POTATO (*Solanum tuberosum* 'Atlantic')
White Mold; *Sclerotinia sclerotiorum*
Early blight; *Alternaria solani*

S. A. Jordan and A.J. Gevens
Department of Plant Pathology
University of Wisconsin-Madison
Madison, WI 53706

Evaluation of foliar fungicides for control of white mold and early blight of potato in Wisconsin, 2023.

A field trial was conducted at the University of Wisconsin Agricultural Research Station in Hancock, WI to evaluate fungicide programs for control of white mold and foliar early blight on potato. Seed pieces, approximately 2 oz in size, were cut mechanically from US#1 'Atlantic' seed tubers on 24 Apr. Seed pieces were allowed to heal prior to planting on 5 May. A randomized complete block design with four replications was used for the trial, and treatment plots consisted of four 20-ft-long rows spaced 36 in. apart with 12 in. spacing in the row. To minimize soil compaction and damage to plants in the treatment rows, drive rows for pesticide application equipment were placed adjacent to the plots. Seed treatments were applied to tubers within 24 hours of planting using a 1.06 qt Solo Hand Pump Sprayer at a rate equivalent to 3.70 L water/ton seed. In-furrow treatments were applied over the top of seed pieces in open furrows in a 12-in. band using a plot sprayer consisting of a tractor-mounted boom, pressurized with an air compressor, using TeeJet Twin Jet Flat Spray Tip nozzles TJ-60 11003VS. In-furrow applied fungicides were applied at a rate equivalent to 9.50 L water/1000 row feet at 30 psi. At-hilling applications were applied directly over freshly hilled plots on 22 May using a CO2-pressurized backpack sprayer with a 4-nozzle spray boom with 19 in. spacing between standard flat fan spray nozzles (Tee Jet 8002VS) at a rate of 35 gal/A at 40 psi. Fertility, insect, and weed management were accomplished using standard commercial practices for the region. Fungicide treatments were initiated at 50% row closure, starting on 21 Jun, and were sprayed a total of 4 applications. (21 Jun, 5 Jul, 19 Jul, 2 Aug). Foliar fungicides were applied with a plot sprayer consisting of a tractor-mounted boom, pressurized with an air compressor, using TeeJet Hollow Disc Cone D3-23 nozzles (16 nozzles at 8-in. spacing). Fungicides were applied at a rate equivalent to 35 gal water/A at 40 psi. Plots were not inoculated for white mold or early blight, but relied on natural dispersal of inocula from soil and residue. White mold strike counts and early blight severity across 20 ft of the two center rows was rated on 23 Jun, 30 Jun, 13 Jul, 25 Jul, 8 Aug, and 28 Aug using the Horsfall-Barratt rating scale (0-11 rating with 0=no disease, 11=100% disease severity). The Area Under the Disease Progress Curve (AUDPC) was determined by trapezoidal integration and then converted into Relative AUDPC (RAUDPC), i.e. percentage of the maximum possible AUDPC for the whole period of the experiment. Vine kill was initiated on 30 Aug with an application of Diquat E at 1.5 pt/A followed by a second application on 5 Sep. Tubers from the center 2 rows of each 4-row plot were harvested and graded on 12 Sep. Total precipitation in Hancock during the potato production season was 7.76 in. Supplemental irrigation was applied 42 times during the potato production season for an additional 18.4 in. All data were analyzed using ANOVA ($P = 0.05$) and Fisher's LSD at $P = 0.05$ (SAS Version 9.2).

Early blight onset was typical, but June and July were hotter and drier than normal, leading to slower disease development as the season progressed. There were no significant differences in early blight RAUDPC among programs No measurable white mold strikes were found during the duration of the trial. There were no significant differences in emergence or marketable yields among fungicide programs. Program 3 had significantly lower B size yield when compared to the non-treated control. Programs 16, 19, 22, and 24 had significantly greater B size yield than the non-treated control. Programs 9, 22, and 24 had significantly greater C size yield when compared to the non-treated control. No phytotoxicity was observed with any of the fungicide programs throughout the duration of the trial.

