

University of California - 2018 Commercial Entry Fusarium Race 4 Screening - SUMMARY (Tulare County Site)

year = 2018

FINAL 1/29/2019 version

COMMERCIAL SEED COMPANY ENTRIES, RBTN (Regional Breeder Testing) program entries

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

Cooperators: S.D.Wright (UCCE); M. Ulloa (USDA-ARS); M.P. Keeley, T. Frigulti, R. Delgado, J. Angeles (UCCE, UCD); Cooperator Grower in Tulare County

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

2018 Fusarium Screen - Summary (Tulare Co.) - University of CA - commercial entries and RBTN entries - R.B. Hutmacher

page 1 of 8

Entry Name	2018 Entry Number	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)		Main Stem Node #		Percent Survival	
				rating	stdev	rating	stdev	Rating	stdev	Rating	stdev	mean	stdev	mean	stdev	mean	stdev
BX 1921 GL	901	Tulare	U	1.33	0.58	0.13	0.52	1.87	1.36	0.93	0.70	25.67	4.05	17.87	1.73	73.4	23.30
BX 1971 GLTP	902	Tulare	U	2.33	0.58	0.13	0.35	2.13	0.92	0.53	0.64	26.40	6.03	16.67	2.23	75.6	21.00
BX 1972 GLTP	903	Tulare	U	1.67	0.58	0.33	0.72	2.33	0.98	0.87	0.74	27.67	2.55	18.20	1.47	82.6	9.00
BX 1973 GLTP	904	Tulare	U	2.14	0.90	0.38	0.77	2.23	1.01	0.77	0.73	29.46	6.40	15.85	1.34	66.4	13.70
BX 1974 GLTP	905	Tulare	U	1.71	0.76	0.13	0.35	2.07	0.70	1.07	0.80	28.73	3.17	16.40	1.72	83.4	15.70
BX 1975 GLTP	906	Tulare	U	1.00	0.00	0.40	0.74	1.67	0.98	0.73	0.80	29.27	2.81	15.13	2.17	72.5	4.00
BX 1976 GLTP	907	Tulare	U	1.67	0.58	0.27	0.59	2.07	0.80	0.60	0.63	28.80	2.01	16.13	1.13	74.9	19.00
FM 1320 GL	908	Tulare	U	2.00	0.00	0.13	0.35	1.87	0.92	0.47	0.74	29.87	3.40	18.87	1.30	78.9	6.50
FM 1830 GLT	909	Tulare	U	2.00	0.00	0.27	0.46	1.60	0.83	0.33	0.62	31.07	2.40	17.60	1.80	82	12.70
FM 1888 GL	910	Tulare	U	1.86	0.38	0.47	0.83	1.93	1.10	0.40	0.63	29.60	2.92	16.73	1.62	84.6	8.60
FM 1911 GLT	911	Tulare	U	1.00	0.58	0.07	0.26	1.30	1.13	0.33	0.62	23.73	3.35	16.27	2.12	80.3	11.10
FM 1953 GLTP	912	Tulare	U	2.00	1.00	0.33	0.72	2.60	0.51	1.27	0.80	28.27	2.94	17.60	2.20	77.6	9.80
FM 2322 GL	913	Tulare	U	1.29	0.49	0.60	0.83	2.47	0.52	0.80	0.68	29.47	3.18	16.47	1.88	81	10.20

MEASUREMENTS SHOWN were made at approximately 7-8 weeks after plant emergence.

