

On-Farm Corn and Soybean Fungicide Demonstration Trials

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Introduction

An application of foliar fungicide to corn and soybean has become a common practice for many farmers in Iowa. The effect of fungicide on corn and soybean yield, however, can vary from year to year. Environmental conditions, such as rainfall and temperature, influence disease development, which will determine whether a fungicide affects yield. Because environmental conditions vary from one year to the next, it is difficult to predict how and when to use a fungicide. The objective of these trials was to evaluate whether the application of a foliar fungicide would result in a yield increase in corn and soybean.

Materials and Methods

In 2018, there were six on-farm trials in Iowa that evaluated the effect of fungicide on corn yield (Table 1). Eight trials investigated the effect of fungicide on soybean yield (Table 2). All trials were conducted on cooperators' farms. Fungicide treatments were applied by ground equipment and arranged in a randomized complete block design with at least three replications per treatment. Plot size varied from field-to-field depending on the field equipment. All plots were machine harvested for grain yield.

In corn Trials 1 and 2, Aproach Prima[®] at 6 oz/acre was applied to corn at R1 (Table 3). In Trials 3, 4, and 5, Quilt Excel[®] was applied at 12 oz/acre to corn at VT. In Trial 6, Stratego

YLD[®] at 4 oz/acre plus Warrior[®] at 3 oz/acre was applied to corn at R1.

In soybean Trials 1 and 4, Acropolis[®] at 23 oz/acre applied to soybean at R1 was compared with an application of Aproach Prima[®] at 6.8 oz/acre to soybean at R1 (Table 4). In Trials 2, 5, and 6, Aproach Prima[®] was applied at 6 to 6.8 oz/acre to R1 soybean. In Trial 3, Endura[®] at 8 oz/acre was applied at R1 and R2, Aproach Prima[®] at 6.8 oz/acre was applied at R1 and R2, and Endura[®] at 8 oz/acre at R1 plus Aproach Prima[®] at 6.8 oz/acre at R2 was applied. In Trial 7, Headline[®] at 6 and 12 oz/acre was applied to soybeans at R1. In Trial 8, Headline[®] at 12 oz/acre was applied to soybean at R1. In all trials except soybean Trials 1 and 4, the corn and soybean strips treated with a fungicide application were compared with untreated strips.

Results and Discussion

Aproach Prima[®] at 6 oz/acre applied to corn at R1 had no effect on the yield in Trials 1 and 2 (Table 3). Quilt Xcel[®] at 12 oz/acre at VT increased the corn yield from 6 to 17 bushels/acre in Trials 3, 4, and 5 ($P \leq 0.06$). In Trial 6 Stratego YLD[®] at 4 oz/acre plus Warrior[®] at 3 oz/acre did not affect the corn yield.

In soybean Trials 1 and 4, there was no difference in soybean yield between the soybeans treated with Acropolis[®] and the soybeans treated with Aproach Prima[®] (Table 4). There was no increase in soybean yield with the application of Aproach Prima[®] in Trials 2, 5, and 6. In Trial 3, the split applications of Endura[®] and Aproach Prima[®] increased the soybean yield from 10 to 12 bushels/acre.

Although plant disease evaluations were not made in most of the trials, it is likely there was not much disease present in the corn and soybean trials where there was not an economic response to the fungicide. This indicates the importance of evaluating plant disease incidence and the likelihood of disease problems with current weather conditions and varieties selected in making decisions on the

use of foliar fungicides in protecting corn and soybean yield.

NOTE: The results presented are from replicated demonstration trials. Statistics are used to detect differences at a location and should not be interpreted beyond the single location.

Table 1. Variety, row spacing, planting date, planting population, previous crop, and tillage practices in the 2018 fungicide trials on corn.

Exp. no.	Trial	County	Variety	Row spacing (in.)	Planting date	Planting population (seeds/ac)	Previous crop	Tillage
180130	1	Sioux	Pioneer PO157AM	30	5/17/18	34,000	Soybean	Conventional
180134	2	Sioux	Pioneer PO306AM	30	5/10/18	34,000	Oats	Conventional
180138	3	Lyon	Pioneer PO306AM	30	4/30/18	35,000	Soybean	Strip till
180139	4	Lyon	Golden Harvest GO2W74-3000GT	30	4/30/18	35,000	Soybean	Strip till
180140	5	Lyon	Wensman W91025STX RIB	30	4/30/18	35,000	Soybean	Strip till
180824	6	Bremer	Pioneer P1197	30	4/28/18	34,000	Soybean	No-till

Table 2. Variety, row spacing, planting date, planting population, previous crop, and tillage practices in the 2018 fungicide trials on soybean.

