

On-farm Corn Fungicide Trials

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In 2013, there were 14 on-farm trials in Iowa that evaluated the effect of fungicide on corn yield. Application of fungicide to corn has become a popular input with many farmers in Iowa. The effect of fungicide on corn yield, however, can vary from year to year. Annual corn fungicide trials offer insight into how fungicides perform each year. Environmental conditions, such as rainfall and temperature, likely are the main factors for differences in how a fungicide affects corn yield because these factors influence disease and crop development. Because environmental conditions vary from one year to the next, it is difficult to predict how and when to use a fungicide. Compilation of trial data over multiple years could help identify factors associated with fungicide response in corn.

Methods

All fungicide trials examined a range of timings and products. All fungicides were applied with ground equipment, except Trials 2 and 12, which were applied by air. Ten trials examined applications of fungicide primarily at silking (R1) compared with an untreated control. The insecticide Cobalt® was included with the fungicide in Trial 2. Three trials examined the application of fungicide at V6-V8 compared with an untreated control. One trial examined the application of fungicide at planting (in-furrow) compared with an untreated control, and one trial compared the application of Priaxor® at V8 with an application of Priaxor® plus the insecticide Prevathon® at V8 compared with an untreated control. Fungicide products used in these studies included Aproach®, Headline®, Headline AMP®, and Priaxor®. Evaluations of foliar diseases were not made in the majority of the trials. All trials had a minimum of three replications. See Table 1 for more information on field data and Tables 2 and 3 for rates.

Results

Over all 14 trials, there was no significant increase in corn yield with any of the fungicide treatments (Table 2 and 3). However, there were two trials (9a and 12) where there was a yield increase of about seven bushels/acre with the fungicide applied at R1 that approached statistical significance ($P \leq 0.11$). The average response to the fungicide treatment across the trials was +1.7 bushels/acre. With a corn price of around \$4/bushel, it would take a yield increase of about 6-7 bushels/acre to pay for the fungicide application, so the fungicide application likely was not profitable this year in any of the trials. Although evaluations of foliar disease were not made in most of the trials, disease pressure was minimal in the trials where it was evaluated, which probably explains the lack of response to the fungicide in this year's trials. The dry weather in mid-late summer over much of the state was not conducive to disease development. Most fungal pathogens require a significant amount of available moisture to sporulate and infect a leaf. In the absence of foliar disease, there likely was little justification to apply a fungicide to protect the yield in 2013.

Table 1. Hybrid, row spacing, planting date, planting population, previous crop, and tillage practices in corn fungicide trials.

Exp. No.	Trial	County	Hybrid	Row spacing (in.)	Planting date	Planting population (seeds/A)	Previous crop	Tillage
130102	1	Sioux	1070 Seed Consultants	30	4/13/13	33,500	Soybean	Spring rotary harrowed
130136	2	Osceola	DKC 4620	30	5/13/13	36,000	Soybean	Spring field cultivate
130137	3	Osceola	DK 5356	30	5/13/13	35,000	Soybean	Field cultivate
130121	4	Lyon	Pioneer 1151 AM	30	5/13/13	VR ~37,000	Soybean	Fall strip-till
130143	5	Lyon	DK 5775	20	5/13/13	34,000	Soybean	Disked
130148	6	Sioux	DKC 56-54 RIB	30	5/15/13	32,900	Soybean	Spring disk
130149	7	Sioux	DKC 55-09 RIB	30	5/15/13	32,900	Soybean	Spring disk
130401	8	Hancock	Viking 60-01 N	30	5/15/13	33,000	Soybean	Conventional
130107	9	Sioux	Pioneer 448AMX & Pioneer 407AMX-T	30	5/13/13	32,900	Soybean	Spring disk
130119	10	Osceola	DKC 50-77	30	5/13/13	34,700	Soybean	Field cultivate
130160	11	Lyon	Pioneer 9834 AMX/DKC 4994 RIB	22	5/21/13	35,000	Soybean	Conventional
130105	12	Lyon	Pioneer 533	20	5/13/13	34,900	Corn	Fall disk, spring soil finished
130164	13	Osceola	Pioneer P9834AMX	30	5/23/13	34,200	Soybean	Spike sweeps fall, regular sweeps spring field cultivate
130161	14	Lyon	Pioneer 062	22	5/16/13	36,000	Corn	Conventional

Table 2. Yield and rates for corn fungicide trials.

Exp. No.	Trial	Treatment	Rate (oz/A)	Application timing	Yield (bu/A)			P-value
					Fungicide	Control	Response	
130102	1	Approach	6	R1	224.4	221.3	3.1	0.39
130136	2	Headline AMP + Cobalt	10 + 13	R1	195.2	204.5	-9.1	0.30
130137	3	Priaxor	4	R1	206.4	199.4	7.0	0.37
130121	4	Headline	4	In-furrow	191.5	192.5	-1.0	0.87
130143	5	Priaxor	4	V6	222.1	223.8	-1.7	0.20
130148	6	Approach	6	R1	221.0	220.3	0.7	0.80
130149	7	Approach	4	R1	228.3	226.7	1.6	0.86
130401	8	Headline AMP	10	R2	202.7	196.2	6.5	0.16
130107*	9a	Approach	6	R1	221.1	213.8	7.3	0.11
	9b	Approach	6	R1	225.3	226.8	1.5	0.59
130119	10	Headline AMP	10	R1	224.3	224.6	-0.3	0.86
130160	11	Priaxor + Prevathon	4 + 14	V6	210.7	205.3	5.4	0.32
130105	12	Headline AMP	10	R1	210.4	202.8	7.6	0.10
130164	13	Approach	6	V8	185.4	183.3	2.1	0.28

*Hybrid is Pioneer 407 AMX for 9a and Pioneer 448 AMX for 9b.

Table 3. Yield from corn fungicide trials, continued.

Exp. No.	Trial	Treatment	Rate (oz/A)	Application timing	Yield (bu)*	P-value
130161	14	Control			221.3 a	0.38
		Priaxor	4	V8	220.1 a	
		Priaxor + Prevathon	4 + 12	V8	219.1 a	

*Values denoted with the same letter within a trial are not statistically different at the significance level 0.05.