Trial 10. Evaluation of fungicide seed treatments with cereal rye cover crops for controlling seedling diseases in Minot, ND - 2025

SOYBEAN (*Glycine max 'PFS 2003E'*) H. R. Becton, G. Dusek and R. W. Webster

Cereal rye was planted over half of the space used for this trial on Oct. 15, 2024. Burndown application was made on May 28, 2025, using glyphosate. 'PFS 2003E' soybean was planted June 3, 2025, at a rate of 120,000 seeds/a and depth of 1.5 inches in bedded single rows spaced 7.5 inches apart at the North Central Research Extension Center in Minot, North Dakota. Plots were seven rows by 25 feet. Treatments included seed treatments and the incorporation of a cover crop; each were replicated four times and organized in a randomized complete block design with a split-plot arrangement. Blocks were separated by 7-foot alleys. The field was rainfed and standard practices were used to manage weeds and fertility. Root rot ratings were taken on July 1, 2025. Yield was collected from the center rows on Oct. 10, 2025. Rainfall during the period totaled approximately 9.3 inches, and weather conditions were only slightly conducive to disease development. 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.

There were significant differences among treatments (P=0.002) with respect to root rot severity. The non-treated (35%) had significantly greater ratings for root rot severity compared to the treated plots, with the exception of the Allegiance + Relenya (31%) treatment. The plots where seed were treated with Allegiance + Relenya + Acceleron D-281 (24%) had the lowest mean severity score; however, the combination Allegiance + Relenya + Acceleron D-281 led to significantly lower (P<0.001) yields compared to all of the other seed treatments. With respect to yields, there were significant differences (P<0.001) between cover crop, seed treatments and the interaction between cover and seed treatment.

Table 10. Effect of integrating seed treatments in a cereal rye cover crop system on stand counts, root rot severity and yield.

Treatment	Rate	Cover Crop	Stand Counts (plants/a)[a]	Root Rot Severity (%)[b]	Yield (bu/a)[c]
Non-Treated	-	Cereal Rye	56,887 ab[d]	34.3	33.9
Allegiance	1.5 fl oz/cwt	Cereal Rye	49,079 b	31.6	34.5
Allegiance Relenya	1.5 fl oz/cwt 0.8 fl oz/cwt	Cereal Rye	52,881 b	30.4	33.9
Allegiance Relenya Acceleron D-281	1.5 fl oz/cwt 0.8 fl oz/cwt 0.3 fl oz/cwt	Cereal Rye	47,210 b	25.0	27.1
Allegiance Relenya Acceleron D-281 Cruiser 5FS	1.5 fl oz/cwt 0.8 fl oz/cwt 0.3 fl oz/cwt 9.0 fl oz/cwt	Cereal Rye	49,399 b	23.8	34.0
Non-Treated	-	No Cover	51,911 b	35.4	37.7
Allegiance	1.5 fl oz/cwt	No Cover	49,071 b	27.4	46.4
Allegiance Relenya	1.5 fl oz/cwt 0.8 fl oz/cwt	No Cover	47,978 b	30.8	44.3
Allegiance Relenya Acceleron D-281	1.5 fl oz/cwt 0.8 fl oz/cwt 0.3 fl oz/cwt	No Cover	62,567 a	23.0	45.2
Allegiance Relenya Acceleron D-281 Cruiser 5FS	1.5 fl oz/cwt 0.8 fl oz/cwt 0.3 fl oz/cwt 9.0 fl oz/cwt	No Cover	50,276 b	30.0	46.9
P-Value		Cover*Treatment	0.001	0.33	<0.001
		Treatment	0.34	0.002	<0.001
		Cover	0.58	0.85	<0.001

[a] Stand counts were recorded at VC growth stage.
[b] Weighted calculation based using severity scale ratings based on root rot ratings collected at the V3 growth stage.
[c] Yield was adjusted to 13% moisture and calculated in bushels per acre (bu/a) and collected on Oct. 10, 2025.
[d] Means followed by different letters are significantly different following Fisher's Protected LSD at α=0.05.