

Evaluation of at-plant fungicides for control of Rhizoctonia diseases of potato in Wisconsin, 2025.

Potatoes were planted on 30 April 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 24 Apr. Seed pieces were allowed to heal 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. Inoculum was prepared by growing active cultures of a Wisconsin isolate of *Rhizoctonia solani* on sterile rye berries for 21 days. All plots, except for the non-treated control, were inoculated. The center rows of each plot were inoculated by placing 250 grams per row of infected rye berries directly over and between treated seed pieces prior to row closure. 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. Applications applied to mimic chemigation (treatments 16, 17, 18) were applied at 50% row closure (19 June) and row closure (2 July) with a plot sprayer consisting of a tractor-mounted boom, pressurized with an air compressor, using TeeJet Hollow Disc Cone D3-23 nozzles (16 nozzles at 8-in. spacing). Mock chemigation applications were immediately followed with irrigation (0.4 in rate). Fertility, insect, and weed management was accomplished using standard commercial practices for the region. Seed emergence data were collected on 12 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) *100). The number of vines exhibiting rhizoctonia stem lesions above the soil line were counted from the 2 center rows of each plot on 2 Aug. Vines were killed with a desiccant treatment of Diquat + non-ionic surfactant applied on 8 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 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). Precipitation in Hancock during the potato production season was 17.09 in. Supplemental irrigation was applied 45 times during the potato production season for an additional 17.8 in.

There were no significant differences among treatments for B size yield, C size yield, and cull weight (data not shown). There were significant differences in emergence with the seed treatments Anoint (13) and Cruiser Maxx Vibrance Potato (15) significantly reducing emergence when compared to the non-treated, non-inoculated control. While there were significant differences among treatments for marketable yield, no treatment had significantly more marketable yield than the non-treated, inoculated control. No treatment had a significantly greater marketable yield when compared to the non-treated control (non-inoculated). Four treatments (3, 5, 7, and 8) had a significant increase in the mean tuber weight when compared to both non-treated controls (inoculated and non-inoculated). All treatments had a significant reduction in Rhizoctonia stem canker incidence when compared to the non-treated, inoculated control. Elatus in furrow (12) was the only treatment that significantly reduced both black scurf incidence and severity on tubers when compared to the inoculated control. There was no phytotoxicity during the growing season associated with any treatment.

Treatment Number, Treatment, and Rate		Application timing ^z	Emergence (%)		Marketable Yield (cwt) ^y		Mean Tuber Weight (oz)		Stem Canker Incidence (%)		Black Scurf Incidence (%)		Black Scurf Severity (%)	
1	Non-treated, non-inoculated Control	-	92.5	b-f ^x	495.9	de	4.54	ab	4.38	a	0.00	a	0.00	a
2	Non-treated, inoculated Control	-	88.8	b-e	463.7	a-e	4.60	ab	20.63	c	91.25	d-h	2.24	d-h
3	Ethos Elite 16 fl oz/A	In Furrow	96.9	f	506.3	e	5.28	f	10.00	b	85.00	c-e	2.11	c-f
4	Ethos Elite 20 fl oz/A	In Furrow	87.5	b-d	436.2	a-c	4.86	a-d	6.88	ab	90.00	d-h	2.36	e-h
5	Ethos Elite 25.5 fl oz/A	In Furrow	93.8	c-f	482.4	b-e	5.24	ef	6.25	ab	89.00	d-g	2.60	g-j
6	Companion Maxx WP 1.8 oz/A	In Furrow	95.0	d-f	445.3	a-d	4.84	a-d	6.88	ab	88.75	d-g	2.50	f-j
7	CR-7 15 g/A	In Furrow	91.3	b-f	476.9	a-e	5.14	d-f	6.25	ab	96.25	gh	2.74	h-j
8	CR-7 30 g/A	In Furrow	91.3	b-f	478.0	a-e	5.06	c-f	7.50	ab	95.00	f-h	2.46	e-i
9	CR-7 60 g/A	In Furrow	93.8	c-f	510.4	e	4.85	a-d	8.13	ab	90.00	d-h	2.52	f-j
10	CR-7 15 g/A + Companion Maxx WP 1.8 oz/A	In Furrow	94.4	c-f	460.8	a-e	4.81	a-d	8.75	ab	90.00	d-h	2.95	ij
11	Quadris 2.018 SC 0.45 fl oz/1000rf	In Furrow	95.7	ef	463.0	a-e	4.50	a	7.50	ab	76.25	bc	1.78	b-d
12	Elatus 45 WG 7.26 oz/A	In Furrow	93.1	b-f	482.7	b-e	4.72	a-c	7.50	ab	68.75	b	1.29	b
13	Annoint 1.0 fl oz/cwt	Seed Treatment	74.4	a	428.3	a	4.90	b-f	8.13	ab	90.00	d-h	2.23	d-g
14	Amara 3 qt/A	In Furrow	87.5	b-d	443.5	a-d	4.72	a-c	8.75	ab	93.75	e-h	2.54	f-j
15	Cruiser Maxx Vibrance Potato 0.5 fl oz/cwt	Seed Treatment	73.8	a	430.3	ab	4.79	a-d	10.00	b	88.75	d-g	2.28	d-h
16	Trianum-P 2 lb/A	In-Furrow												
	Trianum-P 1 lb/A	1, 2	86.9	bc	430.3	ab	4.92	b-f	7.50	ab	98.75	h	3.00	j
17	Trianum-P 1 lb/A	In Furrow												
	Trianum-P 1lb/A	2	85.6	b	484.4	c-e	4.86	a-e	8.75	ab	86.25	d-f	1.96	c-e
18	Trianum-P 1 lb/A + Acadian Organic 2 lb/A	In Furrow, 2	88.1	b-e	464.9	a-e	4.76	a-d	5.00	a	83.75	cd	1.70	bc

^zSeed treatments and in-furrow treatments were applied at the time of planting. Foliar applications were applied at 1 = 50% row closure (19 June), and 2 = row closure (2 July).

^y 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.

^x 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.