# Effectiveness of Foliar Fungicides by Timing on Foliar Diseases on Hybrid Corn in Southwest Iowa

**RFR-A2092**

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## Introduction

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, 3) discern differences, if any, between fungicide products, and 4) to investigate the effect of nitrogen on fungicide yield response.

## Materials and Methods

The corn hybrid Pioneer 1197AM, with a resistance rating of 5 for gray leaf spot (GLS) (1-9 scale, 9 = outstanding), was planted following soybean in a minimum tillage system April 20, 2020. A randomized complete block design with six replications was used. Each plot was four rows wide (30-in. row spacing) by 30 ft long. All plots were bordered by two rows on either side. Two plots (one with no fungicide and one with Miravis Neo (13.7 fl oz/acre) applied at R1) received 75 lb N/acre as a side dressing at V4-V5. Fungicides were applied at either V12 (July 10) or at R1 (July 16) (Table 1). A $CO^2$ pressurized 10-ft hand boom was used to spray the plots, fitted with Tee Jet flat fan sprayer nozzles (XR11003VS), spaced 20 in. apart and delivering 20 gallons/acre at 24 psi. On August 22 (1/2 milk line), disease severity in each plot was assessed on a plot basis as an estimate of percent leaf area diseased. On October 24, 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.

## Results and Discussion

Below normal precipitation throughout the growing season meant very little disease was observed in the trial. Gray leaf spot was observed but at extremely low levels. Gray leaf spot severity on the ear leaf of the control < 1% at R5. No effect of timing on disease severity was detected ($P = 0.77$). Yield of the control was 238.9 bushels/acre. Yields of the fungicide treatments ranged from 235.0 to 243.8. No effect of fungicide on yield was detected ($P = 0.95$). No effects of N on yield were detected ($P > 0.1$).

**Table 1. Effect of fungicide and timing of fungicide applications on northern leaf blight and yield of corn at Armstrong, Iowa in 2020.**

| Fungicide rate/ac, application timing[z] | N application rate and timing | Disease severity (%)[y] | Yield (bu/ac)[x] |
|---|---|---|---|
| Non-treated control | 150 lb/ac preplant | 0.8 | 238.9 |
| Non-treated control | 150 lb/ac preplant + 75 lb/ac side dress | 0.7 | 236.5 |
| Miravis Neo, 13.7 fl oz, R1 | 150 lb/ac preplant | 0.7 | 238.3 |
| Miravis Neo, 13.7 fl oz, R1 | 150 lb/ac preplant + 75 lb/ac side dress | 0.4 | 238.9 |
| USF0411, 8 fl oz, V12 | 150 lb/ac preplant | 0.6 | 235.0 |
| Trivapro, 13.7 fl oz, V12 | 150 lb/ac preplant | 0.5 | 233.8 |
| Miravis Neo, 13.7 fl oz, V12 | 150 lb/ac preplant | 0.3 | 239.8 |
| Veltyma, 7 fl oz, V12 | 150 lb/ac preplant | 1.2 | 240.9 |
| Topguard EQ, 5 fl oz, R1 | 150 lb/ac preplant | 0.4 | 242.3 |
| Lucento, 5 fl oz, R1 | 150 lb/ac preplant | 0.7 | 237.3 |
| Trivapro, 13.7 fl oz, R1 | 150 lb/ac preplant | 0.5 | 238.5 |
| Veltyma, 8 fl oz, R1 | 150 lb/ac preplant | 0.4 | 243.8 |
| USF0411, 8 fl oz, R1 | 150 lb/ac preplant | 0.5 | 235.6 |
| P-value | | 0.7653 | 0.9495 |

[z]V12=12-leaf stage, R1=silking.
[y]Percent lower canopy diseased at 1/2 milk line (September 2). Gray leaf spot was the most prevalent disease.
[x]Corrected to 15.0% moisture content.