

SUMMARY REPORT
California Cotton Alliance Supported Project
2014 Project Activities to Date

PROJECT TITLE: Assessment of Fusarium in San Joaquin Valley Cotton: Field Evaluation Support and Variety Screening Evaluations – Pima cotton

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Grower / Cooperators in various county sites each year

PROJECT SUMMARY:

This project matches the efforts in a similar named project supported by the California Cotton Incorporated State Support Committee. The difference between the two is that the Cotton Incorporated part of the project is set up to support only Acala and Upland cultivar research, while the CA Cotton Alliance project supplements that support and also allows us to also focus on Pima variety screening and related efforts for Pima production. CA Cotton Alliance funds support the same areas of work as the Cotton Incorporated funded project, but since Cotton Incorporated funds are collected for Upland variety work, the expanded efforts in screening, including Pima, are covered under this same project summary report.

General efforts in this project include:

- Assessment of field plant samples submitted by or collected from fields of growers or consultants for the type of Fusarium occurring in grower fields (for growers, consultants, and seed or chemical company representatives requesting assistance in field and plant evaluations, and in sample collection and analysis)
- Setting up and operating cotton germplasm screening trials in multiple field and greenhouse conditions under pressure of race 4 FOV to identify relative resistance / susceptibility of both Upland and Pima materials

This project is dependent upon cooperation with Dr. Michael R. Davis (UC Davis Plant Pathology), as Dr. Davis is the pathologist we are working with to send samples for FOV race identification and classification. More recently, most of our pathology analyses are done using the AgDia quick test method, and the support provided by these projects helps support costs for these quick tests. Dr. Davis, however, continues to support us with inoculum preparation, processing of any plant samples where there are additional questions, and in other evaluations of samples generated by this screening and field sample FOV identification project. Screening trials have again been conducted at a Kern County field site, a Tulare County field site and in a greenhouse location at the Kearney Research and Extension Center near Parlier, CA. Sites used have included:

UC Kearney Research and Extension Center greenhouses have been used each of the past 9 years.

- The first greenhouse plantings for FOV race 1 and race 4 screenings were planted in April, 2014 and consisted of small scale studies to compare impacts of inoculation density and inoculation method on disease incidence, severity and timing of damage.

- The second greenhouse planting at Kearney occurred in July and this was another preliminary evaluation focused on selections made from field FOV resistance screening trials, some of the same entries as the large scale field screening trials.
- A third set of greenhouse screening trials was initiated in August concentrating on screening of selections at a range of inoculum densities.

Two field trials for screening germplasm were planted, as follows:

- one field site with race 4 FOV identified in Kern County, planted in early May, 2014, with evaluations done in July and continuing into August, with 220+ entries
- One field site with race 4 FOV identified in Tulare County, planted in mid to late May, 2014, with evaluations done in July and continuing into August, with the same group of about 220 entries plus about 390 additional experimental entries plus check varieties.

Summary of Recent Field Evaluation Work:

Results in 2014 – grower field evaluations:

In 2014 a total of 72 fields were visited for in-field evaluations, with pathology evaluations done on about 50 of the visited, evaluated fields using the AgDia quick test methods, with the test kits purchased and run using project personnel without additional costs to growers or consultants making the field visit requests. An additional 34 sampled fields had FOV race 4 evaluations done visually based on plant symptoms, with no request made for confirmation using the AgDia kits. Most visited fields were with growers or PCA's familiar with the disease symptoms, who were mostly looking for a general verification of symptoms and likelihood of FOV disease, and they in some cases (over 30 as mentioned above) made in-field decisions that it was not necessary to analyze samples using the AgDia kit. In those cases, the individuals mostly indicated that they were convinced that the symptoms matched what they expected based on knowledge of race 4 FOV in nearby or adjacent fields.

This compares with sampling in earlier years: (1) 2013 a total of 96 fields were visited for in-field evaluations, with about 20 sets of samples submitted for pathology evaluations for race 4 FOV through Mike Davis' lab. An additional 40-45 sampled fields had FOV race 4 sample evaluations done with AgDia kits, which we purchased and ran using project personnel, without additional cost to the growers or consultants; (2) 2012, with about 115 fields visited and 30-32 samples submitted for FOV confirmation; (3) 2011, with 80+ sets of samples submitted for pathology evaluations by early Fall from about 80 fields out of 135 different fields visited, or (4) 2010, when about 35 sets of samples were submitted and evaluated out of over 70 fields evaluated. These numbers most likely do not represent the full number of additional fields identified as race 4 FOV, as some fields were visited where samples were not collected due to lack of grower approval to collect samples. Sites for field evaluations and sampling were located in 5 cotton producing San Joaquin Valley counties (Fresno, Merced, Kings, Tulare and Kern Counties), with the most new confirmed sites located in Kings County, Fresno, and Merced Counties.

Partial Results in 2014 – field resistance screening evaluations:

- Field varietal screens were planted and completed at both field screening sites at the time of this report, both in fields confirmed to be infested with FOV race 4, plus in the greenhouse screening site. The field tests were done only in a part of the field where a prior cotton crop showed consistent, significant plant losses due to FOV race 4 (greater than 30 percent mortality in susceptible Pima entries). An initial plant population count was done within 2 weeks after planting in plots at both sites (in late May at the West Kern County site, and in early June at the Tulare County site), followed by plant survival counts done a minimum of two times during an evaluation period of 7-8 weeks after emergence of cultivars being tested for resistance at the Tulare County site.
- When the plants at the Kern County site reached the point of being at 7-8 weeks past emergence, ratings and growth measurements were also made at that site. In addition to plant survival percentages, we evaluated plants for root vascular staining, foliar damage index rating, and plant size /

height and node counts as a measure of vigor. At both the West Kern site and the Tulare County site, major hand weeding efforts were required to keep weeds under control in these sites due to restricted use of herbicides necessitated by working with conventional cotton varieties.

