

Evaluation of at-plant treatments for control of Rhizoctonia diseases of potato in Wisconsin, 2014.

Potatoes were planted on 5 May at the Hancock Research Station in central WI to evaluate seed- and in-furrow-applied fungicides for the control of Rhizoctonia diseases of potato, including seedling damping-off and tuber black scurf. Fertility, insect, and weed management was accomplished using standard commercial practices. US#1 tubers were cut into approximately 2 oz pieces on 21 Apr. Seed pieces were allowed to heal for 14 days at 13°C with 95% relative humidity and good airflow for suberization. A randomized complete block design with four replications were used for the trial, and treatment plots consisted of four 24-ft-long rows spaced 36 in. apart with 12 in. spacing in the row. To minimize soil compaction and damage to plants in rows used for foliar and yield evaluations, drive rows for pesticide application equipment were placed adjacent to plots. In-furrow treatments were applied using a CO₂ backpack sprayer equipped with a single TeeJet 8002VS flat fan nozzle calibrated to deliver 12 gal/A at a boom pressure of 40 psi. Seed treatments were applied to cut seed prior to planting using the same sprayer equipment as previously described. Plots were not inoculated but relied on natural inocula for disease establishment. Seed emergence data were collected on 26 May from 24 linear feet of each of the center 2 rows of each plot (% seed emergence = number of emerged vines /maximum possible emerged vines (48)*100). Vines were killed with 2 desiccant applications of Diquat+non-ionic surfactant on 5 and 12 Sep. Plots were harvested, graded, and evaluated for black scurf disease incidence on 22 Sep. Twenty tubers were randomly selected from each plot and visually evaluated for symptoms of black scurf (% incidence= number of symptomatic tubers/20*100). Precipitation in Hancock during the potato production season was 16.3 in. Supplemental irrigation was applied 32 times during the potato production season for an additional 13.7 in.

Seed emergence was significantly increased in most treatments, with the exception of Priaxor, Taegro, A18232, A16148+A9765, A16148+A18232, Admire Pro+Moncoat MZ, Admire Pro+Emesto Silver, Emesto Silver+Reason+Nubark Mancozeb, Moncoat MZ (0.75 lb rate), Moncoat MZ+Moncut, Moncoat MZ+Quadris, and Maxim MZ. Significant differences among treatments were observed for marketable yield; A9765 600FS, A16148+A18232+A12946, A20588, Emesto Silver+Nubark Mancozeb, Emesto Silver+Nubark Mancozeb+Serenade Soil, Emesto Silver+Nubark Mancozeb+Quadris, Moncoat MZ (1 lb rate), and Emesto Silver alone had significantly less marketable yield than the non-treated control. Taegro, Serenade Soil, A9765, and Cruiser Maxx Extreme were statistically similar in black scurf incidence when compared to the non-treated control; all other treatments were significantly better than the untreated control in controlling black scurf incidence.

Product and Rate*	Application Type	Seed Emergence (%)	Black Scurf Incidence (%)	Marketable Yield (cwt/A)
Non-treated Control	NA	71.9 hijk**	41.3 de	561.4 ghijk
Priaxor 4.17SC 0.6 fl oz	In-Furrow	81.3 klmn	35.0 de	570.9 ghijk
A18126 45WG 0.34 fl oz	In-Furrow	88.6 mno	15.0 abc	591.1 jk
Quadris 2.08SC 0.6 fl oz	In-Furrow	87.0 mno	25.0 bc	586.6 ijk
Taegro 13WP 0.358 oz	In-Furrow	80.7 klmn	46.3 e	575.0 ghijk
Taegro 13WP 0.358 oz + A18126 45WG 0.34 oz	In-Furrow	91.7 no	12.5 abc	600.9 k
Serenade Soil 1.34%W/W 4.4 fl oz	In-Furrow	88.6 mno	37.5 de	572.9 ghijk
Moncut 70DF 0.75 oz	In-Furrow	92.7 0	15.0 abc	563.6 ghijk
A9765 600FS 0.128 fl oz	Seed Treatment	57.8 efg	48.8 e	502.1 cdef
A18232 435.7FS 0.308 fl oz	Seed Treatment	77.1 ijklm	10.0 abc	522.2 defg
A16148 500FS 0.46 fl oz + A9765 600FS 0.128 fl oz	Seed Treatment	68.8 ghij	5.0 a	554.5 fghijk
A16148 500FS 0.077 fl oz + A9765 600FS 0.128 fl oz	Seed Treatment	56.3 ef	1.3 a	534.9 efghi
A16148 500FS 0.46 fl oz + A18232 435.7FS 0.308 fl oz	Seed Treatment	53.7 e	16.3 abc	526.7 defgh
A16148 500FS 0.077 fl oz + A18232 435.7FS 0.308 fl oz	Seed Treatment	69.3 ghijk	3.8 a	561.3 ghijk
A16148 500FS 0.077 fl oz + A18232 435.7FS 0.308 fl oz + A12946 250SC 0.614 fl oz	Seed Treatment	27.6 ab	16.3 abc	423.7 a
A20588 345.11FS 0.5 fl oz	Seed Treatment	39.6 cd	5.0 a	481.1 bcde

