ILLINOIS FORESTRY IN FOCUS

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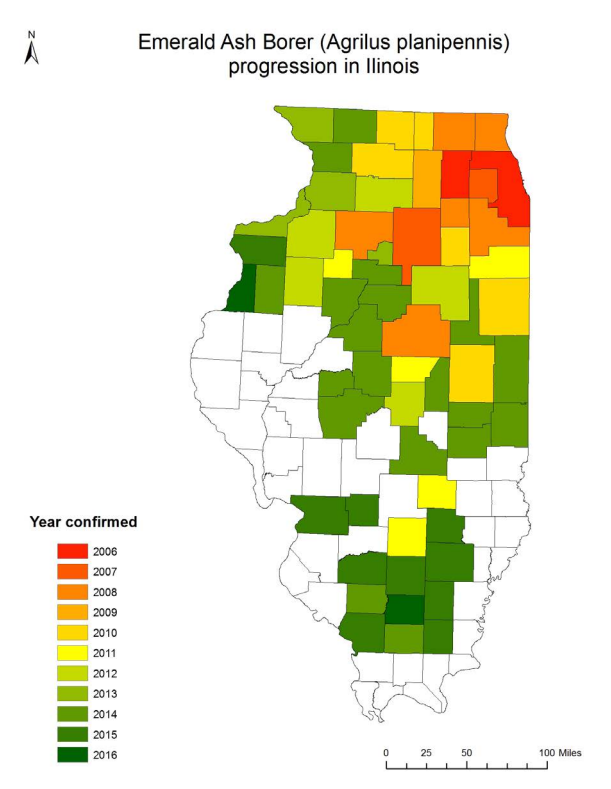
To Treat or Not to Treat

Should you treat your ash trees for emerald ash borer?

Emerald ash borer (EAB for short), is a serious invasive species in Illinois. Most everyone has heard about it and knows that this exotic insect threatens our ash trees. Some landowners may not know that it is possible to treat ash trees to prevent damage. In this article, we will take a closer look at how EAB damages trees and explore the questions every landowner should ask when deciding if an ash tree should be treated or not.



Emerald ash borer rapidly spread throughout Illinois and now occurs in over 60 counties

EAB is one of the metallic wood boring beetles (family Buprestidae). It is a native of Asia. It feeds exclusively on ash trees, with the exception of also feeding somewhat on the closely related fringe tree. While the adults do feed on ash leaves, this is not seriously damaging to the trees. Female ash borers will lay their eggs on the bark of ash trees. The larvae that hatch then burrow under the bark to feed. Larval feeding is restricted mostly to the cambium and phloem, thin layers of tissue that lie just under the bark of trees. The larvae snake through the tree, just under the bark, creating winding paths, called galleries. As more and more beetles infest a tree, the feeding galleries disrupt the trees ability to transport nutrients and water, effectively starving the tree.

EAB, in its native range, is a secondary pest of ash trees, meaning that it only really attacks trees that are already stressed or dying from another cause. The story is much different here. Our North American ash trees do not have any natural resistance or effective defenses to EAB. As such, EAB acts as a primary pest, capable of attacking and killing otherwise healthy trees. This is a big shift in ecological impact from how EAB behaves in its native range. In areas that have had EAB for a length of time, less than 1% of untreated ash trees survive.

Trees infested with EAB typically take 2-3 years to die when smaller size in size, but may take 6-7 years to die when quite large. Outwards signs of an EAB infestation include dieback from the top of the tree and lots of small leafy shoots sprouting from the trunk (called epicormic sprouting). When populations of EAB are at or near peak, most ash trees within the region will die within 3-5 years. All of our native ash trees in Illinois as susceptible to EAB.

This poses a threat to the health and integrity of our natural forests, but also threatens the urban and residential forests, as ash trees are a popular landscaping tree. They were planted extensively throughout Illinois over the last 40 years, comprising approximately 20% of the urban canopy.

Adults emerge in summer for a short period of time. Photo by David Cappaert, bugwood.org

Ash Trees in Illinois

Illinois is home to five species of ash tree, all of which are susceptible to EAB.

