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Effectiveness of Foliar Fungicides by Timing on Hybrid Corn in Iowa

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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 higher 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 A9080, Plant Pathology

Disciplines

Agricultural Science | Agriculture | Plant Pathology

Effectiveness of Foliar Fungicides by Timing on Hybrid Corn in Iowa

RFR-A9080

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Introduction

Fungicide use on hybrid corn has increased considerably in the past three growing seasons primarily due to reports of higher 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 (6oz/acre), Quilt (14oz/acre), and Stratego Pro (4oz/A) were each applied to hybrid corn GH 8531 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 28 (VT), August 11 (R2), and August 18 (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 as many as 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 27. At R6 (October 14), stalk rot severity was assessed by splitting the stalks of 5 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 25. The middle four rows of each plot were harvested with a John Deere 9450 combine on November 23.

Results and Discussion

Disease pressure for the 2009 growing season was high, and the predominant disease present was grey leaf spot. Mean disease severity on the ear leaf of control plots at VT was less than 0.5%, while on the third leaf below the ear leaf it was 1.2%. Fungicide applications significantly reduced foliar disease but no differences were detected between products. An application of fungicide at VT resulted in significantly less disease than applications at R2 and R3. The incidence of anthracnose top dieback and stalk rot severity were significantly reduced by fungicide applications. No differences between product or timing of application were detected. Despite the reduction in disease, fungicide had no effect on yield.

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

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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 ^{a, e}	Anthracnose top dieback ^{b, e}	Stalk rot ^{c, e}	Yield ^d	Harvest moisture
Check	4.0 a	52.3 a	2.2 a	221.3	19.8
Headline VT	0.5 d	12.4 b	1.2 b	227.3	20.7
Headline R2	2.3 abc	16.1 b	1.3 b	221.5	20.5
Headline R3	3.1 ab	15.7 b	1.3 b	222.4	20.6
Quilt VT	1.5 bcd	19.0 b	1.4 b	219.3	20.2
Quilt R2	2.8 ab	24.1 b	1.3 b	211.2	20.0
Quilt R3	2.7 abc	18.0 b	1.7 ab	209.9	20.1
Stratego Pro VT	1.0 cd	24.2 b	1.4 b	217.2	20.4
Stratego Pro R2	2.5 abc	12.8 b	1.1 b	209.5	20.4
Stratego Pro R3	3.3 a	17.0 b	1.1 b	215.2	20.3

^aSeverity (%) (percent of ear leaf with disease) at R3.

^bIncidence (%) (percent plants with top dieback symptoms).

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

^dBushels/acre at 15% moisture.

^eTreatment means with any letter in common are not statistically different from one another.