Admire Pro 4.6SC.035 fl oz + Moncoat MZ 7.5DP 12.0 oz	Seed Treatment	68.8 ghij	10.0 abc	539.5 fghij
Admire Pro 4.6SC 0.35 fl oz + Emesto Silver 118FS 0.31 fl oz	Seed Treatment	69.3 ghijk	2.5 a	544.4 fghij
Emesto Silver 118FS 0.31 fl oz + Nubark Mancozeb 6D 0.06 lb	Seed Treatment	54.7 e	3.8 a	504.2 cdef
Emesto Silver 118FS 0.31 fl oz + Reason 500SC + Nubark Mancozeb 6D 0.06 lb	Seed Treatment	71.4 hijkl	3.8 a	529.1 defgh
Emesto Silver 118FS 0.31 fl oz + Nubark Mancozeb 6D 0.06 lb + Serenade Soil 1.34% w/w 0.31 floz	Seed Treatment	26.6 a	7.5 ab	427.1 ab
Emesto Silver 118FS 0.31 fl oz + Nubark Mancozeb 6D 0.06 lb + Quadris 2.018SC 0.6 fl oz	Seed Treatment Seed Treatment In-Furrow	36.5 abc	11.3 abc	475.2 abcd
Moncoat MZ 7.5 DP 0.75 lb	Seed Treatment	80.2 jklmn	13.8 abc	548.2 fghijk
Moncoat MZ 7.5 DP 1.0 lb	Seed Treatment	38.5 bc	11.3 abc	462.1 abc
Moncoat MZ 7.5 DP 0.5 lb + Moncut 70DF 0.75 lb	Seed Treatment In-Furrow	67.7 fghi	1.3 a	536.7 fghi
Convoy 40SC 0.51 fl oz Nubark Mancozeb 6D 0.06 lb	Seed Treatment Seed Treatment	50.5 de	2.5 a	521.7 defg
Moncoat MZ 7.5 DP 0.75 lb + Quadris 2.08SC 0.6 fl oz	Seed Treatment In-Furrow	61.0 efgh	3.8 a	548.1 fghijk
Cruiser Maxx Extreme 0.31 fl oz	Seed Treatment	56.3 ef	27.5 cd	522.0 defg
Maxim MZ 7.5DP 0.5 lb	Seed Treatment	71.9 hijkl	0.0 a	526.6 defgh
Emesto Silver 118FS .031 fl oz	Seed Treatment	40.1 cd	2.5 a	447.9 ab
Valent Exp1 0.2 fl oz	Seed Treatment	82.3 lmno	1.3 a	580.7 hijk
Valent Exp1 0.2 fl oz + Spirato 480FS 0.08 fl oz	Seed Treatment	90.6 no	1.3 a	556.1 fghijk

*Treatment rates applied in-furrow are provided per linear 1000 row ft. Seed treatment rates are provided per 100 lb seed. Foliar treatment rates are provided per acre.

**Column numbers followed by the same letter are not significantly different at $P=0.05$ as determined by Fisher's Least Significant Difference (LSD) test.