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Soybean Aphid *Aphis glycines* Matsumura (Homoptera: Aphididae) Insecticide Performance in Floyd County, Iowa

Abstract

In 2005 the soybean aphid reached economic populations in many Iowa counties, and a frequent question of growers was “What product offers the highest level of soybean aphid control under Iowa conditions?” To help answer this question we established a replicated field experiment at the Northeast Research Farm located in Floyd County, IA.

Keywords

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Introduction

In 2005 the soybean aphid reached economic populations in many Iowa counties, and a frequent question of growers was “What product offers the highest level of soybean aphid control under Iowa conditions?” To help answer this question we established a replicated field experiment at the Northeast Research Farm located in Floyd County, IA.

Materials and Methods

We established experiments at the Iowa State University Northeast Research Farm in Floyd County, IA and at the Iowa State University Northwest Research Farm located in O'Brien County, IA. In total, we evaluated 15 products alone or in combination in 2006 (Table 1). All experiments included an untreated control and a “zero aphid” treatment in which foliar insecticides (a tank mix of an organophosphate and a pyrethroid) were applied every time aphids were detected. The combination of these two treatments allow for estimation of total yield loss due to soybean aphids. We monitored aphid populations both before and after foliar insecticides were applied.

We compared foliar and seed applied insecticides for their capacity to manage soybean aphids at the Northeast Research Farm in Floyd County with a randomized complete block design experiment consisting of 12 treatments (Table 1). All treatments were replicated six times with the untreated control replicated 12 times. Plots measured 50 ft long

and 30 ft wide. No-till production practices were used to establish soybeans (NK S23-Z3 RR). When foliar insecticides were applied (July 31), aphid populations averaged 85 aphids/plant. Soybean aphid populations were assessed approximately every 7 days following treatment applications, and cumulative aphid days were calculated for each treatment.

Results and Discussion

Compared with the foliar-based insecticides, the seed treatments did not provide as great a level of protection (Table 1). Although we observed some evidence of control between the untreated soybeans and the seed treatments, the variability among these treatments was great. Although Gaucho appeared to provide the lowest amount of protection, when the active ingredient (imidacloprid) is applied as a foliar insecticide (Trimax) later in the season, its ability to manage aphids is improved. It is likely that soybean aphid protection from seed treatments is not sufficient for aphid outbreaks that occur in August, especially for soybeans planted in May. Yields, protein content, and oil content of the soybeans are shown in Table 2.

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Table 1. Cumulative aphid days post-insecticide application at Floyd County, IA.

	Treatment	Cumulative aphid days + SEM	Statistical Grouping ¹
Seed treatments	Untreated	3272 ± 387	A
	zero aphid check	21 ± 7	F
	Gaucho	2451 ± 331	A
	Cruiser 50	2626 ± 608	A
Foliar insecticides	Cruiser 100	2203 ± 260	A
	Reduced risk		
	Trimax	1825 ± 525	AB
	Fulfill	378 ± 75	BCD
Broad-spectrum	Warrior	97 ± 29	DE
	Danitol	45 ± 29	E
	Baythroid XL	324 ± 143	CD
	Dimethoate	1392 ± 441	ABC

¹Treatments labeled with a unique letter are different $P \leq 0.05$.

Table 2. Yield and quality component analysis, Northeast Research Farm, Floyd County, IA.

Product ^{1,5,6}	Yield ²	Protein ³	Oil ⁴
Check	58.0 ± 0.9	34.2 ± 0.2	19.4 ± 0.1
Zero aphid check	59.2 ± 1.1	34.0 ± 0.1	19.7 ± 0.1
Gaucho	58.4 ± 1.0	34.0 ± 0.1	19.7 ± 0.1
Cruiser 50	60.8 ± 0.6	34.2 ± 0.2	19.6 ± 0.1
Cruiser 100	58.7 ± 0.7	34.2 ± 0.1	19.5 ± 0.1
Trimax	59.4 ± 1.1	34.4 ± 0.2	19.6 ± 0.1
Fulfill	60.2 ± 1.1	34.5 ± 0.2	19.6 ± 0.1
Warrior	58.9 ± 0.5	34.4 ± 0.2	19.4 ± 0.1
Danitol	61.8 ± 0.7	34.2 ± 0.1	19.4 ± 0.1
Baythroid XL	63.5 ± 1.1	34.2 ± 0.1	19.5 ± 0.1
Dimethoate	59.7 ± 1.0	34.2 ± 0.1	19.6 ± 0.1

¹All foliar treatments were applied on August 1.

²Yield reported as average bushels/acre at 13% moisture.

³Protein reported as average percent weight at 13% moisture.

⁴Oil reported as average percent weight at 13% moisture.

⁵There were no differences between treatments regarding yield, protein, or oil content ($P < 0.05$).

⁶Zero aphid treatment (Warrior + Lorsban 4E) received an insecticide treatment three times (June 5, July 13, and August 1).