Exp. no.	Trial	County	Variety	Row spacing (in.)	Planting date	Planting population (seeds/ac)	Previous crop	Tillage
180110	1	Lyon	Golden Harvest 19-15	30	5/17/18	140,000	Corn	No-till
180129	2	Sioux	Pioneer P24A99X	30	5/7/18	140,000	Corn	No-till
180133	3	Sioux	Kruger 2301	30	5/4/18	144,000	Corn	Conventional
180135	4	Lyon	Stine 19BA23	30	5/18/18	140,000	Corn	No-till
180136	5	Lyon	Stine 19BA23	30	5/18/18	140,000	Corn	No-till
180137	6	Lyon	AgriGold 1435	30	5/18/18	140,000	Corn	No-till
180705	7	Washington	Dyna Grow S35LS15	30	5/10/18	165,000	Corn	No-till
180712	8	Washington	Pioneer P26T44L	30	5/22/18	165,000	Corn	No-till

Table 3. Yield for on-farm fungicide trials in corn in 2018.

Exp. no.	Trial	Treatment	Yield (bu/ac) ^a	P-value ^b
180130	1	Aproach Prima at 6 oz/ac at R1	244 a	0.27
		Control	241 a	
180134	2	Aproach Prima at 6 oz/ac at R1	238 a	0.65
		Control	239 a	
180138	3	Quilt Xcel at 12 oz/ac at VT	256 a	0.02
		Control	244 b	
180139	4	Quilt Xcel at 12 oz/ac at VT	245 a	0.04
		Control	228 b	
180140	5	Quilt Xcel at 12 oz/ac at VT	235 a	0.06
		Control	229 a	
180824	6	Stratego YLD at 4 oz/ac plus Warrior at 3 oz/ac at R1	210 a	0.21
		Control	203 a	

^aValues denoted with the same letter within a trial are not statistically different at the significance level of 0.05.

^bP-value = the calculated probability that the difference in yields can be attributed to the treatments and not other factors. For example, if a trial has a P-value of 0.10, then we are 90 percent confident the yield differences are in response to treatments. For P = 0.05, we would be 95 percent confident.

Table 4. Yields for on-farm fungicide trials in soybean in 2018.

Exp. no.	Trial	Treatment	Yield (bu/ac) ^a	P-value ^b
180110	1	Acropolis at 23 oz/ac at R1	79 a	0.27
		Aproach Prima at 6.8 oz/ac at R1	77 a	
180129	2	Aproach Prima at 6 oz/ac at R1	80 a	0.22
		Control	77 a	
180133	3	Endura at 8 oz/ac at R1 plus Endura at 8 oz/ac at R2	81 a	0.01
		Aproach Prima at 6.8 oz/ac at R1 plus Aproach Prima at 6.8 oz/ac at R2	80 a	
		Endura at 8 oz/ac at R1 plus Aproach Prima at 6.8 oz/ac at R2	82 a	
		Control	70 b	
180135	4	Acropolis at 23 oz/ac at R1	80 a	0.67
		Aproach Prima at 6.8 oz/ac at R1	80 a	
180136	5	Aproach Prima at 6.8 oz/ac at R1	67 a	0.04
		Control	69 b	
180137	6	Aproach Prima at 6.8 oz/ac at R1	73 a	0.13
		Control	72 a	
180705	7	Headline at 6 oz/ac at R5	76 a	<0.01
		Headline at 12 oz/ac at R5	76 a	
		Control	73 b	
180712	8	Headline at 12 oz/ac at R5	66 a	0.05
		Control	65 b	

^aValues denoted with the same letter within a trial are not statistically different at the significance level of 0.05.

^bP-value = the calculated probability that the difference in yields can be attributed to the treatments and not other factors. For example, if a trial has a P-value of 0.10, then we are 90 percent confident the yield differences are in response to treatments. For P = 0.05, we would be 95 percent confident.