- In greenhouse pathogenicity tests (not completed yet for 2014 on these commercial cultivars), cotton seedlings with 1 to 3 true leaves will be root dip-inoculated in a conidial suspension of 5×10^6 spores/ml for 3 minutes. Plants were then transplanted into heat-treated potting soil mix into 8 cm square by 20 cm deep pots and grown in a temperature-controlled greenhouse for a minimum of 3 to 4 weeks to allow time for disease and symptom development. Plant assessments were made at that time to determine the timing for destructive plant evaluations, and any plants with severe symptoms were assessed and sampled prior to plant death from the disease. After approximately 6 to 7 weeks, all remaining plants were removed from pots by pulling up plants and cutting the tap root at 2-3 cm below the soil line. The vasculature near the soil line and distal several centimeters of stem were examined for vascular staining (discoloration) typical of Fusarium wilt. Efforts to date have focused on a mix of Acala and non-Acala Uplands and commercial Pima varieties of interest to California commercial cotton producers and seed producers, plus some experimental materials both from public and private sources.
- The commercial varieties and company and RBTN program breeder experimental materials evaluated in our Commercial Entry and Company/RBTN Experimentals screening trials for 2014 are shown in the following tables. At the Tulare County location, we also had over 400 additional replicated entries included in the trial that were part of the extended USDA-ARS and UC selection and evaluation program (not part of this supported project, and to be reported elsewhere).

The tables that follow this page show both the **West Kern County** data set and **Tulare County** data set results for FOV-4 commercial screenings, showing the average and standard deviation of the foliar ratings, root vascular stain ratings, plant height and node number as indicators of vigor, and plant survival percentage for each entry. Data shown from the 2014 Fusarium race 4 screenings are determined from multiple plants evaluated in each of three field replications per entry, with the root vascular staining evaluations and plant vigor evaluations done on 5 separate plants in each of the field replications. This is not the full data set from that site, but concentrates on providing a subset of the data collected that focuses on **commercial varieties (those Pima and Uplands that are in our UC variety trials on farm and REC sites, plus company experimental cultivars submitted to us, plus entries in the national RBTN public breeder regional trials.**

The test results shown in just the attached tables include all entries in University of CA cotton variety trials for 2014, additional commercial germplasm (company selected varieties plus experimentals they submitted) plus entries #691-723 are entries from the Regional Public Breeders testing program (including check varieties, organized nationally by Dr. Ted Wallace of Mississippi). Information to focus on in reviewing the tables as best indicators of overall responses to FOV-4 infection are: (a) root vascular stain index; and (b) survival percent at 7 weeks, since they indicate relative severity of infection and impacts on plant mortality. "Check" varieties that are moderately to highly susceptible include: Phy-725RF, DP-340 (moderate), Phy-830 and DP-744 (highly susceptible), while a quite tolerant check variety would be Phy-802RF. The scale for the Foliar FOV index and root vascular stain index ratings is 0 to 5, with 0 being no symptoms and 5 being severe (usually reserved for dead or near dead plants). Keep in mind that the ratings are done at about 7+ weeks post emergence, so they are done on plants surviving at the time of the rating, which in the most severely impacted entries can be some of the few survivor plants, with most others dead.

Results of the screening work done in prior years is available in the "Variety Trials" section of the University of CA Cotton web site: <http://cottoninfo.ucdavis.edu>. Look under "variety trials – 2011 or 2012 or 2013" in the website, and follow down to Field and Greenhouse FOV screening to view summaries from the 2009 through 2013 growing seasons. When available and summarized, we will post the 2014 screening results in this same section of the UC cotton web site. Development of host-plant resistance is currently considered the most economic and effective strategy for managing FOV in California cotton production regions. Since long-term management of Fusarium wilt relies on the development of resistant varieties, efforts have focused on screens of cultivars from a wide range of cotton seed companies, and in addition, we are now including entries from the Regional Breeder trials (RBTN studies representing Upland entries from around the U.S. cotton belt. In

general, to date in our screening evaluations, it has been difficult to find Upland varieties that are as resistant and lightly affected as resistant Pima varieties when placed under moderate to high inoculum pressure. Germplasm highly-resistant to FOV race 4 were identified in Pima at the inoculum levels tested under greenhouse conditions and levels found in multiple infected field test sites.

Publication and Presentation plans: In addition to multiple summaries of data presented on the UC cotton web site (<http://cottoninfo.ucdavis.edu>) , multiple publications are in preparation at this time, and when they are advanced and ready for review, they will be made available to Cotton Incorporated. At the 2014 Beltwide Cotton Conferences in San Antonio, Dr. Mauricio Ulloa and Bob Hutmacher gave presentations in the Cotton Improvement Conference and Cotton Disease conference on germplasm and genetic improvement potential for Race 4 FOV resistance. This presentation included some of the data and findings from the screening / resistance evaluation work in this project. Any publications from this work will be provided to Cotton Incorporated as requested. For two quite detailed summaries of the SCREENING TRIAL data for evaluating resistance of a wide range of cultivars to race 4 Fusarium, please go to the University of CA cotton web site at:

<http://cottoninfo.ucdavis.edu>

It is fairly difficult in the body of this report to easily reproduce what are some fairly large tables of data summaries for the parameters that we evaluate in looking at Fusarium race 4 resistance. With that in mind, our recommendation is for those interested in the variety resistance evaluations to go to the above web site and follow these instructions to look at some multi-year summaries for varieties of specific interest. On the home page of the website shown above, click on "Cotton Variety trial results" for the year of interest. When that comes up, go down to "FOV Race 4 Field Screening – commercially available varieties" – this summary provides a multi-year summary of results from screening tests for varieties where we have 1, 2 or 3 years worth of resistance screening data. The other choice on that page is to go down to "FOV Race 4 Field Screening – all entries" – this summary provides information from the 2014 evaluations done with a wide range of cultivars, including commercially available germplasm, experimentals from a wide range of public breeders across the United States, plus experimental or limited availability entries from a range of seed companies. At this same web site, you can also go into the variety trial results for earlier years (click on variety trial results on the first page, and then scroll down to earlier years. Near the bottom of the different data set choices for each of the years, you will find an option to click on that will be called something like "FOV Race 4 Field screening".