*** see NOTES section at the bottom of page 8 for additional information on the test screening site and suggestions for interpretation of results.**

Entry Name	2018	County	Type of Cotton	Whole Plot Foliar	Single Plant Foliar		Root Vasc. Stain		Cotyledon Vasc. Stain		Plant height (inches)	Main Stem Node #		Percent Survival			
	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 2334 GLT	914	Tulare	U	1.86	0.60	0.60	0.83	2.47	0.52	0.80	0.68	29.47	3.18	16.47	1.88	87.8	11.80
				23.00													
FM 2498 GLT	915	Tulare	U	2.14	0.38	0.86	0.80	2.36	0.74	0.93	0.73	27.21	5.96	15.93	2.09	68	5.90
FM 2574 GLT	916	Tulare	U	1.29	0.49	0.07	0.26	1.60	1.24	0.33	0.49	27.80	4.71	16.47	0.74	81.6	23.70
ST 4848 GLT	917	Tulare	U	1.14	0.38	0.13	0.52	2.13	0.99	1.20	0.77	28.87	3.83	16.20	2.11	76.6	12.90
ST 4949 GLT	918	Tulare	U	1.67	0.58	0.33	0.72	2.40	0.74	0.93	0.80	29.47	2.42	15.40	2.32	74.7	16.60
ST 5122 GLT	919	Tulare	U	1.14	0.38	0.33	0.62	2.20	0.86	0.73	0.46	30.12	3.79	17.60	2.10	71.6	15.50
ST 5517 GLTP	920	Tulare	U	1.71	0.76	0.33	0.62	2.33	0.72	0.80	0.77	29.60	7.10	17.73	3.35	80.9	19.50
ST 5471 GLTP	921	Tulare	U	0.43	0.79	0.20	0.41	2.07	0.80	1.27	0.88	28.20	2.86	16.33	1.11	87.3	9.80
ST 5818 GLT	922	Tulare	U	1.67	1.15	0.73	0.88	1.87	1.25	0.87	0.83	30.27	4.23	16.60	1.84	82.3	6.20
Bayer Daytona RF	923	Tulare	U	2.67	0.51	1.57	1.27	2.87	0.35	1.20	0.41	25.93	5.48	15.53	2.00	62.8	4.50
DP 1646 B2XF	924	Tulare	U	1.29	0.76	0.20	0.41	1.93	0.96	0.47	0.64	35.20	5.33	17.93	1.79	79.9	19.5
DP 1845 B3XF	925	Tulare	U	1.14	0.38	0.20	0.41	2.47	0.92	0.87	0.74	30.87	4.75	18.73	1.53	72.3	10.70
DP 1851 B3XF	926	Tulare	U	2.57	0.79	0.73	0.96	2.20	0.94	1.20	0.77	29.53	6.52	17.40	2.06	794	8.20

	2018	County	Type of Cotton	Whole Plot Foliar		Single		Root		Cotyledon		Plant		Main		Percent	
Entry Name	Entry Number	Location SITE	(P-Pima; U-Upland H-Hybrid)	FOV rating mean stdev		Plant Foliar rating mean stdev		Vasc. Stain Rating mean stdev		Vasc. Stain Rating mean stdev		height (inches) mean stdev		Stem Node # mean stdev		Survival mean stdev	
			(blank if information not provided)														
MON 16R346 B3XF	927	Tulare		1.67 0.58		0.13 0.52		2.00 1.00		0.73 0.59		28.80 3.61		16.73 2.05		80.5 7.20	
17R931 NR B3XF	928	Tulare		2.00 0.58		0.27 0.59		1.80 0.94		0.47 0.74		27.53 2.75		17.00 2.30		77.2 3.70	
17R818 B3XF	929	Tulare		1.33 0.58		0.07 0.26		1.67 1.18		0.53 0.74		30.27 3.24		17.80 1.47		80.8 11.40	
17R820 B3XF	930	Tulare		2.57 0.79		0.27 0.59		2.27 0.80		0.73 0.80		30.13 4.52		16.20 2.04		75.2 10.00	
17R738 XF	931	Tulare		1.86 0.38		0.53 0.74		2.40 0.99		0.93 0.80		25.60 3.74		16.27 1.62		90.3 2.60	
DP 341 RF	932	Tulare	P	0.14 0.38		0.00 0.00		0.87 0.83		0.00 0.00		27.67 2.97		17.47 1.73		94.4 3.90	
DP 348 RF	933	Tulare	P	0.00 0.00		0.13 0.35		1.20 0.68		0.00 0.00		28.40 2.06		17.73 1.91		87.6 11.30	
DP 358 RF	934	Tulare	P	0.67 0.58		0.20 0.41		1.27 0.70		0.13 0.35		29.67 3.02		18.33 1.54		85.7 8.30	
DP 1725 B2XF	935	Tulare	U	0.33 0.58		0.00 0.00		1.33 0.72		0.00 0.00		28.00 3.05		17.40 1.68		88 3.80	
DP 1747 NR B2XF	936	Tulare	U	0.67 0.58		0.27 0.46		1.60 0.63		0.20 0.41		29.07 3.28		17.53 1.96		94 2.70	
DP 1820 B3XF	937	Tulare	U	0.33 0.58		0.07 0.26		1.42 0.80		0.07 0.26		28.00 2.20		16.80 2.11		94.4 1.30	
18R445 B3XF	938	Tulare	U	2.00 0.00		0.54 0.97		1.85 0.90		0.77 0.93		25.92 6.28		16.62 3.80		56.9 11.10	
18R409 B3XF	939	Tulare	U	0.14 0.38		0.07 0.26		1.52 0.94		0.13 0.35		26.47 2.61		16.93 1.16		82.1 15.60	

