Evaluation of foliar fungicides to manage late blight of potato in Michigan, 2024

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Experimental and commercially available fungicides were tested to determine their efficacy for managing potato late blight (*Phytophthora infestans*). A field trial conducted at the Michigan State University Plant Pathology Farm in East Lansing, MI. A randomized complete block design was used, with programs replicated four times. Two-oz 'Lamoka' potato seed pieces were hand-planted 28 June. Plots were two rows wide (34-in spacing) by 18 ft long, and seeded at 1.2 seed/row-ft. Foliar programs were initiated 19 August with follow-up applications made weekly until 16 September. A CO_2-powered backpack sprayer, equipped with two TJ 8004XR nozzles, was used to apply fungicides at 20 gal/A. The trial was inoculated at sunset on 21 August (2 x 10^3 zoospores/mL) and 12 September (2.8 x 10^4 zoospores/mL) at 20 gal/A using the previously described equipment. After inoculating the trial, a misting system was used to maintain leaf wetness and facilitate disease development. Foliar disease incidence (DI) and disease severity (DS) ratings (0-100%) were collected for each plot 21 August, 26 August, 2 September, 9 September, 19 September and 23 September. Due to wet, heavy soil conditions, the trial was not harvested. The disease index values (DX) were calculated by multiplying the DI by DS and dividing by 100. The area under the disease progress curve (AUDPC) was calculated for each program using the DX values. The final DI, DS, and AUDPCs were compared among programs. A generalized linear mixed model procedure was used to conduct the ANOVA and mean separations (α=0.05).

Differences were observed in the DI and DS values of programs ($P < 0.0001$). Programs 2-7 (0.0-2.5%) and program 10 (52.3%) had significantly lower DI than the control (71.3%). DS values for programs 2-7 (0.0-3.8%) and program 10 (28.8%) were also significantly lower than the control (52.5%). Programs 2-7 did not differ from each other but had significantly lower DI and DS than program 10. AUDPCs for programs 2-7 and 10 were significantly lower than the control ($P<0.0001$). The DI, DS, and DX for programs 8 and 9 were not significantly different from the control.

No.	Treatment (Rate[v]) Timing[w]	Disease Incidence[x,y] (%)		Disease Severity[x] (%)		AUDPC[z]	
1	Non-treated control	71.3	a	52.5	a	166.2	a
2	Bravo Weather Stik (1.5 pt) ABCDE	0.6	c	0.4	c	0.1	c
3	Bravo Weather Stik (1.5 pt) ACE + Dithane F-45 (1.6 qt) BD	0.0	c	0.0	c	0.0	c
4	BCS-CS55621 (13.7 fl oz) ABD + Reason 500 SC (5.5 fl oz) AB + Bravo Weather Stik (1.5 pt) CDE	0.0	c	0.0	c	0.0	c
5	Orondis Ultra (8 fl oz) ABD + Bravo Weather Stik (1.5 pt) CE	0.6	c	0.4	c	0.1	c
6	Latitude (29 fl oz) ABCDE	2.5	c	3.8	c	0.8	c
7	Orondis Opti (2.5 pt) ABCDE	0.6	c	0.4	c	0.1	c
8	CX-100082 (16 fl oz) ABCDE	73.8	a	52.5	a	159.7	a
9	CX-100082 (32 fl oz) ABCDE	67.3	ab	45.4	ab	132.7	ab
10	CX-100082 (64 fl oz) ABCDE	52.3	b	28.8	b	62.1	bc
	SE	*4.7*		*6.2*		*24.1*	
	P-value	*<0.0001*		*<0.0001*		*<0.0001*	
	LSD	*14.3*		*17.6*		*69.3*	

[v] All rates are listed as a measure of product per acre, unless otherwise specified. MasterLock was added to all foliar tank mixes at a rate of 0.25 % v/v.

[w] Application letters code for the following dates: A=19 August, B=26 August, C=2 September, D=9 September, and E=16 September.

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

[y] Final foliar disease incidence and severity ratings (combined early blight and brown spot) 23 September.

[z] Area under the disease progress curve was calculated using the disease index values from 21 August, 26 August, 2 September, 9 September, 19 September and 23 September.