

Effectiveness of Foliar Fungicides by Timing for Disease Control on Hybrid Corn

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Foliar fungicides remain an input on hybrid corn that many farmers consider. New fungicides for use on corn are registered annually. The goal of this project is to provide data to help farmers determine the need for foliar fungicides in their production. The objectives of this project were to 1) assess the effect of timing of application of fungicides on foliar 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 Stine 9808E-20, with a resistance rating of 8 for grey leaf spot (GLS) and 7 for northern corn leaf blight (NCLB) (1–9 scale, 9 = excellent), was planted following soybean in a minimum tillage system May 12. A randomized complete block design with six replications was used. Each plot was four rows wide (30-in. row spacing) by 35 ft. long. All plots were bordered by four rows on either side. Fungicides were applied at either V12 (July 12) or at R1 (July 26), Table 1. A Hagie high clearance sprayer was used to spray the plots, fitted with Tee Jet flat fan sprayer nozzles (XR11002VS), spaced 20 in. apart and delivering 20 gal./acre at 35 psi. Disease severity was assessed as an estimate of percent ear leaf area diseased on five plants in each plot September 8. On October 12, 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. 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.

Summary

The growing season was drier than normal (12.37 in. received compared with 20 in. for the 10-year average). Despite the below normal precipitation, disease was observed on the farm. At tasseling, a low incidence of tar spot (< 0.1% severity) was observed on a few scattered plants in the trial. Mean tar spot severity on the ear leaf was 23.2% and 20.6%, gray leaf spot was 3.3% and 3.2%, and northern corn leaf blight was 0.2% and 0.3% in the non-sprayed check plot 1 and 2, respectively. An effect of fungicide treatment on tar spot and gray leaf spot disease severity was detected ($P < 0.0001$). In general, all fungicide applications reduced disease severity. Headline Amp, and Delaro Complete were best at reducing tar spot severity, followed by Adastrio, Veltyma, Miravis, Neo, and TrivaPro. Headline Amp and Veltyma were best at reducing gray leaf spot severity, followed by Adastrio, Lucento, Miravis, Neo, and TrivaPro. Tar spot severity was numerically less with an application of fungicide at R1 compared with V12. Conversely, an application of fungicide at V12 reduced gray leaf spot severity more than an application at R1 ($P < 0.01$). Yield of non-treated check one was 241.2 bushels/acre while yield of non-treated check two was 252.9 bushels/acre. Yields of all fungicide treatments ranged from 236.0 to 252.9 bushels/acre. No effect of fungicide on yield was detected ($P = 0.390$).



Table 1. Effect of fungicide and timing of fungicide applications on foliar disease severity and yield of corn at Crawfordsville, Iowa.

Fungicide product, rate/ac., application timing ^z	Mean tar spot severity on ear leaf, percent	Mean gray leaf spot severity on ear leaf, percent	Mean northern corn leaf blight severity on ear leaf, percent	Yield (bu./ac.) ^y
1. Non-treated check 1	23.2	3.3	0.2	241.2
2. Headline AMP, 10 fl. oz., V12	3.9	0.2	0.5	242.8
3. Veltyma, 7 fl. oz., V12	7.4	0.2	0.1	250.2
4. Trivapro, 13.7 fl. oz., V12	9.0	0.1	1.0	241.6
5. Delaro Complete, 8 fl. oz., V12	4.4	0.7	0.3	247.0
6. Lucento, 5 fl. oz., V12	13.5	0.4	0.2	245.7
7. Miravis Neo, 13.7 fl. oz., V12	8.6	0.5	0.6	246.2
9. Non-treated check 2	20.6	3.2	0.3	235.2
10. Headline AMP, 10 fl. oz., R1	2.2	0.6	0.9	252.9
11. Veltyma, 7 fl. oz., R1	2.7	0.4	0.0	243.4
12. Trivapro, 13.7 fl. oz., R1	3.3	1.0	0.1	250.9
13. Delaro Complete, 8 fl. oz., R1	2.9	1.1	0.4	245.9
14. Lucento, 5 fl. oz., R1	7.4	0.8	0.4	239.0
15. Miravis Neo, 13.7 fl. oz., R1	4.8	0.8	0.8	246.9
17. Adastrio, 8 fl. oz., R1	5.8	0.7	0.2	245.2
18. Xyway LFR, 15.2 fl. oz., at plant	19.6	1.5	0.8	250.6
19. Xyway LFR, 15.2 fl. oz., at plant + Adastrio, 7 fl. oz., R1	7.2	0.7	0.3	237.6
20. Xylem Plus, 32 fl. oz., R1	15.7	2.7	0.3	236.0
21. Xylem Plus, 16 fl. oz., V5 + Xylem Plus, 24 fl. oz., R1	18.5	2.1	0.8	248.1
P-value	< 0.0001	< 0.0001	0.635	0.390
CV	50.51	118.96	384.37	4.64
LSD	27.66	27.67	27.66	5.43

^zV12=12-leaf stage, R1=silking.

^yCorrected to 15% moisture content.