

2020 Fusarium Screens - SUMMARY (Tulare County and Merced County Sites)

February 5, 2021 copy

COMMERCIAL SEED COMPANY ENTRIES

Project Investigator : R.B. Hutmacher (University of California) - cell: (559) 260-8957

Cooperators: M. Ulloa (USDA-ARS); M.P. Keeley, T. Frigulti, J. Angeles (UCCE, UCD); Cooperator Growers in Tulare County and Merced County; M. Ellis (CA State Univ Fresno)

Funding provided by: CA Cotton Alliance, CA Cotton Growers and Ginners Assoc., Cotton Incorporated; University of CA-ANR; USDA-ARS; facilities and equipment by Tulare and Kings County growers

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Entry	2020	County	Type of Cotton	Whole									Plant				
	Entry	Location	known, or based on leaf & flower characteristics	Plot Foliar	Plant Foliar	Single	Root	Cotyledon	Plant	Plant	Plant	Plant	Survival	Survival	Survival		
Name	Number	SITE	(P-Pima; U-Upland H-Hybrid)	rating mean	stdev	rating mean	stdev	Rating mean	stdev	Rating mean	stdev	Rating mean	stdev	(inches) mean	stdev	Percent mean	stdev
PHY 764 WRF	601	Tulare	Upland	1.33	1.15	0.27	0.70	1.73	1.16	0.53	0.74	24.30	1.53	56.3	4.9		
		Merced		1.33	1.15	0.40	0.83	1.67	0.98	0.40	0.51	23.00	6.56	65.8	9.8		
PHY 350 W3FE	602	Tulare	Upland	0.33	0.58	0.17	0.39	1.67	0.78	0.58	0.79	23.70	1.52	70	4.7		
		Merced		0.33	0.58	0.13	0.35	1.40	0.74	0.80	0.78	20.00	3.61	73.9	3.6		
PHY 400 W3FE	603	Tulare	Upland	0.67	1.15	0.17	0.58	1.83	0.38	0.83	0.58	23.70	2.89	65.3	7.5		
		Merced		2.00	1.00	0.47	0.92	1.60	1.12	0.80	0.86	20.30	0.58	65.1	1.9		
PHY 580 W3FE	604	Tulare	Upland	0.00	0.00	0.00	0.00	1.82	0.75	0.91	0.70	25.70	1.53	62.8	8.5		
		Merced		0.67	0.58	0.27	0.46	1.60	1.12	0.73	0.88	20.30	2.31	66.8	11.7		
PHY 881 RF	605	Tulare	Pima	0.00	0.00	0.27	0.70	1.07	0.70	0.80	0.41	25.00	1.00	75.5	5.7		
		Merced		1.00	1.00	0.36	0.63	1.64	0.63	0.57	0.65	19.00	1.73	70.4	6.6		
PX 854207 RF	606	Tulare	Pima	0.67	1.15	0.13	0.52	1.13	0.74	0.13	0.35	25.00	1.00	74.3	9.8		
		Merced		1.67	0.58	0.53	0.83	1.67	1.18	0.80	0.78	21.00	3.61	70.4	5.9		
PX 852901 RF	607	Tulare	Pima	0.00	0.00	0.00	0.00	1.07	0.88	0.21	0.43	15.30	6.10	72.7	8.6		
		Merced		0.67	1.15	0.13	0.52	1.53	1.13	0.80	0.94	22.70	5.69	65.9	8		
DG 3555 B3XF	608	Tulare	Upland	1.00	1.00	0.33	0.65	1.92	0.67	0.75	0.62	26.00	0.90	62.4	8.1		
		Merced		1.00	1.00	0.33	0.72	1.80	1.01	0.80	0.94	23.70	0.58	60.7	11.1		
DG 3402 B3XF	609	Tulare	Upland	1.33	0.58	0.29	0.61	1.43	0.76	0.64	0.84	15.70	10.20	56.5	3.5		
		Merced		2.00	0.00	0.93	0.88	2.07	0.70	0.67	0.72	19.00	4.36	63.6	13.6		
DG 3421 B3XF	610	Tulare	Upland	2.50	0.71	1.80	1.09	2.50	0.58	0.75	0.50	21.00	0.40	16.7	28.9		
		Merced		2.00	0.00	0.92	1.04	2.39	0.65	0.62	0.77	18.70	2.08	58.6	10		
DG 3615 B3XF	611	Tulare	Upland	1.33	1.15	0.27	0.70	1.60	0.63	0.47	0.52	29.00	2.00	61.5	10.20		
		Merced		1.67	0.58	0.73	0.79	1.64	0.81	0.82	0.87	20.00	3.00	60.9	7.3		
DG H959 B3XF	612	Tulare	Upland	1.33	1.15	0.50	0.91	1.92	0.90	0.42	0.67	28.00	1.00	74.7	2.8		
		Merced		1.33	1.15	0.33	0.72	2.00	0.38	0.53	0.74	17.00	2.00	81.1	14.5		
DGX 19003 B3XF	613	Tulare	Upland	1.33	1.15	0.64	0.93	2.07	0.83	0.50	0.52	20.30	2.52	41.7	9.9		
		Merced		1.33	1.15	0.46	0.74	1.73	0.59	0.73	0.88	21.30	3.22	43.6	30.2		

