

Evaluating fungicides applied according to the TOMCAST forecasting model for their ability to provide long-lasting control of *Stemphylium vesicarium* on asparagus fern, 2021.

The trial was established in a grower-cooperator's field in Oceana County, MI in sandy loam soil with established 'Millennium' asparagus. Fertilization, weed, and insect control were managed to commercial production standards by the grower-cooperator. A completely randomized block design with four replicates was used. Treatment replicates consisted of 20-ft rows with 5-ft buffer rows between treatments within a row. Eight treatments were applied with a CO₂ backpack sprayer and a three-nozzle boom equipped with three XR8003 nozzles calibrated at 35 psi and delivering 50 gal/A on 8, 22 Jul; 10, 19, 26 Aug; and 8 Sep following a TOMCAST disease forecasting threshold of 15 Daily Disease Severity Values (DSV). Bravo Weather Stik and Quadris are currently labeled for purple spot disease on asparagus fern in Michigan and were compared to unregistered fungicides. Each test fungicide was alternated with the industry standard, Bravo Weather Stik. Disease severity was evaluated visually using a rating scale of 0 to 10 where 0 = 0% symptomatic fern and 10 = 100% symptomatic fern/defoliation. Disease ratings were taken on 23, 30 Sep; and 13, 20 Oct. Data were analyzed using an analysis of variance (ANOVA), with a mean separation preformed using Fisher's least significant difference (LSD) using the statistical software R v4.1.1.

Over the course of the study, disease severity progressed from 4.3 to 10 for the untreated control plants. All treatments provided sustained protection and limited disease compared to the untreated control 35 days post spray (13 Oct). On the last observation date of 20 Oct (42 days post spray), the only treatment that was similar to the untreated control was Luna Sensation SC alternated with Bravo Weather Stik SC. Miravis Prime SC alternated with Bravo Weather Stik SC was more effective than all other treatments in limiting disease across all observation dates with the exception of 30 Sep (22 days post spray) when it was similar to Merivon SC alternated with Bravo Weather Stik SC. Merivon SC alternated with Bravo Weather Stik WS SC was the second most effective fungicide and provided a level of control 35 and 42 days post spray that was significantly greater than all remaining fungicides. Bravo Weather Stik SC provided a level of control similar to Quadris SC alternated with Bravo Weather Stik SC across all dates with the exception of 13 Oct (35 days post spray) when the Bravo Weather Stik SC treatment had significantly less disease. The AUDPC data indicated that applications of Miravis Prime alternated with Bravo Weather Stik SC was more effective than all other fungicides included in the study. Merivon alternated with Bravo Weather Stik SC was another highly effective treatment according to the AUDPC data. There did not appear to be an advantage in alternating Quadris SC with Bravo Weather Stik SC as this treatment resulted in a similar AUDPC as the Bravo Weather Stik SC treatment. The AUDPC data indicated that Luna Sensation SC alternated with Bravo Weather Stik was similar to several other fungicide programs and significantly less effective than others.

Treatment ^z and rate/A, application schedule, applied at 15 DSV	Disease Severity (0-10)				
	23 Sep ^y (15 dps)	30 Sep (22 dps)	13 Oct (35 dps)	20 Oct (42 dps)	AUDPC ^x
Untreated control	4.3 a ^w	4.8 a	9.0 a	10.0 a	187.4 a
Miravis Prime SC 11.4 fl oz, apps A,C,E -alt- Bravo WS SC 2 pt, apps B,D,F	0.2 b	0.5 b	1.0 b	2.0 b	22.9 b
Merivon SC 11.0 fl oz, apps A,C,E -alt- Bravo WS SC 2 pt, apps B,D,F	1.0 c	1.0 bc	3.8 c	4.5 c	66.8 c
Bravo WS SC 2 pt, apps A-F	2.3 e	2.3 de	5.0 d	6.5 d	103.1 d
Quadris SC 15.5 fl oz, apps A,C,E -alt- Bravo WS SC 2 pt, apps B,D,F	1.8 de	1.8 cd	6.3 e	7.3 d	111.5 d
Luna Experience SC 17 fl oz, apps A,C,E -alt- Bravo WS SC 2 pt, apps B,D,F	1.5 cd	2.0 de	6.3 e	7.3 d	113.1 de
Luna Tranquility SC 11.2 fl oz, apps A,C,E -alt- Bravo WS SC 2 pt, apps B,D,F	1.0 c	2.3 de	6.3 e	7.5 d	114.8 de
Aprovia Top SL 13.5 fl oz, apps A,C,E -alt- Bravo WS SC 2 pt, apps B,D,F	2.0 de	2.8 e	6.0 e	7.5 d	120.8 de
Luna Sensation SC 7.6 fl oz, apps A,C,E -alt- Bravo WS SC 2 pt, apps B,D,F	2.0 de	2.0 de	7.5 f	8.3 ad	130.9 e
P-value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

^zapps = applications. Application dates: A= 8 Jul, B= 22 Jul, C= 10 Aug, D= 19 Aug, E= 26 Aug, and F= 8 Sep. Bravo WS = Bravo Weather Stik SC. -alt= alternative.

^y= dps = Days Post Spray.

^x= Area under Disease Progress Curve.

^w= Column means with a letter in common are not significantly different according to Fisher's Least Significant Difference (LSD t-test; P=0.05).