If we can provide additional information, please contact Bob Hutmacher at (559) 260-8957 or by email at rbhutmacher@ucdavis.edu. On the following pages are summary tables from both field sites for 2014 screening, covering (1) COMMERCIALY AVAILABLE CULTIVARS; (2) SEED COMPANY EXPERIMENTALS OR LIMITED SEED ENTRIES; and (3) ENTRIES IN THE REGIONAL BREEDER PUBLIC BREEDER TESTING PROGRAM (RBTN) for 2014. Plans are for more easily readable summaries of multi-site FOV Screening trial results (greenhouse, Tulare Co. site, Kern Co. Site) to be available at the uc cotton web site in late November or December, 2014 if possible, as tables of results are cross-checked and ready for posting on the web site for use in identifying more FOV-4 resistant cultivars.

Hutmacher et al.- August, 2014 SUMMARY REPORT

"Field Evaluation Support and Variety Screening Evaluations - Fusarium) – Hutmacher, University of California

2014 commercial entries - FOV tests			WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014					page 1		
Race 4 infested field sites			TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014							
ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF # OF PLANTS PER PLOT	AVERAGE	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
601	PHY-725RF	West Kern County	average	2.67	0.80	2.53	24.33	15.33	25.67	58.64
			std deviation	0.58	1.08	0.52	4.37	1.40	4.73	8.70
		Tulare County	average	2.00	0.93	1.93	23.53	15.00		86.23
			std deviation	0.00	0.96	1.03	4.05	1.60		20.07
602	PHY-PX7064-05WRF	West Kern County	average	0.67	0.33	2.00	27.13	16.27	29.33	73.92
			std deviation	1.15	0.90	0.65	3.44	1.22	13.20	10.39
		Tulare County	average	0.00	0.13	2.00	25.86	15.36		85.00
			std deviation	0.00	0.35	0.76	3.48	1.24		6.19
603	PHY-499WRF	West Kern County	average	2.00	0.73	1.80	28.73	17.27	37.67	77.42
			std deviation	0.00	1.10	0.56	5.54	1.71	8.08	17.06
		Tulare County	average	2.00	0.93	1.47	25.53	14.80		78.03
			std deviation	0.00	0.96	0.83	3.89	1.43		23.53
604	FM-1830GLT	West Kern County	average	0.00	0.00	1.53	27.00	17.40	31.67	73.64
			std deviation	0.00	0.00	0.64	4.38	1.40	7.77	8.79
		Tulare County	average	0.67	0.33	1.33	26.33	15.33		86.43
			std deviation	1.15	0.62	0.62	2.38	1.23		10.69
605	FM-2334GLT	West Kern County	average	0.67	0.13	1.53	27.73	16.93	31.67	92.26
			std deviation	1.15	0.52	0.52	4.17	1.62	2.08	3.21
		Tulare County	average	0.67	0.13	0.73	25.47	16.00		72.30
			std deviation	1.10	0.52	0.59	2.56	1.00		16.19
606	FM-2322GLT	West Kern County	average	1.33	0.40	1.87	27.20	15.73	31.67	81.51
			std deviation	1.15	0.83	0.52	5.02	1.10	1.15	6.71
		Tulare County	average	0.33	0.00	1.33	26.33	15.27		69.13
			std deviation	0.58	0.00	0.49	2.23	0.96		13.92
607	DP-1252B2RF	West Kern County	average	2.00	1.00	2.00	27.00	14.73	36.67	82.69
			std deviation	0.00	1.07	0.65	3.76	1.28	4.51	8.63
		Tulare County	average	2.00	0.93	1.60	25.07	12.53		84.80
			std deviation	0.00	1.03	0.83	4.92	1.81		6.97
608	DP-1137B2RF	West Kern County	average	1.33	0.73	2.20	25.53	13.53	36.00	87.29
			std deviation	1.15	1.10	0.41	4.07	1.88	5.29	4.25
		Tulare County	average	2.00	0.87	1.47	27.20	12.60		98.13
			std deviation	0.00	0.92	0.64	3.53	1.36		1.67
609	DP-1050B2RF	West Kern County	average	2.00	0.53	1.60	29.07	15.73	30.00	86.63
			std deviation	0.00	0.92	0.63	3.06	1.16	7.94	7.01
		Tulare County	average	2.00	1.27	1.73	25.80	13.60		96.53
			std deviation	0.00	0.88	0.70	2.93	0.98		1.33
610	PHY-755RF	West Kern County	average	2.00	0.67	2.20	26.67	17.73	32.67	70.06
			std deviation	0.00	0.98	0.56	2.72	1.16	3.79	9.05
		Tulare County	average	2.00	0.93	2.13	23.40	15.07		82.47
			std deviation	0.00	0.88	0.99	3.50	0.96		0.75

Hutmacher et al.- August, 2014 SUMMARY REPORT

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2014 commercial entries - FOV tests

WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014

page 2

Race 4 infested field sites

TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014

ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF NODES	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
611	DAYTONA	West Kern County	average	2.00	0.53	2.07	23.53	15.27	31.33	76.39
			std deviation	0.00	0.92	0.46	5.05	1.28	5.69	10.49
		Tulare County	average	1.33	0.33	2.27	21.93	14.60		72.20
			std deviation	0.58	0.62	0.59	3.86	0.99		19.30
612	PHY-802RF	West Kern County	average	1.33	0.33	0.86	25.87	15.60	38.00	83.86
			std deviation	1.15	0.72	0.53	2.03	1.06	7.94	9.16
		Tulare County	average	0.00	0.00	0.67	26.67	15.80		95.03
			std deviation	0.00	0.00	0.49	1.63	0.86		4.70
613	PHY-805RF	West Kern County	average	2.00	0.40	1.33	22.87	15.60	20.33	44.71
			std deviation	1.00	0.91	0.72	4.70	1.92	3.06	4.52
		Tulare County	average	1.33	0.47	1.33	23.33	15.27		65.23
			std deviation	0.58	0.64	0.90	3.42	1.22		15.94
614	PHY-811RF	West Kern County	average	0.00	0.07	0.93	27.07	15.93	32.00	73.61
			std deviation	0.00	0.26	0.46	2.71	1.22	6.93	13.44
		Tulare County	average	0.33	0.13	1.07	25.80	15.87		69.10
			std deviation	0.57	0.35	0.70	2.34	0.74		3.68
615	DP-358RF	West Kern County	average	1.33	0.60	1.13	25.87	15.87	34.33	85.12
			std deviation	1.15	0.91	0.35	2.47	1.51	1.15	2.51
		Tulare County	average	0.00	0.00	0.40	26.67	15.73		91.17
			std deviation	0.00	0.00	0.51	2.09	1.03		9.82
616	MON 13R348R2P	West Kern County	average	0.00	0.07	1.13	26.93	16.60	37.67	89.19
			std deviation	0.00	0.26	0.35	2.43	1.40	1.53	12.34
		Tulare County	average	0.00	0.00	0.67	26.47	15.60		93.17
			std deviation	0.00	0.00	0.49	1.30	0.91		7.01
617	MON 12R254R2P	West Kern County	average	3.33	1.92	2.83	15.42	14.08	6.67	17.18
			std deviation	0.58	1.00	0.83	4.01	2.68	5.03	15.97
		Tulare County	average	1.67	0.47	1.87	16.73	14.87		41.17
			std deviation	0.58	0.92	0.74	3.08	1.81		18.49
618	HA-211	West Kern County	average	0.00	0.00	1.53	31.60	17.60	22.67	74.51
			std deviation	0.00	0.00	0.64	3.81	1.35	4.04	8.38
		Tulare County	average	1.00	0.20	1.27	27.87	16.05		80.83
			std deviation	1.00	0.77	0.46	4.76	1.87		7.81
619	HA-1432	West Kern County	average	0.00	0.13	1.53	33.40	19.31	31.67	74.82
			std deviation	0.00	0.35	0.52	5.33	1.18	4.04	9.81
		Tulare County	average	0.00	0.00	0.67	30.13	16.67		91.00
			std deviation	0.00	0.00	0.49	2.13	0.98		5.45

