Trial 25. Evaluation of foliar fungicides for controlling white mold of soybean in Oakes, ND - 2025

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The soybean variety PFS 2414E was planted on May 9, 2025, in Oakes, North Dakota, at a rate of 160,000 seeds/a in bedded single rows spaced 30 inches apart and a planting depth of 1.5 inches. Experiment plots were four rows (10 feet) wide by 20 feet long. Treatment evaluations were replicated four times and designed in a randomized complete block, and blocks were separated by 5-foot alleys. The previous crop was dry edible beans, and the soil type was Embden fine sandy loam. Standard practices were used to manage weeds and nutrition. Fungicides were applied at 20 gal/A at 40 psi using four XR TeeJet 8002VS flat-fan nozzles spaced at 20 inches apart. Mixing compatibility issues and phytotoxicity were not observed during the trial. White mold incidence and severity ratings were taken on Aug. 22, 2025. Yield was collected from the first two rows on Oct. 4, 2025. The weather over the course of the growing season was conducive to disease development. This trial was irrigated receiving 7.5 inches of irrigation and it received a total of 17.2 inches of rainfall for a total of 24.2 inches of water input over the course of the growing season. Analysis was conducted using SAS 9.4 PROC GLIMMIX to determine the effects of treatments on disease and yield. Means separations followed Fisher's Protected LSD at α=0.05.

White mold disease index percentages (WM DIX%) are calculated using disease incidence, which is recorded as a percentage of diseased soybeans in a plot, and disease severity, which is rated on a scale that considers the number of diseased soybeans and severity of disease on each soybean. Low levels of white mold developed across this trial with most fungicide treatments resulting in near zero disease. Statistical analysis indicated there were significant differences in WM DIX% among treatments (P=0.0049). The non-treated control had the highest level of disease at 4.4%, which was significantly higher than two fungicide treatments: a duo application of Delaro Complete at 8 fl oz/a at both R1 and R3 growth stages, and an application of Endura at 5.5 oz/a at the R1 growth stage. Similarly, an application of Endura at 5.5 oz/a at the R1 growth stage resulted in significantly lower disease than every treatment except for a duo application of Delaro Complete at 8 fl oz/a at both R1 and R3. Additionally, there were statistical differences in mean yields detected among treatments (P=0.0058). The non-treated control had the lowest mean yield at 62.4 bu/a. Several fungicide application programs had significantly higher yield than the non-treated control, including the following: Propulse at 6 fl oz/a at R1 followed by Delaro Complete at 8 fl oz/a at R3, Propulse at 8 fl oz/a at R1 followed by Delaro Complete at 8 fl oz/a at R3, Delaro Complete at 8 fl oz/a at R1 followed by Delaro Complete at 8 fl oz/a at R3, and Endura at 5.5 oz/a at R1. An application of Propulse at 6 fl oz/a at R1 followed by Delaro Complete at 8 fl oz/a at R3 resulted in the highest mean yield of 75.7, which was 13.3 bu/a higher than the non-treated. Results from this study suggest that the treatments evaluated will result in a higher mean yield than if no fungicide were to be applied in a low disease environment. Additionally, programs that included fungicide applications at more than one growth stage resulted in higher mean yield than programs that only applied a fungicide at one growth stage.

Table 25. Effect of foliar fungicides on white mold disease values and yield.

Treatment[a]	Rate	Growth Stage	WM DIX (%)[b]	Yield (bu/a)[c]
Non-Treated	-	-	4.4 a[d]	62.4 c
Delaro Complete	8 fl oz/a	R1	3.5 a	64.5 bc
Propulse	6 fl oz/a	R1		
Delaro Complete	8 fl oz/a	R3	0.5 ab	75.7 a
Propulse	8 fl oz/a	R1		
Delaro Complete	8 fl oz/a	R3	0.9 ab	70.2 ab
Propulse	6 fl oz/a	R1	0.5 ab	67.7 bc
Propulse	8 fl oz/a	R1	1.6 ab	66.2 bc
Delaro Complete	8 fl oz/a	R1		
Delaro Complete	8 fl oz/a	R3	0.3 bc	69.9 ab
Endura	5.5 oz/a	R1	0.0 c	69.1 b
P-Value			0.0049	0.0058

[a] Treatments were applied on July 14 (R1) and July 24 (R3); all treatments were applied in conjunction with a non-ionic surfactant at a rate of 0.125% V/V except for Endura.
[b] WM DIX (%) = white mold disease index percentage collected on Aug. 22, 2025.
[c] Yield was adjusted to 13% moisture and calculated in bushels per acre (bu/a) and collected on Oct. 4, 2025.
[d] Treatments with different letter groupings differ significantly ($\alpha = 0.05$).