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Entry Name	2020 Entry Number	County Location SITE	Type of Cotton (P-Pima; U-Upland H-Hybrid)	Whole Plot FOV rating		Single Plant FOV rating		Root Vasc. Stain Rating		Cotyledon Vasc. Stain Rating		Plant height (inches)		Plant Survival Percent	
				mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev
DGX 19008 B3XF	614	Tulare	Upland	0.67	1.15	0.20	0.63	1.70	0.68	0.40	0.52	23.50	2.12	30.5	26.4
		Merced		1.33	1.15	0.43	0.85	2.14	0.66	0.64	0.75	19.00	2.00	54.9	19.7
DGX 19010 B3XF	615	Tulare	Upland	0.67	0.58	0.25	0.46	1.63	0.52	0.25	0.71	23.70	1.16	63.2	one plot
		Merced		1.00	0.00	0.67	1.05	2.60	0.83	0.80	1.08	22.00	0.60	57	3.9
DGX 19052 B3XF	616	Tulare	Upland	1.33	1.15	0.27	0.70	1.53	1.06	0.20	0.41	25.70	0.58	60.7	14.1
		Merced		1.67	0.58	0.73	0.96	1.80	1.08	0.67	0.98	20.70	1.53	60.1	12.3
DGX 19731 GLTP	617	Tulare	Upland	1.33	1.15	0.29	0.73	1.86	0.36	1.36	0.84	23.00	0.60	63.2	15
		Merced		1.33	1.15	0.64	0.93	1.87	1.10	0.71	0.73	21.70	5.86	56.9	15.8
DGX 197312 GLTP	618	Tulare	Upland	0.00	0.00	0.00	0.00	1.47	0.83	0.60	0.63	23.70	2.08	63.9	5.1
		Merced		0.67	0.58	0.23	0.44	1.46	1.13	0.69	0.75	18.30	4.51	61.7	3.1
BX 2116 GLTP	619	Tulare	Upland	1.33	1.15	0.40	0.83	2.00	0.76	1.20	0.86	26.00	2.65	62.2	8
		Merced		1.00	0.00	0.36	0.51	1.82	0.41	0.82	0.75	17.67	3.22	57	27.7
BX 2141 GLTP	620	Tulare	Upland	1.00	1.00	0.33	0.62	2.13	0.52	0.93	0.88	25.70	0.58	68	5.3
		Merced		1.33	1.15	0.50	0.86	1.86	1.03	1.00	0.96	17.67	3.51	64	6.8
BX 2151 GLTP	621	Tulare	Upland	1.00	1.00	0.27	0.59	1.67	0.82	0.27	0.46	24.00	1.73	62.9	5.4
		Merced		2.00	0.00	0.47	0.83	2.00	1.07	0.93	0.88	18.67	5.51	53.6	10.6
BX 2191 B3XF	622	Tulare	Upland	1.00	1.00	0.40	0.70	1.40	0.84	0.30	0.48	30.00	3.61	43.5	18.8
		Merced		2.00	0.00	0.75	0.97	1.92	0.52	1.00	0.85	16.30	1.53	57.1	16.5
BX 2192 B3XF	623	Tulare	Upland	1.33	1.15	0.67	1.00	2.00	1.00	0.44	0.53	27.70	3.06	64.9	one plot
		Merced		1.67	1.53	1.07	1.28	2.33	1.13	1.13	1.06	16.33	8.08	61.7	12.6
BX 2193 B3XF	624	Tulare	Upland	0.00	0.00	0.00	0.00	1.40	0.43	0.10	0.32	24.50	2.12	65.7	8.1
		Merced		0.67	0.58	0.29	0.47	1.43	0.85	1.21	0.70	19.00	2.65	65.6	2.7
BX 2194 B3XF	625	Tulare	Upland	0.67	1.15	0.14	0.54	1.40	0.65	0.93	0.83	23.30	2.08	62.2	18.6
		Merced		1.50	0.71	0.30	0.68	2.30	0.68	0.50	0.85	19.00	2.83	66.1	5.4
FM 1621 GL	626	Tulare	Upland	0.33	0.58	0.20	0.41	1.93	0.88	0.87	0.92	22.30	1.53	50.9	10.1
		Merced		0.50	0.71	0.50	0.55	2.00	0.63	1.00	0.40	14.33	1.53	50.2	9.4

