Evaluation of Foliar Fungicides on Soybeans in Southeast Iowa

RFR-A1654

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Introduction

Foliar fungicides were assessed on soybeans for foliar disease management and yield response across seven Iowa State University research station locations including the Northwest Farm (Sutherland), Northern Farm (Kanawha), Northeast Farm (Nashua), Johnson 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, disease assessment date, and harvest date are listed in Table 1. Fungicides (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 (caused by *Septoria glycines*) progression 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 of leaf area covered by the disease 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 at all the locations 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 2016 growing season had timely rains throughout the summer, including during August, a crucial time for disease development on soybeans.

There were two fungal diseases with measureable levels of disease at one or more locations: Septoria brown spot and frogeye leaf spot (caused by *Cercospora sojina*). Bacterial blight (caused by *Pseudomonas savastanoi* pv. *glycinea*) and Cercospora leaf blight (caused by *Cercospora kikuchii*) were identified at several locations but at low levels. Incidence of GSD was inconsistent in 2016 across all locations. Fungicides slightly increased GSD compared with the untreated control, but no differences between products were observed.

Yields averaged between 50.2–85.2 bushels/acre, depending on location. Yields are shown in Table 3. Yield responses to foliar fungicide application were minimal at all locations. Although variation in yield response to specific fungicide treatments occurred at certain locations, no single fungicide was observed over the seven locations to positively effect yield or disease. The average yield response for all R3 applied fungicides across all locations was 1.7 bushels/acre.

For the most part, fungicides had minimal or no effect on seed moisture or GSD.

This information is from a single year (2016) 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 fungicides on soybean in Iowa.

Acknowledgements

This research was partially funded by Iowa Soybean Association checkoff dollars. The authors would like to thank all the research farm staff for their help during the growing season to successfully conduct these trials.

Table 1. Research location, planting date, cultivar, planted population, fungicide application (spray) date, disease assessment date, and harvest date for seven trials throughout Iowa in 2016.

Research location	Planting date	Cultivar	Planted population	Spray date	Disease assessment date	Harvest date
Ames (C)	May 22	Asgrow 2035	120,000	Jul 21	Sep 9	Oct 17
Armstrong (SW)	June 3	NK S26-P3	160,000	Aug 8	Sep 14	Oct 22
Crawfordsville (SE)	May 23	Pioneer P31T11R	165,678	Aug 1	Sep 7	Oct 19
Kanawha (NC)	May 19	Pioneer P22T69R	120,000	Jul 18	Sep 12	Oct 6
McNay (SC)	May 9	Asgrow 3231	160,000	Jul 28	Sep 14	Oct 24
Nashua (NE)	May 12	Asgrow 2033	175,000	Jul 27	Sep 12	Oct 10
Sutherland (NW)	June 1	Credenz 1845LL	150,000	Aug 2	Sep 13	Oct 21

Table 2. Fungicides and rates evaluated in the statewide trials in Iowa in 2016.

Product[a]	Timing	FRAC code	Rate (fl oz/ac)
Untreated control	---	---	---
Aproach	R3	11	6.0
Aproach Prima	R3	3+11	8.0
Custodia	R3	3	8.6
Fortix	R3	3+11	5.0
Preemptor	R3	3+11	5.0
Priaxor	R3	11+7	4.0
Quadris	R3	11	6.0
Quadris Top	R3	3+11	8.0
Quilt Excel	R3	3+11	10.5
Stratego YLD	R3	3+11	4.0
Topgaurd EQ	R3	3	5.0
Trivapro (Quilt Excel + Solatenol)	R3	3+11+7	10.5+4.1
Zoolera FX 3.34 SC	R3	3+11	5.0
Priaxor	R1	11+7	4.0
Priaxor	R5	11+7	4.0

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

Table 3. Treatments of fungicides[a] evaluated for management of foliar disease and yield response at the Iowa State University Southeast Farm, Crawfordsville, IA in 2016.

Fungicide	Brown spot (%)**	Moisture (%)	Yield (bu/ac)
Untreated control	64.5	11.2	69.0
Aproach	67.0	11.4	67.8
Aproach Prima	67.6	11.2	75.4
Custodia	61.9	11.2	75.3
Fortix	59.9	11.3	72.6
Preemptor	58.4	11.7*	68.9
Priaxor	55.8	11.1	82.8*
Quadris	64.2	11.0	72.8
Quadris Top	60.3	11.0	78.0
Quilt Excel	61.9	11.2	75.4
Stratego YLD	64.6	11.0	71.1
Topgaurd EQ	64.5	11.0	72.4
Trivapro (Quilt Excel + Solatenol)	61.8	11.0	72.6
Zoolera FX 3.34 SC	60.3	11.0	69.2
P value	0.32	0.37	0.38
CV	9.69	3.30	10.60
LSD (P < 0.1)	7.20	0.43	9.20

[a]All fungicides 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.

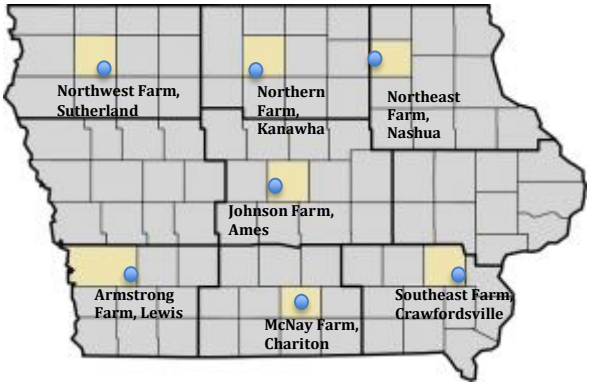

Figure 1. Map of field locations for the 2016 fungicide trials.