Trial 14. Evaluation of fungicide seed treatments and variety selection for controlling Phytophthora root rot in Fargo, ND - 2025

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Three varieties of soybean were planted in Fargo, North Dakota, on May 6, 2025, at a rate of 140,000 seeds/a and depth of 1.5 inches in bedded single rows spaced 30 inches apart. These three varieties were selected to have varying resistance to *Phyopthora sojae*. 'PFS 2003E' was selected as having no Rps gene and low field tolerance, 'PFS 2207E' was selected as having no Rps gene and moderate field tolerance and 'PFS 2405E' was selected as having a stack of Rps1k and Rps3a and having high field tolerance. At planting, 200 grams of millet infested with *Phytophthora sojae* Race 3 was applied in-furrow. Plots were four rows by 20 feet. Treatments were replicated four times and designed in a randomized complete block. Blocks were separated by 7-foot alleys. The field was rainfed and grown to oat the previous year. Soil type was a silty clay. Standard practices were used to manage weeds and nutrition. Mixing compatibility issues and phytotoxicity were not observed during the trial. Stand counts were recorded on June 28, 2025 by counting the number of plants in the center two rows. Yield was collected from the center two rows on Oct. 4, 2025. Rainfall during the period totaled 16.2 inches, and overall, weather conditions were moderately 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 with respect to stand counts (P<0.0001) and yields (P=0.001). The Relenya + Cruiser + Vayantis treatment on PFS 2207E seed provided the greatest protection against seedling disease by P*hytophthora sojae*. Overall, all treatments on PFS 2207E performed better than the same treatments on PFS 2003E and PFS 2207E.

Table 14. Effect of seed treatments and soybean variety on stand counts and yield when inoculated with *Phytophthora sojae* Race 3.

Treatment	Rate	Variety	Stand Count (plants/a)[a]	Yield (bu/a)[b]
Relenya Cruiser 5FS	0.8 fl oz/cwt 8.96 fl oz/cwt	PFS 2003E	87,991 d[c]	49.1 d
Relenya Cruiser 5FS Allegiance	0.8 fl oz/cwt 8.96 fl oz/cwt 1.5 fl oz/cwt	PFS 2003E	101,059 c	45.9 d
Relenya Cruiser 5FS Vayantis	0.8 fl oz/cwt 8.96 fl oz/cwt 0.195 fl oz/cwt	PFS 2003E	109,336 bc	49.2 d
Relenya Cruiser 5FS	0.8 fl oz/cwt 8.96 fl oz/cwt	PFS 2207E	115,870 b	57.6 ab
Relenya Cruiser 5FS Allegiance	0.8 fl oz/cwt 8.96 fl oz/cwt 1.5 fl oz/cwt	PFS 2207E	118,483 ab	57.1 ac
Relenya Cruiser 5FS Vayantis	0.8 fl oz/cwt 8.96 fl oz/cwt 0.195 fl oz/cwt	PFS 2207E	128,502 a	60.4 a
Relenya Cruiser 5FS	0.8 fl oz/cwt 8.96 fl oz/cwt	PFS 2405E	53,143 e	50.4 bd
Relenya Cruiser 5FS Allegiance	0.8 fl oz/cwt 8.96 fl oz/cwt 1.5 fl oz/cwt	PFS 2405E	40,511 f	45.0 d
Relenya Cruiser 5FS Vayantis	0.8 fl oz/cwt 8.96 fl oz/cwt 0.195 fl oz/cwt	PFS 2405E	55,757 e	50.2 cd
P-Value			<0.001	0.001

[a] Stand counts were recorded at VC growth stage.
[b] Yield was adjusted to 13% moisture and calculated in bushels per acre (bu/a) and collected on Oct. 4, 2025.
[c] Means followed by different letters are significantly different following Fisher's Protected LSD at α=0.05.