

POTATO (*Solanum tuberosum* 'Lamoka')
Rhizoctonia canker and black scurf; *Rhizoctonia solani*

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Evaluation of fungicides to manage Rhizoctonia canker and black scurf of potato in Michigan, 2021.

A trial was established at the Montcalm Research Center in Lakeview, MI to determine the efficacy of commercially available fungicides at managing Rhizoctonia canker and black scurf of potatoes. The trial was set up with a randomized complete block design, and all programs were replicated four times. US#1 'Lamoka' potatoes were cut into 2-oz seed pieces and left to suberize before seed treatments were applied. Two row plots (34-in row spacing; 20 ft long) were hand planted 26 May. Before closing furrows, *R. solani* (anastomosis group 4) infested barley was placed in-furrow (6.0 g/row-ft) and in-furrow fungicide applications were made. A CO₂ powered backpack sprayer equipped with TJ2502E nozzles (10.5 gal/A; 19 PSI) was used to apply treatments. On 30 Jun, before hilling, plots were reinoculated with infested barley at 2.7 g/row-ft and programs 2, 3, and 4 received their banded applications. A CO₂ powered backpack, equipped with TJ4002E nozzles, was used to apply treatments at 15 gal/A. Stand counts were collected at emergence and again before differentiating individual plants became too difficult. Stem canker incidence (0-100%) and severity (0-100%) were rated from 1 ft of plants in each of the two rows on 21 Jul and 18 Aug. Both rows were harvested 22 Sep and graded 28 Sep. The total yield (CWT/A) and marketable yield (CWT/A) were calculated from the plot yields and tubers were rated for black scurf while on the grading line. Symptoms were rated on a 0-5 scale where 0 = no symptoms and 5 = more than 50% of the tuber surface area was affected; prior to analysis, scores were converted to percentages using a midpoint transformation. A generalized linear mixed model procedure was used to conduct the ANOVA and mean separations ($\alpha=0.05$).

Significant Rhizoctonia canker pressure and low black scurf pressure were observed uniformly throughout the nursery. Significant differences were observed among the stem canker severity data collected in July ($P < 0.05$), the lognormal distribution was used to normalize data. Program 10 was the only program with significantly lower severity than the control. Differences were not observed in the August stem canker rating. No differences were observed among the yield parameters at harvest for the tested programs. Additionally, black scurf severity ratings were not different among programs. Black scurf pressure on the tubers was considered low for the whole trial with severity values ranging between 0.2-2.1%.

No.	Product and Rate ^z	Timing ^y	Stem Canker Severity (%) July 21 (Normal)	Stem Canker Severity (%) July 21 (Lognormal) ^{x,w}	Stem Canker Severity (%) August 18 (Normal)	Black Scurf Severity (%) ^v	Yield (CWT/A)	Marketable Yield (CWT/A)
1	Control	-	6.0	1.7 a-c	22.5	0.5	231.2	202.9
2	Double Nickel LC (8 fl oz)	IF	5.0	1.5 ab	10.9	0.2	242.0	216.9
	Double Nickel LC (8 fl oz)	B						
3	Double Nickel LC (16 fl oz)	IF	4.0	1.3 ab	17.3	1.2	210.9	185.8
	Double Nickel LC (16 fl oz)	B						
4	Double Nickel LC (1 qt)	IF	2.5	0.8 b-d	17.2	1.0	249.5	219.7
	Double Nickel LC (1 qt)	B						
5	Heads Up (0.46 g/cwt)	S	4.6	1.5 ab	15.1	0.3	236.3	206.7
6	Emesto Silver (0.31 fl oz/cwt)	S	8.9	1.9 a	18.8	0.7	251.6	210.3
7	Heads Up (0.46 g/cwt)	S	5.3	1.6 ab	19.5	0.2	244.6	210.8
	Emesto Silver (0.31 fl oz/cwt)	S						
8	Quadris (12.3 fl oz)	IF	5.7	1.4 ab	14.4	2.1	256.0	224.5
9	Excalia (2 fl oz)	IF	2.8	0.8 b-d	27.3	0.3	221.6	194.4
10	Excalia (4 fl oz)	IF	1.5	0.1 d	24.7	0.3	248.7	214.5
11	Actinovate (3 oz)	IF	3.3	0.8 b-d	19.8	0.4	237.2	204.8
12	Actinovate (6 oz)	IF	4.1	1.3 ab	16.0	0.3	238.2	207.9
13	Actinovate (9 oz)	IF	2.5	0.8 b-d	17.8	0.4	220.3	186.8
14	Actinovate (3 oz)	IF	6.5	1.8 a	14.6	0.2	227.8	195.3
	Excalia (2 fl oz)	IF						

^z All rates are listed as a measure of product per acre, unless otherwise noted.

^y Application letters code for: S = seed treatment (20 May); IF = in-furrow (26 May); B = banded (30 Jun).

^x The lognormal distribution was used to normalize data prior to analysis, and values under the normal distribution are provided for reference.

^w Column values followed by the same letter were not significantly different based on Fisher's Protected LSD ($\alpha=0.05$); if no letter, then the effect was not significant.

^v Symptoms were rated on a 0-5 scale where 0 = no symptoms and 5 = more than 50% of the tuber surface area was affected; prior to analysis, scores were converted to percentages using a midpoint transformation.