given, removals made, and replacements needed. As the budget allows for replacement trees, follow the canopy replacement guidelines further in this document.

## **Boone County's Plan of Action**

### **Public Parks**

The Boone County Parks and Recreation department will conduct an inventory of ash trees within actively utilized areas of county parks, and assess if treatment is feasible. Professional consultants can be utilized to help with this process. A database will be established to track which trees will be treated or removed, treatments given, removals made, and replacements needed. As soon as possible before EAB starts attacking, treatments will begin for the high-value trees, and replacements will begin for the lesser-value trees. In the natural areas of the parks, EAB will be managed under a "no control policy," except where there is risk to people or features under a particular tree. All ash trees will be monitored for canopy decline, and removed when appropriate. During the removal process, care will be given to ensure minimal effect to the environment as discussed above. Removed landscape trees will be recorded for possible future replacement as the budget allows, following the canopy replacement guidelines further in this document.

Plans for park trees in the cities of Florence, Union, and Walton may be different.

### **Public Rights-of-Way**

It is unrealistic for the public works department to treat each ash tree along all county-maintained roads, but ash tree debris falling on roads will become a public hazard and disrupt traffic. Therefore, the public works department anticipates that all ash trees along county roadways will eventually need to be removed. In an effort to prevent a backlog of hazardous situations, removals may need to be scheduled before symptoms develop. The county will make reasonable effort to contact the property owner before healthy trees are removed, though some hazardous trees may require prompt removal.

Recognizing that some citizens may want to preserve the character of their neighborhoods, the county will postpone street-tree removal if the property owner files a 'Residential Ash Tree Care Agreement' (found at the end of this document) with the public works department. Under this arrangement, the resident becomes responsible for the treatment, maintenance and potential removal of the tree while the County will refrain from removal unless the tree declines to the point of being hazardous to the public right-of-way access.

Plans for trees along streets in the cities of Florence, Union, and Walton may be different.

### **Disposal of Debris**

Boone County will consult with other partners to develop a plan to use the debris within Boone County or otherwise destroy it in a responsible and timely manner.

### **Communication and Education**

The County Administration, Parks Department Director, and Public Works Director will give periodic updates to each other to disseminate through their departments. The Boone County Urban Forest Commission will maintain an EAB status page on the county's website: <http://www.boonecountyky.org/pc/EAB.aspx>. Other media relations will be sent through normal press release procedures. Periodic training sessions will be offered for staff, contractors, tree workers, and residents to discuss the infestation, provide ash and EAB identification tips, and updated research findings.

## **Insecticide Treatment Options**

### **Insecticides Labeled for Use on EAB**

This list is current as of this printing. Newer products may exist in the future. Inclusion in this list is for informational purposes only, and is not meant as an endorsement of these products. Many of these products are only available to licensed pesticide applicators, though some are available directly to the consumer.

- Soil injections/drenches:
  - Imidacloprid.....(brand names: Merit®, Xytect™, Bayer Advanced™ Tree & Shrub Insect Control, Bonide Tree and Shrub Insect Control, Ferti-lome Systemic Insect Drench, Ortho Max Tree and Shrub Insect Control)
  - Dinotefuran.....(brand name: Safari™, Transtect, Green Light Tree and Shrub Insect Control with Safari)
- Trunk injections:
  - Imidacloprid.....(brand names: IMA-jet®, Imicide®, Pointer®)
  - Emamectin benzoate...(brand name: TREE-äge™)
  - Bidrin®.....(brand name: Inject-A-Cide B®)
- Systemic trunk bark spray:
  - Dinotefuran.....(brand name: Safari™, Transtect)
- Cover (bark/foilage) spray:
  - Permethrin.....(brand name: Astro®)
  - Bifenthrin.....(brand name: Onyx™)
  - Cyfluthrin.....(brand name: Tempo®)
  - Carbaryl.....(brand name: Sevin® SL)

### **Improper Procedures Lead to Ineffective Treatments**

Insecticide failures are most commonly associated with:

- Application rate (use highest rate allowed for the product where EAB infestations are high)
- Improper Timing (application date must allow for product movement within tree; uptake is slowest with soil-drench applications)
- Soil drench placement/process (must be at the trunk, not at the dripline; mulch must be removed from application area before the pesticide is applied)
- Injecting too deep (must be no more than 4 inches deep)
- Initial degree of infestation is too high (don't wait too long to begin treatments)
- Soil moisture too low (pesticide only moves through tree as it uptakes water)
- Size of tree (harder to achieve effective concentrations of the pesticide in large trees, injections may be best for trees greater than 15" DBH.) Treatments may be ineffective for trees over 25" DBH, studies for this size-class are ongoing.
- Pest pressure trajectory (EAB is more difficult to control as the population increases)

