

POTATO (*Solanum tuberosum* 'Russet Burbank')
Rhizoctonia/black scurf; *Rhizoctonia solani*

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Evaluation of at-plant fungicides for control of Rhizoctonia diseases of potato in Wisconsin, 2021.

Potatoes were planted on 4 May at the University of Wisconsin Hancock Agricultural 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. In preparation for planting, US#1 seed tubers were cut into approximately 2 oz pieces on 27 Apr. Seed pieces were allowed to heal for 7 days at 55°F with 98% relative humidity and good airflow for suberization. A randomized complete block design with four replications was used for the trial and treatment plots consisted of four, 20-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. Seed treatments were applied to tubers after seed cutting using a 1.06 qt Solo Hand Pump Sprayer at a rate equivalent to 3.70 L water/ton seed. In-furrow treatments were applied over the top of seed pieces in open furrows in a 12-in. band using a plot sprayer consisting of a tractor-mounted boom, pressurized with an air compressor, using TeeJet Twin Jet Flat Spray Tip nozzles TJ-60 11003VS. In-furrow applied fungicides were applied at a rate equivalent to 9.50 L water/1,000 row feet at 30 psi. Fertility, insect, and weed management was accomplished using standard commercial practices for the region. Plots relied upon natural inocula from seed and field sources for disease establishment. Seed emergence data were collected on 6 Jun from 20 linear feet of each of the center two rows of each plot (% seed emergence = number of emerged vines /maximum possible emerged vines (40)*100). Precipitation in Hancock during the potato production season was 22.38 in. Supplemental irrigation was applied 38 times during the potato production season for an additional 15.3 in. Vines were killed with a desiccant treatment of Diquat + non-ionic surfactant applied on 21 Sep. Plots were harvested and graded on 4 Oct. At harvest, tubers from the center two, 20-ft long rows of each 4-row plot were graded for size and yield. Twenty tubers were randomly selected from each plot, after washing, and were visually evaluated for symptoms of black scurf (% incidence = number of symptomatic tubers/20*100). All data were analyzed using ANOVA ($P=0.05$) and Fisher's LSD at $P=0.05$ (SAS version 9.2).

Disease pressure was very low in this trial with no visible black scurf on tubers at the time of harvest. This was likely due, in part, to unseasonably high temperatures and limited natural precipitation during the early production season. Vine emergence was very good across the trial with no phytotoxicity or emergence delay from any treatment. There were no significant differences among treatments in marketable yield. Two treatments, NAI-666 0.5 fl oz and NAI-9020 SC1.0 fl oz were the only treatments that had a significant increase in the yield of B size tubers compared to the non-treated control.

No.	Treatment and rate ^z	Application timing ^y	Emergence (%)	Marketable Yield (cwt) ^x	Bs Yield (cwt) ^w	
1	Non-treated Control		99.4	464.3	37.4	a-e ^v
2	Maxim MZ 7.5 DP 0.5 lb	Seed Trt	96.3	450.5	33.4	a-d
3	Maxim MZ 7.5 DP 0.5 lb	Seed Trt				
	Quadris 2.018 SC 0.6 fl oz	In-furrow	98.8	488.1	39.0	b-g
4	Quadris 2.018 SC 0.6 fl oz	In-furrow	96.3	448.4	33.2	a-c
5	Howler 5.5 oz	In-furrow	96.9	461.6	31.0	ab
6	Cruiser Maxx Vibrance Potato 0.5 fl oz	Seed Trt	98.1	490.6	42.7	d-g
7	Serifel 1.1 fl oz	In-furrow	99.4	497.0	42.3	c-g
8	NAI-666 0.5 fl oz + NIS 0.125% v/v	Seed Trt	98.1	507.4	38.8	a-g
9	NAI-666 0.5 fl oz	Seed Trt	98.8	469.9	48.0	g
10	Moncoat ST 0.51 fl oz	Seed Trt	96.3	531.8	29.7	a
11	Moncoat ST 0.51 fl oz + NAI-666 0.5 fl oz	Seed Trt	98.8	512.9	42.4	c-g
12	NAI-9020 SC 1.0 fl oz	Seed Trt	98.8	416.7	47.5	fg
13	Vibrance Ultra Potato FC 0.5 fl oz	Seed Trt	99.4	444.1	45.0	e-g
14	BIO_CNTR_0031 0.5 fl oz	In-furrow	97.5	504.6	34.6	a-d
15	BIO_CNTR_0031 1.0 fl oz	In-furrow	96.3	464.2	37.7	a-e
16	BIO_CNTR_0003 4.76 oz	In-furrow	98.8	423.0	40.0	b-g
17	BIO_CNTR_0064 9.8 fl oz	In-furrow	98.1	480.5	37.5	a-e
18	Serenade ASO 9.8 fl oz	In-furrow	98.1	474.8	37.8	a-e
19	Moncut 40SC 1.91 fl oz	In-furrow	98.1	506.2	38.4	a-f
20	Vertisan 1.67 EC 1.6 fl oz	In-furrow	96.9	507.3	32.3	ab

^zTreatment rates applied in-furrow are given per 1,000 row ft. Seed treatments are given per 100 lb seed.

^ySeed treatments and in-furrow treatments were applied at the time of planting.

^x Marketable yield refers to the weight of Size A potato tubers of a size range ≥ 2.5 in diameter in units of cwt = 100 lb.

^w Size B potato tubers are of a size range between 1.5 and 2.25 in diameter.

^v 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.