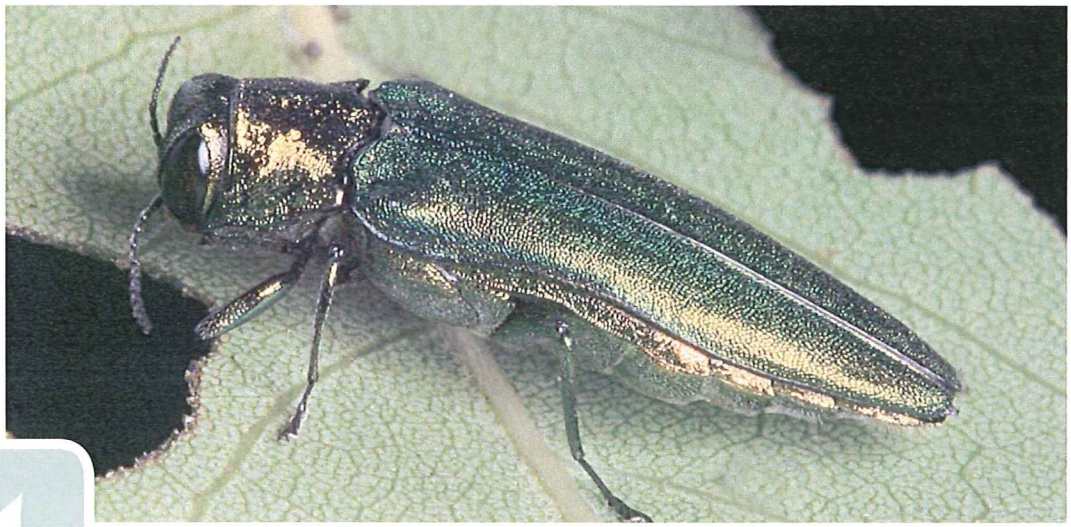

Emerald Ash Borer Management Options

The emerald ash borer (EAB) is an exotic insect that is destructive to ash trees (*Fraxinus* species). Although the adult stage causes minor feeding damage to ash foliage, the larval stage feeds beneath the bark and disrupts water and nutrient flow within the tree, which leads to tree death. Larvae are actively feeding from early summer through fall.

The insecticide products listed in this publication work best as **preventive** treatments for **healthy** ash trees planted along streets or in yard settings. Healthy trees have full crowns, elongating branches, and bark held tightly to the trunk/branches. It is not practical or cost effective to treat woodlot trees with insecticides where timber production is the primary goal.

Before using an insecticide, several factors must be considered:

- Identify the tree as ash. For an identification aid, see ***www.extension.iastate.edu/forestry/iowa_trees/tree_id.html***
- Determine if your ash tree has EAB signs and symptoms: ***www.extension.iastate.edu/Publications/SUL21.pdf***
- Estimate the tree's value in the community (see Table 1). Some benefits of urban trees include helping clean the air, slow storm water runoff, raise property values, sequester carbon, and reduce energy costs.

Table 1. Estimated annual economic benefit of ash trees for a single family residence in Des Moines, Iowa*

Trunk Diameter (in)	Black Ash	Green Ash	White Ash
5	$35	$34	$33
10	$88	$88	$97
15	$144	$150	$181
20	$185	$201	$270
25	$219	$254	$365
30	$213	$306	$485
35	$195	$352	$496

* Based on National Tree Benefit Calculator (***www.treebenefits.com***).