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620	DP-340	West Kern County	average	3.67	1.50	2.43	11.14	11.71	10.67	26.79
			std deviation	0.58	0.85	0.51	3.08	2.30	5.77	9.35
		Tulare County	average	1.33	0.50	2.43	14.21	14.14		31.37
			std deviation	0.58	0.65	0.76	5.15	2.82		18.94
621	BX-1530 GLT	West Kern County	average	2.67	1.07	2.00	26.93	15.00	29.67	83.79
			std deviation	0.58	1.22	0.85	6.17	2.10	1.15	7.08
		Tulare County	average	2.00	1.33	2.07	24.47	12.80		80.83
			std deviation	0.00	0.90	0.70	3.27	1.32		14.76
622	BX-1534 GLT	West Kern County	average	0.00	0.07	1.80	27.67	17.00	32.33	76.58
			std deviation	0.00	0.26	0.68	3.74	1.65	1.15	4.45
		Tulare County	average	0.67	0.13	2.27	26.80	15.87		81.10
			std deviation	0.58	0.35	0.70	2.15	0.74		6.85
623	BX-1535 GLT	West Kern County	average	1.33	0.40	1.80	27.53	17.80	35.00	84.94
			std deviation	1.15	0.83	0.41	4.37	1.78	3.46	7.80
		Tulare County	average	0.00	0.07	1.53	26.83	15.27		93.83
			std deviation	0.00	0.26	0.64	3.07	1.44		8.15
624	BX-1536 GLT	West Kern County	average	1.33	0.40	1.80	27.93	18.00	36.00	91.52
			std deviation	1.15	0.83	0.56	3.49	1.07	1.73	3.94
		Tulare County	average	1.33	0.40	1.53	24.60	15.67		77.30
			std deviation	1.15	0.91	0.64	4.44	2.09		15.78
625	BX-1538 GLT	West Kern County	average	1.00	0.60	2.27	24.40	17.07	35.00	83.52
			std deviation	1.00	0.83	0.59	5.51	1.69	3.00	10.32
		Tulare County	average	1.33	0.40	1.67	25.13	15.53		90.77
			std deviation	1.15	0.74	0.72	3.56	1.13		2.73
626	13R352 B2R2	West Kern County	average	1.33	0.33	2.00	24.13	15.53	24.67	77.46
			std deviation	1.15	0.72	0.65	3.54	1.41	9.07	7.01
		Tulare County	average	2.00	0.67	1.67	22.27	13.67		77.33
			std deviation	0.00	1.05	0.62	2.72	1.23		8.72
627	12R249 B2R2	West Kern County	average	2.00	0.53	2.40	25.00	16.07	34.67	82.46
			std deviation	0.00	1.13	0.51	6.00	2.52	1.53	10.31
		Tulare County	average	1.67	0.40	1.13	24.73	14.47		82.83
			std deviation	0.58	0.74	0.84	2.82	0.99		13.21
628	12R224 B2R2	West Kern County	average	2.00	0.60	1.80	26.13	17.27	29.67	69.61
			std deviation	0.00	1.06	0.68	3.68	1.16	1.15	2.61
		Tulare County	average	1.33	0.73	2.07	27.00	15.73		86.40
			std deviation	1.15	0.88	0.70	2.24	1.16		0.36
629	13R310 B2R2	West Kern County	average	2.00	0.40	2.00	25.60	17.73	32.33	81.14
			std deviation	0.00	0.74	0.00	3.29	1.67	3.79	4.39
		Tulare County	average	0.33	0.13	2.07	26.40	16.60		91.67
			std deviation	0.58	0.35	0.80	2.35	1.18		9.98

Hutmacher et al.- August, 2014 SUMMARY REPORT

"Field Evaluation Support and Variety Screening Evaluations - Fusarium) – Hutmacher, University of California

