Emerald Ash Borer

Homeowner Guide to Insecticide Selection, Use, and Environmental Protection

Before Using an Insecticide Consider the Following:

▶ What is the Risk to Your Tree(s)?

Trees need to be protected with insecticides when emerald ash borer (EAB) populations are abundant enough in an area to cause significant injury in the next year or two. Deciding when to use insecticides to protect trees from EAB depends on the EAB abundance in the area and how much risk you are willing to tolerate regarding the tree or trees in question. To learn about EAB abundance in your area:

- Check the Minnesota Department of Agriculture's (MDA) Interactive EAB Survey Map for the locations of known infestations in Minnesota at: **www.mda.state.mn.us/eab**
- Check with your local government or the MDA about monitoring efforts in your area.
- Learn how to recognize symptoms of EAB infestation and keep an eye on the trees in your neighborhood.

▶ Treatment Will Likely Need to be Repeated

Insecticides only work while they are present in the tree, and products are generally labeled for one to two years of effectiveness. Treatment will need to be repeated to protect trees if EAB are still abundant enough in an area to cause significant injury when the effective period ends. EAB could remain at damaging levels in an area for several treatment cycles or return to damaging levels in the future.

▶ Remove and Replace Ash Trees on Your Property

It may be more cost effective to replace a small or struggling ash tree than to pay the cost of ongoing treatments. In addition, trees in poor health are not likely to respond well to treatments. Do not treat trees showing more than 50 percent canopy decline; these ash trees are unlikely to recover even if treated. Check with a certified arborist or licensed professional pesticide applicator to compare costs and benefits of treatment versus removal.

▶ Check Your Calendar – Timing is Everything

To ensure the insecticide is distributed throughout the tree to control EAB, soil-applied insecticides available to homeowners are most effective when applied mid-to late spring or in mid-fall. Do not apply products when the soil is frozen. Refer to the table on page 2 for more information on the timing of different insecticide options. Weather conditions or other factors may alter these recommendations. Read pesticide labels carefully. **The label is the law.**

▶ Contact a Certified Arborist or City Forester to Evaluate Treatment Options

When contacting a professional, consider the following:

- Your city or township may have requirements or restrictions related to the treatment of EAB, especially for ash trees located on city property, which may include trees planted on or near boulevards or sidewalks. Check with your city's park and recreation or forestry departments.
- If hiring a professional, ask to see their licensure as a Commercial Pesticide Applicator for category "E: Turf and Ornamentals."

▶ Treatment of Large Ash Trees

Treatment options available to homeowners for treating large ash trees require carefully following application instructions to avoid unintended environmental impacts. In general, consider having large ash trees (those greater than 48 inches in circumference, as measured 4½ feet above ground level) treated by a professional. Check specific pesticide product labels for tree size requirements.

MINNESOTA DEPARTMENT OF AGRICULTURE

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Insecticide Treatment Options

Always read and follow the label directions for the specific pesticide product being used.
Homeowners do not have access to some of the products marketed to professionals and arborists.
This document does not endorse the listed insecticide products over other options, and includes only the most common treatments.
For product efficacy questions, consult your local Extension specialist.

