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

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Abstract

Fungicide use on hybrid corn has increased considerably, primarily due to reports of increased yields, even in the absence of disease and higher corn prices. A number of fungicides are registered for use on corn. 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.

Keywords

Plant Pathology and Microbiology

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences | Natural Resources and Conservation

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 has increased considerably, primarily due to reports of increased yields, even in the absence of disease and higher corn prices. A number of fungicides are registered for use on corn. 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 P0533, 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 23, 2014. The experimental design was a randomized complete block design 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 V6

(July 3), or at R1 (July 31), or at both growth stages (Table 1). On September 5 (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 21. 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

The 2014 growing season was predominantly cool and wet with above average rainfall in June, August, and September. NCLB was observed in the trial. Disease severity in the two non-sprayed controls was 10.5 and 9.3 percent. An effect of an application of fungicide at all application timings on NCLB severity was detected for all fungicides. No difference between application timings was detected, that is, applications made at V5 were as effective as applications made at R1, and at V5 plus R1. This is likely due to the fact that NCLB development started early, prior to the crop tasseling. There was significant lodging in the plots due to a wind storm that occurred mid-July. No evidence of an effect of fungicide on yield was detected.

Table 1. Effect of fungicide and timing of fungicide applications on northern leaf blight and common rust severity, yield, and harvest moisture of corn at ISU Northern Research Farm.

Treatment, rate/A, application timing ^z	Northern corn leaf blight	
	severity (%) ^y	Yield (bu/A) ^x
Control 1	10.0	159.1
Priaxor (3 oz/A) @ V5	3.0	164.9
Priaxor (3 oz/A) @ V5 + Headline AMP (10 oz/A) @ R1	3.0	153.5
Headline AMP (10 oz/A) @ R1	4.8	161.7
Stratego YLD (3 oz/A) @ V5	1.9	173.1
Stratego (2 oz/A) @ V5 + Stratego YLD (4 oz/A) @ R1	1.5	170.5
Stratego YLD (4 oz/A) @ R1	6.0	171.1
Quilt Xcel (10.5 oz/A) @ R1	5.3	161.3
Aproach (3 oz/A) @ V5+ Aproach (6 oz/A) @ V5	4.5	157.3
Aproach (6 oz/A) @ V5	7.0	168.9
Fortix (5 oz/A) @ V5	4.0	175.4
Fortix (5 oz/A) @ V5 + Fortix (5 oz/A) @ R1	2.0	181.5
Fortix (5 oz/A) @ R1	4.0	167.3
Custodia (6 oz/A) @ V5	3.0	177.2
Custodia (12.8 oz/A) @ R1	6.0	177.7
Control 2	8.3	172.2
Aproach (3 oz/A) @ V5+ Aproach Prima (6.8 oz/A) @ V5	5.3	167.1
Aproach Prima (6.8 oz/A) @ V5	4.5	164.0
LSD (0.01)	2.25	NA
P-value	<0.0001	0.8712

^zV6, 6-leaf stage; R1, silking.

^yPercent upper canopy (ear leaf and above) diseased at ¼ milk line (Sept. 5).

^xCorrected to 15.5 percent moisture content.