

Effectiveness of Foliar Fungicides by Timing on Northern Leaf Blight on Hybrid Corn in Northeast 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 assess the effect of timing of application of fungicides on disease, evaluate the yield response of hybrid corn to foliar fungicide application, and discern differences, if any, between fungicide products.

Materials and Methods

The corn hybrid Pioneer P0533AM1, with a resistance rating of 5 for northern corn leaf blight (NCLB) (1-9 scale, 9 = outstanding), was planted following soybeans in a minimum tillage system on May 1, 2015. Soil type was a Kenyon loam, 2 to 5 percent slope with a soil test level of Mehlich 3-P of 28 ppm P205 (High) and Mehlich 3-K of 200 ppm K20 (Optimum) with 6.45 percent pH, 6.9 Buffer pH, and 4.0 percent organic matter. The experimental design was a randomized complete block design with six blocks and each plot was four rows wide (30-in. row spacing) by 73 ft long. All plots were bordered by four rows on either side. Fungicides were applied at either V5 (June 12), or at R1 (July 23), or at both 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 gal/acre at 24 psi. On September 11 (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 9450 combine fitted with an Avery Weigh-Tronix weigh scale and Shivers 5010 moisture meter on October 12. 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 2015 were slightly cooler than normal but precipitation was similar to the 30-yr average. Northern leaf corn blight (NCLB) was prevalent with 30 percent of the canopy above the ear leaf blighted in the non-sprayed checks (Table 1). Fungicide applications made at V5 did not reduce NCLB severity observed at R5 ($P > 0.1$). Applications of fungicides at R1 or at V5 plus R1 reduced NCLB severity by approximately 30 percent (mean NCLB severity = 20%) and 50 percent (mean NCLB severity = 16%), respectively ($P < 0.1$, Table 2). Application at R1 or at V5 plus R1 resulted in greater yields compared with the non-sprayed control or V5 only applications ($P < 0.1$, Table 2). Yields were greater when two applications of a fungicide were made compared with one application at R1. ($P < 0.1$, Table 2).

Table 1. Effect of fungicide and timing of fungicide applications on yield of corn at Nashua, Iowa, in 2015.

Treatment, rate/A, application timing^z	Northern corn leaf blight severity (%)^y	Yield (bu/A)^x
Non-treated control 1	30.0	196.7
Priaxor, 3 fl oz, V5	30.0	197.0
Priaxor, 3 fl oz, V5 + Headline Amp, 10 fl. oz, R1	16.2	205.2
Headline Amp, 10 fl oz, R1	26.7	201.2
Stratego YLD, 2 fl oz, V5	27.5	195.6
Stratego YLD, 2 fl oz, V5 + Stratego YLD, 4 fl oz, R1	20.0	208.9
Stratego 4 YLD, 4 fl oz, R1	25.2	206.1
Quilt Xcel, 10.5 fl oz, R1	16.7	203.2
Approach, 3 + Approach Prima, 6.8, V6 + R1	14.0	208.1
Approach Prima, 6.8, R1	17.7	202.4
Fortix, 5 fl oz, V5	29.7	194.7
Fortix, 5 + 5 fl oz, V6 + R1	9.2	206.6
Fortix, 5 fl oz, R1	12.8	200.3
Trivapro Co-pack, 4.1 fl oz, R1	22.0	205.7
Non-sprayed control 2	30.0	194.0
Quilt Xcel, 10.5 fl oz, V5	32.2	194.9
Approach, 3 fl oz, V5	28.8	195.6
Headline, 3 fl oz, V5	38.3	191.1
Quilt Xcel, 10.5 fl oz, V5 + Trivapro Co-Pack, 4.1 fl oz, R1	17.8	209.3
<u>Quilt Xcel, 10.5 fl oz, V5 + Quilt Xcel, 10.5 fl oz, R1</u>	<u>16.7</u>	<u>210.3</u>
LSD (0.1)	7.7	7.3
CV (%)	34.7	3.8
P-value	<0.1	<0.1

^zV5, 5-leaf stage; R1, silking.^yPercent upper canopy (ear leaf and above) diseased at ¼ milk line (Sept. 11).^xCorrected to 15.0% moisture content.**Table 2. Effect of fungicide application timing on yield of corn at Nashua, Iowa, in 2015.**

Application timing^z	Northern corn leaf blight severity (%)^y	Grain moisture at harvest (%)	Yield (bu/A)^x
Non-treated control	30.0	16.8	195.3
V5	31.1	17.0	194.8
R1	20.2	17.5	203.1
V5 + R1	15.6	17.6	208.1
LSD (0.1)	4.0		4.3
P-value	<0.1		<0.1

^zV5, 5-leaf stage; R1, silking.^yPercent upper canopy (ear leaf and above) diseased at ¼ milk line (Sept. 11).^xCorrected to 15.0% moisture content.