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# Evaluation of Foliar Fungicides Applied On Corn in 2011

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# Evaluation of Foliar Fungicides Applied On Corn in 2011

## **Abstract**

The effect of foliar fungicides applied on foliar disease, stalk rot and yield of corn were evaluated during the 2011 growing season at six locations in Iowa: ISU Northwest Research and Demonstration Farm near Sutherland; ISU Northern Research and Demonstration Farm, Kanawha; ISU Northeast Research and Demonstration Farm, Nashua, Ames (central); ISU Southeast Research and Demonstration Farm near Crawfordsville; and the Armstrong Research and Demonstration Farm near Lewis (Fig. 1). Foliar fungicides were applied at various growth stages on corn (Table 1).

## **Keywords**

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## Evaluation of Foliar Fungicides Applied On Corn in 2011

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The effect of foliar fungicides applied on foliar disease, stalk rot and yield of corn were evaluated during the 2011 growing season at six locations in Iowa: ISU Northwest Research and Demonstration Farm near Sutherland; ISU Northern Research and Demonstration Farm, Kanawha; ISU Northeast Research and Demonstration Farm, Nashua, Ames (central); ISU Southeast Research and Demonstration Farm near Crawfordsville; and the Armstrong Research and Demonstration Farm near Lewis (Fig. 1). Foliar fungicides were applied at various growth stages on corn (Table 1).

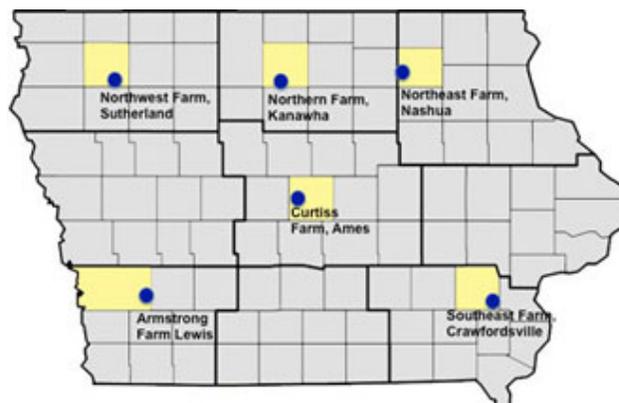


Figure 1. Map of field locations where the 2011 corn fungicide study was done

### Materials and Methods

The experimental design at each location was a randomized complete block with four replications. Plot sizes were 10 foot-wide (four rows) by 35 to 100 foot long. Details on hybrid and planting, application and harvest dates are listed in Table 1. Fungicides were ground applied at either growth stage V5 to V6, R1 (silking), R2 (blister) or at both V5 to V6 and R1 at all six locations.

Foliar disease was assessed on the ear leaf and in the canopy above the ear leaf at R5 (dent) growth stage at the Nashua, Crawfordsville, Armstrong and Ames locations. Stalk rot was assessed at R6 (physiological maturity) at all locations except Sutherland. Plots were harvested with a plot combine. Grain moisture at harvest was determined and yields were converted to bushel per acre at 15.5 percent moisture.

Table 1. Hybrid, planting date, application dates, harvest date for corn fungicide trials done at six location

Location	Hybrid	Planting	Fungicide Application dates			Harvest
			V5	R1	R2	
Ames	PO528KR	May 10	June 11	July 19	Aug. 2	Oct. 14
Nashua	DKC55-09	May 9	June 15	July 21	Aug. 6	Oct. 15
Kanawha	GH 8211	May 8	June 13	July 22	Aug. 4	Oct. 4
Sutherland	PO115XR	May 3	June 16	July 22	Aug. 2	Oct. 11
Armstrong	DKC61-69	May 2	June 11	July 14	July 26	Oct. 12
Crawfordsville	P1162XR	May 5	June 8	July 21	Aug. 2	Oct. 11

## Results

Foliar disease at R5 varied between locations (Table 2).

