

**Supplementary Table 1.** Experimental plot year-specific responses of basal foliage removal and duration of fungicide applications on powdery mildew leaves on hop leaves and cones, yield, and cone quality factors in cultivar Galena

Treatment <sup>ab</sup>		Disease <sup>c</sup>		Yield			Cone quality factors <sup>d</sup>		
Basal foliage removal	Last spray	AUDPCS	Cones (%)	Alpha-acids (%)	Cone yield (kg/string)	Alpha-acids yield (kg/string)	Dry matter (%)	Color (median)	Relative effect
2012									
0X	Nontreated	0.11	4.9	13.9	0.19	0.027	28.2	5.5	0.31 (0.17-0.53)
1X	Nontreated	0.10	6.4	13.6	0.20	0.027	28.1	5	0.22 (0.11-0.50)
2X	Nontreated	0.19	13.0	13.7	0.22	0.030	28.0	6	0.41 (0.25-0.59)
0X	30 July	0.04	3.1	14.0	0.19	0.027	27.4	6	0.41 (0.25-0.59)
1X	30 July	0.05	3.0	13.4	0.20	0.027	28.2	5.5	0.41 (0.17-0.72)
2X	30 July	0.06	2.1	13.6	0.20	0.028	27.4	7	0.78 (0.55-0.89)
0X	20 Aug	0.03	2.1	14.0	0.22	0.031	27.9	6	0.59 (0.41-0.75)
1X	20 Aug	0.03	1.1	13.7	0.18	0.025	27.2	7	0.78 (0.55-0.89)
2X	20 Aug	0.07	1.9	13.3	0.23	0.031	27.8	6	0.60 (0.41-0.75)
<i>Model factor P-value</i>									
<i>Last spray</i>		<0.001	<0.001	0.847	0.935	0.959	0.492	0.005	
<i>Basal foliage removal</i>		0.055	0.238	0.046	0.483	0.511	0.951	0.175	
<i>Last spray*Basal</i>		0.644	0.109	0.562	0.745	0.825	0.607	0.083	
2014									

0X	Nontreated	0.49			0.26				0.19 (0.13-
			54.0	13.3		0.035	23.7	4.5	0.30)
1X	Nontreated	0.39			0.29				0.24 (0.18-
			39.3	12.9		0.037	24.8	5	0.34)
2X	Nontreated	0.45			0.23				0.10 (0.07-
			56.0	12.2		0.028	23.6	4	0.16)
0X	31 July	0.20			0.24				0.61 (0.38-
			25.3	13.3		0.033	23.0	6.5	0.79)
1X	31 July	0.18			0.27				0.60 (0.45-
			29.1	12.7		0.035	23.8	6	0.72)
2X	31 July	0.17			0.28				0.78 (0.56-
			18.2	12.8		0.036	22.8	7	0.89)
0X	13 Aug	0.19			0.21				0.60 (0.45-
			19.6	12.9		0.028	23.8	6	0.72)
1X	13 Aug	0.16			0.28				0.71 (0.48-
			13.0	13.4		0.037	23.1	6.5	0.85)
2X	13 Aug	0.19			0.28				0.68 (0.41-
			14.0	12.5		0.035	22.8	7	0.85)
<i>Model factor P-value</i>									
	<i>Last spray</i>	<0.001	<0.001	0.797	0.900	0.849	0.082	<0.001	
	<i>Basal foliage removal</i>	0.425	0.352	0.005	0.187	0.254	0.153	0.717	
	<i>Last spray*Basal</i>	0.898	0.109	0.113	0.339	0.315	0.464	0.379	

<sup>a</sup> Basal foliage was removed using carfentrazone once, twice, or three times late in the season. Plots received the same fungicide treatments up to 31 July/1 August. The last treatment in these plots was quinoxifen. Plots treated with fungicides after this date received two (2012) or one (2014) additional application of myclobutanil.

<sup>b</sup> Probability values of fixed factors for each experiment and variable are given in the corresponding column. Data were analyzed using a linear mixed model or by nonparametric methods (Shah and Madden 2004) for cone color.

<sup>c</sup> AUDPCS: relative area under the disease progress curve of the incidence of leaves with powdery mildew.

<sup>d</sup> Cone color was rated on a 1 to 10 ordinal scale, where 10 is the best possible color (see Twomey et al 2015). Relative effect is a nonparametric statistic that ranges from 0 to 1. Differences among treatments are inferred by non-overlap of the confidence intervals noted parenthetically.