

Evaluation of strawberry cultivars and advanced breeding selections for resistance to charcoal rot caused by *Macrophomina phaseolina*, 2019-2020.

Twelve commercial cultivars and thirteen advanced selections from the UF-GCREC strawberry breeding program were evaluated for resistance to charcoal rot, caused by *Macrophomina phaseolina*. Bare root, green top strawberry plants (Crown nursery, Red Bluff, CA) were transplanted on 9 Oct 2019 into Telone II (150 lbs./A) fumigated, raised beds (28-in wide, on 4-ft centers) covered with black totally impermeable film. Transplants were planted in two staggered rows per bed with 15-in spacing between rows and 12-in between plants within each row. Four plots of each cultivar containing 10 plants per plot were arranged in a randomized complete-block design (2-ft between plots), with each replication in a separate bed. Transplants, with roots trimmed to 2.5 in, were root dip inoculated in a sclerotial suspension for 20 s immediately prior to planting. Inoculum was a mixture of three *M. phaseolina* isolates produced by homogenizing 40 potato-dextrose-agar (PDA) plates (two week old cultures grown in the dark at 30°C) in a blender with 54 fl oz deionized water and the volume was brought up to 2 gal with 0.2% water-agar (0.5 gal per replication). Transplants were overhead irrigated during the day for approximately 10 days to facilitate establishment and then irrigated and fertilized through single drip tape throughout the season. Plants were monitored for development of typical charcoal rot symptoms, wilt and mortality, weekly for three months. Isolations from symptomatic crown tissues were performed to confirm the causal agent. An analysis of variance was performed on the area under the disease progress curve (AUDPC), final percent wilt and final percent mortality using the proc GLM procedure in SAS. Percent data were arcsine transformed for analysis. Multiple means comparisons were made by the Fisher Protected LSD test ($\alpha = 0.05$).

No cultivar tested was immune to charcoal rot. 'Florida Brilliance' had the least disease (lowest wilt, mortality and AUDPC) and is therefore moderately resistant (MR). Sensation® 'Florida127', Winterstar™ 'FL 05-107', and the advanced selections 16.78-109, 17.14-250, 17.15-127, 17.27-80, and 17.40-150 had similar levels of disease to 'Florida Brilliance' by all three measures analyzed and were considered MR. 'Treasure', 'Strawberry Festival', 'Cabrillo', 16.30-128, 16.74-68, and 17.15-86 were all highly susceptible (HS) with the greatest wilt, mortality, and AUDPC. The remaining cultivars and breeding lines, including Florida Radiance, Florida Beauty, Monterey, Petaluma, Fronteras, and San Andreas, were classified as susceptible (S) having intermediate levels of wilt.

Cultivar/ Advanced Breeding Selection	% Wilt *		% Mortality *		AUDPC*		Susceptibility **
	(1/7/20)		(1/7/20)		(Wilt)		Category
17.15-86	100	a	100	a	4855	a	HS
'Treasure'	95	ab	90	b	4809	a	HS
16.30-128	90	abc	90	ab	3854	bc	HS
'Strawberry Festival'	87.5	bc	85	b	4670	ab	HS
'Cabrillo'	85	bcd	82.5	bc	3533	cd	HS
16.74-68	85	bcd	77.5	bcd	3346	cde	HS
17.17-22	75	cd	62.5	cde	2528	ef	S
16.33-8	65	de	52.5	def	2754	def	S
16.69-1	42.5	efg	40	efg	1988	fg	S
'Florida Radiance'	43.5	ef	30	fgh	985	hi	S
16.78-55	35	fgh	27.5	fghi	1350	gh	S
'Fronteras'	35	fgh	27.5	fghi	1051	ghi	S
'Monterey'	30	fghij	27.5	fghi	1089	ghi	S
17.17-127	32.5	fghi	22.5	ghij	993	hi	S
'San Andreas'	35	fghij	22.5	ghij	940	hi	S
'Florida Beauty'	27.5	fghijk	20	ghij	1076	ghi	S
'Petaluma'	27.5	fghijk	20	ghij	875	hi	S
Sensation® 'Florida127'	22.5	fghijkl	20	ghij	871	hi	MR
17.15-127	17.5	ghijkl	12.5	hij	539	hi	MR
17.14-250	12.5	kl	12.5	ij	564	hi	MR
WinterStar™ 'FL 05-107'	10	ijkl	10	hij	584	hi	MR
16.78-109	15	ijkl	7.5	j	414	hi	MR
17.27-80	12.5	jkl	7.5	j	325	i	MR
17.40-150	10	ijkl	7.5	j	321	i	MR
'Florida Brilliance'	7.5	l	7.5	j	318	i	MR

* Means in a column followed by the same letter are not significantly different by Fisher's protected LSD test ($\alpha = 0.05$).

** Highly Susceptible (HS), Susceptible (S), Moderately Resistant (MR)