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# Best Management Practices for Emerald Ash Borer Control

*Arboricultural Use of MERIT® for Soil Drench and  
Soil Injection Application in  
Michigan, Ohio, Illinois, and Indiana*



Bayer CropScience

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**BEST MANAGEMENT PRACTICES  
EMERALD ASH BORER CONTROL  
ARBORICULTURAL USE OF MERIT® FOR SOIL DRENCH AND  
SOIL INJECTION APPLICATION  
IN MICHIGAN, OHIO, ILLINOIS, AND INDIANA**

**Introduction**

The goal of this BMP is to provide a clear concise guidance to arborists on the proper use of MERIT<sup>®</sup> for control of the Emerald Ash Borer (EAB) to minimize impact on the environment, especially to aquatic invertebrates. Guidelines for other uses of imidacloprid in agricultural crops, other arboricultural uses, and turf are addressed in other Best Management Practices available from distributors, Bayer CropScience, or State Cooperative Extension.

EAB is one of the most devastating invasive tree pests of forests and ornamental trees in the United States and Canada. Since its introduction into the Detroit/Windsor area in 2002, EAB already has killed millions of ash trees in Michigan and Ontario, and is now spreading south into Indiana, Ohio, Illinois, and along the north shore of Lake Erie in Canada. The environmental impact of EAB is substantial; the species composition in forests and urban woodlots has been changed due to widespread loss of ash. The social and economic impact of EAB also has been significant, as thousands of street trees, parkland trees, and trees in urban woodlots have died.

University data show that MERIT<sup>®</sup> is a very effective product for control of EAB, and researchers are recommending the product for use in urban environments. To maintain the delicate balance between the protection and preservation of trees from this devastating pest, and the need to protect our surface and groundwater from chemical elements used in pest management, professional arborists, state regulators, university researchers, and Bayer Environmental Science have in collaboration developed this Best Management Practices (BMP) document. This BMP describes the proper use of MERIT<sup>®</sup> by soil application for management of EAB, and will be available to the arboricultural community of Michigan, Ohio, Illinois, and Indiana.

This document has been prepared by Bayer Environmental Science (a business unit of

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Bayer CropScience), with the cooperation of Dr. David Smitley, Michigan State University, Dr. Phil Nixon, University of Illinois, and Dr. Cliff Sadof, Purdue University. The information presented in this document is consistent with the information about and recommendations for emerald ash borer management found on the Michigan State University, the University of Illinois, The Ohio State University, and the Purdue University websites.

## **I. When to apply MERIT**

EAB spreads through flight of adults and/or transport of infested firewood, and once an area becomes infested, all ash trees in the vicinity are in danger of attack. Once an ash tree is attacked, the health of the tree declines quickly and even large trees can be killed in 2-3 years. Once a tree has been attacked by EAB, it is difficult for the tree to recover from the damage. It may require 2-3 years of insecticide treatments to return the tree to a healthy condition.

As a result, MERIT® by soil application is most effective when applied as a preventative treatment. Applications to ash should begin when EAB has been detected within 20-30 miles of the trees in question. Annual applications should be made as long as EAB is detected in the area. Annual applications will slow or stop the canopy dieback caused by EAB provided the vascular system of the tree was not too badly damaged prior to the beginning of the treatments. If dieback worsens after the first year of treatment, it may be advisable to remove the tree rather than to continue MERIT® treatments. Always apply the highest labeled dose of MERIT® for control of EAB, and always follow label directions.

Research trials have shown that trunk injections with imidacloprid-, acephate-, or dicrotophos-based products reduce the population of larvae within a tree, provided that severe larval feeding on vascular tissue in the tree has not occurred. Trunk injection with one of these products coupled with MERIT® by soil injection or soil drench is an effective method of introducing insecticide into an infested tree (to reduce the number of EAB larvae in the tree at the time of treatment), and to protect the tree from subsequent attack.

It is important to remember that no one treatment option is a foolproof way to control EAB. Effective EAB management requires the use of numerous tools, including knowl-

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edge of when EAB is found in your area, scouting for injury (bark galleries, canopy dieback), an understanding of which chemical control strategy will be effective in a given situation, and the knowledge of when infested trees should be removed. For more information, consult your local cooperative extension office.

## II. Application Rate

MERIT<sup>®</sup> is available as three different products: MERIT<sup>®</sup> 75WP, MERIT<sup>®</sup> 75WSP and MERIT<sup>®</sup> 2F. MERIT<sup>®</sup> 75WP and MERIT<sup>®</sup> 75WSP are wettable powders with 75% active ingredient (ai). MERIT<sup>®</sup> 75WSP is sold in pre-measured 1.6 ounce water-soluble packets (WSP). MERIT<sup>®</sup> 2F is a flowable liquid with 21% ai (2 lb ai/gallon).