PM 2084 Revised September 2013

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Extension and Outreach

- Evaluate tree health. If the tree is declining, storm damaged, and/or cost of treatment will exceed the landscape value, replace the tree with an alternate species:
  - ***www.extension.iastate.edu/pme/Publications/EAB/AshAlternateShadetrees2013.pdf*** or
  - ***www.extension.iastate.edu/pme/Publications/EAB/AshAlternateSmall-staturetrees2013.pdf***
- Many insecticide products must be used EACH year for the life of the tree. There is one product (Tree-Age™) that protects ash trees for two years following treatment.
- Systemic insecticides are the products of choice when dealing with the emerald ash borer. These chemicals are transported within the vascular system of the tree from the roots and trunk to the branches and leaves. Systemic insecticides reduce hazard such as drift of pesticides to nontarget sites or applicator exposure, and have less impact on beneficial organisms.
- When applied properly, insecticide treatments can control EAB in your ash tree. Keep in mind that storm damage, other injuries to the tree, soil moisture, soil compaction, and other site and environmental factors can influence tree uptake and product effectiveness.

- Treatments are suggested ONLY if you live within **15 miles** of a confirmed EAB infestation. Known infestations are given at ***www.emeraldashborer.info/***. Treatment outside the risk zone is not prudent.
- Treatment before a tree is infested is most effective. Infested trees with less than 30 percent dieback of the crown due to EAB feeding may respond to treatment. The goal in any application would be to prevent further canopy dieback; those branches already killed should be removed.

Table 2. Products for Homeowners – carefully follow label directions[1]

Type of Application	Active Ingredient	Tree Size – trunk circumference (diameter at 4.5 ft [dbh])	Time of Application[2]
Soil drench[3]	Imidacloprid (1.47%)[4]	Up to 60" (20" dbh)	early April to mid-May **OR** late Aug through Sept
Soil drench[3]	Imidacloprid (21.4%)[5]	Up to 60" (20" dbh)	late Aug through Sept
Soil drench[3]	Imidacloprid (0.74%) + Clothianidin (0.37%)[6]	Up to 60" (20" dbh)	early April to mid-May **OR** late Aug through Sept
Granular[7]	Dinotefuran (2%)[8]	Up to 36" (12" dbh)	early April to mid-May
Granular[7]	Imidacloprid (0.55%) + Clothianidin (0.275%)[9]	Up to 36" (12" dbh)	early April to mid-May
Granular[7]	Imidacloprid (2.5%)[10]	Up to 36" (12" dbh)	early April to mid-May

[1] The amount of insecticide required depends on the tree's circumference in inches; see product label directions.

[2] If the product label lists spring and fall as possible treatment times, homeowners can treat only ONCE per year. Research suggests spring applications may be preferable to fall at the low rate of imidacloprid soil applications.

[3] Before applying a soil drench, pull back any mulch or dead leaves 12" from the base of the tree. Replace any mulch over the treated area after the mixture has been absorbed into the soil. For trees larger than 60" circumference, enlist the services of a commercial pesticide applicator. Do not make soil applications when soil is saturated or frozen.

[4] Examples of products include: Bayer Advanced 12 month Tree & Shrub Insect Control, Bonide Annual Tree & Shrub Insect Control with Systemaxx, Compare N Save Systemic Tree & Shrub Insect Drench, Ferti-Lome Systemic Insect Spray, Gordon's Tree & Shrub Insect Killer, Green Light Tree & Shrub Systemic Insect Killer, Ortho Bug B Gon Year-Long Shrub Insect Control Concentrate, and Ortho Tree & Shrub Insect Killer Ready-Spray II

[5] An example of product is Optrol Insecticide

[6] An example of product is Bayer Advanced 12 month Tree & Shrub Protect & Feed Concentrate II

[7] Spread granules evenly on the soil around the base of the plant within 18" of the trunk. Irrigate after application with enough water to dissolve granules and move product into root zone.

