

Evaluation of iceberg lettuce cultivars for resistance to Fusarium wilt, 2021.

The purpose of this study was to assess Fusarium wilt resistance in iceberg lettuce cultivars. Cultivars evaluated were both in-slot (developed for early Sep planting) and out-of-slot cultivars bred for desert planting. The trial was in Yuma, AZ in a field with a silty clay loam naturally infested with *Fusarium oxysporum* f.sp. *lactucae*. Forty cultivars were direct seeded in 100-foot sections in single seed lines on 34-in. beds, then sprinkler-irrigated to germinate seed on 15 Sep. Each cultivar was planted four times in a randomized complete block design. At two weeks post-planting, the beds were thinned to a 12-in. spacing. Plots of 50 plants were flagged post-thinning in each replicate for evaluation. Mean soil temperature at the 4-in. depth recorded at nearby University of Arizona AZMET (Arizona Meteorological Network) weather stations for Sep, Oct and Nov 2021 were as follows: 83.3°C, 72.3°C, and 65.3°C. On 24 Sep, 0.01 in. of rain was recorded.

Symptoms of Fusarium wilt of lettuce, including plant stunting and chlorotic leaves, were first observed approximately one-month post-thinning (13 Oct). Disease severity (DS) and Marketable Heads (MH) was recorded at crop maturity on 30 Nov. Disease pressure caused by Fusarium wilt varied by cultivar as implied by the mean DS and MH. Powerball and Fredonia were the highest performing cultivars with significantly more marketable heads than the 38 other cultivars for Powerball and 37 for Fredonia. Powerball, Fredonia, 18C1230 and Oracle had the lowest mean disease severity, however, 18C1230 and Oracle had less than 50% marketable heads.

Cultivar	Mean DS ^z	% MH ^y	Cultivar	Mean DS ^z	% MH ^y
Powerball	0.83 a ^x	80.5 a	PYB 7101	3.05 hi	6.5 hijk
Fredonia	1.43 a	67.5 ab	LT 4083	3.22 hij	8.0 ghijk
18C1230	1.72 a	49.5 bc	Tamarack	3.23 ijk	5.0 ijk
Oracle	1.74 a	42.5 cd	Slot Machine	3.53 ijkl	8.0 ghijk
PX 1671	1.75 b	34.5 cdef	Coyote	3.56 ikl	0.5 k
Midway	2.10 b	14.5 fghijk	Lucky ^w	3.58 klm	10.0 ghijk
Blas	2.13 bc	37.0 cdef	Prescott	3.57 jkl	2.5 ijk
Desert Eagle	2.26 bcd	30.5 cdefg	Growler	3.68 klm	3.5 ijk
Frosty	2.32 bcd	38.0 cde	El Guapo	3.68 klm	1.0 k
Meridian	2.32 bcde	24.5 defghij	Huskey	3.81 klm	0.0 k
Franchise	2.45 cdef	28.5 cdefgh	Winter Select	3.86 klm	0.0 k
SV4204LD	2.55 def	25.0 defghi	Quest	3.88 lm	1.0 k
Raider	2.63 def	15.0 efghijk	EXP 1221	3.89 m	1.5 jk
Uppercut	2.64 efg	34.0 cdef	Darkhorse	3.97 m	0 k
Hotshot	2.70 efg	17.0 efghijk	Serengeti	3.98 m	0 k
Sun Devil	2.74 fg	10.0 ghijk	Antelope	3.99 m	0 k
Sunquest	2.84 fg	10.0 ghijk	Grizzly	3.99 m	0 k
Javalina	2.85 fg	21.5 defghijk	Pocona	3.99 m	0 k
Estival	2.86 fgh	5.0 ijk	Supai	3.99 m	0 k
Dover	2.89 gh	22.0 defghijk	Bubba	4.00 m	0 k

^zDisease Severity (DS) was recorded by evaluating on a 0-to-4 disease severity scale 0 = symptomless plants; 1=slight chlorosis on outer leaves, stunting; 2 = more extensive chlorosis and stunting, in-slot varieties have stunted head; 3 = severe stunting, chlorosis, and no head formation; and 4 = remaining leaves are chlorotic and nearly dead, or plant is entirely dead. Mean DS was calculated by averaging 50 plants from each of the four replicates.

^y Marketable Heads (MH) was recorded as a plant having a head >5 inches and no symptomatic leaves on the head. Outer wrapper leaves may show symptoms.

^xAlthough the DS rating was based on a categorical scale of 1 to 4, each replication was a mean of 50 plants and thus, the analysis of variance (ANOVA) was performed on non-categorical data ($P \leq 0.05$) 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 ($P \leq 0.05$).