

### Combining conventional and biorational fungicides for the control of purple spot disease on asparagus fern, 2023.

The experiment was established in a grower-cooperator’s field in Oceana County, MI in sandy loam soil with mature ‘Sequoia’ asparagus. Four replicates were established for each of the four treatments and an untreated control, arranged in a randomized complete block design. Each treatment plot included a 20-ft long row with a 5-ft buffer between treatment plots within a row. The rows to either side of the treatment plot were also unsprayed buffers. Insecticide and fertilizer applications to maintain the crop were provided by the grower cooperator according to commercial production standards. In 2023, trials were initiated on 30 Jun prior to purple spot disease symptom development. Applications were made with a backpack sprayer calibrated to 35 PSI with three XR8003 flat-fan nozzles spaced 18 in. apart, delivering approximately 50 gallons per acre. Applications were made every 9 to 11 days. Application dates in 2023 were 30 Jun, 10, 20 and 31 Jul, and 10 and 21 Aug. In 2023, disease assessments were made on 20, 27 Jul, 10, 18 and 31 Aug, and 19 Sep. Visual assessment of the foliar disease severity was made using a 0 to 100% scale; 0% = no disease symptoms and 100% = all foliage diseased. Disease ratings were used to calculate the area under the disease progress curve (AUDPC). Data were analyzed using an analysis of variance (ANOVA) with means separation performed using Fisher’s protected least significant difference (LSD) using the statistical software RStudio v4.1.1.

The foliar disease severity (%) in the untreated plot developed from 2% (27 Jul) to 92% (19 Sep). For each assessment and according to AUDPC data, all treatments were more effective than the untreated control. On 27 Jul, 10, and 18 Aug, all treatments were effective and statistically ( $P<0.0001$ ) similar to each other for foliar disease severity. According to the foliar disease severity on 19 Sep and the AUDPC data, Quadris F mixed with Howler EVO WP at either the low (1.25 lb) or high (2.5 lb) rate were more effective than Bravo WS SC either alone or combined with Howler EVO WP 1.25 lb. There were no differences between the Bravo WS SC treatment applied alone or in combination with Howler EVO WP at any assessment data or according to the AUDPC data. No phytotoxicity was observed in any of the treatments. Fungicides applied alone or in combination with a biorational can control purple spot in conventional asparagus fields.

Treatment and rate/A <sup>2</sup> , application schedule, applied at 9–11 day intervals	Foliar Disease Severity (%) <sup>y</sup>					AUDPC <sup>x</sup>
	27 Jul	10 Aug	18 Aug	31 Aug	19 Sep	
Untreated	2.0 a <sup>w</sup>	10.3 a	67.5 a	87.5 a	92.5 a	3121.3 a
Howler EVO WP 1.25 lb + Quadris F 6 fl oz	0.0 b	0.0 b	5.8 b	5.8 cd	44.5 c	575.1 c
Howler EVO WP 2.5 lb + Quadris F 6 fl oz	0.3 b	0.8 b	10.3 b	5.0 d	40.0 c	578.5 c
Bravo WS SC 32 fl oz	0.3 b	1.5 b	8.3 b	12.5 b	58.8 b	863.9 b
Howler EVO WP 1.25 lb + Bravo WS SC 32 fl oz	0.3 b	0.8 b	9.5 b	11.3 bc	63.8 b	896.3 b
<i>P-value</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001

<sup>z</sup>Bravo WS= Bravo WeatherStick.

<sup>y</sup>Foliar Disease Severity (%) = Assessment was made using a 0 to 100% scale; 0 = 0% foliar disease severity; 100= 100% foliar disease severity.

<sup>x</sup>AUDPC=Area under disease progress curve.

<sup>w</sup>Column means with a letter in common are not statistically different (LSD,  $P=0.05$ ).