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Effectiveness of Foliar Fungicides by Timing on Northern Leaf Blight and Common Rust on Hybrid Corn

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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 P0157, with a resistance rating of 5 for northern corn leaf blight (NCLB) (1-9 scale, 1 = poor and 9 = excellent), was planted into a Sac silty clay loam following soybeans in a minimum tillage system May 18, 2016. The experimental design was a randomized complete block design and each plot was four rows wide (30-in. row spacing) by 44 ft long. All plots were bordered by four rows on either side, and 6-ft alleys were cut between replications at V4.

Fungicides were applied at either V5 (June 20), or R1 (July 25), or at both growth stages (Table 1) using a sprayer fitted with Tee Jet flat fan spray nozzle XR8002VS spaced 20-in. apart and delivering 15.5 gal/acre at 40 psi. On September 4 (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 small plot combine on October 28. 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 and precipitation during the growing season favored the development of NCLB in the trial. Disease severity in the non-sprayed control was 12.6 percent for NCLB (Table 1). Applications of fungicide reduced NCLB severity compared with the non-sprayed control. Disease severity was significantly reduced ($P < 0.1$) with applications made at R1 or V5 + R1, compared with applications made at V5 alone ($P < 0.001$; Table 2). No effect of fungicide on yield was detected ($P > 0.1$). No differences in the efficacy of fungicides on NCLB disease severity or yield were detected ($P = 0.1031$ and 0.3349 , respectively; Table 2).

Table 1. Effect of fungicide and timing of fungicide applications on northern leaf blight and yield of corn at Sutherland, Iowa, in 2016.

Treatment, rate/ac, application timing^z	Northern corn leaf blight severity (%)^y	Yield (bu/ac)^x
Non-treated control	12.6 a ^w	252.9
Stratego YLD, 2 fl oz, V5	12.5 a	247.8
Topguard EQ, X fl oz, V5	10.7 b	261.0
Preemptor SC, 5 fl oz, V5	10.2 bc	255.4
Topguard EQ, 5 fl oz, V5 + Topguard EQ, 5 fl oz, R1	2.6 efgh	261.4
Stratego YLD, 2 fl oz, V5 + Stratego YLD, 4 fl oz, R1	3.7 def	268.5
Approach, 3 + Approach Prima, 6.8, V5 + R1	2.2 fgh	251.3
Preemptor SC, 5 fl oz, V5 + Preemptor SC, 5 fl oz, V5	4.7 d	252.5
Topguard EQ, 5 fl oz, R1	2.7 efgh	256.8
Preemptor SC, 5 fl oz, R1	4.7 d	246.8
Stratego YLD, 4 fl oz, R1	4.0 de	252.0
Approach Prima, 6.8 fl oz, R1	2.5 efgh	256.7
Trivapro, 10.5 fl oz + 4 fl oz, R1	1.2 h	257.8
Zolera FX, 5 fl oz, R1	2.0 gh	260.0
P-value	<0.0001	0.2615

^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 Sutherland, Iowa, in 2016.

Product	Northern corn leaf blight severity (%)^z	Yield (bu/A)^y
Stratego YLD	6.7 a ^x	254.9
Topguard EQ	5.4 b	258.5
Preemptor SC	6.6 a	250.3
P-value	0.1031	0.3349
Timing^w		
V5	11.1 a	253.5
R1	3.8 b	250.6
V5 + R1	3.7 b	259.5
P-value	<.0001	0.2639

^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.