2014 commercial entries - FOV tests

WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014

page 4

Race 4 infested field sites

TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014

ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF # OF PLANTS	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
630	14R1455 B2R2	West Kern County	average	2.00	0.40	2.00	28.40	15.73	32.33	82.24
			std deviation	0.00	0.83	0.38	4.78	1.71	1.53	4.12
		Tulare County	average	2.00	1.20	2.33	24.00	13.73		89.50
			std deviation	0.00	1.01	0.72	3.55	1.83		2.91
631	14R1456 B2R2	West Kern County	average	1.00	0.27	1.87	31.67	18.62	35.33	85.55
			std deviation	1.00	0.59	0.35	2.58	4.75	3.06	7.21
		Tulare County	average	1.33	0.53	1.80	26.53	14.93		84.50
			std deviation	1.15	0.83	0.86	1.96	1.58		9.75
632	PHY-417WRF	West Kern County	average	2.00	0.60	2.07	24.87	16.33	27.33	69.12
			std deviation	1.00	1.06	0.26	4.49	1.84	8.14	12.99
		Tulare County	average	2.00	1.27	2.40	23.93	15.25		82.23
			std deviation	0.00	0.88	0.64	4.53	1.83		9.78
633	PHY-427WRF	West Kern County	average	1.67	0.73	2.20	27.00	17.07	30.33	67.93
			std deviation	1.53	0.96	0.56	3.07	1.10	3.06	7.02
		Tulare County	average	2.00	1.00	1.87	25.73	15.47		83.00
			std deviation	0.00	1.00	0.84	3.24	0.99		8.34
634	OA-1	West Kern County	average	1.67	0.27	1.53	25.07	16.53	24.67	53.98
			std deviation	0.58	0.70	0.52	4.53	1.51	4.04	7.58
		Tulare County	average	1.33	0.40	1.20	23.27	14.93		78.17
			std deviation	0.58	0.83	0.86	3.41	1.28		6.83
635	OA-2	West Kern County	average	0.67	0.27	1.53	27.47	15.80	41.00	86.27
			std deviation	1.15	0.70	0.52	2.70	1.37	4.58	12.23
		Tulare County	average	0.00	0.07	0.93	28.47	15.53		93.43
			std deviation	0.00	0.26	0.59	1.88	1.13		3.75
636	OA-3	West Kern County	average	0.67	0.13	1.13	26.67	16.60	39.33	85.19
			std deviation	1.15	0.52	0.35	1.59	0.99	8.50	15.61
		Tulare County	average	0.33	0.13	1.07	24.67	15.73		79.77
			std deviation	0.58	0.35	0.46	1.54	1.39		14.04
637	OA-4	West Kern County	average	0.67	0.20	0.93	27.60	16.92	35.67	80.38
			std deviation	1.15	0.56	0.26	3.38	2.40	5.03	7.22
		Tulare County	average	0.00	0.00	0.80	26.20	15.60		91.70
			std deviation	0.00	0.00	0.68	1.78	0.83		4.98
638	OA-5	West Kern County	average	0.00	0.00	1.07	25.20	15.20	29.33	68.62
			std deviation	0.00	0.00	0.46	3.91	1.66	9.29	13.49
		Tulare County	average	0.00	0.07	0.73	26.00	14.73		81.03
			std deviation	0.00	0.26	0.46	1.93	1.28		19.88
639	OA-6	West Kern County	average	1.33	0.33	1.27	25.00	16.73	24.33	51.17
			std deviation	1.15	0.90	0.59	4.71	2.05	2.52	6.55
		Tulare County	average	0.67	0.27	1.00	25.47	15.60		62.03
			std deviation	1.15	0.70	0.53	1.92	3.29		4.41
640	OA-7	West Kern County	average	0.67	0.27	1.47	26.00	16.47	37.00	78.34
			std deviation	1.15	0.70	0.64	3.25	1.36	3.46	9.47
		Tulare County	average	0.33	0.07	1.07	25.67	15.80		82.03
			std deviation	0.58	0.26	0.26	2.29	1.26		13.75

2014 commercial entries - FOV tests			WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014					page 5		
Race 4 infested field sites			TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014							
ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF # OF PLANTS PER PLOT	AVERAGE OF PLANTS	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
641	OA-8	West Kern County	average	0.67	0.13	1.20	26.20	16.27	34.00	78.99
			std deviation	1.15	0.52	0.41	2.01	1.16	13.89	19.94
		Tulare County	average	0.33	0.07	0.73	28.20	16.33		90.10
			std deviation	0.58	0.26	0.70	1.78	0.49		4.45
642	OA-9	West Kern County	average	0.67	0.40	1.07	25.73	16.67	37.67	79.11
			std deviation	1.15	0.83	0.46	3.61	1.18	1.15	3.38
		Tulare County	average	0.33	0.20	0.80	24.13	15.27		80.87
			std deviation	0.58	0.41	0.56	1.73	1.28		11.54
643	OA-10	West Kern County	average	0.00	0.00	1.07	27.87	17.13	37.00	80.41
			std deviation	0.00	0.00	0.46	2.77	1.64	1.73	2.45
		Tulare County	average	0.00	0.00	0.60	24.20	14.87		91.27
			std deviation	0.00	0.00	0.51	1.61	0.92		7.71
644	OA-13	West Kern County	average	2.33	0.60	2.20	17.93	15.60	15.33	76.84
			std deviation	1.15	0.83	0.41	2.22	1.40	2.08	0.56
		Tulare County	average	1.67	0.67	2.53	22.40	15.67		81.37
			std deviation	0.58	0.98	0.52	2.77	0.90		10.56
645	OA-14	West Kern County	average	2.00	2.00	1.00	24.00	19.00	0.33	10.00
			std deviation						0.58	0.00
		Tulare County	average	no living plants						0.00
			std deviation							0.00
646	OA-15	West Kern County	average	0.67	0.07	1.47	34.47	18.87	24.33	79.72
			std deviation	1.15	0.26	0.52	3.50	1.64	2.52	8.39
		Tulare County	average	0.33	0.00	1.33	27.27	15.40		96.77
			std deviation	0.58	0.00	0.82	4.03	2.16		2.99
647	OA-16	West Kern County	average	0.67	0.67	2.00	26.67	16.33	0.67	66.67
			std deviation	1.15	1.15	0.00	7.77	1.53	0.58	31.20
		Tulare County	average	1.00	0.25	1.75	23.00	14.25		66.67
			std deviation	0.00	0.50	0.96	4.16	2.75		57.74
648	OA-17	West Kern County	average	1.00	0.27	1.67	31.27	18.33	24.33	82.05
			std deviation	1.00	0.59	0.62	2.19	1.35	3.51	8.59
		Tulare County	average	0.33	0.00	1.07	26.47	16.53		79.70
			std deviation	0.58	0.00	0.56	5.26	1.19		10.80
649	OA-18	West Kern County	average	0.33	0.07	1.87	24.73	16.47	6.00	78.25
			std deviation	0.58	0.26	0.52	3.33	2.56	1.73	6.14
		Tulare County	average	1.33	0.27	1.33	23.80	14.73		94.43
			std deviation	0.58	0.70	0.72	5.82	1.87		9.64

ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF NODES	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
650	OA-19	West Kern County	average	1.67	0.67	1.60	29.73	16.67	11.33	94.12
			std deviation	0.58	0.98	0.51	4.45	1.40	3.06	10.19
		Tulare County	average	2.33	0.93	2.13	20.10	13.60		87.50
			std deviation	0.58	0.88	0.74	4.09	1.72		21.65
651	OA-20	West Kern County	average	0.67	0.13	1.67	22.60	15.27	22.00	93.96
			std deviation	0.58	0.35	0.49	4.15	1.33	8.89	7.39
		Tulare County	average	1.00	0.07	0.93	20.80	14.33		77.03
			std deviation	0.00	0.26	0.70	1.97	0.90		1.38
652	BX-1531 GLT	West Kern County	average	2.00	0.87	1.93	26.80	16.20	35.33	87.66
			std deviation	0.00	1.13	0.46	4.28	1.74	2.52	4.84
		Tulare County	average	2.00	1.13	2.00	25.47	14.73		87.80
			std deviation	0.00	0.92	0.76	2.03	1.44		5.64
653	BX-1532 GLT	West Kern County	average	2.00	0.53	1.73	27.07	15.00	19.00	70.87
			std deviation	0.00	0.92	0.59	3.01	1.20	8.89	25.76
		Tulare County	average	2.00	1.07	1.33	24.20	13.53		75.47
			std deviation	0.00	1.09	0.82	3.26	1.36		11.08
654	BX-1533 GLT	West Kern County	average	2.00	0.40	2.07	30.73	16.87	37.00	84.13
			std deviation	0.00	0.83	0.46	4.42	1.55	2.00	4.16
		Tulare County	average	1.33	0.40	1.87	26.20	14.87		90.93
			std deviation	1.15	0.74	0.64	4.74	1.35		12.32
655	BX-1537 GLT	West Kern County	average	1.33	0.40	1.47	26.47	17.87	22.33	92.91
			std deviation	1.15	0.83	0.52	4.07	1.60	11.68	2.10
		Tulare County	average	1.33	0.47	1.20	23.53	15.20		79.73
			std deviation	1.07	0.92	0.77	4.41	2.21		17.53
656	BX-1539 GLT	West Kern County	average	0.33	0.00	1.47	26.93	17.13	34.33	91.53
			std deviation	0.58	0.00	0.74	3.56	1.77	6.11	6.16
		Tulare County	average	0.67	0.20	2.00	24.80	16.07		87.53
			std deviation	0.58	0.41	0.76	5.07	0.70		2.39
657	FM-1320 GL	West Kern County	average	2.00	0.40	1.73	20.80	16.20	22.33	84.14
			std deviation	1.00	0.74	0.70	3.45	1.61	8.39	10.42
		Tulare County	average	0.67	0.13	1.67	26.33	16.33		91.93
			std deviation	1.15	0.52	0.98	2.66	1.05		11.79
658	FM-1944 GLB2	West Kern County	average	1.33	0.47	1.53	29.07	17.00	40.00	92.01
			std deviation	1.15	0.83	0.52	4.43	1.41	6.00	7.98
		Tulare County	average	0.67	0.33	1.33	27.47	15.47		90.03
			std deviation	1.15	0.62	0.72	2.35	1.30		7.71

Hutmacher et al.- August, 2014 SUMMARY REPORT

"Field Evaluation Support and Variety Screening Evaluations - Fusarium) – Hutmacher, University of California

2014 commercial entries - FOV tests				WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014				page 7		
Race 4 infested field sites				TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014						
ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF NODES	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
659	FM-2484 B2F	West Kern County	average	2.00	0.53	1.67	26.93	17.13	34.33	72.57
			std deviation	0.00	0.92	0.49	3.92	1.64	15.04	33.88
		Tulare County	average	1.00	0.07	1.20	24.93	15.93		84.93
			std deviation	1.00	0.26	0.77	2.74	0.96		10.15
660	ST-4747 GLB2	West Kern County	average	1.67	0.40	1.80	23.33	16.33	39.67	89.25
			std deviation	0.58	0.83	0.41	1.76	0.82	4.04	4.97
		Tulare County	average	1.33	0.47	1.87	24.40	15.00		83.87
			std deviation	1.15	0.83	0.52	3.18	1.13		8.32
661	ST-4946 GLB2	West Kern County	average	0.67	0.13	1.93	26.80	16.40	29.33	84.18
			std deviation	1.15	0.52	0.46	2.01	1.40	10.79	6.00
		Tulare County	average	1.67	0.47	1.80	26.87	14.87		83.87
			std deviation	0.58	0.74	0.77	2.33	1.25		6.60
662	ST-5032 GLT	West Kern County	average	0.67	0.20	2.07	25.00	16.47	41.00	93.21
			std deviation	0.58	0.41	0.46	4.23	1.64	6.00	3.60
		Tulare County	average	2.00	0.40	1.73	26.93	15.53		89.17
			std deviation	0.00	0.83	0.70	2.37	0.83		6.40
663	ST-5289 GLT	West Kern County	average	2.00	0.87	2.33	24.33	16.33	29.00	86.10
			std deviation	0.00	1.13	0.82	3.29	1.80	12.49	1.14
		Tulare County	average	2.00	0.93	1.93	25.20	14.67		92.07
			std deviation	0.00	1.22	0.80	3.61	1.68		2.03
664	ST-6448 GLB2	West Kern County	average	2.00	0.40	1.80	26.40	16.73	30.00	75.96
			std deviation	0.00	0.83	0.56	5.42	2.19	7.55	17.35
		Tulare County	average	1.33	0.40	1.67	25.80	16.07		79.93
			std deviation	1.15	0.83	0.72	2.68	1.58		4.64
665	DP-348	West Kern County	average	1.33	1.07	1.27	23.73	15.40	26.33	67.44
			std deviation	1.15	1.03	0.46	4.06	1.59	12.66	30.24
		Tulare County	average	0.33	0.33	1.33	26.53	15.67		89.17
			std deviation	0.58	0.48	0.49	2.03	1.35		3.78
666	OA-EXP.5-08-1	West Kern County	average	1.33	0.47	1.13	26.13	15.60	39.33	81.00
			std deviation	0.58	0.74	0.35	1.51	1.30	4.73	11.45
		Tulare County	average	0.00	0.07	1.13	26.20	15.27		88.13
			std deviation	0.00	0.26	0.35	1.78	1.33		11.56
667	PHY-72	West Kern County	average	1.33	0.40	1.40	25.13	15.73	35.00	63.39
			std deviation	1.15	0.83	0.51	3.27	1.83	3.00	3.40
		Tulare County	average	2.00	0.53	1.60	23.47	14.93		70.20
			std deviation	0.00	0.92	0.63	3.93	1.71		19.32
668	OA-EXP.11.8	West Kern County	average	0.00	0.00	1.20	21.80	14.87	33.33	78.24
			std deviation	0.00	0.00	0.56	2.11	1.36	2.89	4.58
		Tulare County	average	0.00	0.00	0.40	26.13	15.67		85.20
			std deviation	0.00	0.00	0.51	3.18	1.23		10.41

ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF # OF PLANTS	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
669	OA-EXP.13.1	West Kern County	average	0.67	0.40	1.27	22.60	14.60	34.33	83.16
			std deviation	1.15	0.74	0.59	3.36	1.72	5.51	1.70
		Tulare County	average	0.33	0.20	1.13	25.73	14.07		89.57
			std deviation	0.58	0.41	0.64	2.49	1.91		5.50
670	OA-EXP.13-7	West Kern County	average	1.33	0.60	1.20	23.47	15.47	35.00	80.61
			std deviation	1.15	0.91	0.41	2.80	1.46	4.36	7.18
		Tulare County	average	0.33	0.13	0.93	25.47	15.60		86.40
			std deviation	0.58	0.35	0.80	2.75	1.68		12.64
671	OA-EXP.13-9	West Kern County	average	2.00	0.53	1.40	22.33	15.53	35.67	76.92
			std deviation	0.00	0.92	0.63	2.44	1.30	6.66	13.90
		Tulare County	average	0.00	0.07	1.33	25.20	15.20		95.80
			std deviation	0.00	0.26	0.49	3.09	1.90		4.15
672	OA-EXP.16-9	West Kern County	average	1.67	0.40	1.13	24.13	15.53	39.00	95.89
			std deviation	0.58	0.83	0.35	3.56	1.68	3.46	12.36
		Tulare County	average	0.33	0.20	1.27	25.67	16.27		78.43
			std deviation	0.50	0.41	0.46	1.54	0.96		1.65
673	OA-EXP.17-12	West Kern County	average	1.67	0.53	1.00	23.60	16.47	25.67	57.81
			std deviation	1.53	0.83	0.38	3.09	1.51	8.50	13.10
		Tulare County	average	0.67	0.07	0.80	23.20	13.80		72.27
			std deviation	0.58	0.26	0.68	3.10	4.18		7.05
674	OA-EXP.19-14	West Kern County	average	0.00	0.00	0.93	25.07	15.00	251.00	85.78
			std deviation	0.00	0.00	0.46	2.02	0.93	366.39	7.12
		Tulare County	average	0.67	0.00	0.60	27.33	15.67		92.50
			std deviation	1.15	0.00	0.51	1.59	0.82		7.05
675	OA-EXP.20-13	West Kern County	average	2.00	0.73	1.33	22.93	16.27	20.67	47.63
			std deviation	0.00	0.96	0.49	3.61	1.16	6.66	5.20
		Tulare County	average	0.67	0.13	1.27	23.67	16.27		73.23
			std deviation	0.58	0.35	0.70	2.69	1.03		12.57
676	OA-EXP.20-16	West Kern County	average	0.67	0.40	1.27	23.67	16.73	31.67	65.32
			std deviation	1.15	0.83	0.46	2.77	1.28	7.23	8.01
		Tulare County	average	0.00	0.07	0.80	23.07	16.13		68.63
			std deviation	0.00	0.26	0.41	2.34	1.46		11.55
677	OA-EXP.21-12	West Kern County	average	0.67	0.40	1.27	21.60	15.47	27.67	77.44
			std deviation	1.15	0.83	0.59	1.96	0.99	12.74	2.15
		Tulare County	average	0.00	0.13	1.13	23.67	14.53		87.17
			std deviation	0.00	0.35	0.74	2.92	2.17		1.04
678	OA-EXP.21-15	West Kern County	average	0.67	0.13	1.07	25.13	15.00	33.00	74.43
			std deviation	1.15	0.52	0.46	2.70	1.41	13.08	13.43
		Tulare County	average	1.67	1.00	2.07	21.80	15.00		80.13
			std deviation	0.58	0.93	0.70	3.21	1.81		9.64

Hutmacher et al.- August, 2014 SUMMARY REPORT

"Field Evaluation Support and Variety Screening Evaluations - Fusarium) – Hutmacher, University of California

