POTATO (*Solanum tuberosum* 'Russet Burbank')
Rhizoctonia: *Rhizoctonia solani*

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Evaluation of seed, in-furrow, and foliar treatments for control of Rhizoctonia diseases of potato in Wisconsin, 2013.

Potatoes were planted on 6 May to initiate a field trial at the Hancock Research Station in central WI to evaluate seed treatment, in-furrow, and foliar-applied fungicides for the control of Rhizoctonia diseases of potato, including seedling decline and tuber black scurf. Fertilization, insect, weed, and foliar disease control was accomplished using standard commercial practices for the production region. Approximately 2 oz seedpieces were cut mechanically on 25 April from US#1 'Russet Burbank' tubers. Seedpieces were allowed to heal for 2 days at 55°F with 95% relative humidity and good airflow prior to treatment and/or planting. 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 CO_2 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 same sprayer equipment as previously described. Foliar treatments were applied using the same sprayer equipment as previously described yet calibrated to deliver 35 gal/A at a boom pressure of 40 psi and were applied in addition to aforementioned standard fungicide program. Plots were not inoculated but relied on natural inocula for disease establishment. Seed emergence data were collected 4 June as the number of emerged hills in 10 linear feet of each of the center 2 rows of each plot. Vines were killed with herbicide (Diquat E 1.5 pt/acre +non-ionic surfactant) applied on 9 and 16 September. Plots were harvested, graded, and evaluated for black scurf disease incidence on 24 September. 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 15.0 in. Supplemental irrigation was applied 44 times during the potato production season for an additional 19.5 in.

Cool and wet soil conditions favoring Rhizoctonia disease prevailed during mid-May of trial year. Overall, marketable yields were high in this trial with all treatments resulting in≥58 2 cwt/acre. There were no significant differences among treatments for marketable yield. Most (20/31) of the treatments significantly reduced black scurf incidence when compared to the untreated control; of these treatments, 9 included in-furrow applications and 11 were seed treatments. Treatments providing the lowest incidence of black scurf included two experimental seed treatments, A16148 500FS 0.077 fl oz + A9765 600FS 0.128 fl oz seed and A18232 435.7FS 0.308 fl oz + A16148 500FS 0.046 fl oz; and recently registered seed treatment Emesto Silver 118FS 0.31 fl oz + Admire Pro 4.6SC 0.35 oz. All but 3 treatments resulted in lower emergence than the untreated control. Notably, some of the best treatments for black scurf control, significantly reduced seed emergence including A18232 435.7FS 0.308 fl oz + A16148 500FS 0.077 fl oz + A12946 250SC 0.614 fl oz. No phytotoxicity was noted with any of the treatments.

Product and Rate[x]	Application Type[z]	Seed Emergence	Black Scurf Incidence (%)	Marketable Yield (cwt/A)
Untreated Control…….	NA	18.3 fgh[y]	67.5 fg	648.8
Tiger Sul 90CR 50.0 oz……	In-Furrow	18.5 fgh	82.5 g	625.5
Experimental #1 4.0 fl oz…….....	In-Furrow	19.3 gh	45.0 def	620.8
Experimental #1 1.35 fl oz…….….	In-Furrow	17.5 d-h	45.0 def	636.4
Quadris SC250GL 0.8 fl oz……..	In-Furrow	15.5 b-f	17.5 abc	631.2
Vertisan EC 1.67 LG 1.1 fl oz……..	In-Furrow	17.3 d-h	27.5 a-d	592.6
A18126 FS435.7 0.34 fl oz…….…….	In-Furrow	15.3 b-f	27.5 a-d	653.6
Quadris 2.08SC 0.6 fl oz…….…….	In-Furrow	16.3 c-g	27.5 a-d	669.4
A15457 100EC 0.47 fl oz…….……	In-Furrow	15.8 b-fg	37.5 b-e	643.2
Priaxor 4.17SC 0.55 fl oz…….……	In-Furrow	15.5 b-f	42.5 c-f	660.7
Serenade Soil 7.7 fl oz…….....	In-Furrow	16.75 c-g	80.0 g	671.3
Moncut 70DF 1.18 oz……..	In-Furrow	17.5 d-h	67.5 fg	633.1
Moncut 70DF 0.76 oz……..	In-Furrow	14.0 a-d	65.0 fg	636.3
Gowan 9935 70DF 1.2 oz……	In-Furrow	16.8 c-g	60.0 efg	636.1
Gowan 9935 70DF 0.8 oz……..……..	In-Furrow	15.3 b-f	57.5 efg	653.2
Regalia 5SC 2.0 fl oz +				
Quadris SC250GL 0.6 fl oz……..	In-Furrow	17.8 e-h	10.0 a	687.6
Regalia 5SC 2.2 fl oz +				
Quadris SC250GL 0.6 fl oz……...	In-Furrow			
Regalia 5SC 1.0 qt +				
Quadris SC250GL 6.0 fl oz……..	Spray 1 + 2	20.8h	15.0 ab	671.4
Emesto Silver 118FS 0.31 fl oz +				
Manzate 75DF 1.0 lb…….....	Seed Treatment	17.8 e-h	20.0 a-d	618.9
Emesto Silver 118FS 0.31 fl oz +				
Manzate 75DF 1.0 lb	Seed Treatment			
Serenade Soil 7.7 fl oz……..……	In-Furrow	15.3 b-f	12.5 ab	606.8
Regalia 5SC 2.0 fl oz	Seed Treatment			
Quadris SC250GL 0.6 fl oz……..…	In-Furrow	17.3 d-h	30.0 a-d	640.9
Maxim MZ 6.2 0.5 lb……	Seed Treatment	17.5 d-h	10.0 a	656.8
Tops MZ 8.5D 1.0 lb……	Seed Treatment	15.8 b-h	37.5 b-e	661.8
A18232 435.7FS 0.308 fl oz……	Seed Treatment	15.8 b-h	15.0 ab	643.9
A16148 500FS0.046 fl oz +				
A9765 600FS 0.128 fl oz…….	Seed Treatment	16.8 c-g	7.5 a	693.7
A16148 500FS 0.077 fl oz +				
A9765 600FS 0.128 fl oz…..……..	Seed Treatment	14.5 a-e	5.0 a	644.9
A18232 435.7FS 0.308 fl oz +				
A16148 500FS 0.046 fl oz…..…….	Seed Treatment	15.3 b-f	6.7 a	649.1
A18232 435.7FS 0.308 fl oz +				
A16148 500FS 0.077 fl oz…..……	Seed Treatment	18.0 e-h	15.0 ab	701.2
A18232 435.7FS 0.308 fl oz +				
A16148 500FS 0.077 fl oz +				
A12946 250SC 0.614 fl oz…..……...	Seed Treatment	11.3 a	7.5 a	582.2
Emesto Silver 118FS 0.31 fl oz +				
Admire Pro 4.6SC 0.35 oz…..……	Seed Treatment	17.5 d-h	15.0 ab	663.2
Regalia 5SC 2.0 fl oz…..…….....	Seed Treatment	12.5 ab	30.0 a-d	626.9
Regalia 5SC 2.0 fl oz	Seed Treatment			
Regalia 5SC 2.0 qt…..…….	Spray 1	13.5 abc	45.0 def	649.5

[z] Foliar applications were applied at either the 4-6 leaf rosette stage on 29 May (Spray 1) and/or at the hooking stage 12 June (Spray 2).
[y] 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.
[x] Treatment rates applied in-furrow are given per linear 1000 row ft. Seed treatment rates are given per 100 lb seed. Foliar treatment rates are given per acre.