

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

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Alison Robertson, associate professor
Department of Plant Pathology
and Microbiology
Myron Rees, farm superintendent

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 P1197AMXT, with a resistance rating of 5 for gray leaf spot (1-9 scale, 9 = outstanding), was planted following soybeans in a minimum tillage system May 17, 2017. The experimental design was a randomized complete block design with 4 blocks and each plot was 4 rows wide (30-in.

row spacing) by 40 ft long. All plots were bordered by four rows on either side. Fungicides were applied at either V5 (June 15), V12 (July 14), R1 (July 25), or both V5 and R1 growth stages (Table 1). On August 28 (1/4 milk line), disease severity in the upper canopy (ear leaf and above) and lower canopy of each plot was assessed. Disease severity was an estimate of percent leaf area diseased. All four rows of each plot were harvested with a small plot combine October 25. 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

Weather conditions during the 2017 growing season were hot and humid. Gray leaf spot was the most prevalent disease observed in the trial. Applications made at V12 were most effective at reducing disease in the lower canopy compared with all other application timings. Applications of fungicide made at V12 or R1 effectively reduced disease severity compared with the non-sprayed control. Gray leaf spot severity was not reduced by applications at V5. There was no effect of a fungicide application on yield or grain moisture.

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

Treatment, rate/ac, application timing ^z	Gray leaf spot severity (%) ^y		Yield (bu/ac) ^x	Moisture (%)
	Upper canopy ^w	Lower canopy ^w		
Non-treated control	1.3 a	6.3 bcd	269.0	22.0
Regalia, 32 fl oz, V5	1.3 a	9.0 a	281.1	22.1
Delaro, 4 oz, V5	1.1 ab	7.5 ab	288.1	22.0
Regalia, 32 fl oz, V5 + Regalia, 32 fl oz, R1	0.6 bcde	6.3 bcd	279.1	22.1
Topguard EQ, 5 fl oz, V5 + Topguard EQ, 5 fl oz, R1	1.0 abc	4.3 def	285.7	22.1
Aproach, 3 + Aproach Prima, 6.8 fl oz, V5 + R1	0.6 bcde	5.0 cde	300.1	21.6
Regalia, 32 fl oz, R1	0.6 bcde	5.3 bcde	288.1	21.9
Topguard EQ, 5 fl oz, R1	0.6 bcde	3.8 efg	281.9	22.1
Stratego YLD, 4 fl oz, R1	0.8 abcd	7.0 abc	287.6	22.3
Aproach Prima, 6.8 fl oz, R1	0.6 bcde	4.3 def	286.3	22.4
Trivapro, 10.5 fl oz + 4.1 fl oz, R1	0.5 cdef	3.3 efg	293.8	22.7
Helmstar, 10.8 fl oz, R1	0.6 bcde	5.0 cde	291.8	22.4
Delaro, 4 oz, R1	0.0 f	1.8 g	288.5	22.4
Trivapro, 10.5 fl oz + 4.1 fl oz, V12	0.4 def	2.0 fg	288.1	22.3
Topguard EQ, 5 fl oz, V12	0.1 ef	2.6 fg	286.5	22.3
Delaro, 4 oz, V12	0.6 bcde	2.0 fg	287.2	22.5
P-value	0.0083	<0.0001	0.5022	0.1738

^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).