

Evaluation of foliar fungicides for control of potato white mold and foliar early blight in Wisconsin, 2024.

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 7 days prior to planting. Seed pieces were allowed to heal before planting on 6 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. One program required an incorporation of fungicide to treated plots one day before planting. This was applied over the top of the treated plot 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 followed by shallow incorporation by raking. 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. (18 Jun, 2 Jul, 16 Jul, 30 Jul). 2 Maintenance applications of Bravo Weatherstik (1.5 pt/A) were applied to all plots on 13 Aug and 27 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. White mold strike counts and early blight severity across 20 ft of the two center rows was rated on 4 Jul, 16 Jul, 2 Aug, 12 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 2 Sep with an application of Diquat E at 1.5 pt/A followed by a second application on 9 Sep. Tubers from the center 2 rows of each 4-row plot were harvested and graded on 18 Sep. Total precipitation in Hancock during the potato production season was 20.16 in. Supplemental irrigation was applied 33 times during the potato production season for an additional 12.6 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 as expected for the region yet progressed slowly with drier weather in July and August. White mold infection points were found in low amounts on 17 Jul and recorded, but were not significantly different across treatments. Later evaluations did not find new infections and previous infections were either not growing or had dried out. Nine programs had significantly higher marketable yield (9,18,10,16,12,8,22,15,20) than the non-treated control). There were no significant differences across programs for B size yield (range between 1.5 and 2.25 in diameter), C size yield (range less than 1.5 in. in diameter), and cull weight (data not shown). All of the fungicide programs significantly reduce foliar early blight compared to the non-treated control except for 2 treatments (5 and 7).

Treatment Number, Treatment, and Rate/A		Application Timing ^z	Emergence (%)	Marketable Yield (cwt) ^x		Early Blight RAUDPC ^u	
1	Non-treated Control	NA	74.4	344.7	a-c	0.408	f
2	Adastrio 4.0 SC 18.0 fl oz	Hilling	80.6	370.8	a-f	0.354	c-e
3	Topguard EQ 4.29 SC 28 fl oz	Hilling	72.5	374.5	a-f	0.329	a-e
4	Lucento 4.17F 11.0 fl oz	Hilling	72.5	378.0	a-f	0.327	a-e
5	Adastrio 4.0 SC 9.0 fl oz + MSO 1% v/v	50% Row Closure, 1					
	Endura 70 WG 7 oz + Supertin 4L 5 fl oz	3	82.5	334.8	a	0.360	ef
6	Lucento 4.17F 5.5 fl oz + MSO 1% v/v	50% Row Closure					
	Adastrio 4.0 SC 9.0 fl oz + MSO 1% v/v	1					
	Endura 70 WG 7 oz + Supertin 4L 5 fl oz	3	71.3	348.7	a-d	0.352	c-e
7	Luna Tranquility 4.16 SC 11.2 fl oz + MSO 1% v/v	50% Row Closure, 1					
	Endura 70 WG 7 oz + Supertin 4L 5 fl oz	3	71.3	336.9	ab	0.359	d-f
8	Luna Tranquility 4.16 SC 11.2 fl oz + Bravo WS 6SC 1.5 pt	1,2					
	Bravo WS 6SC 1.5 pt	3	70.6	418.3	e-g	0.299	ab
9	DFO + PYM 500 SC 23.9 fl oz + Bravo WS 6SC 1.5 pt	1,2					
	Bravo WS 6SC 1.5 pt	3	74.4	401.3	d-g	0.316	a-e
10	Luna Pro 3.34 SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	1,2					
	Bravo WS 6SC 1.5 pt	3	67.5	406.7	e-g	0.304	a-c
11	Miravis Prime 3.33SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	1,2					
	Bravo WS 6SC 1.5 pt	3	73.1	388.3	a-g	0.319	a-e
12	Endura 70 WG 7 oz + Provysol 3.34 SC 4.0 oz	1,2					
	Bravo WS 6SC 1.5 pt	3	75.0	415.1	e-g	0.286	a
13	Delaro 325SC 6 oz	50% Row Closure					
	Bravo WS 6SC 1.5 pt	1,3					
	Luna Tranquility 4.16 SC 11.2 fl oz + Bravo WS 6SC 1.5 pt	1	74.4	364.9	a-e	0.323	a-e
14	Delaro 325SC 6 oz	50% Row Closure					
	Bravo WS 6SC 1.5 pt	1,3					
	Propulse 400 SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	2	75.0	388.7	a-g	0.318	a-e
15	Experimental 1 13 fl oz	In-furrow					
	Bravo WS 6SC 1.5 pt	50% Row Closure					
	Propulse 1.67 SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	1					
	Scala 5.0 SC 7.0 fl oz + Bravo WS 6SC 1.5 pt	2	78.8	424.9	fg	0.341	b-e
16	Experimental 1 13 fl oz	In-furrow					

	Bravo WS 6SC 1.5 pt	50% Row Closure					
	Propulse 1.67 SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	1					
	Luna Tranquility 4.16 SC 11.2 fl oz + Bravo WS 6SC 1.5 pt	2	78.8	409.1	e-g	0.352	c-e
	Elatus 45WG 6.4 oz	In-Furrow					
17	Bravo WS 6SC 1.5 pt	50% Row Closure					
	Miravis Prime 3.33SC 10.0 fl oz + Bravo WS 6SC 1.5 pt	1,3	83.1	393.1	c-g	0.333	a-e
	Experimental 1 13 fl oz	In-Furrow					
18	Bravo WS 6SC 1.5 pt	50% Row Closure					
	Endura 70WG 5.5 oz + Provysol 3.34 SC 4 fl oz + Bravo 1.5 pt	1,3	78.8	402.8	d-g	0.297	ab
	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	80.0	393.0	c-g	0.310	a-e
	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	81.9	432.6	g	0.303	a-c
	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	2	82.5	390.8	bg	0.312	a-e
	Experimental 1 13 fl oz	In-Furrow					
22	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	81.9	418.3	e-g	0.310	a-e
	Experimental 1 13 fl oz	In-furrow					
23	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	2	84.4	394.2	c-g	0.302	a-c
	Experimental 1 13 fl oz	Pre-plant Incorp					
24	Velum Prime 6.5 fl oz	In-furrow					
	Bravo WS 6SC 1.5 pt	1					
	Scala 5.0 SC 7.0 fl oz + Bravo WS 6SC 1.5 pt	2	73.1	379.9	a-g	0.3	a-d

^zFungicide application dates: 50% Row Closure = 21 Jun, 1 = 5 Jul, 2 = 19 Jul, 3 = 2 Aug

^yMarketable 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.

^xB size range between 1.5 and 2.25 in diameter.

^wC size (range less than 1.5 in. in diameter)

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

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