**Evaluation of foliar fungicide timing to manage white mold of potato in Michigan, 2020.**

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***Montcalm Research Center (MRC):*** A foliar fungicide timing trial was established at MRC in Lakeview, MI and managed by the Potato and Sugar Beet Pathology program (Bloomingdale and Willbur). 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' tubers and allowed to suberize before planting. The trial was hand-planted 12 Jun. Plots were four 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 30 Jul (full bloom) and 13 Aug (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 applications (1.5 pt/A) were initiated 22 Jul and applied until vine kill 31 Aug. Apothecia and disease data were collected 20 Jul and 13 Aug. Ten stems were arbitrarily rated from the center two rows of plots 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 center two rows of plots were harvested 24 Sep, potatoes were washed then specific gravity and internal defects determined. Due to a technical failure, tuber size and yield data were lost and were not available for these analyses. A generalized linear mixed model procedure was used to conduct the ANOVA and mean separations at $\alpha$=0.05.

Mean DI values from the final rating ranged between 32.5 and 43.8% and DX values ranged between 10.8 and 17.1%. There were no differences among mean DI ($P > 0.05$) or mean DX ($P > 0.05$) values of various timings (Table 1). Specific gravities ranged from 1.080 to 1.082 and were also not different among tested fungicide programs ($P > 0.05$). As a result of the low white mold pressure observed in this location, no differences among the fluazinam timings were detected. Nutrient management programs to promote canopy and disease development, as well as alternate locations with naturally elevated levels of white mold pressure, will be considered for future trials.

Table 1. White mold and specific gravity observations in treatments tested in small-plot research at the Montcalm Research Center in Lakeview, MI in 2020.

| No. | Treatment, Rate[z], and Timing[y] | DI (%)[x] | DX (%) | Specific Gravity |
|---|---|---|---|---|
| 1[w] | Grower standard treated control | 35.0 | 12.5 | 1.082 |
| 2 | Omega 500F (8 fl oz) full bloom | 43.8 | 17.1 | 1.080 |
| 3 | Omega 500F (8 fl oz) 14-d post-bloom | 33.8 | 11.3 | 1.081 |
| 4 | Omega 500F (8 fl oz) full bloom + 14-d post-bloom | 32.5 | 10.8 | 1.081 |

[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: full bloom = 30 Jul and 14-d post-bloom = 13 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 the effect was not significant.

[w] Treated control.

***Dale Johnson Farm, Sagola, MI:*** A foliar fungicide timing trial was established on the Dale Johnson Potato Farm in Sagola, MI and managed by the grower with guidance from MSU Extension (DeDecker). The trial objective was to determine the most effective timing of fungicide applications for managing white mold in potato. A completely randomized design with three replicates was used. A commercial potato field with a history of white mold was selected for the trial and planted to the variety Silverton using standard grower practices. Plots were 36 rows wide (34-in. row spacing), running the length of the field, to accommodate the grower's self-propelled sprayer. Standard grower practices were followed to manage non-target pests. A John Deere R4038 sprayer, equipped with air-induction flat fan nozzles, was used to apply fungicides at 40 gal/A. To control for late blight, weekly chlorothalonil applications (Bravo Ultrex at 1.25 lbs/A) were made until vine kill. Fluazinam applications (8 fl oz/A) were made 20 Jul (full bloom) and 3 Aug (14-d post-bloom) as a tank mix with chlorothalonil. Treatments of full bloom and 14-d post-bloom were compared to the grower's standard treated control (chlorothalonil only). Apothecia and disease data were collected 20 Jul and 27 Aug, respectively. No apothecia were observed at the full bloom timing. Fifty stems were later rated (5 subsamples of 10 stems each) from the center twelve rows of each plot 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. A generalized linear mixed model procedure was used to conduct the ANOVA and mean separations at $\alpha$=0.05.

DI values from the final rating ranged between 30.0 and 72.0% and DX values ranged between 12.7 and 38.7%. There were significant differences among mean DI ($P$ = 0.0006) and mean DX ($P$ = 0.01) values of the treatments (Table 2). These results suggest that later fungicide applications may be helpful in managing potato white mold, particularly in longer flowering varieties. Possible confounding factors in this study included a) that our full bloom application was slightly early (1-2 days), and b) a wind event that removed many blossoms between the full bloom and post bloom applications.

Table 2. White mold observations in treatments tested on-farm in Sagola, MI in 2020.

| No. | Treatment, Rate[z], and Timing[y] | DI (%)[x] | DX (%) |
|---|---|---|---|
| 1[w] | Grower standard treated control | 72.0 a | 38.7 a |
| 2 | Omega 500F (8 fl oz) full bloom | 50.0 b | 25.1 b |
| 3 | Omega 500F (8 fl oz) 14-d post-bloom | 30.0 c | 12.7 c |

[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: full bloom = 20 Jul and 14-d post-bloom = 3 Aug.

[x] Column values followed by the same letter were not significantly different based on Student–Newman–Keuls multiple comparisons test ($\alpha$=0.05); if no letter, then the effect was not significant.

[w] Treated control.