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Entry Name	2020 Entry Number	County	Type of Cotton (P-Pima; U-Upland H-Hybrid)	Whole Plot Foliar FOV		Single Plant Foliar		Root Vasc. Stain		Cotyledon Vasc. Stain		Plant height (inches)		Plant Survival Percent	
				rating mean	stdev	rating mean	stdev	Rating mean	stdev	Rating mean	stdev	mean	stdev	mean	stdev
FM 1830 GLT	627	Tulare	Upland	1.50	0.71	0.38	0.74	1.63	0.52	0.38	0.52	24.50	6.36	59.6	13.6
		Merced		2.00	1.00	0.93	1.03	2.27	0.59	1.20	0.78	19.33	2.08	66	8
FM 1888 GL	628	Tulare	Upland	0.00	0.00	0.00	0.00	1.67	0.72	0.87	0.83	25.30	2.08	68.6	7.7
		Merced		1.00	1.00	0.42	0.79	1.83	0.84	0.58	0.67	18.70	4.73	57.5	19.9
FM 2202 GL	629	Tulare	Upland	2.00	0.00	0.50	0.93	1.63	0.92	0.63	0.92	25.50	0.71	49.6	9.5
		Merced		2.00	0.00	0.87	0.83	1.67	0.49	0.80	0.78	19.67	2.08	60	3.7
FM 2334 GLT	630	Tulare	Upland	1.00	1.41	0.20	0.63	1.60	0.52	0.40	0.84	24.00	0.90	51.4	13.7
		Merced		0.67	1.15	0.27	0.70	1.80	1.15	0.40	0.51	21.70	3.51	47.3	6.1
FM 2398 GLTP	631	Tulare	Upland	0.67	1.15	0.21	0.58	1.64	0.50	0.57	0.45	25.30	2.90	79.4	0.9
		Merced		1.00	1.00	0.20	0.56	1.60	0.74	0.33	0.62	19.67	6.03	74.5	2.7
FM 2498 GLT	632	Tulare	Upland	1.00	1.00	0.33	0.62	1.73	0.80	0.73	0.80	25.30	1.53	72	3.4
		Merced		1.67	1.15	0.40	0.83	2.07	0.80	0.67	0.90	18.67	3.51	66.9	7.5
ST 4480 B3XF	633	Tulare	Upland	1.00	1.00	0.27	0.65	1.73	0.47	0.64	0.51	25.70	0.58	41.6	16.7
		Merced		2.00	0.00	0.53	0.83	1.73	1.22	0.67	0.98	17.67	1.16	53.2	11.3
ST 4550 GLTP	634	Tulare	Upland	1.33	1.15	0.33	0.72	1.73	0.88	0.67	0.72	26.00	2.65	57.7	13.7
		Merced		2.33	0.58	0.47	0.64	2.00	0.66	1.27	0.88	20.67	4.73	56.4	5.9
ST 4990 B3XF	635	Tulare	Upland	1.00	0.00	0.33	0.49	1.67	0.72	1.13	0.92	23.70	4.51	61.8	8.4
		Merced		1.33	1.15	0.47	0.74	1.60	1.30	0.20	0.41	16.00	7.94	59.3	16.8
ST 5600 B2XF	636	Tulare	Upland	0.33	0.58	0.08	0.29	1.25	0.75	0.33	0.65	23.75	4.72	60.7	5.1
		Merced		0.67	1.15	0.53	0.92	2.00	1.07	1.07	0.80	18.67	3.79	60.3	9.7
ST 5610 B3XF	637	Tulare	Upland	1.00	1.00	0.67	0.87	1.67	0.87	0.67	0.87	20.20	5.36	27.9	28.6
		Merced		1.50	0.71	0.50	0.85	1.50	1.18	0.40	0.84	17.50	2.12	49.2	29.3
ST 5707 B2XF	638	Tulare	Upland	1.67	0.58	0.47	0.74	2.40	0.74	1.00	0.66	29.00	1.23	73.5	9.6
		Merced		1.67	0.58	1.00	0.66	1.87	0.74	0.33	0.62	18.33	0.58	69.3	8.1
HA 1432	639	Tulare	Hybrid	1.00	1.00	0.36	0.75	1.71	0.72	0.43	0.65	28.30	4.93	71.3	11.7
		Merced		1.33	0.58	0.60	0.63	1.73	0.70	0.80	0.68	22.00	7.00	66	1.1

