Evaluation of Foliar Fungicides on Soybeans in Northern Iowa

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Daren Mueller, associate professor
Yuba Kandel, associate scientist
Stith Wiggs, research associate
Department of Plant Pathology
and Microbiology

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), Central Iowa Farms (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 10 leaves in the upper canopy. Only diseases greater than 1 percent severity were analyzed and included in this report.

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 2017 growing season varied greatly for precipitation and temperature across the state. During August, a critical time of soybean disease development, the precipitation varied widely. Northern sites received less precipitation in August than other sites. The temperature was lower than average with many days below 90°F.

There were two fungal diseases with measureable levels of disease at one or more locations—Septoria brown spot and Cercospora leaf blight (caused by *Cercospora kikuchii*). Frogeye leaf spot (caused by *Cercospora sojina*) also was identified at several locations, but at very low levels.

Yields averaged between 53.0–81.9 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 affect yield or disease. The average yield response for all R3 applied fungicides across all locations was 0.3 bushels/acre.

This information is from a single year (2017) 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.

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 2017.

Research location	Planting date	Cultivar	Planted population	Spray date	Disease assessment date	Harvest date
Ames (C)	May 30	Asgrow 2733	125,000	Aug 4	Sep 9	Oct 19
Lewis (SW)	May 15	Pioneer P25T51R	140,000	Jul 24	Sep 12	Oct 23
Crawfordsville (SE)	June 1	Asgrow 3334	165,000	Aug 8	Sep 13	Oct 26
Kanawha (NC)	May 13	Pioneer P22T69R	150,000	Aug 1	Sep 16	Oct 19
Chariton (SC)	May 30	Asgrow 3686	150,000	Jul 24	Sep 12	Oct 25
Nashua (NE)	May 29	Kruger K2X-2052	175,000	Jul 25	Sep 14	Oct 9
Sutherland (NW)	May 30	Syngenta S24-K2	140,000	Aug 3	Sep 13	Oct 20

Table 2. Fungicides and rates evaluated in the statewide trials in Iowa in 2017.

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
Topguard EQ	R3	3	5.0
Trivapro	R3	3+11+7	13.7
Zolera FX 3.34 SC	R3	3+11	5.0

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

Table 3. Treatments of fungicides evaluated for management of foliar disease and yield response at the ISU Northern Farm, Kanawha, IA, in 2017.[a]

Fungicide	Brown spot (%)[b]	Moisture (%)	Yield (bu/ac)
Untreated control	53.8	10.3	59.5
Aproach	46.6	10.4	59.7
Aproach Prima	53.3	10.4	61.1
Custodia	56.2	10.5	64.3
Fortix	50.4	10.4	60.0
Preemptor	52.3	10.3	61.3
Priaxor	56.1	10.3	57.8
Quadris	52.6	10.4	59.6
Quadris Top	53.7	10.4	62.0
Quilt Excel	54.1	10.3	56.3
Stratego YLD	50.3	10.4	57.5
Topguard EQ	54.7	10.5	59.3
Trivapro	53.3	10.3	56.3
Zolera FX 3.34 SC	53.9	10.4	57.9
P value	0.73	0.48	0.39

[a]All fungicides applied with nonionic surfactant (Induce at 0.3% v/v) unless otherwise noted.
[b]Disease progression in the canopy measured by highest leaf with brown spot divided by total canopy height.
*Different (P < 0.1) from untreated control.
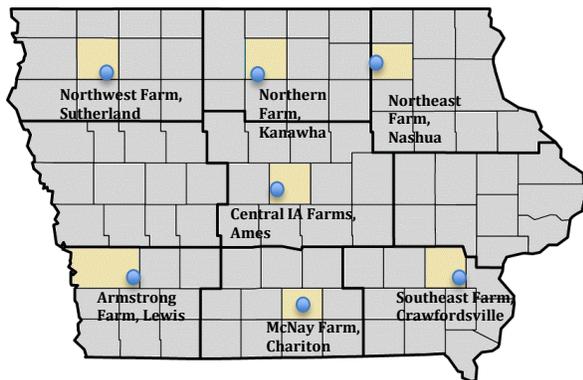
Figure 1. Map of field locations for the 2017 fungicide trials.