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Effectiveness of Foliar Fungicides by Timing on Hybrid Corn in Iowa

Abstract

Fungicide use on hybrid corn has increased considerably in the past three growing seasons 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) compare the efficacy of various products for management of foliar corn diseases, 2) assess the effect of timing of application of fungicides on foliar disease development, and 3) evaluate the yield response of hybrid corn to foliar fungicide application.

Keywords

RFR A9079, Plant Pathology

Disciplines

Agricultural Science | Agriculture | Plant Pathology

Effectiveness of Foliar Fungicides by Timing on Hybrid Corn in Iowa

RFR-A9079

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Introduction

Fungicide use on hybrid corn has increased considerably in the past three growing seasons 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) compare the efficacy of various products for management of foliar corn diseases, 2) assess the effect of timing of application of fungicides on foliar disease development, and 3) evaluate the yield response of hybrid corn to foliar fungicide application.

Materials and Methods

Headline (6 oz/acre), Quilt (14 oz/acre), and Stratego Pro (4 oz/acre) were each applied to hybrid corn DKC61-69 at one of three growth stages: VT (tasseling), R2 (blister), and R3 (milk). The experimental design was a randomized plot design. Each plot was 8 rows wide (30-in. row spacing) by 97 ft long. Corn was planted with a 7000 series John Deere 8-row planter calibrated to plant @ 35,600 seeds/acre on corn following corn. Fungicides were applied with a Hagie high clearance sprayer on July 23 (VT), August 6 (R2), and August 13 (R3). Spray solutions were applied in a volume of 10 gal/acre. Foliar disease assessments were done on control plots

immediately prior to each spray application. The numbers of lesions on the ear leaf, and up to three leaves below the ear leaf of each of five plants, were counted. Disease severity was assessed as the percent ear leaf diseased on August 20. At R6 (September 23), stalk rot severity was assessed by splitting the stalks of five plants. The University of Illinois Stalk Rot Scale was used where 0 = no disease and 5 = lodging due to stalk rot. Anthracnose top dieback was assessed on September 10. The middle four rows of each plot were harvested with a John Deere 9410 combine on October 28.

Results and Discussion

Disease pressure for the 2009 growing season was moderate, and the predominant diseases present were common rust and eyespot. Mean disease severity on the ear leaf of control plots at VT was less than 0.1 %, and on the third leaf below the ear leaf it was 0.2%. Fungicide applications reduced foliar disease but the only application that resulted in significantly less disease was Quilt at VT. The incidence of anthracnose top dieback and stalk rot severity were significantly reduced by fungicide applications. Fungicides had no effect on yield or grain moistures

Studies on the efficacy of foliar fungicide timing for disease management and yield responses are expected to continue in 2010.

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Kevin Van Dee, Southeast Research Farm, and his staff were key in the completion of this study.

Table 1. Effect of fungicide and timing of fungicide applications on foliar disease severity, anthracnose top dieback, stalk rot severity, yield, and harvest moisture of corn.

Treatments	Foliar disease ^{1,3,5}	Anthracnose top dieback ^{2,5}	Stalk rot ^{3,5}	Yield ⁴	Harvest moisture
Check	1.15 a	44.2 a	3.1 a	202.5	20.8
Headline VT	0.9 ab	13.1 b	2.1 ab	207.8	21.9
Headline R2	0.95 ab	21.1 b	2.5 ab	184.7	21.1
Headline R3	1.0 ab	22.7 ab	1.8 b	185.4	20.5
Quilt VT	0.85 b	9.2 b	1.8 b	204.6	21.3
Quilt R2	1.05 ab	25.0 ab	2.7 ab	197.4	21.3
Quilt R3	0.95 ab	20.4 b	1.7 b	216.9	22.1
Stratego Pro VT	0.95 ab	27.6 ab	2.3 ab	201.6	21.0
Stratego Pro R2	1.0 ab	21.3 b	2.2 ab	215.5	20.9
Stratego Pro R3	1.05 ab	19.5 b	2.4 ab	213.1	20.4

¹Severity (%) (percent of ear leaf with disease) at R3.

²Incidence (%) (percent plants with top dieback symptoms).

³Severity at R6 (where 0 = healthy and 5 = lodging due to stalk rot–R. Hines, University of Illinois stalk rot scale).

⁴Bushels/acre at 15% moisture.

⁵Means within a column with the same letter in the same column are not statistically different ($P < 0.05$) using Tukey's test.