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Entry	2020	County	Type of	Whole		Single		Root		Cotyledon		Plant		Plant	
	Entry		Location	Cotton	Plot Foliar	FOV	Plant Foliar	Vasc. Stain	Vasc. Stain	height	Survival				
Name	Number	SITE	(P-Pima; U-Upland H-Hybrid)	rating	stdev	rating	stdev	Rating	stdev	Rating	stdev	(inches)	stdev	Percent	stdev
				mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev
DP 341 RF	640	Tulare	Pima	0.67	0.58	0.20	0.41	1.00	0.85	0.00	0.00	22.00	3.61	73.7	6.2
		Merced		1.33	1.15	0.46	0.88	1.22	1.06	0.69	0.75	19.67	6.03	67.8	6.2
DP 359 RF	641	Tulare	Pima	0.00	0.00	0.00	0.00	1.27	0.70	0.00	0.00	22.00	2.00	74	3.4
		Merced		0.33	0.58	0.13	0.35	1.60	0.83	0.67	0.82	19.33	1.16	69.8	7.7
DP 347 RF	642	Tulare	Pima	0.67	0.58	0.20	0.41	1.07	0.70	0.13	0.52	23.30	1.53	69.5	4.3
		Merced		1.33	1.15	0.62	1.12	1.45	0.79	0.69	0.86	21.00	4.36	65.1	10
DP 2044 B3XF	643	Tulare	Upland	1.33	0.58	0.31	0.63	1.62	0.96	0.46	0.78	21.70	1.53	54.5	32.1
		Merced		1.67	1.53	0.60	0.96	1.93	1.22	0.67	0.82	17.33	4.04	67.6	10.9
DP 1646 B2XF	644	Tulare	Upland	0.00	0.00	0.00	0.00	1.60	0.70	0.50	0.53	25.00	1.00	36.7	6.9
		Merced		0.67	1.15	0.27	0.70	1.40	0.99	0.20	0.41	18.67	1.53	39.8	27.2
DP 1840 B3XF	645	Tulare	Upland	1.00	1.00	0.42	0.67	1.58	1.17	0.50	0.67	27.00	1.73	47.5	5.7
		Merced		1.00	1.00	0.55	0.69	1.46	1.04	1.18	0.98	20.67	0.58	53.3	6.5
DP 1845 B3XF	646	Tulare	Upland	0.00	0.00	0.27	0.46	1.27	0.70	0.60	0.74	25.00	2.65	68.4	9.4
		Merced		0.00	0.00	0.00	0.00	1.53	0.74	0.20	0.41	22.00	6.25	66.3	8.9
DP 2012 B3XF	647	Tulare	Upland	1.67	0.58	0.53	0.74	2.27	0.70	1.07	0.80	27.30	2.08	66.5	9.2
		Merced		2.33	0.58	0.53	0.99	2.33	0.82	1.27	0.96	19.33	2.52	68	3
DG 3520 B3XF	648	Tulare	Upland	1.00	0.00	0.33	0.49	1.33	0.78	0.42	0.79	25.67	0.58	63.5	7.4
		Merced		1.33	1.15	0.53	0.83	2.00	0.85	0.47	0.64	18.00	1.00	64.7	10.8
NG 4936 B3XF	649	Tulare	Upland	1.33	1.15	0.46	0.82	2.27	1.01	0.82	0.60	24.30	0.58	68.4	8.1
		Merced		1.67	0.58	0.40	0.74	1.47	0.99	0.67	0.62	21.67	1.53	63	4.5
DP 348 RF	650	Tulare	Pima	0.00	0.00	0.00	0.00	1.13	0.74	0.00	0.00	21.70	2.52	73.2	8.5
		Merced		0.67	0.58	0.58	0.52	1.61	0.57	0.83	0.72	15.67	4.93	68.5	5.3
Gowan GS-1	651	Tulare		1.00	0.00	0.29	0.47	1.43	0.51	0.43	0.65	27.30	2.90	47.2	15
		Merced		1.33	0.58	0.46	0.78	2.00	0.91	0.54	0.52	17.67	4.16	40.8	10.6
Gowan GS-2	652	Tulare		0.00	0.00	0.00	0.00	1.92	0.49	0.62	0.87	23.00	1.00	59.4	0.8
		Merced		0.67	0.58	0.20	0.41	1.60	0.91	0.67	0.82	21.00	5.20	59.7	8.5

