

Evaluation of foliar fungicides to manage late blight of potato in Michigan, 2019.

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Commercially available fungicides were tested to determine their efficacy for managing potato late blight. A field trial was established at the Michigan State University Plant Pathology Farm in Lansing, MI. A randomized complete block design was used, and treatments were replicated four times. US#1 ‘Lamoka’ potatoes were cut into 2-oz seed pieces, treated with Cruiser Maxx Potato Extreme (0.31 fl oz/100 lb seed), and then left to suberize. The trial was planted 27 Jun. Plots were two rows wide (36-in row spacing) by 20 ft long (10-in seed spacing) and were planted by hand. Equipment was used to open and close furrows. Potatoes and non-target pests were managed following standard grower practices. First fungicide applications occurred the morning of 20 Sep, and were repeated weekly until 8 Oct. A CO₂ powered backpack sprayer, equipped with two TJ 8004XR flat fan nozzles and operating at a boom pressure of 38 psi, was used to apply fungicides at 20 gal/A. Inoculations were postponed until 20 Sep, pending an earlier in-state detection. At sunset on 20 Sep, liquid *P. infestans* inoculum (2.0×10^3 sporangia/mL) was applied using the previously mentioned spray equipment, which was sanitized before and after use. To document disease progression, disease ratings were conducted regularly until vines were chemically killed 8 Oct. The plot disease incidence (0-100%) and plot disease severity (0-100) were estimated and then used to calculate a plot disease index. Tubers were harvested from both rows 24 Oct and washed and graded to determine marketable yield (cwt/A). A generalized linear mixed model procedure was used to conduct the ANOVA ($\alpha=0.05$) and mean separations.

End of season disease incidence and disease severity ratings were used to calculate a disease index (DX) value for each treatment. Mean index values for treated plots ranged from 0.02% to 10.13% and, though not different from each other, were significantly lower than the non-treated control (85.06%; $P<0.001$). Marketable yield was not different among treatments ($P>0.05$), and ranged between 265 and 300 cwt/A. The lack of differences among treatments, despite strong disease pressure, was likely due to the short period of disease progression. At the requests of Michigan potato growers, the trial was terminated within 3 wk of the first late blight detection. Had disease onset occurred earlier, or disease continued to progress, it is possible significant differences among treatment yields would have been observed.

Table 1.

No.	Treatment, Rate ^z , and Timing ^y	Disease Index (%) ^{x, w}	Marketable Yield (cwt/A)
1	Non-Treated Control	85.06 a	273.9
2	Bravo Weather Stik (1.5 pt) ABC	10.13 b	300.4
3	Orondis Opti (2.5 pt) A + Bravo Weather Stik (1.5 pt) BC	5.01 b	262.4
4	Orondis Opti (2.5 pt) A + Revus Top (5.5 fl oz) B + Bravo Weather Stik (1.5 pt) C	0.02 b	265.7

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

^y Application letters code for the following dates: A= 20 Sep, B= 25 Sep, C= 4 Oct.

^x Disease index was calculated by multiplying the disease incidence (0-100%) by the mean severity (0-100), then dividing by 100.

^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.

Other pathology trials for potatoes in Michigan, 2019.

Another trial was conducted at the Plant Pathology Research Farm to investigate the efficacy of a foliar applied experimental compound at managing early blight. Methods are similar to those described here. These experiments are still in early stages, but results are available upon request.