- White Ash (*Fraxinus americana*) – Common throughout the state. Prefers rich, well-drained upland sites but can grow in lower slopes and ravines
- Black Ash (*Fraxinus nigra*) – Scattered in northern half of state. Grows in poorly drained bottomland forests, swamps, seeps, and other wet forests
- Green Ash (*Fraxinus pennsylvanica*) – Common throughout the state. Prefers moist bottomland forests but grows in a variety of habitats, including upland forests
- Pumpkin Ash (*Fraxinus profunda*) – Scattered in southern third of state. Grows in bottomland forests and swamps
- Blue Ash (*Fraxinus quadrangulata*) – Scattered in northern and central Illinois and along the Mississippi River. Grows in dry upland forests on high-pH soils

To understand more about Emerald ash borer, it is important to know its history and current distribution in Illinois. Emerald Ash Borer was first identified in the United States in Detroit, Michigan in 2002. It is estimated that it had been in the area for about a decade before being discovered. It was likely unintentionally introduced as a contaminate in wood packing material (i.e. crates). Since that first discovery, it has spread to at least 30 states and 2 Canadian provinces. It is estimated that EAB has already killed over 250 million ash trees in North America.

In Illinois, it was first found in 2006 in northeast Illinois (Cook and Kane counties). EAB has progressed rapidly throughout the state since that first discovery and, by 2016, has been found in 62 counties. Emerald ash borer itself is a weak flyer, so on its own, the range would expand slowly. The reason it has spread so rapidly throughout North America is because humans have moved it around, mainly by moving firewood or ash logs.

The heavily forested areas of southern and western Illinois are just getting EAB, and these regions have an advantage. The diverse forest and lower prevalence of ash on the landscape should aid in slowing progression of EAB populations and lessen the visual and ecological impact of the loss of ash trees. Still, while the progression may be slower, in all likelihood, without treatment, the vast majority of ash trees will be end up dying.

Knowing this gloomy fate of ash trees, the question arises, as a landowner, should you treat your ash trees? For many landowners in Illinois, it is too late to answer this question. Emerald Ash Borer has been found in some regions of Illinois for over a decade now and most of the ash trees not getting regular treatments are already gone. However, for much of the state Emerald Ash Borer remains either an emerging problem that is just starting to show up or still on the horizon and not yet impacting ash trees in that region.

Understanding the cost and process of treating a tree is important to further exploring the question of "to treat or not to treat." The only way to effectively prevent an ash tree from dying from EAB is to treat it with a systemic insecticide so that any beetles attempting to feed on it will be killed. The two most common methods of treating trees are a soil drench and trunk injections.

Costs of treatment can vary greatly depending upon the size of the tree, which chemical is used, and the contractor cost (if one is used). Soil drench applications can range from $15-$50 per tree per treatment. Tree injections can range from $50-$200 per treatment.

Soil drenches are either mixed with water and poured under the dripline of the target tree or applied as granules and watered in. Most of these can be done by the homeowner. These treatments are most effective on smaller trees under 20" in diameter. Depending upon the chemical used, trees need to be retreated every 1-2 years. A couple of important considerations when using a soil drench application are proximity to waterways and presence of insect-

pollinated plants within the treatment zone. Having a waterway nearby the tree may result in the insecticide contaminating the waterway. The label information for the chemical used will have minimum setback distances and other information relevant to protecting waterways when treating ash trees. Soil drench applications should be avoided when insect-pollinated flowering plants occur within the treatment zone.

Tree injections must be done by a licensed professional. Small holes are drilled into the base of the tree and the insecticide is injected directly into the vascular system of the tree, resulting in a more direct application and quicker protection of the tree. Injections can be done on trees of any size. Typically, injections are more expensive than soil drench applications, but usually last 2-3 years before additional treatments are needed.

Timing is also important when treating. Treatments should be made before adults emerge in mid-Summer. The most effective time for treatments in Illinois is mid-April through June. However, this varies depending upon the particular insecticide and application method used. Consulting with a local arborist experienced in treating EAB is the best method of determining the appropriate timing and method of treatment. The federal EAB website - http://www.emeraldashborer.info, has very detailed information on how to treat ash trees for EAB, including the different options for insecticides.

Galleries, created by larval feeding, when excessive can interrupt nutrient and water flow in a tree, leading to tree death

Larvae mostly feed just under the bark in the cambial and phloem layers of the tree. Photo by David Cappaert, bugwood.org

To Treat or Not to Treat?

