

Evaluation of iceberg lettuce cultivars for resistance to Fusarium wilt, 2020.

The purpose of this study was to assess Fusarium wilt resistance in iceberg lettuce cultivars. Cultivars evaluated were both released and unreleased cultivars from commercial seed companies. Two trials were conducted, Trial One was located in Wellton, AZ with 22 different cultivars, and Trial Two was located in Yuma, AZ with 25 lettuce cultivars. The soil at each site was a silty clay loam. Lettuce was seeded in double rows on beds with 42-inch (Wellton) and 34-inch (Yuma) centers, then sprinkler-irrigated to germinate seed on 14 Sep for Trial One and 24 Sep for Trial Two. At two weeks post planting the beds were thinned to a 12-inch spacing. At both locations, the lettuce cultivars were planted in 100-ft-long plots, with four replicated plots per lettuce cultivar. Each plot contained roughly 100 plants for the two trials. Within the plots four 10-plant subplots were established post-thinning and these 40 plants were evaluated at maturity per replication. Plots were arranged in a randomized complete block design. Mean soil temperature at the 4-inch depth recorded at nearby University of Arizona AZMET (Arizona Meteorological Network) weather stations were as follows:: Wellton site: 92.7°F, 82.2°F, and 70.7°F; Yuma site: 90.5°F, 83.1°F, and 68.7°F. No rainfall occurred during the two trials.

Naturally occurring *F. oxysporum* f. sp. *lactucae* was the cause of disease at both sites. Symptoms, including plant stunting and chlorotic leaves, were first observed at thinning for the Wellton location (21 Sep) and approximately one month post-thinning (8 Oct) at the Yuma location. Disease severity (DS) was recorded at crop maturity (15 Nov in Wellton and 2 Dec in Yuma) when plants were 62-69 days old. Disease pressure caused by Fusarium wilt varied by cultivar as implied by the mean DS, with the Grizzly cultivar consistently being the most susceptible. Considering the cultivars present in both trials, the disease severity of Fusarium wilt at the Wellton site was significantly higher than at the Yuma site.

Trial One-Wellton, AZ		Trial Two-Yuma, AZ	
Lettuce cultivar	Mean disease severity ^z	Lettuce cultivar	Mean disease severity ^z
Grizzly	3.9 a ^y	Grizzly	3.3 a
Kyoto	3.8 a	El Guapo	2.5 b
Dover	3.3 ab	Growler	2.2 bc
83	3.2 abc	Primo	2.0 bcd
Slotmachine	3.2 abcd	Kyoto	2.0 bcd
Growler	3.2 abcd	Midway	2.0 bcd
El Guapo	3.1 abcd	SV4204LD	1.9 bcde
LT4083	3.1 abcde	LT4083	1.8 cdef
Tamarack	2.9 abcdef	Tamarack	1.7 cdefg
99	2.5 bcdefg	Desert Eagle	1.6 defgh
Primo	2.4 bcdefg	83	1.6 defgh
Blas	2.2 cdefgh	Dover	1.6 defgh
98	2.2 cdefgh	18c1230	1.6 defgh
SV4204LD	2.1 cdefgh	Copper	1.6 defgh
Desert Eagle	2.1 defghi	97	1.5 defgh
Copper	2.0 efghi	Meridian	1.4 efgh
97	1.9 fghi	99	1.4 fgh
SVLD9014	1.5 ghi	98	1.4 fgh
Powerball	1.2 hi	71	1.3 fgh
SVLD9012	1.2 hi	Blas	1.3 gh
Meridian	1.1 hi	Fredonia	1.2 gh
71	1.0 i	Franchise	1.2 gh
		SVLD9014	1.2 gh
		SVLD9012	1.1 gh
		Powerball	1.1 h

^z Disease Severity (DS) was recorded by evaluating on a 1-4 disease severity scale 1 = symptomless plants; 2 = mild stunting and chlorosis; 3 = severe stunting, chlorosis, and no head formation; and 4 = a dead plant. Intermediate ratings, such as 1.5 or 2.5 were used where appropriate. Mean DS was calculated by averaging 40 plants from each of the four replicates.

^y Although the DS rating was based on a categorical scale of 1-4, each replication was a mean of 40 plants and thus, the analysis of variance (ANOVA) was performed on non-categorical data (P<0.05) followed by Post Hoc analysis using Tukey's honest significance difference (HSD) test. Mean DS scores with the same letter are not significantly different as determined by Tukey's HSD test (P<0.05).