Effectiveness of Foliar Fungicides by Timing on Foliar Disease on Hybrid Corn in Northern 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 P0589AM, with a resistance rating of 4 for grey leaf spot (GLS) (1-9 scale, 9 = outstanding), was planted following soybean in a minimum tillage system April 19, 2020. A randomized complete block design with five replications was used. Each plot was four rows wide (30-in. row spacing) by 41 ft long. All plots were bordered by two rows on either side. All plots received 52 gallons/acre UAN 32-0-0 urea April 17, 2020. Two additional plots (with no fungicide or Miravis Neo (13.7 fl. oz/acre) applied at R1) received 20 gallons/acre UAN 32-0-0 June 8, 2020. Fungicides were applied at either V12 (July 2) or at R1 (July 16) (Table 1). A CO^2 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 gallons/acre at 24 psi. On August 26 (1/2 milk line), disease severity in the lower canopy above ear leaf of each plot was assessed. Disease severity was assessed on a plot basis as an estimate of percent leaf area diseased. On October 1, 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 in the lower canopy of the untreated check was <1 percent at R5. No effects of timing on disease severity was detected (P = 0.28). Yield of the control was 222.2 bushels/acre. Yields of the fungicide treatments ranged from 214.9 to 231.7. No effect of fungicide on yield was detected (P = 0.52). A side dressing of N improved the yield response of corn to Miravis Neo at R1 compared with Miravis Neo at R1 with no side dressing of N. (P = 0.09).

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

Fungicide rate/ac, application timing[z]	N application rate and timing	Disease severity (%)[y]	Yield (bu/ac)[x]
Non-treated control	Manure + 52 gal/ac preplant	0.8	222.2
Non-treated control	Manure + 52 gal/ac preplant + 20 gal/ac side dress	0.7	220.8
Miravis Neo, 13.7 fl oz, R1	Manure + 52 gal/ac preplant	0.2	222.6
Miravis Neo, 13.7 fl oz, R1	Manure + 52 gal/ac preplant	0.2	231.7
USF0411, 8 fl oz, V12	Manure + 52 gal/ac preplant	0.3	219.5
Trivapro, 13.7 fl oz, V12	Manure + 52 gal/ac preplant	0.0	223.9
Miravis Neo, 13.7 fl oz, V12	Manure + 52 gal/ac preplant	0.0	223.1
Veltyma, 7 fl oz, V12	Manure + 52 gal/ac preplant	0.0	218.1
Topguard EQ, 5 fl oz, R1	Manure + 52 gal/ac preplant	0.1	221.3
Lucento, 5 fl oz, R1	Manure + 52 gal/ac preplant	0.0	228.0
Trivapro, 13.7 fl oz, R1	Manure + 52 gal/ac preplant	0.0	223.6
Veltyma, 8 fl oz, R1	Manure + 52 gal/ac preplant	0.4	214.9
USF0411, 8 fl oz, R1	Manure + 52 gal/ac preplant	0.1	221.4
P-value		0.28	0.52

[z]V12 = 12-leaf stage, R1 = silking.
[y]Percent lower canopy diseased at 1/2 milk line (September 2). Gray leaf spot was the most prevalent disease.
[x]Corrected to 15.0% moisture content.