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Entry	2020 Entry	County	Type of Cotton (P-Pima; U-Upland H-Hybrid)	Whole Plot Foliar		Single Plant Foliar		Root Vasc. Stain		Cotyledon Vasc. Stain		Plant height (inches)		Plant Survival Percent	
				rating	stdev	rating	stdev	Rating	stdev	Rating	stdev	mean	stdev	mean	stdev
Gowan GS-3	653	Tulare		1.00	1.41	0.67	1.03	2.00	0.63	0.33	0.52	19.50	3.54	35.5	18.4
		Merced		1.67	1.53	0.53	0.92	1.87	0.74	1.00	0.85	18.67	0.58	49.1	15.9
Gowan GS-4	654	Tulare		1.33	1.15	0.57	0.85	1.93	0.73	0.21	0.43	24.70	1.16	57.9	9.3
		Merced		2.33	0.58	0.73	1.03	1.73	1.16	0.60	0.83	20.67	1.53	40.6	20
Gowan GS-5	655	Tulare		1.00	1.00	0.27	0.64	1.46	0.69	0.09	0.30	24.00	2.00	51	16.6
		Merced		2.00	0.00	0.71	0.91	2.14	0.54	1.14	0.95	16.67	1.53	53.9	8.2
Gowan GS-6	656	Tulare		1.00	1.00	0.50	0.76	1.63	0.52	0.13	0.35	19.30	5.51	59.4	13.3
		Merced		2.00	0.00	0.60	0.83	2.13	0.64	1.13	0.83	17.67	2.52	65	9.3
Gowan GS-7	657	Tulare		1.67	0.58	0.60	0.84	1.70	0.48	0.40	0.52	17.74	2.52	66.6	3
		Merced		1.33	0.58	0.40	0.63	1.47	0.92	0.67	0.82	21.67	3.06	60.8	13.6
Gowan GS-8	658	Tulare		1.33	0.58	0.36	0.63	1.21	0.80	0.21	0.43	23.30	2.31	66.7	9.7
		Merced		2.00	1.00	0.80	1.08	1.67	1.18	0.80	0.94	20.67	1.53	63.1	6.6
Gowan GS-9	659	Tulare		1.00	1.00	0.60	0.89	1.60	1.14	0.80	0.84	24.70	1.16	66.5	7
		Merced		2.33	0.58	1.46	1.13	2.27	0.65	0.82	0.87	17.00	6.93	67.4	9
Mons 109-C7		Tulare	Pima -susc. Check	2.00	1.00	1.13	1.12	2.50	0.54	0.78	0.67	17.30	1.53	23	13
		Merced		3.00	1.00	0.40	0.63	1.93	0.70	1.13	0.99	18.00	1.46	29.7	8.3
DP-340		Tulare	Pima-susc. Check	2.33	0.58	1.08	1.12	2.29	0.56	0.93	0.83	16.40	3.10	26	13.2
		Merced		3.33	0.58	1.07	1.28	2.84	0.91	0.68	0.50	13.90	5.50	19.4	9.5

