Field, Cereal, and Forage Crops

Efficacy of Foliar Fungicides on Soybean Foliar Disease Severity and Yield in Southeast Pennsylvania, 2024.

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Frogeye leafspot (FELS), caused by *Cercospora sojina*, and septoria brown spot (SBS), caused by *Septoria glycines*, are foliar diseases that impact soybean (*Glycine max* (L.) Merr.) production annually. FELS is characterized by circular, tan foliar lesions with dark margins and SBS occurs primarily in the lower canopy and consists of small, irregular brown lesions/blotches. These diseases may cause leaf necrosis, premature leaf drop, or plant death when symptoms are advanced, though significant yield loss is rarely observed in Pennsylvania. This trial tests the effectiveness of foliar fungicide treatments applied at the R3 growth stage on disease severity and yield. This trial was conducted at the Southeast Agricultural Research and Extension Center in Manheim, PA. Results from the trial help inform corn growers on the best management to prevent foliar disease in soybeans.

Keywords: Miravis Neo, Trivapro, Delaro Complete, Adastrio, Lucento, Revylok, Revytek, Aproach Prima, Priaxor, Topguard EQ, Quadris, Veltyma, Equus 720, Folicur, Topsin, frogeye leafspot, septoria brown spot, Canopeo

Soybean variety ‘SC7364E’ was bulk planted in Hagerstown silt loam with corn residue on May 2 at 140,000 seeds per acre in 30-inch rows. Plots were established 25 feet long and 10 feet wide, with alleys 5 feet wide to accommodate 14 treatments and four replicates. Standard farm management practices were used for weed management. Treatments were applied using a CO_2 backpack sprayer with 8002-VS spray

tips calibrated at 30 psi. An untreated check was included, and all treatments were applied at R3 with nonionic surfactant. The treatments were sprayed at twenty gallons a^{-1} and included: Miravis Neo (13.7 oz a^{-1}), Trivapro (13.7 oz a^{-1}), Delaro Complete (8 oz a^{-1}), Adastrio (8 oz a^{-1}), Lucento (5 oz a^{-1}), Revylok (8 oz a^{-1}), Revytek (8 oz a^{-1}), Aproach Prima (6.8 oz a^{-1}), Priaxor (4 oz a^{-1}), Topguard EQ (5 oz a^{-1}), Quadris (6 oz a^{-1}), Veltyma (7 oz a^{-1}), and Equus 720+Folicur+Topsin M (36+4+20 oz a^{-1}). The application date for all treatments was July 31. During the late R6 growth stage, there was not a high enough FELS incidence to warrant a rating. Approximately four weeks after fungicide treatments were made, each plot was rated for SBS disease severity (%) by estimating the lesion coverage at four locations in the plot. The mean disease severity was calculated for each plot. A plot photo was taken and the Canopeo app was used to estimate the canopy coverage (Patrignani and Ochsner 2015). The yield and test weight were measured at harvest on October 14, 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).

Weather conditions and the moderately resistant variety were not conducive for FELS development in the trial, but SBS became more prevalent late in the growing season. The untreated check yielded 57.0 bu A^{-1} and a test weight of 56.6 lb bu^{-1}. At the disease assessment, the untreated check had 36.9% SBS severity, mostly in the middle canopy and all treatments significantly reduced disease severity compared to the untreated check. All products performed among the best at reducing disease severity except Quadris (18.3% severity). There were no significant differences between treatments for the Canopeo ratings. There were no significant differences in yield or test weight, though all treatments ranged from 57.0-65.5 bu A^{-1} and 55.8-57.3 lb bu^{-1}.

References

Patrignani, A., & Ochsner, T. E. (2015). Canopeo: A powerful new tool for measuring fractional green canopy cover. Agronomy journal, 107(6), 2312-2320.

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

Treatment	Appl. Rate (oz a^{-1})	Appl. Timing	SBS Severity (%) [y]	Canopeo (%) [y]	Test Weight (lb/bu) [y]	Yield (bu A^{-1}) [y]
Untreated Check	-	-	36.9 a	76.9 a	56.6 a	57.0 a
Miravis Neo	13.7	R3	2.1 c	78.1 a	55.8 a	61.5 a
Trivapro	13.7	R3	3.3 c	85.0 a	56.4 a	61.5 a
Delaro Complete	8	R3	3.2 c	81.7 a	56.9 a	63.0 a
Adastrio	8	R3	4.4 bc	81.6 a	57.3 a	61.2 a
Lucento	8	R3	4.9 bc	81.4 a	56.1 a	61.8 a
Revylok	8	R3	3.9 bc	83.1 a	56.8 a	63.2 a
Revytek	5	R3	3.0 c	87.4 a	57.0 a	65.5 a
Aproach Prima	13.7	R3	10.9 bc	76.1 a	56.8 a	59.5 a
Priaxor	13.7	R3	4.2 bc	81.8 a	57.1 a	62.6 a
Topguard EQ	8	R3	3.6 c	78.6 a	56.8 a	60.5 a
Quadris	6.8	R3	18.3 b	79.7 a	56.3 a	60.9 a
Veltyma	10	R3	1.6 bc	84.9 a	57.1 a	64.7 a
Equus 720+Folicur+Topsin M	7, 10	R3	5.0 bc	82.6 a	56.6 a	63.3 a

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