Evaluation of foliar fungicide timing to manage white mold of potato in Michigan, 2022.

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Montcalm Research Center (MRC): In 2022, a foliar fungicide timing trial was established at MRC in Lakeview, MI and managed by the Potato and Sugar Beet Pathology program. The trial objective was to determine the most effective timing of fungicide applications for managing white mold in potato. A randomized complete block design, with four replicates, was used. Potato seed were cut from US#1 'Lamoka' and an undisclosed white mold susceptible Frito Lay variety tubers and allowed to suberize before planting. The trial was hand-planted 1 Jun. Plots were two rows wide (34-in. row spacing) by 20 ft long and a 10-in seed spacing was used. Standard grower practices were followed to manage non-target pests. Fluazinam applications (8 fl oz/A) were made at full bloom and 14-d post-bloom; treatments of full bloom, post-bloom, and full followed by post-bloom applications were compared to a grower standard control. A CO_2 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. To control for late blight, weekly chlorothalonil or mancozeb applications were initiated 1 Jul and applied until vine kill. Apothecia data were collected weekly between approximately 5 Jul and 17 Aug. Disease data were collected 17 Aug and 7 and 14 Sep. Ten stems were arbitrarily rated from both rows and assigned a disease severity (0-3). The severity ratings were: 0 = no disease to 3 = infection girdling mainstem, resulting in wilting and/or death. The ratings were used to calculate a percent disease incidence (DI) and average disease severity of symptomatic plants (DS; 0-3). Disease index (DX) was calculated from the following equation: DX = DI x DS/3. The plots were harvested 28 Sep. On 7 Oct, potatoes were washed then graded for size, weight, specific gravity, and internal defects. A generalized linear mixed model procedure was used to conduct the ANOVA and mean separations at α=0.05.

Mean DX values ranged between 34 and 43% at the final rating for the Frito Lay variety (Table 1) and 23 to 35% for Lamoka (Table 2). White mold indices were lower than in 2021. Across both varieties, most treatments resulted in numerically lower DX values by Sep 7 when compared to the grower standard control. In the Lamoka trial, the 14-d post-bloom and two-application programs resulted in significantly lower frequencies of severely symptomatic stems observed Sep 14 ($P < 0.05$). No significant differences in total or marketable yield were observed ($P > 0.05$). In the Frito Lay variety, the greatest yields were observed in the two-application program, whereas Lamoka yields were greatest following the single 14-d post-bloom application. Apothecial observations indicated that inoculum pressure developed later in the season, likely due to the drier than normal early growing season. Apothecia were observed beginning the last week of July and peaked in early August (two to three weeks after full bloom) supporting white mold reductions in programs that included a later 14-d post-bloom application. Flowers continued to be present at low percentages in the Frito Lay variety for several weeks which could have contributed to the higher end-of-season disease indices. Overall, several site-years of observations suggest that, in varieties with longer flowering periods and when apothecia are present, fungicide applications after the full bloom period may offer more effective white mold control.

Table 1. White mold, yield, and marketable yield observations in treatments tested on undisclosed Frito Lay variety in small-plot research at the Montcalm Research Center in Lakeview, MI in 2022.

No.	Treatment, Rate[z], and Timing[y]	DX (%)[x] Aug 17	DX (%) Sep 7	Severe DI (%) Sep 14	Total Yield (CWT/A)	Marketable Yield (CWT/A)
1	Grower standard treated control	20.8	43.3	21.3	376.7	354.7
2	Omega 500F (8 fl oz) full bloom	28.3	40.9	16.5	377.3	349.9
3	Omega 500F (8 fl oz) 14-d post-bloom	13.3	38.3	13.0	367.1	338.1
4	Omega 500F (8 fl oz) full bloom + 14-d post-bloom	20.0	34.4	11.8	388.6	362.7

[z] All rates, unless otherwise specified, are listed as a measure of product per acre, and all tank mixes contained MasterLock at a rate of 0.25 % v/v.
[y] Applications were made on the following dates for Frito Lay variety: full bloom = 14 Jul and 14-d post-bloom = 27 Jul.
[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 the effect was not significant.

Table 2. White mold, yield, and marketable yield observations in treatments tested on Lamoka in small-plot research at the Montcalm Research Center in Lakeview, MI in 2022.

No.	Treatment, Rate[z], and Timing[y]	DX (%)[x] Aug 17	DX (%) Sep 7	Severe DI (%) Sep 14	Total Yield (CWT/A)	Marketable Yield (CWT/A)
1[w]	Grower standard treated control	18.4	35.0	17.9 a	451.1	391.2
2	Omega 500F (8 fl oz) full bloom	15.8	27.5	20.4 a	458.6	390.4
3	Omega 500F (8 fl oz) 14-d post-bloom	19.2	32.0	7.1 b	472.0	404.2
4	Omega 500F (8 fl oz) full bloom + 14-d post-bloom	12.5	23.3	7.5 b	442.1	391.8

[z] All rates, unless otherwise specified, are listed as a measure of product per acre, and all tank mixes contained MasterLock at a rate of 0.25 % v/v.
[y] Applications were made on the following dates for Lamoka: full bloom = 21 Jul and 14-d post-bloom = 4 Aug.
[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 the effect was not significant.
[w] Treated control.