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Fungicide-Insecticide Study on Soybeans

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Abstract
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Introduction

This study was designed to optimize insecticide and fungicide usage on soybean by comparing different products applied at different timings. To explain yield responses, foliar disease severity and aphid populations were assessed throughout the season.

Materials and Methods

Plots were established on July 2, 2008. Plot size was four 30-in. rows by 35 ft long. The field was set up in a randomized block design with five replications.

Fungicides and insecticides were sprayed either alone or in combination at growth stage R1 or growth stage R3. Two controls were included, one was a non-treated control and the other was an IPM-based control that used the 250 aphid threshold to trigger an insecticide application (Table 1). The R1 sprays were on July 2 and the R3 sprays were on July 30, 2008.

Data were collected for foliar disease three times during the summer. The upper and lower canopies were assessed for percent coverage of foliar disease caused by fungal pathogens. Because of low disease pressure, only the last assessment (August 25) was included in Table 1. Aphids were assessed on selected treatments regularly throughout the summer and are reported as Cumulative Aphid Days (CAD). Before harvest, stems from selected treatments were rated for anthracnose stem blight. Finally, grain yield (adjusted to 13% moisture), moisture, protein, and oil were recorded.

Results and Discussion

Aphid populations at the Armstrong Farm never reached economic threshold before growth stage R5 so the IPM treatment was not sprayed.

Preliminary results indicate that insect and disease pressure was greater in plots receiving R1 sprays compared with R3 sprays. In nearly every case an R1 treatment had more disease or aphid pressure than an R3 treatment (Table 1). This suggests that insect and disease pressure did not start until well after the R1 application, so these products were not able to manage the pests.

Yields reflect these results by showing similar differences between R1 and R3 sprays.

This project will continue for the next three growing seasons. We will continue to look at the interaction between insecticides and fungicides to optimize the use of these products on soybean.

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Table 1. Fungicides and insecticides applied at growth stages R1 and R3 and resultant disease and insect pressure and yield response.

Treatment	Application timing	Brown spot in lower canopy (%)	Cercospora leaf blight in upper canopy (%)	Anthracnose stem blight (%)	Cumulative Aphid Days (CAD)*	Protein (%)	Oil (%)	Moisture (%)	Yield (bu/A)
Stratego Pro	R1	2.2	11.8	4.95	7,724	34.9	18.3	12.36	50.9
Stratego Pro	R3	4.0	8.2	1.40	3,994	34.3	18.5	12.32	51.4
Punch	R1	3.4	13.1	.	.	34.9	18.1	12.24	48.5
Punch	R3	5.0	17.3	.	.	34.7	18.2	12.42	49.9
Headline	R1	1.9	6.5	8.50	.	34.3	18.6	12.48	50.3
Headline	R3	2.3	9.7	1.55	.	34.9	18.1	12.28	50.2
Leverage	R1	4.4	9.0	13.85	5,196	34.8	18.3	12.4	49.6
Leverage	R3	1.9	9.5	11.40	2,088	34.2	18.4	12.42	53.7
Asana	R1	3.6	5.6	.	.	35.3	18.2	12.24	51.2
Asana	R3	3.4	5.1	.	.	34.1	18.6	12.50	51.5
Stratego Pro + Leverage	R1	2.4	17.7	7.25	9,315	34.8	18.3	12.50	48.0
Stratego Pro. + Leverage	R3	1.5	11.4	2.70	1,217	34.1	18.8	12.70	53.3
Punch + Asana	R1	3.7	18.8	.	.	35.0	18.2	12.32	50.4
Punch + Asana	R3	2.6	9.2	.	.	34.3	18.6	12.40	54.1
Control	--	4.2	12.3	9.40	12,832	35.3	17.9	12.38	48.6
IPM*	--	4.6	5.6	.	3,692	35.0	18.3	12.32	46.8

*Threshold of 250 aphids/plant; Asana was assigned as the IPM insecticide.