Entry Name	2018	County Location	Type of Cotton	Whole Plot Foliar	Single Plant Foliar		Root Vasc. Stain		Cotyledon Vasc. Stain		Plant height (inches)		Main Stem Node #		Percent Survival		
	Entry Number		(P-Pima; U-Upland H-Hybrid)	FOV rating	rating	rating	Rating	Rating	Rating	Rating	height (inches)	Node #	Survival	Survival			
			(blank if information not provided)	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev
18R432 B3XF	940	Tulare		1.00	1.00	0.40	0.74	1.73	0.80	0.67	0.72	31.67	3.70	17.13	1.30	89.8	6.60
18R440 B3XF	941	Tulare		1.29	0.49	0.60	0.74	2.47	0.64	1.07	0.70	29.47	4.36	17.80	1.78	78.8	6.30
18R639 NR B3XF	942	Tulare		1.00	1.00	0.20	0.56	1.18	0.86	0.07	0.26	27.00	1.41	17.27	1.44	86.6	9.70
18R628 NR B3XF	943	Tulare		0.14	1.38	0.00	0.00	1.33	0.88	0.07	0.26	26.80	2.43	16.67	2.06	89.8	14.00
18R525 B3XF	944	Tulare		0.67	0.58	0.07	0.26	1.27	0.70	0.00	0.00	28.27	4.13	17.93	2.12	83.7	6.60
16R246 NR B2XF	945	Tulare		0.14	0.38	0.00	0.00	1.67	0.62	0.13	0.35	28.13	1.46	18.53	1.06	92.1	5.20
Phy 841 RF	946	Tulare	P	0.29	0.49	0.47	0.74	0.87	0.70	0.00	0.00	27.60	1.80	17.87	0.92	91.6	8.40
Phy 881 RF	947	Tulare	P	0.67	0.58	0.00	0.00	1.13	0.74	0.00	0.00	27.27	2.09	17.67	1.99	88.1	7.20
Phy 888 RF	948	Tulare	P	1.33	0.58	0.00	0.00	1.40	1.06	0.40	0.63	31.40	3.46	17.20	1.70	87.7	12.50
Phy 805 RF	949	Tulare	P	1.71	0.49	0.07	0.26	1.87	0.99	1.00	0.85	30.53	2.70	17.80	1.37	82.7	10.30
Phy 802 RF	950	Tulare	P	1.14	0.38	0.07	0.26	1.33	1.05	1.07	0.80	29.87	3.72	16.20	1.93	85.4	7.30
Phy 444 WRF	951	Tulare	U	2.00	0.00	0.33	0.62	2.13	0.64	1.00	0.76	29.87	2.72	18.40	0.99	83.1	0.30
Phy 764 WRF	952	Tulare	U	1.00	0.00	0.07	26.00	1.73	0.70	0.53	0.64	31.27	1.62	17.93	1.16	96.1	3.40

