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

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Evaluation of at-plant fungicides and pop-up fertilizer for control of Rhizoctonia diseases of potato in Wisconsin, 2019.

Potatoes were planted on 7 May at the University of Wisconsin Hancock Agricultural Research Station in central WI to evaluate seed- and in-furrow- applied fungicides and pop-up fertilizer (Miracle-Gro Quick Start 8-24-8 lbs/A) 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 29 Apr. Seed pieces were allowed to heal for 8 days at 13°C with 95% 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 within 24 hours of planting 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 and pop-up fertilizer were applied at a rate equivalent to 9.50 L water/1000 row feet at 30 psi. Fertility, insect, and weed management was accomplished using standard commercial practices for the region. Plots relied upon natural inocula for disease establishment. Seed emergence data were collected on 7 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 24.4 in. Supplemental irrigation was applied 38 times during the potato production season for an additional 14.95 in. Vines were killed with a desiccant treatment of Diquat + non-ionic surfactant applied on 16 Sep with a second application on 23 Sep. Plots were harvested and graded on 30 Sep. 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 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.

Treatment Number, Treatment, and Rate[z]		Application Timing[y]	Emergence (%)		Total Plot Yield (cwt)		Marketable Yield (cwt)[x]	Bs Yield (cwt)[w]		Culls Weight (cwt)	
1	Non-treated Control		97.5	e[v]	569.9	e-i	408.8	154.5	e	3.3	a
2	NAI-9021 0.5 lb	Seed Treatment	85.6	ab	514.6	a-e	432.4	64.2	ab	9.0	b
3	NAI-9019 0.75lb	Seed Treatment	81.9	a	497.4	ab	432.5	55.6	a	4.7	a
4	MoncoatMZ 7.5DS 1.0 lb	Seed Treatment	90.6	b-e	482.8	a	410.8	62.7	ab	4.7	a
5	Emesto Silver 118FS 0.31 fl oz + Nubark 1.0	Seed Treatment	95.6	de	515.3	a-f	448.7	59.0	ab	3.8	a
6	Cruiser Maxx Vibrance Potato 0.5 fl oz	Seed Treatment	86.3	a-c	501.6	a-c	434.0	64.6	ab	1.5	a
7	Maxim MZ 7.5DP 0.5 lb	Seed Treatment	86.9	a-c	506.1	a-d	430.3	67.0	ab	4.4	a
8	Maxim MZ 7.5DP 0.5 lb Quadris 2.018 SC 0.6 fl oz	Seed Treatment In Furrow	91.9	b-e	518.8	a-g	433.2	78.7	a-c	3.4	a
9	Quadris 2.018 SC 0.6 fl oz	In Furrow	96.3	de	557.9	c-i	479.0	73.2	ab	2.9	a
10	Vertisan EC1.67 1.1 fl oz	In Furrow	93.8	b-e	551.6	b-i	475.6	71.9	ab	2.1	a
11	Elatus 45WG 0.5 fl oz	In Furrow	93.8	b-e	531.5	a-h	459.7	68.1	ab	1.9	a
12	Priaxor 4.17SC 0.48 fl oz	In Furrow	96.3	de	549.3	b-i	470.3	73.6	ab	2.7	a
13	Velum Prime 0.45 fl oz	In Furrow	89.4	a-e	583.3	hi	491.2	82.9	bc	4.6	a
14	Regalia 5SC 2.2 fl oz	In Furrow	85.6	ab	551.8	b-i	464.1	82.4	bc	2.6	a
15	Double Nickel LC 2.2 fl oz	In Furrow	88.1	a-d	572.5	f-i	492.7	73.6	ab	3.1	a
16	Howler 5.5 oz	In Furrow	86.3	a-c	558.2	c-i	474.2	79.5	a-c	2.3	a
17	Azteroid FC3.3 0.24 fl oz	In Furrow	92.5	b-e	590.7	i	419.5	162.5	e	4.4	a
18	Azteroid FC3.3 0.48 fl oz	In Furrow	97.5	e	574.0	g-i	408.9	159.9	e	2.6	a
19	Azteroid FC3.3 0.24 fl oz + Pop-up Fertilizer (P-u F) 8-24-8	In Furrow	94.4	c-e	597.1	i	437.1	154.2	e	2.9	a
20	Azteroid FC3.3 0.48 fl oz + P-u F 8-24-8	In Furrow	90.6	b-e	560.5	d-i	438.4	116.0	d	3.1	a
21	Azteroid FC3.3 0.24 fl oz + P-u F 8-24-8 + Regalia 5SC 2.2 fl oz	In Furrow	93.1	b-e	577.8	hi	465.7	105.2	cd	3.5	a
22	Azteroid FC3.3 0.48 fl oz + P-u F 8-24-8 + Regalia 5SC 2.2 fl oz	In Furrow	90.0	a-e	570.8	e-i	444.5	122.0	d	2.2	a

[Z] Treatment rates applied in-furrow are given per 1000 row ft. Seed treatments are given per 100 lb seed.
[Y] Seed 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.