2020 Fusarium Screens - SUMMARY (Tulare County and Merced County Sites)

February 5, 2021 copy

COMMERCIAL SEED COMPANY ENTRIES

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2020 Fusarium Screen - Summary - University of CA - commercial entries - R.B. Hutmacher

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	2020	County	Type of Cotton	Whole Plot Foliar		Single Plant Foliar		Root Vasc. Stain		Cotyledon Vasc. Stain		Plant height (inches)		Plant Survival		
Entry Name	Entry Number	Location SITE	(P-Pima; U-Upland H-Hybrid)	FOV rating	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev
FM 2498 GLT		Tulare	Upland - check	1.00	0.00	0.31	0.48	1.62	0.51	0.92	0.76	24.00	2.65	70.9	13.1	
		Merced	variety	1.00	0.00	0.40	0.42	1.86	0.58	0.80	0.40	19.30	4.50	64.7	6	
PHY 881 RF		Tulare	Pima - check	0.00	0.00	0.20	0.41	1.33	0.62	0.27	0.46	23.70	2.10	71.8	6.3	
		Merced	resistant check	0.00	0.00	0.73	0.50	1.61	0.16	0.60	0.53	21.30	2.52	68	4.5	

COMMENTS ON THE FUSARIUM RACE 4 SITUATION AND FIELD SITUATION IN TERMS OF OTHER PATHOGENS AT THE TWO LOCATIONS: (Merced County, Tulare County):

In California there are two known *Fusarium oxysporum* f. sp. *vasinfectum* race 4 (FOV4) strains (genotypes), identified as null and true.

In the Dos Palos field the FOV4-true and FOV4-null genotypes were found along with a moderate to high incidence of Rhizoctonia.

The Tipton location had both FOV4-null and FOV4-true strains with a low to moderate incidence of Verticillium.

Research is currently being conducted to determine if there is a difference in the virulence of these two genotypes.

The FOV4-null genotype was most frequently isolated from cotton in fields within Merced County, while the FOV4-true genotype was frequent in all counties surveyed (Merced, Kings, Kern, and Tulare).

The FOV4-true and a third genotype FOV4-MT have been reported in Texas. We have not found the FOV4-MT genotype in California.

There are some claims this one may be more aggressive, but more studies are needed to see if there are different responses among the FOV4 genotypes with different cotton cultivars.