Entry Name	2018	County	Type of Cotton	Whole Plot Foliar	Single		Root		Cotyledon		Plant		Main		Percent		
	Entry Number		Location SITE	(P-Pima; U-Upland H-Hybrid) <i>(blank if information not provided)</i>	FOV rating	mean	stdev	Plant Foliar rating	mean	stdev	Vasc. Stain Rating	mean	stdev	height (inches)	mean	stdev	Survival
PX 803	953	Tulare		2.33	0.58	0.20	0.41	2.40	1.06	1.13	0.74	27.73	3.47	15.27	1.83	65.7	5.70
PX 804	954	Tulare		1.67	0.58	0.33	0.62	2.40	0.74	0.60	0.63	26.13	2.67	18.07	1.44	74.3	14.00
PX 806	955	Tulare		1.14	0.38	0.07	0.26	1.91	0.70	0.60	0.63	31.13	3.44	16.47	2.10	93	3.10
PX 807	956	Tulare		1.14	0.38	0.13	0.52	1.60	1.06	0.53	0.74	26.40	3.50	16.60	1.92	82.5	16.40
PX 808	957	Tulare		1.86	0.38	0.53	0.74	2.33	0.90	1.07	0.80	30.60	4.97	18.60	2.10	71.4	12.90
PX 809	958	Tulare		1.14	0.38	0.13	0.52	2.13	1.13	0.87	0.83	28.87	3.91	17.07	1.79	79.1	9.70
Ark 1015-42	959	Tulare	U-RBTN program	2.00	1.00	1.07	0.88	2.40	0.83	1.20	0.86	27.27	5.31	17.80	2.24	69	15.80
Ark 1005-41	960	Tulare	U-RBTN program	1.29	0.49	0.27	0.59	2.07	0.96	0.53	0.74	29.40	4.82	17.87	2.95	76.3	12.60
Ark 1004-38	961	Tulare	U-RBTN program	1.67	1.15	0.40	0.74	2.33	0.72	0.80	0.77	32.20	8.18	17.93	1.71	67.9	23.40
Ark 1005-35	962	Tulare	U-RBTN program	1.14	0.38	0.20	0.41	1.60	0.83	0.67	0.72	30.13	3.34	17.00	1.73	90	7.20
Ark 1007-15	963	Tulare	U-RBTN program	1.67	1.15	0.33	0.62	1.87	1.30	0.80	0.77	29.80	6.01	16.73	2.12	83.7	14.00
16-13P1115	964	Tulare	U-RBTN program	1.67	0.58	0.33	0.72	1.73	1.28	0.80	0.86	32.60	4.31	17.20	2.31	81.1	17.60
TAM LBB 150107	965	Tulare	U-RBTN program	1.29	0.49	0.27	0.70	2.07	1.10	0.87	0.83	31.53	3.52	18.53	2.85	77.6	15.50

