

INFLUENCE OF FORMULATION AND DOSAGE ON THE EFFICACY OF ARENA AGAINST FIRST INSTAR JAPANESE BEETLE LARVAE IN KENTUCKY BLUEGRASS TURF 2008

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OBJECTIVES

The primary objective of this study was to describe the activity of Arena applied at early curative timing against larvae of the Japanese beetle *Popillia japonica* Neman. Two different formulations and dosages of Arena were compared to Merit (Imidacloprid) applied at established field rates.

METHODS AND MATERIALS

The experiment was located at the Purdue University nursery complex on a lawn consisting primarily of Kentucky bluegrass maintained at 5 cm (Fig. 1). Plots measuring 1.5 x 1.5 meters were arranged in a randomized complete-block design with 0.3 meter alleys between plots. Each treatment was replicated 4 times. All liquid materials were applied August 18, 2008 using a hand-held CO₂ boom sprayer configured with four 8010 nozzles operating at 20 psi and calibrated to deliver a spray volume of 2 gal/1000ft². Granular materials were applied using a shaker jar. Plots were irrigated (2 cm) immediately following applications.

Field conditions on the August 18 treatment date were:

- (1) Soil: moist, 17.7 °C at 10 cm depth (8:00 am)
- (2) Air Temp: 19.0 °C (8:00 am)
- (3) Weather: foggy, no wind
- (4) Thatch: < 1.0 cm

Larval populations of the Japanese beetle were established by caging adult beetles on plots during the last week of July and first week of August using three, 8" diameter PVC cages in each plot (1.05 ft² total area). Larval populations were assessed on September 26, 2008 by using a sod cutter to remove the sod lying beneath the previously caged areas and counting the number of individuals of each white grub species present in the soil layer to a depth of 3". Samples were taken at least 0.15 m inside the border of each plot. White grub species composition in the plots on September 26, 2008 was 100% Japanese beetle. Between treatments variation in Japanese beetle populations was examined using main effects ANOVA. Treatment means were compared using Fisher's LSD test ($\alpha=0.05$).

RESULTS

Table 1. Japanese beetle larval densities and percent control resulting from early curative applications of Arena applied at two different rates compared to Merit in Kentucky bluegrass turf. Applications were made on Aug 18th, 2008 and larval populations were assessed on September 26, 2008. West Lafayette, IN., 2008.

TRT#	Treatment	Japanese beetle	
		JB/ft ²	% Control
1	Untreated	30.5±14.9b	---
2	Arena 50WG @ 0.15 lb ai/A	0.0±0.0a	100.0
3	Arena 50WG @ 0.2 lb ai/A	0.0±0.0a	100.0
4	Arena 0.25G @ 0.15 lb ai/A	0.0±0.0a	100.0
5	Arena 0.25G @ 0.2 lb ai/A	0.0±0.0a	100.0
6	Merit 0.5G @ 0.3 lb ai/A	0.0±0.0a	100.0

Numbers followed by same letters are not significantly different (Fisher LSD, $\alpha=0.1$)

* There were no signs of phytotoxicity associated with any of the insecticide treatments.

All treatments significantly reduced white grub populations compared to untreated controls and all dosages and formulations provided 100% control of Japanese beetle larvae in this experiment.

Figure 1. Experimental site, Purdue Nursery Complex, West Lafayette, IN.



Figure 2. Sampling technique used to evaluate against larvae of the Japanese beetle.