### **Recommended Treatment Based on Tree Size**

This list is meant only for informational purposes, to indicate which products have been shown to be effective in which tree size classes, based on research trials completed as of this printing. Inclusion in this list is not an endorsement of these products over others, since other products not yet researched may also prove to be effective in future trials. Not all of these options are available directly to the homeowner, most are only available through licensed pesticide applicators. Currently, imidacloprid formulations available directly to the homeowner can only be used at the lower rate, and only once per year. Therefore, homeowners wishing to protect trees larger than 15-inch DBH should consider having their trees professionally treated by a licensed pesticide applicator.

The timing indicated below has been determined as optimal for the Greater Cincinnati, Ohio area. Systemic treatments in the fall are less effective because of slower uptake in the tree and less larval feeding through the winter. However, if an untreated tree has just been found to be infested in mid- to late-summer, starting treatments then may be preferred over waiting until the following spring.

- Tree DBH up to 8"
  - Imidacloprid soil drench (single rate) is effective when done yearly by mid-April.
  - Imidacloprid trunk injection is effective when done yearly between mid-May and mid-June.
  - Emamectin benzoate trunk injection is effective when done every-other year between mid-May and mid-June.
  - Dinotefuran trunk sprays are effective when done yearly between mid-May and early-June.
  - Cover sprays on foliage and upper branches, or the whole tree, may help keep new larvae from infesting small trees, but have no effect on larvae already in the tree.
- Tree DBH 8-20"
  - Imidacloprid (double rate) soil drench is moderately effective when done yearly; most effective when applied in the spring at the 2X rate. (Currently only Xytect™ is labeled for this rate – for other brands use the 1x rate in two separate applications 4 weeks apart.)
  - Imidacloprid trunk injection is moderately effective when done yearly by mid-May.
  - Dinotefuran trunk sprays are moderately effective when done yearly between mid-May and mid-June.
  - Emamectin benzoate trunk injection is effective when done every-other year between mid-May and mid-June.
  - Cover sprays on foliage and upper branches, or the whole tree, may help keep new larvae from infesting small trees, but have no effect on larvae already in the tree. Use caution to minimize insecticide overspray/drift, which may affect non-target species.
- Tree DBH 20-25"
  - Emamectin benzoate trunk injection is effective when done every-other year by mid-May.
  - Cover sprays not recommended for large trees because of the increased risk of insecticide overspray/drift, which may affect non-target species.
- Tree DBH greater than 25"
  - Not yet determined (research currently ongoing, not yet finalized).

## Relevant Contacts for Information on Emerald Ash Borer

### **Report suspected infestations to:**

USDA APHIS EAB Hotline (866) 322-4512, or  
Office of the State Entomologist - (859) 257-5838

### **University of Ky - Dept. of Entomology**

S-225 Ag Science North

Lexington, KY 40546

Phone: (859) 257-5955

Fax: (859) 323-1120

<http://pest.ca.uky.edu/EXT/EAB/welcome.html>

**Office of the State Entomologist**

Phone: (859) 257-5838

Fax: (859) 257-3807

### **USDA-APHIS**

US Department of Agriculture - Animal and Plant  
Health Inspection Service

[www.aphis.usda.gov](http://www.aphis.usda.gov)

Dean M. Daugherty

1973 Burlington Pk. (Ellis House)

Burlington, KY 41005

Mail to: P.O. Box 475; Hebron, KY 41048

Phone: (859) 586-2700

Fax: (859) 586-2201

[Dean.M.Daugherty@aphis.usda.gov](mailto:Dean.M.Daugherty@aphis.usda.gov)

### **Kentucky Division of Forestry**

627 Comanche Trail

Frankfort, KY 40601

Phone: (502) 564-4496

Fax: (502) 564-6553

<http://www.forestry.ky.gov/>

**Bluegrass District Office**

Phone: (502) 573-1085 or (502) 573-1086

Fax: (502) 573-1088

### **Boone County Arboretum**

9190 Camp Ernst Rd

Union, KY 41091

Phone: (859) 384-4999

Fax: (859) 384-6888

[www.bcarboretum.org](http://www.bcarboretum.org)

