

Effectiveness of Foliar Fungicides by Timing on Gray Leaf Spot on Hybrid Corn

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Introduction

Foliar fungicides have become an input on hybrid corn that many farmers consider. New fungicides for use on corn are registered annually. In 2017, three companies were interested in comparing an application made at V12 with applications made at R1. The goal of this project is to provide data to help farmers determine if foliar fungicides could be incorporated into their production. The objectives of this project were to 1) assess the effect of timing of application of fungicides on disease, 2) evaluate the yield response of hybrid corn to foliar fungicide application, and 3) discern differences, if any, between fungicide products.

Materials and Methods

The corn hybrid Pioneer P0937AM, with a resistance rating of 5 for grey leaf spot (GLS) (1-9 scale, 9 = outstanding), was planted following soybeans in a minimum tillage system April 24, 2017. The experimental design was a randomized complete block design with 4 blocks. Each plot was 4 rows wide (30-in. row spacing) by 30 ft long. All plots were bordered by four rows on either

side. Fungicides were applied at either V5 (June 16), V12 (July 7), R1 (July 24), or both V5 and R1 growth stages (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 gallons/acre at 24 psi. On August 25 (1/4 milk line), disease severity in the upper canopy (ear leaf and above) of each plot was assessed. Disease severity was assessed on a plot basis as an estimate of percent leaf area diseased. The plots were harvested October 18 with a John Deere 9450 combine fitted with a Harvest Master system. The Harvest Master system uses a weigh scale and moisture sensor to record yields of each plot. 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

Temperature conditions during the 2017-growing season were normal with precipitation below the 30-yr average. The most prevalent disease observed in the trial was gray leaf spot. Applications made at V12 and for some fungicide applied at R1 were most effective at reducing disease compared to applications made at V5 and the non-sprayed control. Disease severity was not reduced by applications at V5. There was no effect of a fungicide application yield or grain moisture.

Table 1. Effect of fungicide and timing of fungicide applications on gray leaf spot, yield and moisture of corn at the ISU Armstrong Farm, Lewis, Iowa.

Treatment, rate/acre, application timing^z	Gray leaf spot severity (%)^{y, w}	Yield (bu/ac)^x	Moisture (%)
Non-treated control	8.8 abc	216.0	22.1
Regalia, 32 fl oz, V5	10.5 a	216.2	22.3
Delaro, 4 oz, V5	9.0 abc	203.6	22.2
Regalia, 32 fl oz, V5 + Regalia, 32 fl oz, R1	10.0 a	212.8	22.0
Topguard EQ, 5 fl oz, V5 + Topguard EQ, 5 fl oz, R1	6.0 bcde	206.5	22.2
Aproach, 3 + Aproach Prima, 6.8, V5 + R1	7.5 abcd	213.5	22.1
Regalia, 32 fl oz, R1	5.0 de	210.9	22.2
Topguard EQ, 5 fl oz, R1	5.8 cde	225.3	21.9
Stratego YLD, 4 fl oz, R1	9.3 abc	221.1	21.9
Aproach Prima, 6.8 fl oz, R1	4.8 de	210.2	21.9
Trivapro, 10.5 fl oz + 4.1 fl oz, R1	9.5 abc	217.1	22.1
Helmstar, 10.8 fl oz, R1	5.7 cde	150.2	18.7
Delaro, 4 oz, R1	9.8 ab	217.4	22.1
Trivapro, 10.5 fl oz + 4.1 fl oz, V12	3.8 e	217.0	22.3
Topguard EQ, 5 fl oz, V12	4.4 de	214.6	22.1
Delaro, 4 oz, V12	3.5 e	219.4	22.1
P-value	0.0076	0.2788	0.2054

^zV5, 5-leaf stage; V12, 12-leaf stage, R1, silking.

^yPercent canopy diseased at ¼ milk line (August 25).

^xCorrected to 15.5% moisture content.

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