

Influence of Application Timing on the Efficacy of Acelepryn and Merit Against Japanese Beetle Larvae in Kentucky bluegrass turf

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SUMMARY: This study examined how application timing influences the efficacy of Acelepryn and Merit against larvae of the Japanese beetle.

MATERIALS AND METHODS

The experiment was located at the Nursery Complex at Purdue University (West Lafayette, IN) on a stand of turfgrass consisting primarily of Kentucky bluegrass maintained at 7.6 cm. 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 materials were applied using a hand-held CO₂ boom sprayer configured with four 8010 nozzles operating at 30 psi and calibrated to deliver a spray volume of 2 gal/1000ft². Immediately after products were applied, plots were irrigated (approximately 1.0 cm).

Field conditions on the May 15 application date were:

- (1) Soil Temp.: 15.5°C
- (2) Air Temp: 17.0°C
- (3) Weather: clear, wind 0-5 mph
- (4) Thatch: 1.0 cm

Field conditions on the June 15 application date were:

- (1) Soil Temp.: 18.3 °C
- (2) Air Temp: 22.2 °C
- (3) Weather: clear, wind 0-5 mph
- (4) Thatch: 1.0 cm

ADDITIONAL INDEX WORDS:

White grub, chlorantraniliprole, imidacloprid, insecticide

Field conditions on the July 15 application date were:

- (1) Soil Temp.: 23 °C
- (2) Air Temp: 22 °C
- (3) Weather: clear, wind 0-5 mph
- (4) Thatch: 1.0 cm

Japanese beetle larval infestations were created by driving three, 8" diameter PVC cylinders into each plot along its mid-line and caging two separate groups of 40 Japanese beetle adults (50:50 sex ratio) within each cylinder at two week intervals during late June and early July. Larval populations were assessed October 8, 2012 using a sod cutter to remove a strip of sod lying directly beneath the caging area of each plot and examining the soil to a depth of 3 inches (Fig. 1). The number of Japanese beetle larvae were counted and recorded. Variation in Japanese beetle larval populations was examined using main effects ANOVA and treatment means were compared using Fisher's LSD test ($\alpha=0.05$).

RESULTS AND DISCUSSION

Both materials provided excellent control of Japanese beetle larvae regardless of application timing (Table 1). Acelepryn achieved 100% control when applied during mid-July and Merit also achieved its highest level of control when applied during this time. However, no statistically significant differences in efficacy could be discerned between products or among the different application dates.

Table 1. Influence of application timing on Japanese beetle larval populations in Kentucky bluegrass turf. Populations were assessed on October 8, 2012.

Product	Application Rate (oz/Acre)	Application Date	Larvae/ft ² (Mean±SE)	% Control
Acelepryn 1.67 SC	4.0	15-May	0.5±0.5 c	97.1
Merit 75 WP	6.4	15-May	1.3±0.6 bc	92.4
Acelepryn 1.67 SC	4.0	15-Jun	0.3±0.5 c	98.2
Merit 75 WP	6.4	15-Jun	0.8±0.3 c	95.3
Acelepryn 1.67 SC	4.0	15-Jul	0.0±0.0 c	100.0
Merit 75 WP	6.4	15-Jul	0.5±0.5 c	97.1
UNTREATED		---	17.0±2.1 a	---

Figure 1. October evaluation of Kentucky bluegrass plots for Japanese beetle larval population density following May, June or July applications of Acelepryn or Merit. Purdue Nursery Complex, West Lafayette, IN.

