Table 18. 2016 Race 4 Fusarium wilt infested field evaluation of RBTN entries in Tulare country near Tipton, CA[1], conducted by University of California and USDA-ARS (Hutmacher, Ulloa et al). Averages and standard deviations (σ) are shown for disease severity index, root staining, number of mainstem nodes, plant height, plant survival.

	Number of Plants Evaluated	Foliar Disease Severity Index[2]		Vascular Root Staining[3]		Number of Main Stem Nodes		Plant Height		Plant Percent Survival[4]
Cultivar	#	0-5	σ	0-5	σ		σ	cm	σ	PS
Tam 13Q-18	15	0.00	0.00	0.40	0.63	12.0	2.1	16.5	3.9	83.2
Tam 11L-24	15	0.07	0.26	0.60	0.74	12.7	1.9	18.2	2.8	83.9
PD 07040	15	0.20	0.56	0.93	0.96	11.1	2.0	17.9	3.4	89.1
PD 09084	15	0.20	0.56	0.73	0.88	12.0	3.8	20.2	2.0	98.0
PD 08028	15	0.27	0.59	1.40	1.12	12.1	2.0	15.9	2.0	94.2
PD 09046	15	0.20	0.41	0.67	1.05	12.4	2.8	15.9	5.5	85.2
Ark 0812-87ne	15	0.27	0.59	1.13	0.83	10.2	2.2	17.8	2.7	93.1
Ark 0818-23	15	0.07	0.26	0.60	0.74	12.3	2.0	19.1	2.8	92.4
Ark 0824-89	15	0.13	0.52	0.67	1.05	12.4	2.4	22.1	3.1	90.6
Ark 0822-48	15	0.20	0.41	0.64	0.63	11.6	1.3	19.0	2.8	86.7
Ark 0819-89	15	0.27	0.70	1.13	0.99	14.1	1.7	19.2	1.7	95.1
NM 13G1029	15	0.07	0.26	0.60	0.99	12.1	1.9	21.0	2.8	81.9
NM 13G2019	15	0.13	0.52	1.33	0.90	10.6	1.5	15.4	1.1	98.5
AU 77082	15	0.09	0.30	0.60	0.83	12.8	1.8	21.5	3.9	92.1
AU 82074	15	0.13	0.35	1.33	1.11	11.4	2.0	19.6	3.2	94.7
GA 2011113	15	0.13	0.35	0.87	0.83	12.3	1.1	18.9	3.4	95.3
GA 2012050	15	0.20	0.56	1.33	1.05	11.0	2.2	18.8	3.6	89.4
GA 2012082	15	0.13	0.52	1.13	0.92	12.1	3.1	20.3	5.8	91.0
GA 2012141	15	0.00	0.00	1.11	1.05	16.0	0.8	24.5	1.7	85.4
MD 16-1	15	0.07	0.26	0.47	0.83	12.3	2.1	22.5	4.7	100.0
MD 16-2	15	0.00	0.00	0.60	0.83	12.0	2.1	22.0	2.1	91.1
MS 0152-3-11	15	0.13	0.35	0.80	0.77	13.7	2.4	18.9	2.3	96.0
MS 0043-28-1	15	0.20	0.56	0.73	1.03	11.7	1.8	19.2	3.2	85.5
DP 393 CK	15	0.40	0.63	0.87	0.92	11.6	1.3	17.2	1.2	93.9
DP 493 CK	15	0.20	0.41	0.67	0.82	13.6	2.6	21.6	3.7	73.3
FM 958 CK	15	0.07	0.26	0.87	0.92	12.0	1.4	19.8	2.8	92.2
SG 105 CK	15	0.27	0.59	0.53	0.92	12.4	2.7	17.9	4.3	93.0
UA 222 CK	15	0.33	0.72	0.87	0.99	14.3	1.8	20.4	3.2	86.8
***FM 2484 B2F**	15	0.00	0.00	1.00	0.85	13.7	2.5	19.0	2.9	84.0
***Phy 725 RF**	15	0.07	0.26	1.40	0.91	11.6	1.1	21.6	3.5	96.2
***Phy 764 RF**	15	0.13	0.52	1.00	1.07	12.6	2.7	19.9	4.7	90.9
****DP-744**	15	3.50	0.61	3.40	0.62	6.7	1.9	9.1	1.4	16.6
****DP-340**	15	2.10	0.58	2.46	1.10	12.3	1.2	14.6	2.2	62.9
****Phy-802 RF**	15	0.00	0.00	0.27	0.59	11.3	1.0	15.6	0.8	94.4
****DP-358 RF**	15	0.00	0.00	0.30	0.48	12.1	1.8	17.6	2.6	96.3

* FM 2484 B2F, Phy 725 RF, and Phy 764 RF - Upland and Acala check varieties moderately susceptible to Fusarium Race-4

** DP-744 (highly-susceptible Pima), DP-340 (moderately-susceptible Pima), and Phy-802 RF and DP-358 RF (moderately resistant Pima)

[1] Tulare County Fusarium wilt (FOV) race 4 field evaluation planted on May 23 and evaluated during July and August (approximately 7-9 weeks post emergence). This site is a naturally infested field where presence of the race 4 Fusarium pathogen had been confirmed in prior pathology studies. This site had a moderate infestation of Race 4 Fusarium, and was a new test site for 2016 (next to the 2015 site) and observed symptoms were not as severe as in prior years at the same farm. All except the most susceptible cultivars (including some of the check varieties), had very high survival rates (>80%) at this site/year. For purposes of screening for resistance to FOV race 4, at this site and year, Vascular Root Staining rating of 0.5-0.6 can be conisdered as having a degree of resistance, and should be included in future field tests.

[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: 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 (PS) 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.