Insecticide Products Available to Professionals and Homeowners for EAB Control

Insecticide Active Ingredient	Examples of Products Available to Professionals	Examples of Products Available to Homeowners	Treatment Frequency and Optimal Timing[1]	Application Methods Available to Professionals	Application Methods Available to Homeowners
Emamectin benzoate (Avermectin)	• TREE-äge Restricted Use Pesticide. Any person using this product is required to be a licensed or certified pesticide applicator.	• Arbormectin	Every 2 years Early May to mid-June	Trunk injection	Trunk injection (requires specialized equipment)
Dinotefuran (Neonicotinoid)	• Safari • Transtect	• Ortho Tree & Insect Control Granules	Once per year (bark spray) 1-2 times per year (other methods) Early May to early June	Bark spray; soil injection; soil-applied drench	Soil-applied drench
Imidacloprid (Neonicotinoid)	• Merit products • Xytect/Optrol products • Ima-jet	• Xytect/Optrol products • Bayer Advanced Tree and Shrub Insect Control • Bonide Tree and Shrub Insect Control • Ferti-lome Systemic Insect Drench • Ortho Max Tree and Shrub Insect Control	1-2 times per year[2] Late April to late May and/or mid-fall (before ground freezes)	Trunk injection; soil injection; soil-applied drench	Soil-applied drench
Imidacloprid + Clothianidin (Neonicotinoids)	• Bayer Advanced 12 Month Tree & Shrub Protect & Feed Concentrate II	Bayer Advanced 12 Month Tree & Shrub Protect & Feed Concentrate II	1-2 times per year Late April to late May and/or mid-fall (before ground freezes)	Soil-applied drench	Soil-applied drench
Azadirachtin (neem tree seed oil)	• TreeAzin	None	Once per year Early May to mid-June	Trunk injection	None

[1] Application timing will vary in Minnesota, depending on location and seasonal temperature fluctuations.
[2] Recommended only for trees less than 48 inches in circumference (as measured 4½ feet above ground level); for exceptions, check specific pesticide product labels.

Water Quality and Pollinator Considerations

When using pesticides, read and carefully follow all label directions. Use in accordance with all precautionary statements, label directions, and applicable state and federal regulations.

Aquatic Considerations:
• To protect the environment, do not apply these pesticides directly to water or where surface water is present; prevent pesticide entry or runoff into storm drains, drainage ditches, gutters, or surface water; consider the risks of groundwater contamination.
• Trunk injections have fewer concerns for water quality, unless accidentally spilled.
• Emamectin benzoate is highly toxic to mammals, fish, and aquatic invertebrates.
• Neonicotinoids are highly toxic to aquatic invertebrates and have the potential to leach into the groundwater.

Pollinator Considerations:
• When using pesticides, take steps to prevent exposure to bees and other insect pollinators. Look for the bee hazard icon on the label, and in Directions for Use section of the pesticide label, check instructions for each application site for any additional specific use restrictions and instructions to protect bees and other insect pollinators.
• To protect pollinators, prevent pesticide drift from foliar applications onto beehives or to off-site, pollinator-attractive habitat areas; prevent drift of insecticides to blooming, pollen-shedding, or nectar-producing plants.
• Systemic insecticides can move into plant pollen and nectar resulting in exposure to pollinators. For soil injection and drenching applications to trees, protect pollinators by not planting pollinator-attractive habitat within the area of treatment.

The MDA's Insect Pollinator Best Management Practices for Minnesota Yards and Gardens are available at:
www.mda.state.mn.us/protecting/bmps/pollinators.aspx

Follow These Recommendations to Protect Water Quality

The MDA conducted a special registration review of EAB insecticides in 2011. The review concluded that insecticides commonly used to control EAB are not likely to result in unreasonable risks to human health or the environment when used according to label directions.

In some cases, the following recommendations may refer to mandatory label use requirements:

Generally, professionally applied trunk injections have fewer concerns for water quality.

For soil-applied products and bark sprays, the following considerations are important:

- Properly prepare application site and apply product according to label instructions. Consider avoiding use within 25 feet of water bodies. This includes streams, lakes, ponds, wetlands, or conduits to surface water or groundwater such as street curbs, storm drains, sumps, or well heads.
- Do not apply when heavy rainfall is expected within 24 hours of the planned treatment.

Situations that could cause soil-applied insecticides to wash away or leach, potentially contaminating water resources

Avoid applications when heavy rainfall is expected.

Products can leach to groundwater – use only recommended amounts to treat trees.

Do not use products when soil is frozen or saturated.

Sweep-up granular products from sidewalks back onto treatment area around tree.

Avoid use when closer than 25 feet from a street curb or storm drain.