	Treatment Number, Treatment, and Rate/A	Application Timing[z]	Emergence (%)	Marketable Yield (cwt/A)[y]	Bs Yield (cwt)[x]		Cs Yield (cwt)[w]		Early Blight RAUDPC[u]
1	Non-treated Control	NA	85.0	509.2	14.4	b-d[v]	1.5	a-e	0.289
2	F4413-1 10.0 fl oz	In-furrow	90.0	524.1	9.5	ab	1.2	a-c	0.202
3	Topguard EQ 4.29 SC 28 fl oz	In-furrow	73.1	496.2	7.5	a	0.7	a	0.230
4	Adastrio 4.0 SC 18.0 fl oz	Hilling	90.6	527.7	14.3	b-d	1.6	b-g	0.207
5	Topguard EQ 4.29 SC 28 fl oz	Hilling	83.8	470.4	13.6	b-d	1.2	a-c	0.218
6	Adastrio 4.0 SC 9.0 fl oz + MSO 1% v/v Endura 70 WG 7 oz + Supertin 4L 5 fl oz	50% Row Closure, 1 3	83.8	470.2	12.1	a-c	1.3	a-d	0.193
7	Luna Tranquility 4.16 SC 11.2 fl oz + MSO 1% v/v Endura 70 WG 7 oz + Supertin 4L 5 fl oz	50% Row Closure, 1 3	92.5	504.2	17.4	d-g	1.7	b-h	0.260
8	Orlian 17.1 fl oz + NIS 0.25% v/v	1-3	90.6	510.6	15.3	c-f	1.8	b-h	0.243
9	Orlian 20.5 fl oz + NIS 0.25% v/v	1-3	95.0	480.6	17.2	c-g	2.4	f-h	0.276
10	Orlian 24.0 fl oz + NIS 0.25% v/v	1-3	88.1	483.3	16.6	c-g	1.6	a-f	0.263
11	Orlian 30.0 fl oz + NIS 0.25% v/v	1-3	92.5	502.1	16.5	c-g	2.4	e-h	0.241
12	Vertisan 15.0 fl oz + NIS 0.25% v/v	1-3	81.3	470.1	13.5	b-d	1.3	a-d	0.223
13	Approach 2.34 SC 12.0 fl oz + NIS 0.25% v/v	1-3	85.0	467.0	12.6	a-d	1.0	ab	0.230
14	Luna Tranquility 4.16 SC 11.2 fl oz + NIS 0.25% v/v	1-3	87.5	521.9	15.0	c-e	1.7	b-h	0.214
15	Emesto Silver 118FS 0.31 fl oz/cwt Experimental 1 13 fl oz Bravo WS 6SC 1.5 pt Propulse1.67 SC 10.0 fl oz + Bravo WS 6SC 1.5 pt Scala 5.0 SC 7.0 fl oz + Bravo WS 6SC 1.5 pt	Seed Trt In-furrow 50% Row Closure 1 3	86.3	508.0	16.9	c-g	1.8	b-h	0.206
16	Emesto Silver 118FS 0.31 fl oz/cwt Experimental 1 13 fl oz Bravo WS 6SC 1.5 pt Propulse1.67 SC 10.0 fl oz + Bravo WS 6SC 1.5 pt Luna Tranquility 4.16 SC 11.2 fl oz + Bravo WS 6SC 1.5 pt	Seed Trt In-furrow 50% Row Closure 1 3	91.9	487.6	19.8	e-h	1.8	b-h	0.215
17	Emesto Silver 118FS 0.31 fl oz/cwt Elatus 45WG 6.4 oz Bravo WS 6SC 1.5 pt Miravis Prime 3.33SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	Seed Trt In-Furrow 50% Row Closure 1,3	91.9	479.4	17.6	d-h	1.9	c-h	0.182
18	Emesto Silver 118FS 0.31 fl oz/cwt Experimental 1 13 fl oz Bravo WS 6SC 1.5 pt	Seed Trt In-Furrow 50% Row Closure							

