CURATIVE EFFICACY OF INSECTICIDES AGAINST BILLBUGS IN KENTUCKY BLUEGRASS TURF 2007

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OBJECTIVES

The primary objective of this study was to describe the curative activity of chlorantraniliprole and indoxacarb alone and in combination against bluegrass billbug by:

1) Describing the influence of various application rates and combinations of active ingredients on larval billbug populations
2) Comparing the efficacy of chlorantraniliprole and indoxacarb against a series of selected reference compounds

METHODS AND MATERIALS

The experiment was located at the W.H. Daniel Center for Turfgrass Research and Education, Purdue University (West Lafayette, IN) on a lawn consisting primarily of Kentucky bluegrass maintained at 6.4 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 materials were applied June 26, 2007 using a hand-held CO_2 boom sprayer configured with four 8010 nozzles operating at 30 psi and calibrated to deliver a spray volume of 2 gal/1000ft^2. Plots were not irrigated for 24 hr following applications but received 1.0 cm irrigation within 48 h of application.

Field conditions on the May 7 treatment date were:
(1) Soil: moist, 23.8-24.4°C at 10 cm depth (8:00-9:30 am)
(2) Air Temp: 24.2-27.1°C (8:00-9:30 am)
(3) Weather: clear, wind 0-7 mph
(4) Thatch: less than 0.63 cm
(5) Billbugs species: *S. parvulus* (90%), *S. inaequalis* (8%) and *S. minimus* (2%)

Larval populations were assessed July 10, 2007 by extracting five turf and soil cores (10.8 cm diameter) from each plot and counting the number of billbug larvae in each core. Samples were taken at least 0.25 m inside the border of each plot. Between treatment variation in larval populations was examined using main effects ANOVA and treatment means were compared using Fisher's LSD test ($\forall$=0.05).

RESULTS

Table 1. Billbug larval densities and percent control resulting from curative applications of chlorantraniliprole, indoxacarb and several reference compounds in Kentucky bluegrass turf. Applications were made on June 26, 2007 and larval populations were assessed on July 10, 2007.

TRT#	Treatment	Billbugs	
		0/ft^2	% Control
1	Provaunt 30WG @ 0.225 lb ai/A	4.6ab	52.1
2	Chlorantraniliprole 1.67SC @ 0.104 lb ai/A	2.5ab	74.0
3	Chlorantraniliprole 1.67SC @ 0.313 lb ai/A	1.5b	84.4
4	Chlorantraniliprole 1.67SC @ 0.104 lb ai/A + Provaunt 30WG @ 0.225 lb ai/A	3.6ab	62.5
5	Merit 240SC @ 0.3 lb ai/A	5.1ab	46.9
6	Arena 50WDG @ 0.25 lb ai/A	1.0b	89.6
7	Mach 2 2SC @ 1.8 lb ai/A	4.7ab	51.1
8	Sevin SL @ 8 lb ai/A	2.0b	79.2
9	Dinotefuran 20SG @ 0.54 lb ai/A	1.0b	89.6
10	Meridian 25WG @ 0.266 lb ai/A	1.0b	89.6
11	Meridian 25WG @ 0.187 lb ai/A	1.0b	89.6
12	Untreated	9.6a	---

Numbers followed by same letters are not significantly different (Fisher LSD, ∀=0.05)
* There were no signs of phytotoxicity associated with any of the insecticide treatments.

Billbugs are notoriously difficult to target using curative applications and not all treatments significantly reduced billbug larval populations compared to the untreated control. At the highest rate, chlorantraniliprole provided levels of control similar to or better than all reference compounds, but at the lower rate and in combination with provaunt, somewhat reduced levels of control were obtained. Provaunt, by itself, provided only moderate control of billbugs when applied as a curative treatment. Efficacy of some compounds may be enhanced by post treatment irrigation.