



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 Pioneer P0157AMXT, with a resistance rating of 4 for grey leaf spot (GLS) (1-9 scale, 9 = outstanding), was planted following soybeans in a minimum tillage system on May 15, 2022. A randomized complete block design with six replications was used. Each plot was four rows wide (30-in. row spacing) by 73 ft. long. All plots were bordered by two rows on either side. All plots had 3,500 gallons of hog manure (175 lbs. N/acre, 80 lbs. P₂O₅/acre, 112 lbs. K₂O/acre) injected on November 7, 2021, and 32% UAN sprayed at 20 gallon/acre (70 lbs. N/acre) on May 18, 2022. Fungicides were applied at either V12 (July 12) or at R1 (July 26) (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.

Table 1. Effect of fungicide and timing of fungicide applications on foliar disease severity and yield of corn.

Fungicide product, rate/ac., application timing ^z	Mean tar spot severity on ear leaf, %	Mean gray leaf spot severity on ear leaf, %	Mean northern corn leaf blight severity on ear leaf, % ^y	Yield (bu./ac.) ^y
1. Non-treated check 1	1.06 bcd	1.33 b	1.27 a	240.0
2. Headline AMP, 10 fl. oz., V12	0.34 fg	0.45 efg	0.10 b	243.2
3. Veltyma, 7 fl. oz., V12	0.21 fg	0.13 g	0.03 b	241.6
4. Trivapro, 13.7 fl. oz., V12	0.27 fg	0.18 fg	0.00 b	249.7
5. Delaro Complete, 8 fl. oz., V12	0.18 fg	0.25 efg	0.17 b	240.4
6. Lucento, 5 fl. oz., V12	0.61 def	0.60 de	0.00 b	239.6
7. Miravis Neo, 13.7 fl. oz., V12	0.53 efg	0.38 efg	0.17 b	245.0
8. Aproach Prima, 6.8 fl. oz., V12	0.33 fg	0.25 efg	0.10 b	247.1
9. Non-treated check 2	1.51 ab	0.95 cd	1.77 a	249.8
10. Headline AMP, 10 fl. oz., R1	0.46 efg	0.53 ef	0.00 b	246.3
11. Veltyma, 7 fl. oz., R1	0.16 fg	0.52 ef	0.00 b	244.5
12. Trivapro, 13.7 fl. oz., R1	0.44 efg	0.57 e	0.17 b	245.2
13. Delaro Complete, 8 fl. oz., R1	0.09 g	0.58 de	0.07 b	242.1
14. Lucento, 5 fl. oz., R1	0.66 def	0.57 e	0.03 b	244.8
15. Miravis Neo, 13.7 fl. oz., R1	0.35 fg	0.43 efg	0.00 b	246.0
16. Aproach Prima, 6.8 fl. oz., R1	0.40 efg	0.55 ef	0.03 b	243.6
17. Adastrio, 8 fl. oz., R1	0.57 defg	0.60 de	0.17 b	254.5
18. Xyway LFR, 15.2 fl. oz., at plant	1.47 ab	2.08 a	0.00 b	239.9
19. Xyway LFR, 15.2 fl. oz., at plant + Adastrio, 7 fl. oz., R1	0.87 cde	0.40 efg	0.00 b	250.4
20. Xylem Plus, 32 fl. oz., R1	1.78 a	1.13 bc	0.00 b	244.3
21. Xylem Plus, 16 fl. oz., V5 + Xylem Plus, 24 fl. oz., R1	1.36 abc	1.13 bc	0.00 b	250.7
P-value	< 0.0001	< 0.0001	0.0018	0.4892
CV	82.13	16.18	366.47	4.08
LSD	0.61	0.45	0.81	11.49

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

^yCorrected to 15.0% moisture content.

apart and delivering 20 gal/acre at 24 psi. On August 4 (pollination), percent disease on the ear leaf of five plants in each check plot was assessed. Disease severity was assessed as an estimate of percent ear leaf area diseased on five plants in each plot on September 6. On October 16, all four rows of each plot were harvested with a John Deere 9450 combine fitted with an Avery Weigh-Tronix weigh scale and Shivvers 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

A total of 16.29 inches of precipitation was received from June-October, during the 2022 growing season (Table 2). July was drier than normal (2.55 inches) while August was wet (6.74 inches). At pollination, low levels of gray leaf spot and northern corn leaf blight were observed in the non-sprayed check plots and tar spot (<0.1% severity) was observed on the ear leaf of one plant in one plot. Despite the precipitation in August, disease severity observed in the trial at ¼ milk line (September 6) was low. Mean tar spot severity on the ear leaf was 1.06% and 1.51%, gray leaf spot was 1.33 and 0.95%, and northern corn leaf blight was 1.27 and 1.77% in the non-sprayed check Plot 1 and 2, respectively. An effect of fungicide treatment on disease severity was detected ($P < 0.01$). In general, all fungicide applications reduced disease severity. It was difficult to distinguish an effect of product and/or timing on disease severity because severity was so low. Yield of non-treated check one was 240 bu./acre while yield of non-treated check two was 249.8 bu./acre. Yields of all fungicide treatments ranged from 239.6 to 254.5 bu./acre. No effect of fungicide on yield was detected ($P = 0.4892$)

Table 2. Precipitation (inches) during the growing season.

	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Total
2022	3.62	4.10	5.22	2.55	6.74	1.03	0.75	2.02	26.03
1976-2020 average	3.61	4.50	5.38	4.53	4.80	3.51	2.71	1.75	30.79