Josh Selm, Curator

[jselm@boonecountyky.org](mailto:jselm@boonecountyky.org)

Kristopher Stone, Director

[kstone@boonecountyky.org](mailto:kstone@boonecountyky.org)

### **Boone County Extension**

6028 Camp Ernst Rd. / P.O. Box 876

Burlington, KY 41005

Phone: (859) 586-6101

Fax: (859) 586-6107

<http://ces.ca.uky.edu/boone/>

Mike Klahr, Agent for Horticulture

### **Boone County Public Works**

5645 Idlewild Road

Burlington, KY 41005

Phone: (859) 334-3600

Fax: (859) 334-3598

### **Boone County Urban Forest Commission**

c/o Boone County Planning Commission

2950 Washington St. / P.O. Box 958

Burlington, KY 41005

Phone: (859) 334-2196

Fax: (859) 334-2264

### **N Ky Urban and Community Forestry Council**

P.O. Box 876

Burlington, KY 41005

[www.nkyurbanforestry.org](http://www.nkyurbanforestry.org)

[info@nkyurbanforestry.org](mailto:info@nkyurbanforestry.org)

## Online Resources

- Official multi-state EAB website with research-based publications: [www.emeraldashborer.info](http://www.emeraldashborer.info)
  - Coalition for Urban Ash Tree Conservation: [http://www.emeraldashborer.info/files/conserve\\_ash.pdf](http://www.emeraldashborer.info/files/conserve_ash.pdf)
  - Insecticide fact sheet: [http://www.emeraldashborer.info/files/multistate\\_EAB\\_Insecticide\\_Fact\\_Sheet.pdf](http://www.emeraldashborer.info/files/multistate_EAB_Insecticide_Fact_Sheet.pdf)
  - Side effects: [http://www.emeraldashborer.info/files/Potential\\_Side\\_Effects\\_of\\_EAB\\_Insecticides\\_FAQ.pdf](http://www.emeraldashborer.info/files/Potential_Side_Effects_of_EAB_Insecticides_FAQ.pdf)
  - EAB University Webcasts: [http://www.emeraldashborer.info/eab\\_university\\_ondemand.cfm](http://www.emeraldashborer.info/eab_university_ondemand.cfm)
- Kentucky EAB Pages: <http://pest.ca.uky.edu/EXT/EAB/welcome.html>    <http://www.eabinky.org>
- Boone County, Kentucky EAB Pages: <http://www.boonecountky.org/pc/EAB.aspx>,  
<http://www.bcarboretum.org/EmeraldAshBorer.aspx>
- Find an ISA Certified Arborist: <http://www.treesaregood.com/findtreeservices/FindTreeCareService.aspx>.
- Wood utilization: <http://www.ca.uky.edu/forestryextension/woodindustries.php>,  
<http://www.harvestingurbantimber.com>
- National Tree Benefit Calculator: <http://www.treebenefits.com/calculator/>

## Boone County Residential Ash Tree Care Agreement

I understand that one or more ash trees on my property are within the Boone County Public Works right-of-way, that BCPW has no intention of treating ash trees for Emerald Ash Borer, and will instead remove trees that are deemed hazardous for people or objects in the public right-of-way. I also understand that BCPW may remove some trees before symptoms develop in an effort to prevent a backlog of hazard-tree removals.

In an effort to maintain this ash tree, and perhaps prevent its removal, I agree to maintain the tree according to the following tree-care plan:

- Maintain the health of the tree, keeping proper soil moisture during the growing season, adding fertilizers if recommended.
- Keep mulch away from the trunk, and keep depth of new and old mulch under 3 inches total (no 'volcano' mulching).
- Provide preventative treatments for emerald ash borer on an on-going basis, following label directions and state regulations.
- Provide pruning as necessary for structural stability or to remove hazardous branches.
- Never top the tree's branches.
- Monitor the health of the tree(s), checking for disease or pest infestations, changes in growth habit, etc.
- Provide BCPW with tree health updates by completing and returning stewardship report forms, which may be mailed to me periodically.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Description of tree's location on property: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

I understand that it is my responsibility to oversee this tree's care, monitor it for decay or other hazards, and promptly remove the tree/debris if necessary. I also agree that since the tree is within the public right-of-way, Boone County Public Works reserves the right to remove the tree if and when it is deemed hazardous.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_