

Evaluation of Perma Guard D-20 and Imidacloprid to Control Emerald Ash Borer

Robert A. Haack and Toby R. Petrice, USDA Forest Service, North Central Research Station
rhaack@fs.fed.us, tpetrice@fs.fed.us

Objective:

This study tested the effectiveness D-20 by Perma Guard (Albuquerque, NM) in controlling emerald ash borer. This product is composed of diatomaceous earth and natural pyrethrins (0.2% a.i.). The study included 40 newly transplanted green ash trees, 4-5 meters tall, which were moved from a nursery in a non EAB-infested area of Michigan to an area that was heavily infested with EAB near Ann Arbor, MI.

Methods:

(1) The trees were moved on 26 June, transplanted on 26-27 June, and treated on 27 June 2003. EAB adults were able to freely infest any tree. In fact, a few EAB adults were seen on the test trees on 27 June 2003. There were five treatments, using 8 trees per treatment: untreated control trees, one application of D-20, two applications of D-20, three applications of D-20, and trees treated with imidacloprid (Imicide by Mauget). A backpack sprayer was used to apply D-20 to both the foliage and trunk of the trees. D-20 was applied on 27 June, 14 July, and 30 July. The D-20 was mixed with water at a rate of 1 tablespoon per gallon, the recommended rate.

(2) In a second study in 2003, infested ash logs were sprayed with two concentrations of D-20 (1 tablespoon/gallon and 1 cup/gallon), and imidacloprid (Merit 2; 21.4% a.i.; mixed at 0.9 ml/ gal.) approximately 5 days prior to estimated adult emergence. Prior to treatment, 18 logs were cut, 6 logs per treatment. Half of each log was sprayed with insecticide, while the other half served as a control. Logs were placed in separate containers and monitored daily for adult emergence.

Results:

(1) After early results showed little mortality of adults in leaf-feeding bioassays, additional foliage was treated at a rate of 1 cup of D-20 per gallon of water. Overall, EAB mortality after 3 days of feeding was very low on the control trees (4% mortality), low on foliage treated with D-20 at the 1 tablespoon/gallon rate (ca. 30%), but high on trees treated with D-20 (ca. 85%) at the 1 cup/gallon rate or with imidacloprid (ca. 90%). The test trees will be felled and debarked in winter 2003/2004 to evaluate EAB attack density by treatment.

(2) In the second study, neither concentration of D20 reduced EAB emergence. By contrast, no adults completely emerged from the infested ash logs treated with imidacloprid. Several dead adults were found that had partially emerged prior to their death.