For soil application, MERIT<sup>®</sup> 75WP label rates allow for 1.0-2.0 ounces per 30 cumulative inches of trunk diameter (DBH\*). Each MERIT<sup>®</sup> 75WSP packet treats 24-48 cumulative inches of trunk diameter (DBH\*). MERIT<sup>®</sup> 2F label rates allow for 0.1-0.2 fluid ounces (3-6 mL) per cumulative inch of trunk diameter (DBH\*). For emerald ash borer, always use the highest labeled rate.

*\*DBH - diameter at breast height, i.e. measured 4 1/2 feet above the ground. "Cumulative inches of trunk diameter" is defined as the combined total of inches DBH of all trees to be treated. For example, if three ash trees having DBH of 10, 18 and 24 inches are to be treated, the total cumulative inches of trunk diameter will be 52 inches (10 + 18 + 24 = 52).*

## III. Soil and Moisture Conditions

Do not apply MERIT<sup>®</sup> under any of the following soil conditions:

- Where the water table is shallow to prevent possible leaching into groundwater.
  - When soil is frozen or saturated.
  - Directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark.
  - During or when heavy rainfall is expected within 24 hours of the planned treatment.
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If there is a need to treat numerous trees, and therefore to apply MERIT® at a dose rate of greater than 0.4 lbs imidacloprid/acre (up to the maximum rate of 0.8 lbs imidacloprid/acre on the 24(c) Supplemental Label. Please obtain a copy from your State's Agency for Pesticide and Plant Regulation or from a Bayer Environmental Science Authorized Distributor), do not apply MERIT® under the following conditions:

- Where the depth to the permanent ground water is less than 5 feet from the soil surface.
- During heavy rainfall, or when heavy rainfall would be expected to generate runoff (i.e., within 1 to 2 days of the planned treatment).
- In coarse, sandy soils, where the organic matter content is less than 0.9%.
- Closer than 25 feet from water sources. Within 25 ft of water, use MERIT® only at a maximum dose of 0.4 lb imidacloprid/acre.

The above conditions are designed to avoid contamination of water. However, the applicator should consider all factors for the site. Soil injection should not be used in circumstances where the applicator feels that there is significant potential for contamination of water from this application method. In these situations, trunk injection should be used as an alternative treatment approach.

*NOTE: The presence of a shallow water table can be determined from site inspection, the presence of standing water, the existence of poor drainage, or through the use of soil maps.*

#### **IV. Proper Application Technique**

To assure optimum effectiveness, MERIT® must be placed where the target roots of the ash tree can readily absorb the active ingredient. Fine roots that absorb the material are typically concentrated in the upper 3-8 inches of soil in an area close to the trunk of the tree (i.e., within 2-4 ft of the trunk). If organic mulch is present, move the mulch aside prior to making drench applications, or make sure that the soil injection is made beneath the layer of mulch.

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## **Check Application Equipment**

- Equipment must be properly calibrated and be maintained in good working order
- Equipment used to store and deliver MERIT® solutions must not have leaks or the reasonable potential for spillage.
- Mix and fill equipment at least 25 feet (of which at least 15 feet must be heavily vegetated) from any potential groundwater or surface water conduits such as storm drains, sumps or well heads.
- Handle spills properly. In the event of a liquid spill, promptly spread an absorbent material such as sawdust or cat litter. When there is a high likelihood of surface or groundwater contamination, dam around the spill. Do not allow the material to wash into drains, recharge basins, or similar areas where there is a high risk of leaching or runoff. Sweep or shovel the absorbent material into a heavy-duty plastic bag. Repeat this procedure a number of times to ensure thorough decontamination. For areas where soil needs to be removed, immediately shovel the top 2-3 inches of soil into a heavy-duty bag and cover area with fresh topsoil. Imidacloprid-contaminated soil and absorbent material in quantities under 500 lbs can be disposed of through the normal waste stream. For larger spills and for more information regarding disposal and spill guide lines, contact Bayer CropScience at 1-800-334-7577, Chemtrec at 1-800-424-9300.

## **Soil Drenching**

- Uniformly apply the recommended dosage of MERIT® using sufficient water to just adequately wet the root zone. Direct the drench to the root zone at the base of the tree.
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## IMPORTANT!

This bulletin is not intended to provide all the information necessary for the use of this product. Before using the product, read and carefully observe the precautionary statements, directions for use, restrictions, storage and disposal statements and other pertinent information on the label. For additional product information, call toll-free 1-866-99BAYER (1-866-992-2937) or visit our Web site at [BayerCropScienceUS.com](http://BayerCropScienceUS.com).

*ALWAYS READ AND FOLLOW LABEL DIRECTIONS. These guidelines are not a substitute for pesticide labeling. Applicators should be sure to verify current pesticide labels and registration status with State Regulatory Agencies.*

**For Human, Animal, Transportation or other emergency involving a Bayer CropScience product 24/7 call: 1-800-334-7577**

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