

### Evaluation of fungicides for control of downy mildew and halo blight in hops, 2022.

This experiment was conducted at a hopyard during the spring and summer of 2022 at the Plant Pathology Research Farm in East Lansing, Michigan. The hop plants were trellised at 5 ft tall and spaced 4 ft by 8 ft. Treatments were randomized in four complete blocks that included four plants per block and were applied with a hand-held Smith Contractor Sprayer equipped with a CF Valve to maintain 29 psi with a spray volume of 40 GPA. Spray dates and growth stages were as follows: 25 May (6-10 inches, sprout), 6 June (vegetative growth 1), 17 June (vegetative growth 2), 24 June (vegetative growth 3), 1 July (vegetative growth 4), 8 July (vegetative growth 5), 15 July (reproductive growth 1), 22 July (reproductive growth 2), 22 July (reproductive growth 3), and August 5 (reproductive growth 4). Each plant was inoculated with *P. humuli* sporangia at a concentration of  $4.60 \times 10^5$  on May 24 using a two-gallon battery sprayer. Each plant was also inoculated with *D. humulicola* conidia on June 28, and July 5, 12, and 18 at a concentration of  $3.2 \times 10^5$ - $6.9 \times 10^5$  conidia/ml. From July 6– August 23, 25 random leaves from each treatment were rated for Halo blight. Data was presented as the following: Incidence (percentage of leaves showing infection), Severity (percentage of infected leaf area), and Overall Severity (severity\*incidence/100). The number of cones on each treatment was also measured on August 31. Data was analyzed using the Statgraphics Centurion XVI program (Statgraphics Technologies, Inc., The Plains, Virginia).

Halo blight on the leaf (rated 7 Aug)				
Treatment, rate/A <sup>x</sup>	Application timing <sup>z</sup>	Incidence (%) <sup>x</sup>	Severity (%)	Control (%)
Untreated		66.0 a	29.6 a	
Presidio 4 floz	1, 2, 3, 4,			
Pristine 14 oz	5, 6, 7, 8, 9, 10	66.0 a	21.9 abc	[26]
Presidio 4 floz	1, 2, 3, 4,			
Tanos 8 oz	5, 6, 7, 8, 9, 10	62.0 ab	20.5 bc	[31]
Presidio 4 floz	1, 2, 3, 4,			
Vivando 15.4 floz	5, 6, 7, 8, 9, 10	59.0 ab	17.6 bc	[41]
Presidio 4 floz	1, 2, 3, 4,			
Quintec 8.2 floz	5, 6, 7, 8, 9, 10	58.0 ab	20.0 bc	[34]
Presidio 4 floz	1, 2, 3, 4,			
Luna Experience 10 floz	5, 6, 7, 8, 9, 10	57.0 abc	19.5 bc	[34]
Presidio 4 floz	1, 2, 3, 4,			
Torino 8 floz	5, 6, 7, 8, 9, 10	55.0 abc	21.3 bc	[28]
Folpan 3 lb	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	53.0 abc	29.3 a	[1]
Presidio 4 floz	1, 2, 3, 4,			
LifeGard 4.5oz/100gal	5, 6, 7, 8, 9, 10	51.0 bc	22.2 abc	[25]
Presidio 4 floz	1, 2, 3, 4,			
Rhyme 7 floz	5, 6, 7, 8, 9, 10	50.0 bc	23.7 ab	[20]
Presidio 4 floz	1, 2, 3, 4,			
Flint Extra 2 oz	5, 6, 7, 8, 9, 10	43.0 c	14.5 c	[51]

<sup>z</sup> Spray dates: 1 = 25 May (6-10 inches/sprout), 2 = 10 June (Vegetative 1), 3 = 17 June (Vegetative 2), 4 = 24 June (Vegetative 3), 5 = 1 July (Vegetative 4), 6 = 8 July (Vegetative 5), 7 = 15 July (Reproductive 1), 8 = 22 July (Reproductive 2), 9 = 29 July (Reproductive 3), and 10 = 5 August (Reproductive 4).

<sup>x</sup> Column means followed by the same letter are not significantly different according to Fisher's Protected LSD test ( $P \leq 0.05$ ).