

EVALUATION OF PERMA GUARD D-20 AND IMIDACLOPRID TO CONTROL EMERALD ASH BORER

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ABSTRACT

The emerald ash borer (EAB), *Agrilus planipennis* Fairmaire (Buprestidae), a native of Asia, was discovered in the USA and Canada in 2002. Drs. Deborah McCullough (Michigan State University) and Therese Poland (USDA-FS) tested several systemic and topical insecticides for EAB control, which they reported elsewhere. One additional insecticide that we tested was D-20 by Perma Guard (Albuquerque, NM), which is composed of diatomaceous earth and natural pyrethrins (0.2 percent a.i.). The study included 40 newly transplanted green ash trees, 4-5 m 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. 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 eight 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). We used a backpack sprayer to apply D-20 to both the foliage and trunk. D-20 was applied on 27 June, 14 July, and 30 July. D-20 was mixed with water at a rate of 1 tablespoon per gallon, as recommended by Mr. Wallace Tharp of Perma Guard. Later, after early results showed little mortality of adults in leaf-feeding bioassays, we treated additional foliage at a rate of 1 cup of D-20 per gallon of water. Soon after each application of D-20, feeding bioassays were set up, using EAB adults and foliage from each of the test trees. Overall, EAB mortality after three days of feeding was very low on the control trees (4 percent mortality), low on foliage treated with D-20 at the 1 tablespoon/gallon rate (approximately 30 percent), but high on trees treated with D-20 (approximately 85 percent) at the 1 cup per gallon of water or with imidacloprid (approximately 90 percent). The test trees will be felled and debarked in winter 2003/2004 to evaluate EAB attack density by treatment.

In a second study in 2003, we also sprayed infested ash logs with two concentrations of D-20 (1 tablespoon/gallon and 1 cup/gallon), and imidacloprid (Merit 2; 21.4 percent a.i.; mixed at 0.9 ml/ gal.) approximately five days prior to estimated adult emergence. Prior to treatment, 18 logs were cut, 6 logs per treatment. We sprayed half of each log with insecticide, while the other half served as a control. Logs were placed in separate containers and monitored daily for adult emergence. Overall, neither concentration of D20 reduced EAB emergence. By contrast, no adults completely emerged from the logs treated with imidacloprid; however, several dead adults were found that had partially emerged prior to their death.