Name	2018	County	Type of	Whole	Single		Root		Cotyledon		Plant		Main		Percent		
	Entry		Cotton	Plot Foliar		Plant Foliar		Vasc. Stain		Vasc. Stain		height		Stem		Survival	
	Number	Location	(P-Pima; U-Upland H-Hybrid)	FOV rating		rating		Rating		Rating		(inches)		Node #			
			(blank if information not provided)	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev
TAM LBB 150824	966	Tulare	U-RBTN program	1.00	0.00	0.47	0.83	2.07	0.88	1.20	0.94	33.93	5.32	18.27	2.02	71.3	4.90
TAM LBB 150921	967	Tulare	U-RBTN program	2.00	1.00	0.60	0.83	2.13	0.83	0.87	0.74	30.60	5.53	17.60	1.88	76.3	13.80
GA 2012141	968	Tulare	U-RBTN program	1.33	1.15	0.33	0.72	1.73	1.22	0.67	0.72	27.87	4.63	15.40	1.80	75.1	20.40
GA 2015024	969	Tulare	U-RBTN program	1.00	0.00	0.13	0.35	1.60	1.06	0.40	0.63	35.61	4.14	19.60	1.18	88.4	13.60
TAM 13S-03	970	Tulare	U-RBTN program	1.33	0.58	0.40	0.74	2.07	0.88	0.60	0.74	26.87	4.56	17.40	2.06	86	14.30
TAM 12J-39	971	Tulare	U-RBTN program	2.00	0.00	0.33	0.72	1.87	0.99	0.87	0.92	27.27	7.31	16.87	1.51	88.3	15.60
LA 14063083	972	Tulare	U-RBTN program	1.29	0.49	0.20	0.56	2.53	0.99	0.80	0.68	25.87	4.31	16.67	1.99	82.4	11.10
LA 14063075	973	Tulare	U-RBTN program	1.14	0.38	0.07	0.26	1.53	0.74	0.40	0.63	25.93	3.06	15.33	2.13	79.5	13.70
LA 11309040	974	Tulare	U-RBTN program	1.00	0.00	0.40	0.51	2.47	0.64	0.60	0.63	28.87	3.64	17.20	1.52	82.4	17.50
PD 2011 021	975	Tulare	U-RBTN program	1.00	0.00	0.20	0.41	2.00	0.76	0.67	0.72	28.67	4.32	17.27	1.79	90.4	2.40
PD 2011 081	976	Tulare	U-RBTN program	1.71	0.49	0.33	62.00	1.60	1.24	0.33	0.49	26.73	8.46	16.67	1.54	76.9	17.60
PD 2011 026	977	Tulare	U-RBTN program	1.14	0.38	0.13	0.35	1.73	1.16	0.47	0.74	31.73	2.99	16.20	1.32	81.4	5.30
MS 2010-87-5	978	Tulare	U-RBTN program	1.00	0.00	0.33	0.49	2.20	0.68	0.60	0.63	31.00	3.25	18.33	1.11	92.3	9.50

Entry Name	2018	County Location SITE	Type of Cotton	Whole Plot Foliar	Single Plant Foliar	Root		Cotyledon		Plant		Main		Percent	
	Entry Number		(P-Pima; U-Upland H-Hybrid)	FOV rating		Vasc. Stain Rating	Vasc. Stain Rating	height (inches)	Stem Node #	Survival					
			(blank if information not provided)	mean stdev	mean stdev	mean stdev	mean stdev	mean stdev	mean stdev	mean stdev	mean stdev	mean stdev	mean stdev	mean stdev	mean stdev
DP 393 RBTN check	979	Tulare	U	0.29 0.49	0.00 0.00	1.27 1.16	0.27 0.59	29.73 3.20	16.80 1.66	89.1 2.70					
DP 493 RBTN check	980	Tulare	U	1.00 0.00	0.07 0.26	1.40 1.12	0.20 0.41	28.33 3.37	17.67 1.88	88.6 1.30					
FM 958 RBTN check	981	Tulare	U	1.29 0.76	0.27 0.59	1.20 1.37	0.40 0.63	29.80 4.69	16.53 1.73	73.4 16.20					
UA 222 RBTN check	982	Tulare	U	2.00 0.00	0.33 0.62	2.47 0.64	0.67 0.72	29.73 3.22	18.13 2.47	73.1 15.30					
CPS 18501-A B3XF	983	Tulare		2.00 0.00	0.27 0.59	2.87 0.52	1.27 0.70	28.40 4.61	16.33 1.45	77.7 12.80					
CPS 18502-A B3XF	984	Tulare		1.00 1.00	0.07 0.26	2.13 1.13	0.60 0.63	27.47 4.49	18.20 1.08	87.7 3.80					
CPS 18501-B B3XF	985	Tulare		1.67 0.58	0.20 0.41	2.20 0.94	1.00 0.93	31.13 3.09	16.60 1.76	83.2 9.90					
CPS 18501-C B3XF	986	Tulare		1.00 0.00	0.27 0.46	1.87 0.99	0.73 0.59	32.33 2.74	16.87 1.64	81.8 6.00					
CPS 18503-A B3XF	987	Tulare		1.33 0.58	0.13 0.35	2.20 0.86	0.67 0.72	31.33 2.77	19.00 1.93	88.6 4.50					
CPS 18503-D B3XF	988	Tulare		2.00 1.00	0.33 0.62	1.93 1.22	0.80 0.86	32.07 8.54	17.67 1.63	74.1 17.90					
CPS 18505-C B3XF	989	Tulare		1.00 0.00	0.13 0.35	1.40 1.24	0.53 0.74	34.87 4.56	17.27 2.74	92.1 3.10					
CPS 18506-D B3XF	990	Tulare		1.33 0.58	0.27 0.46	2.13 0.64	0.67 0.82	29.07 5.64	16.40 1.92	78.1 11.1					

