Evaluation of Foliar Fungicides on Soybeans in Southwest Iowa

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Introduction

Foliar fungicides were assessed on soybeans across seven Iowa State University research station locations including the Northwest Farm (Sutherland), Northern Farm (Kanawha), Northeast Farm (Nashua), Curtiss Farm (Ames), Armstrong Farm (Lewis), McNay Farm (Chariton), and Southeast Farm (Crawfordsville) (Figure 1).

Materials and Methods

The experimental design at each location was a randomized complete block with four replications. Details on cultivar, planting date, population, pesticide applications, and harvest dates are listed in Table 1. Fungicides and insecticides (Table 2) were applied with a self-propelled research sprayer at growth stage R3 (beginning pod) at all seven locations, unless otherwise noted. Disease was assessed when soybeans were at the R6 (full seed) growth stage. Septoria brown spot was assessed by measuring the height of the highest infected leaf at two sites/plot and dividing this by the canopy height and multiplying by 100. Other foliar diseases were assessed by estimating the percent leaf area blighted on 20 leaves in the upper canopy. Only diseases greater than 1 percent severity were analyzed and included in this report. Green stem disorder (GSD) notes were taken once soybeans were at growth stage R8 (full maturity). Total seed weight/plot and moisture were measured with a 2009 Almaco SPC20 research plot combine. Seed weight was adjusted to 13 percent moisture and yield was calculated.

Results and Discussion

The 2015 growing season had timely rains throughout the summer, including August, a crucial time for disease development on soybeans.

There were three fungal diseases with measureable levels of disease at one or more locations; Septoria brown spot, white mold, and Cercospora leaf blight. Soybean vein necrosis virus, Pyllosticta leaf spot, downy mildew, and frogeye leaf spot were identified at several locations but at very low levels. GSD notes were taken at all the locations. GSD was greater in 2014, but was inconsistent across locations. Fungicides slightly increased GSD compared with the untreated control, but no differences between products were observed.

Yields averaged between 62.5–83.7 bushels/acre, depending on location. Yields for the Armstrong Research Farm are shown in Table 3. Yield responses to fungicide were minimal at all locations. There were both negative and positive responses to various treatments at some locations, but nothing consistent was observed over the seven locations. The average yield response for all R3 applied fungicides across all locations was 2.1 bushels/acre.

For the most part, fungicides had minimal or no effect on seed moisture or green stem disorder. This information is from a single year (2015) and is not meant to be representative of pesticide performance every year. Additional research and analyses are required to fully understand the effect of these pesticides on soybean in Iowa.

Acknowledgements

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Table 1. Research location, planting date, cultivar, planted population, pesticide application date, disease assessment date, and harvest date for seven fungicide and insecticide trials in Iowa in 2015.

Research location	Planting date	Cultivar	Planted population	Spray date	Disease assessment date	Harvest date
Ames (C)	May 19	Asgrow 2431	125,000	Aug 3	Sep 9	Oct 8
Lewis (SW)	May 22	Pioneer 92Y83	160,000	Jul 23	Sep 9	Oct 6
Crawfordsville (SE)	June 2	Pioneer 92Y75	165,678	Aug 4	Sep 9	Oct 2
Kanawha (NC)	May 22	Pioneer P22T69R	150,000	Jul 29	Sep 10	Oct 5
Chariton (SC)	April 29	Pioneer 93Y60	160,000	Jul 31	Sep 10	Oct 1
Nashua (NE)	May 13	Kruger K2-2402RR	188,000	Jul 27	Sep 10	Oct 2
Sutherland (NW)	May 22	Mycogen 5N206R2	147,000	Jul 30	Sep 9	Oct 12

Table 2. Products and rates evaluated in the statewide trials in Iowa in 2015.

Product[a]	Timing	FRAC code	Rate (fl oz/A)
Untreated control	---	---	---
Aproach	R3	11	6
Aproach	R3	11	9
Priaxor	R3	11+7	4
Quilt Xcel	R3	3+11	10.5
Stratego YLD	R3	3+11	4
Stratego YLD + Leverage	R3	3+11+Insecticide	4 + 2.8
Aproach Prima	R3	3+11	8
Quadris Top	R3	3+11	8
Fortix	R3	3+11	5
Trivapro (Quilt Xcel + Solatenol)	R3	3+11+7	10.5 + 4.1
Custodia	R3	3	8.6
Quadris	R3	11	6
Topguard	R3	3	5
Fortix	R1	3+11	5
Proline 480 SC (R1) + Stratego YLD (R3)	R1+R3	3 then 3+11	3+4

[a]All products applied with nonionic surfactant (Induce at 0.3% v/v) unless otherwise noted.

Table 3. Treatments and rates of products[a] evaluated for management of foliar disease and yield response at the Armstrong Farm, Lewis, IA in 2015.

Product	Brown spot (%)**	Moisture (%)	Yield (bu/A)
Untreated Control	54.2	13.6	67.1
Aproach	41.5*	14.5	68.9
Aproach	38.6*	14.8	64.5
Priaxor	39.8*	15.1*	66.9
Quilt Xcel	45.2*	14.1	67.8
Stratego YLD	45.6*	14.1	68.0
Stratego YLD + Leverage	45.2*	14.2	67.8
Aproach Prima	44.1*	15.4*	66.0
Quadris Top	43.1*	14.5	68.3
Fortix	43.9*	14.0	66.8
Trivapro (Quilt Xcel + Solatenol)	42.3*	14.5	64.2
Custodia	45.2	13.7	69.5
Quadris	40.5*	14.3	69.1
Topguard	47.1	14.1	64.8
P value	0.15	0.21	0.08
CV	14.2	5.6	3.8
LSD (P < 0.1)	**7.40**	**1.68**	**3.04**

[a]All products applied with nonionic surfactant (Induce at 0.3% v/v) unless otherwise noted.
*Different (P < 0.1) from untreated control.
**Disease progression in the canopy measured by highest leaf with brown spot divided by total canopy height.

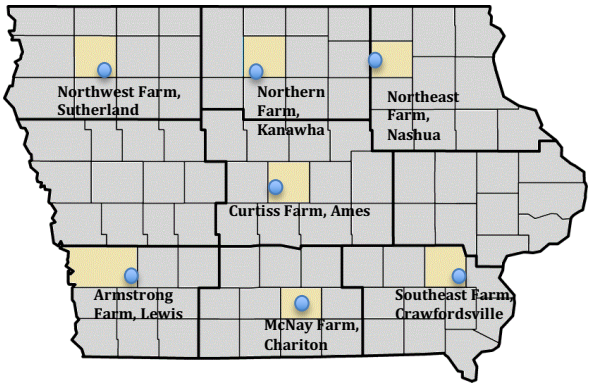

Figure 1. Map of field locations for the 2015 fungicide and insecticide study.