[8] Examples of products include: Green Light Tree & Shrub Insect Control with Safari 2G, Ortho Tree & Shrub Insect Control Granules

[9] An example of product is Bayer Advanced 12 month Tree & Shrub Protect & Feed RTU Granules II

[10] An example of product is Ortho Tree & Shrub Insect Control RTU Granules

Some insecticides used to control EAB have annual per acre use limits. Refer to product labels and the following publication for more information: ***www.mda.state.mn.us/plants/pestmanagement/~/media/Files/chemicals/pesticides/eablabelguide.ashx***

Table 3. Products for Commercial Pesticide Applicators

Product (Formulation)	Active Ingredient	Application Method (rate a.i./inch dbh)	Time of Application	Tree Size – trunk circumference (diameter at 4.5 ft [dbh])
IMA-Jet™	Imidacloprid	Trunk injection	**Spring:** Full canopy	All healthy ash trees
Imicide®	Imidacloprid	Trunk injection	**Spring:** Full canopy	All healthy ash trees
Merit® (75WP, 75WSP, 2F)	Imidacloprid	Soil injection or drench (1.4 g)	**Spring:** Early April to mid-May	All healthy ash trees
Merit® (75WP, 75WSP, 2F)	Imidacloprid	Soil injection or drench (2.8 g)	**Spring:** Early April to mid-May	All healthy ash trees
Merit® (75WP, 75WSP, 2F)	Imidacloprid	Soil injection or drench (2.8 g)	**Fall:** Late Aug through Sept	All healthy ash trees
Safari® (20SG)	Dinotefuran	Soil injection (3 to 12 g/in dbh)	**Spring:** Mid-May to mid-July	Up to 36" (12" dbh)
Safari® (2SG)	Dinotefuran	Soil application (2 to 4 oz/in dbh)	**Spring:** Mid-May to mid-July	Up to 36" (12" dbh)
Transtect™ (70WSP)	Dinotefuran	Basal Bark Spray (4 to 60" above soil)	**Spring:** Early April to mid-May	Up to 36" (12" dbh)
Transtect™ (70WSP)	Dinotefuran	Soil injection or drench	**Spring:** Early April to mid-May	Up to 36" (12" dbh)
Tree-Age®	Emamectin benzoate	Trunk injection (0.1 to 0.4 g)	Full canopy in early spring – mid-Sept with good soil moisture	All healthy ash trees
TreeAzin™	Azadirachtin	Trunk injection (5 ml – 10 ml/in dbh)	**Spring:** Early May to mid-June	All healthy ash trees
Xytect™ (75WSP, 2F)	Imidacloprid	Soil injection or drench (1.4 g)	**Spring:** Early April to mid-May	All healthy ash trees
Xytect™ (75WSP, 2F)	Imidacloprid	Soil injection or drench (2.8 g)	**Spring:** Early April to mid-May	All healthy ash trees
Xytect™ (75WSP, 2F)	Imidacloprid	Soil injection or drench (2.8 g)	**Fall:** Late Aug through Sept	All healthy ash trees

Notes

- Trunk injections have the advantage of being absorbed and distributed throughout the tree more quickly (1 to 4 weeks) than soil applications (4 to 8 weeks), and are useful where soil treatments are not practical (excessively wet soils, compacted sites, or restricted surface areas). Research has shown that tree injections are tolerated in healthy green ash trees, especially if treatments are applied once every two years, small volumes of product are injected, and injection holes are small and shallow. Rotate annual trunk injections with other management options to decrease the possibility of long-term damage.
- Before applying a soil drench, pull back any mulch or dead leaves 12" from the base of the tree. Replace any mulch over the treated area after the mixture has been absorbed into the soil. Do not make soil applications when soil is saturated or frozen.
- Soil injections should be made within 12 to 18 inches of the trunk, and the solution placed 2 to 4 inches beneath the soil surface.
- Emamectin benzoate has been shown to protect ash trees for 2 years from one application.
- Canopy sprays are not recommended because of limited effectiveness, the need for special equipment, spray drift, and possible adverse effects to nontarget organisms.
- Some insecticides used to control EAB have annual per acre use limits. Refer to product labels and the following publication: ***www.mda.state.mn.us/plants/pestmanagement/~/media/Files/chemicals/pesticides/eablabelguide.ashx***

For more information:

Contact your Iowa State University Extension and Outreach office or see the following website for additional information: ***www.extension.iastate.edu/pme/EmeraldAshBorer.html***

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