TWO YEAR SUMMARY OF HOST PLANT RESISTANCE IN STRAWBERRY TO MACROPHOMINA CROWN ROT AND VERTICILLIUM WILT

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Strawberry (*Fragaria* × *ananassa* Duch.) is an important crop for California and the United states. Soilborne diseases such as Verticillium wilt, caused by *Verticillium dahliae*, and Macrophomina crown rot caused by *Macrophomina phaseolina* have become more important since the phase-out of methyl bromide (MB) which effectively controlled all soilborne diseases. Most of the currently popular commercial cultivars are susceptible to these pathogens. It is necessary to find a replacement for MB to prevent millions of dollars in yield loss each year. Finding sources of host plant resistance to these soilborne diseases is an efficient way to increase yields in the presence of soilborne pathogens.

We evaluated approximately 90 genotypes (30 cultivars and 60 elite breeding lines) for their susceptibility to *M. phaseolina* and *V. dahliae* in replicated field trials in 2017 and 2018. These genotypes came from six different breeding programs: University of California Davis, Driscoll's, Plant Sciences, Lassen Canyon, Planasa and University of Florida. Genotypes were planted in a randomized complete block design with four replications and 20 plants per replicate. The *V. dahliae* field was naturally infested by *V. dahliae* after decades of growing Verticillium wilt-susceptible crops such as lettuce and tomato. Soil concentration of *V. dahliae* was 20-25 CFU/g of soil. The *M. phaseolina* field was artificially infested with 5 g inoculum (microsclerotia grown in a corn-meal sand mixture). Plant mortality was recorded every two weeks. Although there were different genotypes used in both years, approximately 15 cultivars were common between years.

The results showed some level of resistance in both *M. phaseolina* and and *V. dahliae* trials in both years (Tables 1 and 2). The mortality data in 2017 and 2018 were recorded on 24 Jul 2017 and 25 Jul 2018 for the *M. phaseolina* trials and 18 Jul 2017 and 24 Jul 2018 for *V. dahliae* trials. For both pathogens, results were relatively consistent between years, especially for those cultivars at the extremes (i.e., very high or very low % mortality) (Tables 1 and 2).

Table 1. List of cultivars and the percent average mortality for Macrophomina crown rot in 2017 and 2018

	Average mortality (%)[z]			
Cultivar name	**2017**		**2018**	
Osceola	1	a[y]	17	ab
Manresa	3	ab	14	ab
Grenada	11	ab	27	cd
Laredo	17	abc	11	a
Amado	23	abc	25	cd
Petaluma	25	bc	21	cd
Big Sur	30	c	34	de
Del Rey	36	cd	40	de
Fronteras	40	cd	46	de
Celine	52	cd	35	de
Albion	52	cd	76	ef
Monterey	69	de	65	e
Sweet Ann	69	de	87	ef
Festival	81	f	89	ef
Ruby June	90	f	95	f

[z]Percent plant mortality on 24 Jul 2017 and 25 Jul 2018.

[y]Means in a column with the same letter are not significantly different ($P = 0.05$) per Fisher's protected least significant difference test.

Table 2. List of cultivars and the average percent mortality for Verticillium wilt in 2017 and 2018

	Average mortality (%)[z]			
Cultivar name	**2017**		**2018**	
Marquis	3	a[y]	8	ab
Petaluma	5	a	4	a
Sweet Ann	14	ab	12	ab
Fronteras	17	ab	11	ab
Cabrillo	19	ab	13	ab
Manresa	25	ab	5	a
Monterey	26	ab	32	d
Big Sur	31	bc	15	ab
Amado	32	bc	8	ab
Ruby June	35	bc	29	cd
Del Rey	39	bc	16	ab
Osceola	42	bc	19	bc
Laredo	55	cd	32	d
Festival	62	d	31	d

[z]Percent plant mortality on 18 Jul 2017 and 24 Jul 2018.

[y]Means in a column with the same letter are not significantly different ($P = 0.05$) per Fisher's protected least significant difference test.