

Effectiveness of Foliar Fungicides by Timing on Foliar Diseases on Hybrid Corn in Northwest Iowa

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Introduction

Foliar fungicides remain an input on hybrid corn that many farmers consider. New fungicides for use on corn are registered annually. The goal of this project is to provide data to help farmers determine the need for foliar fungicides in their production. The objectives of this project were to 1) assess the effect of timing of application of fungicides on foliar disease, 2) evaluate the yield response of hybrid corn to foliar fungicide application, 3) discern differences, if any, between fungicide products, and 4) to investigate the effect of nitrogen on fungicide yield response.

Materials and Methods

The corn hybrid Pioneer P0306Q, with a resistance rating of 4 for grey leaf spot (GLS) (1-9 scale, 9 = outstanding), was planted following soybeans in a minimum tillage system April 21, 2020. A randomized complete block design with six replications was used. Each plot was four rows wide (30-in. row spacing) by 55 ft long. All plots were bordered by two rows on either side. All plots received 150 lb N/acre April 2, 2020. Two additional plots (with no fungicide or Miravis Neo (13.7 fl oz/acre) applied at R1 received

50 lb N/acre as a sidedress June 3, 2020. Fungicides were applied at either V12 (July 7) or at R1 (July 20) (Table 1). A CO² pressurized 10 ft hand boom was used to spray the plots, fitted with Tee Jet flat fan sprayer nozzles (XR11003VS), spaced 20 in. apart and delivering 20 gal/acre at 24 psi. On August 28 (1/2 milk line), disease severity on the ear leaf of 5 plants in each plot was assessed. Disease severity was assessed on a plot basis as an estimate of percent leaf area diseased. On October 9, all four rows of each plot were harvested with a John Deere 9450 combine fitted with an Avery Weigh-Tronix weigh scale and Shivvers 5010 moisture meter. All data were subjected to analysis of variance and means were compared at the 0.1 significance level using Fisher's protected least significant difference (LSD) test.

Results and Discussion

Below normal precipitation throughout the growing season meant very little disease was observed in the trial. Gray leaf spot was observed, but at extremely low levels. Gray leaf spot severity on the ear leaf of the control < 1% at R5. An effect of timing on disease severity was detected ($P < 0.01$) but with such low disease severity, these data should be read with caution. Yield of the control was 235.8 bushels/acre. Yields of the fungicide treatments ranged from 227.1 to 242.4. No effect of fungicide on yield was detected ($P = 0.33$). No effects of N on yield were detected ($P > 0.1$).

Table 1. Effect of fungicide and timing of fungicide applications on gray leaf spot and yield of corn at Sutherland, Iowa, in 2020.

Fungicide rate/ac, application timing^z	N application rate and timing	Disease severity (%)^y	Yield (bu/ac)^x
Non-treated control	150 lb/ac preplant	0.2 b ^w	235.8
Non-treated control	150 lb/ac preplant + 50 lb/ac sidedress	0.1 b	240.6
Miravis Neo, 13.7 fl oz, R1	150 lb/ac preplant	0.0 b	234.4
Miravis Neo, 13.7 fl oz, R1	150 lb/ac preplant + 50 lb/ac sidedress	0.1 b	231.8
USF0411, 8 fl oz, V12	150 lb/ac preplant	0.0 b	232.5
Trivapro, 13.7 fl oz, V12	150 lb/ac preplant	0.0 b	239.2
Miravis Neo, 13.7 fl oz, V12	150 lb/ac preplant	0.0 b	226.8
Veltyma, 7 fl oz, V12	150 lb/ac preplant	0.0 b	231.2
Topguard EQ, 5 fl oz, R1	150 lb/ac preplant	0.2 b	227.1
Lucento, 5 fl oz, R1	150 lb/ac preplant	0.5 a	242.4
Trivapro, 13.7 fl oz, R1	150 lb/ac preplant	0.4 a	234.8
Veltyma, 8 fl oz, R1	150 lb/ac preplant	0.1 b	230.6
USF0411, 8 fl oz, R1	150 lb/ac preplant	0.2 b	233.9
P-value		0.0005	0.3308

^zV12 = 12-leaf stage, R1 = silking.

^yPercent lower canopy diseased at 1/2 milk line (August 28). Gray leaf spot was the most prevalent disease.

^xCorrected to 15.0% moisture content.

^wMeans followed by same letter do not significantly differ (P = 0.1, LSD).