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Effectiveness of Foliar Fungicides by Timing on Northern Leaf Blight on Hybrid Corn in Northern Iowa

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Introduction

Fungicide use on hybrid corn continues to be of interest to many farmers in Iowa. The number of fungicides registered for use on corn continues to increase, especially with the introduction of various generics. 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 P0969 AMXT, with a resistance rating of 6 for northern corn leaf blight (NCLB) (1-9 scale, 1 = excellent, 9 = poor), was planted following soybean in a minimum tillage system April 17, 2016. The experimental design was a randomized complete block design with six blocks and each plot was four rows wide (30-in. row spacing) by 63 ft long. All plots were bordered by four rows on either side. Fungicides were applied at either V5 (June 10), or R1 (July 22), or both growth stages (Table 1). On August 16

(1/4 milk line), disease severity in the upper canopy (ear leaf and above) 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 John Deere 9410 combine October 19. 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 2016 were normal and similar to the 30-yr average. Gray leaf spot and common rust were present in the trial, but at very low severity. Mean disease severity in the non-sprayed control was 2.0 percent. Treatment effects were detected on disease severity ($P = 0.0004$; Table 1), but not on yield ($P > 0.1$). When data for Stratego Yld, Topguard EQ, and Preemptor SC were compared, no interactions between product and timing were detected ($P > 0.1$; Table 2). Topguard was more effective at reducing disease than the other two products, albeit mean disease severity was very low for all three products. A double application of product at V5 + R1 reduced disease more compared with single applications of product made at either V5 or R1 (Table 2). Greater yields occurred when a fungicide was applied at R1 or V5 + R1, compared with an application made at V5 alone (Table 2).

Table 1. Effect of fungicide and timing of fungicide applications on northern leaf blight and yield of corn at Kanawha, IA, 2016.

Treatment, rate/A, application timing^z	Northern corn leaf blight severity (%)^y	Yield (bu/ac)^x
Non-treated control	2.0 a ^w	228.3
Stratego YLD, 2 fl oz, V5	1.4 abc	231.8
Topguard EQ, 5 fl oz, V5	1.2 bcd	232.0
Preemptor SC, 5 fl oz, V5	1.7 ab	223.0
Topguard EQ, 5 fl oz, V5 + Topguard EQ, 5 fl oz, R1	0.5 e	235.0
Stratego YLD, 2 fl oz, V5 + Stratego YLD, 4 fl oz, R1	1.4 abc	237.5
Approach, 3 + Approach Prima, 6.8, V5 + R1	0.6 de	229.0
Preemptor SC, 5 fl oz, V5 + Preemptor SC, 5 fl oz, V5	0.6 de	237.1
Topguard EQ, 5 fl oz, R1	1.0 cde	236.2
Preemptor SC, 5 fl oz, R1	2.0 a	235.3
Stratego YLD, 4 fl oz, R1	2.0 a	230.6
Approach Prima, 6.8 fl oz, R1	0.9 cde	230.0
Trivapro, 10.5 fl oz + 4 fl oz, R1	0.9 cde	233.5
Zolera FX, 5 fl oz, R1	1.7 ab	233.4
P-value	0.0004	0.3284

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

^yPercent upper canopy (ear leaf and above) diseased at ¼ milk line (Sept. 4).

^xCorrected to 15.5% moisture content.

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

Table 2. Comparison of fungicide and timing of fungicide applications on northern leaf blight and yield of corn at Kanawha, Iowa in 2016

Product	Northern corn leaf blight severity (%)^z	Yield (bu/ac)^y
Stratego YLD	1.6 a ^x	233.5
Topguard EQ	0.9 b	234.6
Preemptor SC	1.4 a	232.0
P-value	0.0262	0.641
Timing^w		
V5	1.4 a	229.2 b
R1	1.7 a	234.2 a
V5 + R1	0.8 b	236.7 a
P-value	0.006	0.0304

^zPercent upper canopy (ear leaf and above) diseased at ¼ milk line (Sept. 4).

^yCorrected to 15.5% moisture content.

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

^wV5, 5-leaf stage; R1, silking.