Entry Name	2018	County	Type of Cotton	Whole Plot					Root					Cotyledon					Plant					Main Stem	Percent Survival
	Entry Number		Location SITE	(P-Pima; U-Upland H-Hybrid)	FOV rating	mean	stdev	mean	stdev	Vasc. Stain Rating	mean	stdev	mean	stdev	Vasc. Stain Rating	mean	stdev	mean	stdev	height (inches)	mean	stdev	mean	stdev	mean
HA 1432	991	Tulare	H	1.67	0.58	0.60	0.83	2.00	1.00	0.73	0.59	28.67	6.03	15.93	1.98	78.8	8.70								
Phy 499 WRF	992	Tulare	U	1.00	0.00	0.20	0.41	1.53	0.99	0.47	0.74	37.07	4.89	17.73	1.28	98.9	1.90								
NG 4545 B2XL	993	Tulare	U	1.33	0.58	0.53	0.74	2.27	0.80	0.67	0.72	32.53	3.02	17.87	1.19	84.3	2.80								
DP 149 B2XF	994	Tulare	U	1.33	1.15	0.40	0.63	2.33	0.62	1.07	0.80	33.67	4.92	17.93	1.75	77.1	11.20								
DG 2355 B2RF	995	Tulare	U	1.00	0.00	0.27	0.46	1.60	0.91	0.40	0.63	33.67	2.47	17.93	1.22	97.4	2.40								
DP-340	check A	Tulare	P	3.00	0.63	0.62	0.80	2.54	0.81	0.69	0.47	14.32	5.98	13.05	1.77	20.5	12.90								
	moderate to high susceptibility																								
Phy 881 RF	check B	Tulare	P	0.11	0.32	0.07	0.25	1.23	0.86	0.03	0.18	25.80	3.29	16.20	2.17	84.4	16.40								
	highly tolerant																								
Mon 109-C7	check C	Tulare	P	2.57	0.53	0.35	0.65	2.61	0.99	0.74	0.75	17.48	4.10	12.78	2.17	18.5	11.60								
	high susceptibility																								

NOTES: The Tulare County site is a naturally infested field site where presence of the race 4 Fusarium pathogen had been confirmed in prior pathology studies. Averages and standard deviations of data are shown.

This site had a moderately severe infestation of Race 4 Fusarium (Huttmacher assessment), and observed symptoms were much more severe than in 2016-2017 at the same farm research site.

For screening purposes for race 4 Fusarium resistance, at this site & year we consider Vascular Root Staining numbers of 1.5 or lower as having some useful levels of resistance, worth considering for more field screening tests.

In general, we consider the data shown in columns "Root Vascular Staining" and "Percent Survival" as the most useful information for assessments of relative resistance to the FOV-4 pathogen. Foliar damage levels are often not a clear indicator of plant infection or disease severity. Vascular staining at the cotyledon node is less consistent than tap root vascular staining. Plant growth measurements (plant height, # of nodes) shown are just measured as relative indicators of impacts on plant vigor and growth.

Foliar Damage/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.

Root Vascular Staining Index 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 crosssection; 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 seen throughout a cross-section of root tissue (Ulloa et al. 2006, 2009a).