

Table 18. Race 4 Fusarium (FOV-4) infested field evaluation of entries in the 2019 RBTN in Tulare County¹ near Tipton, California, conducted by University of California and USDA-ARS (Cooperators: Bob Hutmacher and Mauricio Ulloa).

Entry	Foliar Disease Severity Index ²		Vascular Root Staining ³		Main Stem Nodes		Plant Height		Plant Percent Survival ⁴	
	0-5	σ	0-5	σ	no.	σ	cm	σ	%	σ
13-AFX13-12-5	1.00	0.00	2.07	0.88	15.2	1.2	26.4	3.5	82.0	4.0
13-AFX6-27-2	1.33	0.58	2.67	0.49	15.1	1.5	23.4	2.1	83.0	9.0
Ark 1102-55	1.33	0.58	2.13	1.25	15.6	1.1	27.1	3.6	82.0	8.0
Ark 1112-59	1.00	0.00	1.00	0.93	16.4	1.4	29.1	1.5	84.0	4.0
Ark 1114-21	1.33	0.58	2.33	1.05	15.2	1.2	24.0	2.5	69.0	16.0
Ark 1115-36	1.33	0.58	1.93	1.10	16.1	0.8	26.9	3.0	74.0	9.0
Ark 1117-60	1.67	0.58	1.87	0.83	15.9	1.1	28.4	4.0	83.0	9.0
Ark 1124-50	1.00	0.00	1.53	0.99	16.0	1.2	26.8	2.3	80.0	3.0
CSX 8308	1.00	0.00	1.13	0.74	15.8	1.5	23.6	2.7	86.0	12.0
GA 2016024	1.00	0.00	1.53	0.99	15.2	1.0	27.1	1.4	85.0	6.0
GA 2016099	1.33	0.58	1.73	0.59	15.4	0.9	26.4	2.7	84.0	5.0
GA 2016103	1.00	0.00	2.13	0.74	16.4	1.3	25.8	2.3	78.0	4.0
LA 16063019	3.00	1.00	2.54	0.52	13.4	2.3	20.0	4.0	60.0	26.0
LA 16063033	2.00	1.73	1.87	0.99	14.9	1.1	24.8	4.4	74.0	28.0
LA 16063054	2.00	1.00	2.20	0.86	15.3	1.3	23.2	3.6	79.0	14.0
MS 2010-87-37	1.00	0.00	2.00	0.93	15.6	1.1	27.9	1.8	77.0	3.0
TAM 12J-39	1.00	0.80	2.40	0.74	16.2	1.0	27.7	0.7	83.0	9.0
TAM 135-03	1.33	0.58	1.93	0.96	15.9	0.8	23.1	2.4	85.0	3.0
TAMLBB 15905	1.00	0.00	1.40	0.91	15.7	0.9	26.0	3.2	85.0	6.0
TAMLBB 16507	1.00	0.00	1.93	0.96	16.7	1.0	25.1	2.2	89.0	8.0
DP 393 check	1.00	0.00	1.53	0.99	14.8	1.3	26.3	2.9	78.0	5.0
DP 493 check	1.00	0.00	2.20	0.56	16.6	1.0	28.3	1.1	82.0	4.0
FM 958 check	1.00	0.00	1.87	0.74	15.8	0.7	23.7	2.3	80.0	6.0
UA 222 check	1.00	0.00	1.87	0.52	15.9	0.6	24.9	2.7	76.0	4.0
Phy 499 WRF ⁵	1.00	0.00	1.53	0.74	14.9	1.1	28.0	2.6	81.0	2.0
Phy 764 WRF ⁵	1.00	0.00	2.20	0.94	15.9	1.1	26.9	1.6	81.0	7.0
DP 340 ⁶	2.67	0.58	2.40	0.91	14.2	1.5	18.0	2.6	38.0	15.0
DP 744 ⁶	3.33	0.58	4.00	0.63	11.8	2.6	11.0	4.3	4.0	4.0
Phy 881 RF ⁶	1.00	0.00	1.13	0.99	15.7	2.1	22.1	4.2	92.0	3.0
Phy 888 RF ⁶	0.67	0.58	0.80	0.86	15.4	2.1	24.3	2.1	90.0	3.0
DP 348 RF ⁶	1.00	0.00	0.67	0.72	15.3	1.6	22.2	4.3	91.0	2.0

¹ Tulare county location is a naturally infested field site where presence of race 4 of the Fusarium pathogen has been confirmed in pathology studies. Evaluations were conducted approximately 7 to 9 weeks after emergence (multiple dates in July and August). Destructive measurements were collected from 5 plants in each of three replications. A moderate to severe development of FOV-4 symptoms was observed in 2019, the fourth year of evaluations at this test site. All but the most FOV-4 susceptible entries (susc. checks) had moderate to moderately high survival rates (>80%) in 2019.

² Foliar Disease Severity Index scale: 0 = no symptoms; 1 = epinasty and slight dwarfing; 2 = 1 to 30% of leaves chlorotic; 3 = 31 to 80% of leaves chlorotic and severe stunting; 4 = 81 to 100% of leaves chlorotic; and 5 = plant death.

³ Vascular Root Staining Scale: 0 = no vascular root staining evident, 1 = light vascular root staining evident as spotty areas, 2 = more continuous than 1, but light colored staining covering an area between one quarter and one half of the stem cross-section, 3 = moderate brown/black staining evident in a band encircling most of the stem cross section, 4 = brown/black staining evident across most vascular tissue in stem cross section, and 5 = plant severely damaged or plant death with staining evident throughout a cross-section of root tissue (Ulloa et al. 2006, 2009a).

⁴ The percentage of plant survival was calculated by dividing the total number of surviving plants on sample date by the initial plant count after plant establishment, and multiplying by 100.

⁵ Upland (Phy 499 WRF) and Acala (Phy 764 WRF) check cultivars moderately-susceptible to FOV-4

⁶ Pima check cultivars moderately-susceptible (DP 340), and moderately resistant (Phy 881 RF and DP 348 RF) to FOV-4.