Some products are highly toxic to aquatic invertebrates.
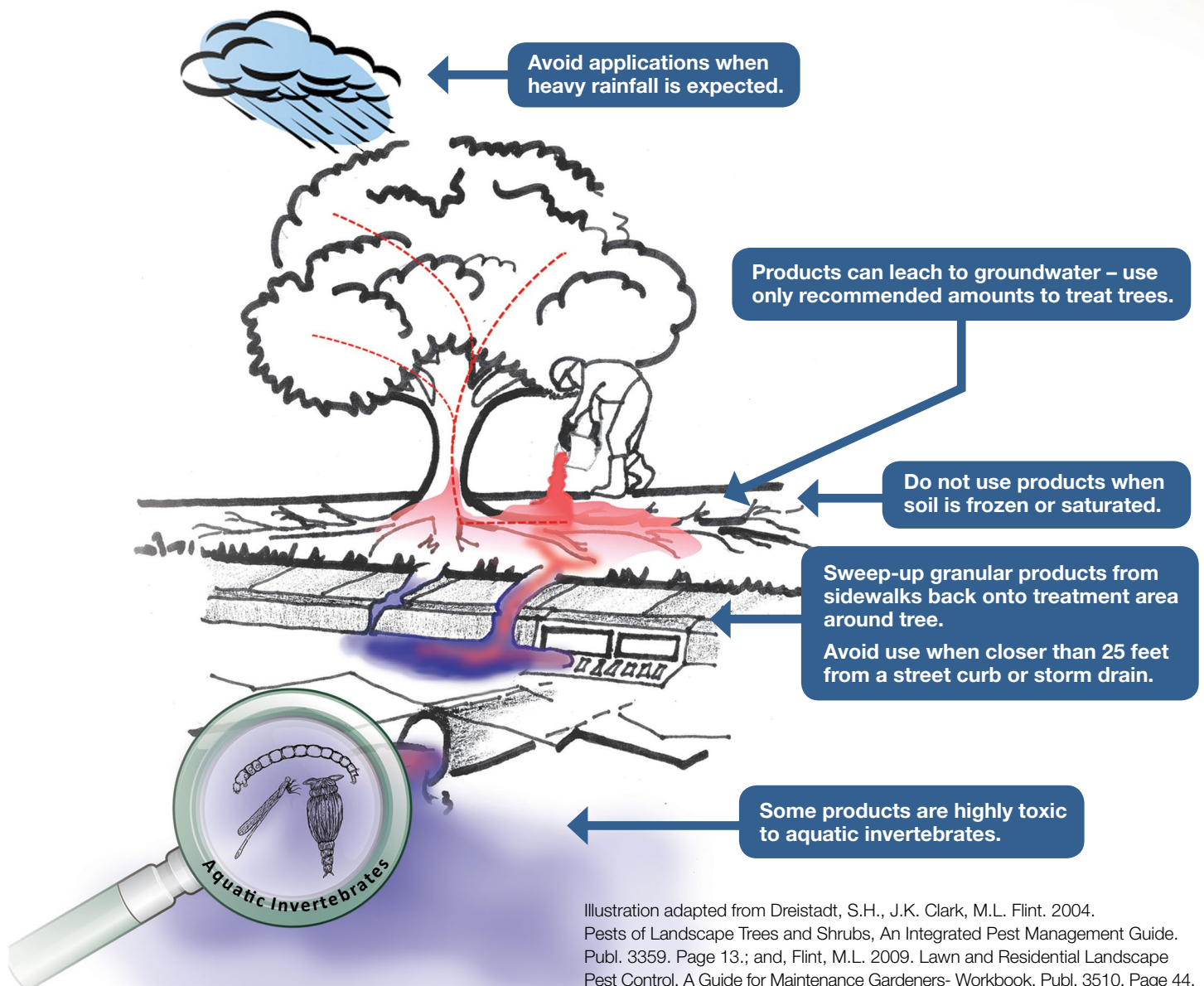
Aquatic Invertebrates

Illustration adapted from Dreistadt, S.H., J.K. Clark, M.L. Flint. 2004. Pests of Landscape Trees and Shrubs, An Integrated Pest Management Guide. Publ. 3359. Page 13.; and, Flint, M.L. 2009. Lawn and Residential Landscape Pest Control, A Guide for Maintenance Gardeners- Workbook. Publ. 3510. Page 44.

