Field, Cereal, and Forage Crops

Efficacy of Foliar Fungicides on Corn Foliar Disease Severity and Yield in Central Pennsylvania, 2024.

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Tar spot, caused by *Phyllachora maydis*, and gray leaf spot, caused by *Cercospora zeae*-maydis are foliar diseases that cause yield loss in corn (*Zea mays* L.) in Pennsylvania each year. Tar spot is characterized by black stromata on corn leaves late in the season, while gray leaf spot foliar lesions are tan or gray rectangular lesions. These diseases may cause leaf or entire plant death when symptoms are severe. This trial tests the effectiveness of foliar fungicide treatments applied before, at, and after tasseling on disease severity and yield. This trial was conducted at the Russel E. Larson Agricultural Research Center in Pennsylvania Furnace, PA. Results from the trial help inform corn growers on the best management timing and products to prevent foliar disease in corn.

Keywords: Veltyma, Adastrio, Topguard, Topguard EQ, Lucento, Miravis Neo, Trivapro, Delaro Complete, Aproach Prima, Headline AMP, tar spot, gray leaf spot

Corn ‘P0157AM’ was bulk planted in Hagerstown silt loam with soybean stubble on June 13th at 32,000 plants per acre with standard farm fertilizer and herbicides applied. Plots were established 25 feet long and 10 feet wide with alleys 5 feet wide to accommodate 12 treatments and four replicates. One hundred twenty units of N were applied around V5 for the side dress, and standard farm management practices were used for the post-herbicide. Treatments were applied using a CO_2 backpack sprayer and telescoping boom with 8002-VS spray tips. An untreated check was included and Adastrio (8 oz a^{-1}) was applied at

V10. Most treatments, including Veltyma (7 oz a^{-1}), Adastrio (8 oz a^{-1}), Miravis Neo (13.7 oz a^{-1}), Trivapro (13.7 oz a^{-1}), and Delaro Complete (8 oz a^{-1}) were applied at VT. One treatment, Adastrio (8 oz a^{-1}), consisted of one late application at R3. Several treatments included an early application and a late application: Topguard (8 oz a^{-1}) at V10 followed by Adastrio (8 oz a^{-1}) at R3 and Adastrio (8 oz a^{-1}) V10 followed by Topguard EQ (7 oz a^{-1}) at R3. Approximately four weeks after VT, during the R5 growth stage, each plot was rated for TS and GLS disease severity (%). The ear, ear plus one, and ear minus one leaves were rated for ten plants in each plot. A second disease assessment was completed at R6 for TS and GLS. The yield and test weight were measured at harvest on November 20, and yield was corrected to 15.5% moisture for analysis. Data were analyzed using ANOVA with a Tukey's HSD post hoc test (α=0.05).

Tar spot severity was extremely low across the trial because it was the first year detected on the research farm. In the first assessment, Veltyma, Trivapro, Miravis Neo, Adastrio at VT, and Delaro Complete performed the best at reducing TS. In the second assessment, Veltyma, Adastrio followed by Topguard, Adastrio at R3, Lucento, Delaro Complete, and Topguard followed by Adastrio were best at reducing TS. All treatments reduced GLS compared to the untreated check. There were no significant differences in yield or test weight; however, when comparing means numerically, all treatments except Lucento and Trivapro yielded higher than the untreated check.

Supplementary Table S1. Efficacy of Foliar Fungicides on Corn Foliar Disease Severity and Yield in Central Pennsylvania, 2024

Treatment	Appl. Rate (oz a^{-1})	Appl. Timing	Tar spot severity		Gray leaf spot severity		Test Weight (lb/bu) [z]	Yield (bu/A) [z]
			September 13 (%) [y]	September 30 (%) [y]	September 13 (%) [y]	September 30 (%) [y]		
Untreated Check	-	-	0.92 a	2.00 a	6.38 a	10.25 a	60.7	152.8
Veltyma	7	VT	0.00 f	0.46 f	0.63 e	0.33 g	60.5	164.1
Adastrio	8	VT	0.17 ef	1.25 b-d	0.92 de	1.58 c-f	60.3	161.9
Adastrio	8	R3	0.50 b-d	0.67 ef	2.83 b	3.25 bc	60.4	172.6
Topguard fb Adastrio	8, 8	V10, R3	0.67 a-c	0.79 d-f	1.54 b-d	2.63 b-d	59.9	160.7
Adastrio fb Topguard EQ	8, 7	V10, R3	0.42 b-e	0.63 ef	1.00 de	1.58 c-f	60.3	155.4
Adastrio	8	V10	0.79 ab	1.67 ab	1.71 b-d	4.67 b	60.6	163.7
Lucento	5	R3	0.79 ab	0.71 d-f	2.38 bc	3.04 bc	60.3	145.3
Miravis Neo	13.7	VT	0.08 f	1.04 b-e	0.71 de	0.71fg	60.0	159.6
Trivapro	13.7	VT	0.00 f	1.00 c-e	1.46 c-e	2.54 b-e	58.0	140.9
Delaro Complete	8	VT	0.25 d-f	0.79 d-f	0.96 de	1.13 d-g	59.6	164.4

[y] Means followed by the same letter within columns are not significantly different according to Tukey's LSD ($P < 0.05$).
[z] Means are not significantly different according to Tukey's LSD ($P < 0.05$).