So how does a landowner decide if their ash trees should be treated? Normally, it isn't practical to treat with the intention of keeping ash trees a significant part of the forest matrix. In that type of setting, other trees should be able to rapidly replace the ash in the canopy. Trying to keep multiple ash trees within the forest becomes expensive, especially understanding that the trees will again be vulnerable if treatments are halted; any new regeneration will also become vulnerable as it ages into saplings and young trees. If conducting a timber harvest, it makes sense to go ahead and harvest any marketable ash. Once ash trees are killed by EAB, the wood rapidly deteriorates so salvage logging is often not an option. Ash are a mid-value timber species, so it is not profitable to treat ash trees with the intention of harvesting them at a later date.

For individual trees, particularly landscape and residential trees, below is a series of questions that a landowner should ask when making the decision to treat.

- What would the loss of this tree mean to me? Sometimes trees have special value beyond economics. It could have been planted by a loved one, or been the site of a kid's wedding. If losing the tree would be a significant emotional loss, then it is likely worth saving.

Questions to ask when deciding whether or not to treat an ash tree...

- *What would the loss of this tree mean to me?*
- *Does this tree provide valuable services that cannot easily be replaced?*
- *How would the loss of this tree impact my home/forest/landscape?*
- *Is my tree healthy?*
- *Has EAB been found nearby?*
- *Can I legally treat this tree?*
- *Can I afford not to treat this tree?*
- *Can I commit to long-term treatments?*

Dead ash trees rapidly deteriorate. When killed by EAB, trees need to be removed soon to prevent hazards.

- **Does this tree provide valuable services that cannot easily be replaced**? Large trees that are providing shade to a house, deck, pool, etc. are hard to replace in a timely manner. Trees provide many other benefits to properties as well, so a good resource to check the monetary value a tree is providing your property, and help to determine if a treatment is a good financial option, is http://www.treebenefits.com/calculator/

- **How would the loss of this tree impact my home/forest/landscape?** Trees that are the cornerstone of landscaping can leave a void that changes the look and feel of a home. Conversely, trees that are mixed with others, at the corner of a property, or don't provide value, might not be worth the funds to treat.

Is the tree healthy and likely to last if treated? The health of a tree is also an important factor when deciding whether or not to treat for EAB. Treatments can prevent future damage from EAB but cannot reverse existing damage. Waiting until a tree is already showing dieback or other symptoms, means EAB has already caused extensive damage to that tree. If 50% or more of the canopy has been killed or about half of the leaves lost due to EAB, that tree is not likely to recover, even with treatments. Ideally, trees should be healthy with a full canopy and free from other ailments when starting treatments.

- **Has EAB been found nearby?** The proximity of known EAB populations help determine when to start treatments. If a known population does not occur within 15 miles, the risk of EAB is much lower. Treatments at that point may be unnecessary and a waste of money. The Illinois Department of Agriculture maintains a list of communities and counties with known populations of Emerald Ash Borer. That information can be found at https://www.agr.state.il.us/eab/. Since the internal quarantine was dropped for EAB in Illinois in 2015, intensive surveys for EAB have ceased, meaning that detection of new communities and counties relies upon local reports. Maps may not represent the situation on-the-ground. As such, local arborists and municipal foresters should also be consulted to determine the local extent of EAB.

- **Can I legally treat this tree?** Homeowners should check with their local units of government to determine if there are any ordinances and/or policies in place related to EAB before starting any treatment regime. In some cases, funds may be available for treatment, removal, or replacement of trees impacted by EAB.

- **Can I afford not to treat this tree?** Removing trees, especially dead or dying ones, can be pricey! Sometimes the decision is made to treat a tree simply to defer removal costs to a later date or, in the case of multiple ash trees on a single property, to spread out the costs over time. Having an arborist come and give an estimate of removal costs can aid a landowner in answering this question.

- **Can I commit to long-term treatments?** With the exception of treating a tree to defer removal costs, it is important to understand the necessity of continued treatments to prevent EAB damage. Treatments need to be reapplied every 1-3 years, depending upon the application method and chemical used. Before starting to treat an ash tree, make sure long-term treatments are an option.

Overall, if EAB has been found close by, healthy trees that are an important component of the landscape or otherwise have significance to the landowner are worth treating. If not, then replacement, removal, or simply waiting to see what happens are probably better courses of action.

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