Evaluation of foliar fungicides to manage late blight of potato in Michigan, 2018.

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A fungicide efficacy trail was established at the Michigan State University Plant Pathology Farm in Lansing, MI. The objective of this trial was to compare the levels of late blight control provided by commercially available fungicides. To achieve this objective, a randomized complete block design was used, which was replicated four times. Potato seed was cut from US#1 'Snowden' tubers into 2 oz pieces, and allowed to suberize for 5 d before planting. To mitigate risk of late blight to commercial crops, planting was delayed until 6 Jun, to offset trial maturity for intended inoculation. Furrows were mechanically opened, so that seed could be hand planted. Plot dimensions were 4 rows wide, on 36-in. row spacing, and 20 ft long with 10-in. seed spacing. Two spreader rows of the highly susceptible variety 'Atlantic' were planted as borders along the trial. After planting, furrows were mechanically closed. Standard grower practices were followed to manage the trial and non-target pests. First fungicide applications occurred on 24 Jul, and were repeated weekly until 13 Sep. A CO_2 powered backpack sprayer, equipped with two TJ 8004XR flat fan nozzles and operating at a boom pressure of 24 psi, was used to apply fungicides at 15 gal/A. Inoculations were postponed until 15 Aug, pending an earlier in-state detection. At sunset on 15 Aug, liquid *P. infestans* inoculum ($3.6x10^3$ spores/mL) was applied using the previously mentioned spray equipment. Disease progression was recorded daily for the first 2 weeks after inoculation, then recorded weekly. In-field sprinklers were run late morning and late afternoon daily to extend periods of leaf wetness. The trial was not irrigated for 24 hr after applying treatments. Vines were removed by hand 9 Oct, and the center two rows of each plot harvested 12 Oct. Potatoes were washed and the marketable yield (cwt/A) determined. A general linear mixed model procedure was used to conduct the ANOVA and mean separations at α=0.05.

Disease incidence was not significantly different among treatments in either the lower or upper canopy (P>0.05). Additionally, no differences were detected in disease severity of the lower or upper canopy (P>0.05). Disease incidence was overall low in the trial. The greatest mean disease incidence was 3.8% in the upper canopy and 0.5% in the lower canopy, both of these values were from the non-treated control. The mean severity was <1% in both upper and lower canopy. Marketable yield (cwt/A) did not differ among treatments. The range of mean yield was 267.0-385.1 cwt/A, with the lowest mean recorded in the non-treated control. Despite irrigation, the overall hot and dry Aug inhibited disease establishment. Initial disease ratings showed relatively high disease establishment, however, disease levels stalled and fluctuated with the hot, dry bouts. The overall low disease pressure made assessing the efficacy of the tested fungicides difficult. No significant differences were detected, but this is believed to be due to the unfavorable environmental conditions for the pathogen.

No.	Treatment and Rate/A	Upper Canopy DI (%)[z, y]	Upper Canopy DS (%)[x]	Lower Canopy DI (%)	Lower Canopy DS (%)	Marketable Yield (cwt/A)
1	Non-treated Control	3.8	0.05	0.5	0.02	267.0
2	Manzate Max 1.6 qt	0.0	0.00	0.1	0.01	385.1
3	Bravo Weather Stik 1.5 pt	0.0	0.00	0.0	0.00	364.3
4	Oranil 6L 1.5 pt	0.3	0.00	0.0	0.00	348.0

[z] Disease incidence (DI) reported as a visual estimate of the percent plants in the plot exhibiting signs/symptoms.
[y] Column values followed by the same letter are not significantly different based on Fisher's Protected LSD (α=0.05); if no letter, then the effect is not significant.
[x] Disease severity (DS) reported as a visual estimate of the percent leaf area of infected plants showing signs/symptoms.