- At Crawfordsville, foliar disease severity was less than one percent and no treatment effects on disease severity were detected.
- The predominant disease at the Armstrong location was gray leaf spot which ranged from 0.66 to 8.8 percent severity on the ear leaf and 0.25 to 4.55 percent severity in the upper canopy. Applications of Headline Amp and Quilt Xcel at R1, and Headline + Headline Amp and Quadris + Quilt Xcel at V5+R1 significantly reduced disease severity.
- At Ames, gray leaf spot and northern leaf blight were present. Disease severity ranged from 2.6 to 9.8 percent. In general, applications of all fungicides applied at R1 or R2 reduced disease, although disease severity was not statistically different from the unsprayed check.
- At Nashua, gray leaf spot was the predominant disease on the ear leaf (1.4 to 3.5 percent severity), while northern leaf blight was predominant in the canopy above the ear leaf (5.0 to 23.75 percent severity). Disease severity on the ear leaf and in the upper canopy was significantly lower than the unsprayed check for all fungicide applications, except for all product applications made at V5 alone. An application of fungicide at R2 was most effective at reducing northern leaf blight in the upper canopy (5 to 7.5 percent versus 10.0 to 12.5 percent for an application at R1 versus 22.5 percent for the unsprayed check).
- Applications of fungicide made at V5 did not reduce foliar disease development during the R stages. Disease severity in V5 + R1 application treatments was similar to that of R1 application treatments.
- Goss's wilt was present in the upper canopy of some plots at the Ames and Armstrong locations.

*Stalk rot severity* was low (approximately 1 on the University of Illinois 1 to 5 scale) at all five locations where it was assessed. Treatment differences were detected only at the Armstrong location; stalk rot severity was significantly lower with applications of fungicide made at V5+R1 (0.0 to 0.35 versus 0.8 for the unsprayed check).

*Seed moisture* ranged from 14.4 to 20.5 percent depending on the location, but did not differ more than a few tenths of a percent amongst treatments within any location.

*Yield* varied across locations ranging from 156.7 to 229.6 bu/ac in the untreated control (Table 1). No differences in yield were detected between fungicide treatments and the untreated control at five of the six locations. At Armstrong, lower yields (P=0.08) occurred with some treatments than the unsprayed check.

**Table 2. Fungicide products and application timings tested in corn fungicide trials at six locations in Iowa in 2011 and mean yield (bu/A at 15.5 percent moisture) of each treatment.**

Product	Rate <sup>1</sup>	Timing	Ames	Arms trong	Crawfo rdsville	Kana wha	Nashua	Suther land
Check	-	-	180.6	182.8	156.7	184.9	229.6	191.0
Headline	6	V5	173.9	185.1	152.0	194.8	231.6	201.5
Headline AMP	10	R1	182.3	173.6	157.9	184.2	237.6	209.2*
Headline + Headline AMP	6 + 10	V5 + R1	178.8	187.1	165.6	196.1	237.0	207.1*
Headline AMP	10	R2	168.4	166.7 *	160.9	188.8	232.9	202.0
Stratego YLD	4	V5	174.5	168.3	162.4	192.1	234.2	199.6
Stratego YLD	4	R1	171.4	164.7 *	151.0	189.2	234.1	207.1
Stratego YLD	4 + 4	V5 + R1	177.0	168.2	168.5	199.6	233.3	202.7
Stratego YLD	4	R2	173.3	178.6	157.3	181.7	236.8	199.6
Quadris	6	V5	182.4	175.4	152.3	181.4	236.9	203.5*
Quilt Xcel	10.5	R1	180.8	169.0	155.3	190.3	237.0	203.1*
Quadris + Quilt Xcel	6 + 10.5	V5 + R1	180.5	175.0	150.2	180.8	231.0	211.1*
Quilt Xcel	10.5	R2	164.5	177.4	158.2	176.7	238.4	200.9
LSD (0.1)			NS <sup>2</sup>	13.7	NS	NS	NS	12.0
C.V. %			8.85	6.5	13.6	7.7	3.7	2.0

<sup>1</sup> Rate = oz/A

<sup>2</sup> NS = Not significant

### Summary

Where foliar disease severity was moderate to high, all fungicide products successfully reduced disease when applied during early reproductive growth stages. Applications of fungicides made at V5 to V6 had no effect on foliar disease severity. Surprisingly low stalk rot disease occurred in the trial at all locations. There were no significant positive yield responses to fungicide applications. There was no justification in terms of reduced disease severity or yield response for double applications of fungicides made at V5 and R1.

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