

POTATO (*Solanum tuberosum* 'Lamoka')
Early Blight; *Alternaria solani*
Brown Spot; *Alternaria alternata*

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Evaluation of in-furrow and foliar fungicides to manage foliar diseases of potato in Michigan, 2022.

Experimental and commercially available fungicides were tested to determine their efficacy in managing potato early blight and brown spot. A field trial was established at the Montcalm Research Center in Stanton, MI. A randomized complete block design was used, and treatments were replicated four times. Soil type is a loamy sand. US#1 'Lamoka' potatoes were cut into 2-oz seed pieces and left to suberize. The trial was hand planted 1 Jun, and in-furrow treatments were applied before closing rows. A CO₂-powered backpack sprayer, equipped with TJ4002E nozzles, was used to apply fungicides in-furrow at 10.5 gal/A (40 psi). Plots were two rows wide (34-in row spacing) by 20 ft long and seeded at 1.2 seed/row-ft. Due to the trial's proximity to commercial potato fields, a blanket application of Manzate Max (1.6 qt/A) was applied weekly after row-closure to the entire trial to reduce the risk of late blight developing near commercially grown potatoes. Beginning at 50% row closure, seven foliar applications (B, C, D, E, F, G, and H) were made across programs on 14 Jul, 21 Jul, 26 Jul, 4 Aug, 10 Aug, 18 Aug, and 24 Aug. Foliar fungicides were applied at a rate of 20 gal/A (38 psi) via CO₂-powered backpack sprayer (TJ8004XR nozzles). Plots were inoculated on 28 Jul with an *A. solani* solution (9×10^3 conidia/mL) at 20 gal/A using the previously mentioned equipment. Stand establishment was monitored and foliar disease data (combined early blight and brown spot observations) were collected regularly throughout the growing season. The trial was harvested 29 Sep, and both rows were dug and later graded. The final disease incidence (DI), disease severity (DS), estimated yield, and estimated marketable yield (cwt/A) were compared among treatments. A generalized linear mixed model procedure was used to conduct the ANOVA and mean separations at the $\alpha=0.05$ significance level (SAS version 9.4).

Differences were observed among the foliar DI ($P < 0.0001$) and foliar DS ($P < 0.0001$) values of programs. All treated programs had significantly lower DI (38.8-66.3%) and DS (4.0-12.5%) values than the control (DI=80.0%, DS=21.3%). The lowest DI was observed in program 2, but it was not significantly different from several other programs. No significant differences were observed in yield or marketable yield. It is likely that the short infection duration due to late disease onset was not adequate time to observe differences among program yields.

No.	Treatment, Rate ^z , and Timing ^y	Disease Incidence (%) ^{x,w}		Disease Severity (%) ^w		Total Yield (cwt/A)	Marketable Yield (cwt/A)
1	Treated Control	80.0	a	21.3	a	382	327
2	Excalia (2 fl oz) A; Elumin (8 fl oz) B; Quash WG (2.5 oz) CF; Luna Tranquility (11.2 fl oz) DG; Bravo Weatherstik (24 fl oz) EH	38.8	e	4.5	c	372	322
3	Excalia (2 fl oz) A; Elumin (8 fl oz) B; Quash SC (2.5 fl oz) CF; Luna Tranquility (11.2 fl oz) DG; Bravo Weatherstik (24 fl oz) EH	46.3	c-e	4.0	c	424	376
4	Luna Tranquility (11.2 fl oz) CE	55.0	bc	8.5	bc	369	323
5	Propulse (10 fl oz) CE	53.8	c	5.8	c	386	342
6	Miravis Prime (10 fl oz) CE	41.3	de	4.0	c	403	351
7	Endura (5.5 oz) CE	66.3	b	12.5	b	367	318
8	Exp ^v (13 fl oz) A; Delaro (6 fl oz) B; Luna Tranquility (11.2 fl oz) E	47.5	c-e	6.3	c	391	343
9	Exp (13 fl oz) A; Delaro (6 fl oz) B; Propulse (10 fl oz) E	55.0	bc	8.3	bc	383	333
10	Elatus (6.4 oz) A; Miravis Prime (10 fl oz) E	53.8	c	5.8	c	356	309
11	Velum Prime (6.5 fl oz) A; Endura (5.5 oz) BE	52.5	cd	5.3	c	365	313
12	Elatus (6.4 oz) A; Miravis Duo (13.7 fl oz) CE	46.3	c-e	5.8	c	409	359

^z All rates are listed as a measure of product per acre. MasterLock was added to all tank mixes at a rate of 0.25 % v/v.

^y Application letters code for the following dates: A (in-furrow)=1 Jun, B=14 Jul (50% row closure), C=21 Jul, D=26 Jul, E=4 Aug, F=10 Aug, G=18 Aug, and H=24 Aug.

^x Column values followed by the same letter were not significantly different based on Fisher's Protected LSD ($\alpha=0.05$). If no letter, then means were not significantly different.

^w Final foliar disease incidence and severity ratings (combined early blight and brown spot) collected 7 Sep.

^v Exp=Experimental compound.