The label is the law! Always read, understand, and follow the label directions for the specific insecticide product being used.

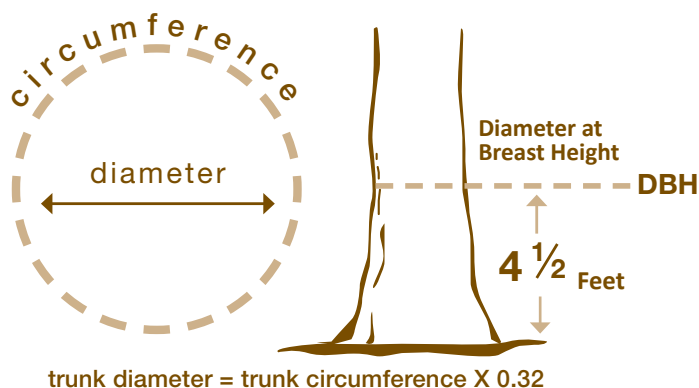### Selecting and Using an Insecticide:

- Look for products marketed to control emerald ash borer (see Products Table on page 2).
- Read the Environmental Hazard Statements on the insecticide label.
- To facilitate uptake, soil-applied insecticides should be applied when the soil is moist but not saturated or excessively dry.
- For soil drenches, remove or rake any mulch or dead leaves, then pour the insecticide solution directly onto soil.
- Do not allow children and pets to re-enter treatment area until sprays or drenches have dried.
- Store insecticides where children cannot reach them.
- Many homeowner products only allow one soil drench application per year.
- Some products have maximum per acre use limits. Do not apply more than the approved labeled rate.

Disposing an Insecticide:

- When using the last of a liquid insecticide, triple-rinse the container before disposal, then apply the rinse water as you would apply the insecticide.
- Unusable and unwanted insecticides must be disposed of according to the label directions, or at a county household hazardous waste disposal event.
- It is illegal to bury or burn an insecticide.

Measure Your Ash Trees

It is important to measure your ash tree to determine the appropriate treatment and to accurately follow the use instructions on insecticide labels.

trunk diameter = trunk circumference X 0.32

CONVERSION TABLE
Tree Measurements at 4½ Feet Above Ground Level

Circumference – Inches	Diameter at Breast Height (DBH) – Inches
15	5
20	6
25	8
30	9.5
35	11
40	13
45	14
> 48 inches	> 15 inches

In general, large trees are best treated by a professional. For exceptions, check specific pesticide product labels.

Additional Resources

Emerald Ash Borer Resources

- Minnesota Department of Agriculture – **www.mda.state.mn.us/eab**
- EAB Multi-State Site – **www.emeraldashborer.info**
- University of Minnesota Extension – **www.extension.umn.edu/garden/insects/find/emerald-ash-borer/**
- USDA-APHIS – **www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b**
- Minnesota Department of Natural Resources – **www.mndnr.gov/invasives/terrestrialanimals/eab**

Pesticide Disposal

For more information about disposing of unusable or unwanted pesticides, visit MDA at
www.mda.state.mn.us/chemicals/spills/wastepesticides/schedule.aspx or **651-201-6562**.

Reporting and Investigating Pesticide Spills and Misuse

Complaints can be reported to the Minnesota Duty Officer at **800-422-0798**.

The MDA staff will evaluate the information provided and if a pesticide misuse is suspected, an the MDA inspector will be assigned.

More information is available at **www.mda.state.mn.us/chemicals/pesticides/complaints.aspx**