	Endura 70WG 5.5 oz + Provysol 3.34 SC 4 fl oz + Bravo 1.5 pt	1,3	85.6	505.2	14.5	b-d	1.6	b-g	0.219
	Emesto Silver 118FS 0.31 fl oz/cwt	Seed Trt							
	Experimental 1 13 fl oz	In-furrow							
19	Delaro 325 SC 8.0 fl oz + Bravo WS 6SC 1.5 pt	50% Row Closure							
	Bravo WS 6SC 1.5 pt	1							
	Luna Tranquility 4.16 SC 11.2 fl oz + Bravo WS 6SC 1.5 pt	3	95.6	523.1	22.7	h	2.2	e-h	0.243
	Emesto Silver 118FS 0.31 fl oz/cwt	Seed Trt							
	Experimental 1 13 fl oz	In-furrow							
20	Quadris 2.018 SC 9.0 fl oz	50% Row Closure							
	Bravo WS 6SC 1.5 pt	1							
	Miravis Prime 3.33SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	3	91.9	507.6	20.2	f-h	2.2	d-h	0.202
	Emesto Silver 118FS 0.31 fl oz/cwt	Seed Trt							
	Elatus 45WG 6.4 oz	In-furrow							
21	Quadris 2.018 SC 9.0 fl oz	50% Row Closure							
	Omega 500F 8.0 fl oz + Bravo WS 6SC 1.5 pt	1							
	Miravis Prime 3.33SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	3	91.3	491.1	17.3	c-g	2.1	c-h	0.223
	Emesto Silver 118FS 0.31 fl oz/cwt	Seed Trt							
22	Experimental 1 13 fl oz	In-Furrow							
	Headline 2.09 SC 9.0 fl oz	50% Row Closure							
	Endura 70WG 5.5 oz + Provysol 3.34 SC 4 fl oz + Bravo 1.5 pt	1,3	92.5	488.8	20.9	gh	2.5	h	0.205
	Emesto Silver 118FS 0.31 fl oz/cwt	Seed Trt							
	Experimental 1 13 fl oz	In-furrow							
23	Bravo WS 6SC 1.5 pt	50% Row Closure							
	Velum Prime 6.5 fl oz + Bravo WS 6SC 1.5 pt	1							
	Scala 5.0 SC 7.0 fl oz + Bravo WS 6SC 1.5 pt	3	92.5	529.8	16.9	c-g	2.1	c-h	0.202
	Emesto Silver 118FS 0.31 fl oz/cwt	Seed Trt							
	Experimental 1 13 fl oz	In-furrow							
24	Velum Prime 6.5 fl oz	50% Row Closure							
	Bravo WS 6SC 1.5 pt	1							
	Scala 5.0 SC 7.0 fl oz + Bravo WS 6SC 1.5 pt	3	91.3	495.9	20.8	gh	2.4	gh	0.202

[z]Fungicide application dates: 50% Row Closure = 21 Jun, 1 = 5 Jul, 2 = 19 Jul, 3 = 2 Aug

[y]Marketable yield refers to weight of Size A potato tubers of a size range ≥2.5 in diameter measured in hundredweight or 100 lb per acre or cwt/A.

[x]B size range between 1.5 and 2.25 in diameter.

[w]C size (range less than 1.5 in. in diameter)

[u]RAUDPC= Relative Area Under the Disease Progress Curve determined by trapezoidal integration and then converted into Relative AUDPC (RAUDPC).

[v]Column numbers followed by the same letter are not significantly different at P=0.05 as determined by Fisher's Least Significant Difference (LSD) test.