2014 commercial entries - FOV tests				WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014				page 9		
Race 4 infested field sites				TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014						
ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF # OF PLANTS	AVERAGE OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
679	OA-EXP.23-11	West Kern County	average	1.00	0.47	1.40	19.13	15.20	19.00	45.45
			std deviation	1.73	0.74	0.51	4.31	2.01	7.55	12.73
		Tulare County	average	0.33	0.00	1.20	21.53	15.53		74.17
			std deviation	0.51	0.00	0.41	2.50	1.19		8.97
680	OA-EXP.23-14	West Kern County	average	1.33	0.27	1.00	24.20	15.80	33.00	73.68
			std deviation	1.15	0.70	0.38	1.93	1.32	9.64	17.65
		Tulare County	average	0.00	0.13	0.73	25.13	14.80		93.20
			std deviation	0.00	0.35	0.59	2.36	1.21		7.99
681	OA-EXP.24-14	West Kern County	average	0.67	0.20	1.13	21.67	15.07	30.33	80.94
			std deviation	1.15	0.56	0.35	3.44	1.28	5.86	11.28
		Tulare County	average	0.00	0.00	0.47	23.33	15.20		77.23
			std deviation	0.00	0.00	0.64	2.79	1.27		19.73
682	DP-360	West Kern County	average	0.67	0.33	1.13	23.87	16.80	31.33	78.99
			std deviation	1.15	0.72	0.35	2.97	1.32	7.23	10.22
		Tulare County	average	0.33	0.20	0.87	23.07	15.80		83.40
			std deviation	0.58	0.41	0.64	3.28	2.01		13.24
683	DP-744	West Kern County	average	3.33	1.93	2.33	10.47	14.00	15.00	28.06
			std deviation	1.15	0.59	0.62	2.97	3.02	11.36	11.31
		Tulare County	average	1.67	0.82	2.45	12.18	13.55		32.37
			std deviation	0.58	0.98	0.69	4.35	2.84		17.45
684	PHY-830	West Kern County	average	3.00	1.50	2.10	17.50	16.80	16.00	18.18
			std deviation	0.00	0.85	0.74	5.58	2.10	18.33	25.71
		Tulare County	average	2.33	1.46	2.62	15.69	14.46		38.13
			std deviation	0.57	1.05	1.12	5.89	2.30		24.91
685	FM-2989 GLB2	West Kern County	average	0.00	0.00	1.87	24.33	16.53	28.67	76.96
			std deviation	0.00	0.00	0.52	2.97	1.68	8.39	11.83
		Tulare County	average	1.00	0.20	1.53	27.20	15.93		94.33
			std deviation	1.00	0.56	0.74	2.88	1.33		3.67
686	OA-EXP-15-3	West Kern County	average	0.00	0.00	1.20	25.67	16.53	34.67	76.85
			std deviation	0.00	0.00	0.56	2.55	2.36	5.51	12.53
		Tulare County	average	0.33	0.20	0.87	26.87	15.20		97.03
			std deviation	0.58	0.41	0.64	1.96	0.94		3.42
687	OA-EXP-20-9	West Kern County	average	0.00	0.00	1.27	23.27	15.00	35.00	80.27
			std deviation	0.00	0.00	0.46	2.96	1.51	1.00	5.12
		Tulare County	average	0.33	0.20	1.20	24.80	14.73		87.77
			std deviation	0.57	0.41	0.56	2.51	1.22		9.18
688	SPR-856/1	West Kern County	average	1.00	0.27	0.53	23.93	16.00	34.67	92.88
			std deviation	1.00	0.59	0.64	2.28	1.41	0.58	1.35
		Tulare County	average	0.00	0.00	0.07	23.00	15.87		83.37
			std deviation	0.00	0.00	0.26	2.87	1.25		13.91

Hutmacher et al.- August, 2014 SUMMARY REPORT

"Field Evaluation Support and Variety Screening Evaluations - Fusarium) – Hutmacher, University of California

2014 commercial entries - FOV tests				WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014				page 10		
Race 4 infested field sites				TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014						
ENTRY	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION	WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF NODES	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE	
689	SPR-1000	West Kern County	average	1.67	0.27	1.40	19.87	14.73	29.00	86.09
			std deviation	1.15	0.70	0.51	2.20	1.22	7.00	16.43
		Tulare County	average	0.33	0.00	0.87	19.67	14.60		54.17
			std deviation	0.58	0.00	0.64	3.11	1.12		23.46
690	SPR-9009-6	West Kern County	average	0.00	0.00	0.47	29.20	16.07	37.00	79.07
			std deviation	0.00	0.00	0.52	4.09	2.05	7.55	14.52
		Tulare County	average	0.00	0.07	0.33	25.67	14.87		83.33
			std deviation	0.00	0.26	0.49	1.18	1.06		9.87
691	GW-06-3233	West Kern County	average	1.00	0.20	1.60	19.10	14.40	14.33	94.44
			std deviation	0.00	0.42	0.52	5.36	2.84	18.82	9.62
		Tulare County	average	1.00	0.00	2.00	16.00	15.00		16.67
			std deviation							28.87
692	GW-07-269	West Kern County	average	0.00	0.00	1.73	27.00	15.80	21.00	68.50
			std deviation	0.00	0.00	0.70	3.78	1.15	16.70	19.14
		Tulare County	average	2.00	0.47	1.33	26.73	14.47		90.30
			std deviation	0.00	0.84	0.72	2.74	1.30		8.94
693	GW-07-373	West Kern County	average	0.67	0.13	2.20	19.73	14.40	29.33	80.94
			std deviation	0.58	0.35	0.56	2.99	1.18	7.51	14.11
		Tulare County	average	2.00	0.87	2.40	22.53	13.93		91.37
			std deviation	0.00	0.99	0.51	2.48	1.49		9.14
694	Ark 0614-49	West Kern County	average	1.33	0.47	1.73	24.47	15.53	44.33	89.24
			std deviation	1.15	0.99	0.59	5.57	1.92	5.13	8.01
		Tulare County	average	1.33	0.40	1.93	25.60	15.33		89.53
			std deviation	1.15	0.74	0.70	2.64	0.82		5.80
695	Ark 0615-38	West Kern County	average	1.67	0.80	2.40	23.80	15.40	38.00	82.52
			std deviation	0.58	1.08	0.74	4.35	2.47	6.24	11.91
		Tulare County	average	1.00	0.40	1.93	26.07	14.33		85.90
			std deviation	1.00	0.63	0.80	2.58	3.85		11.06
696	PHY-72	West Kern County	average	2.00	0.67	1.80	27.60	16.23	41.67	84.16
			std deviation	0.00	0.98	0.41	4.87	1.24	7.09	12.25
		Tulare County	average	2.00	0.73	2.53	21.20	13.80		83.43
			std deviation	0.00	0.88	0.52	6.30	3.09		7.19
697	PD 07066	West Kern County	average	1.67	0.40	2.00	29.33	17.14	35.00	84.90
			std deviation	0.58	0.83	0.38	3.62	2.18	1.73	6.78
		Tulare County	average	0.67	0.47	2.00	29.07	16.33		82.53
			std deviation	1.15	0.99	0.93	4.79	2.16		12.26

Hutmacher et al.- August, 2014 SUMMARY REPORT

"Field Evaluation Support and Variety Screening Evaluations - Fusarium) – Hutmacher, University of California

2014 commercial entries - FOV tests				WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014				page 11		
Race 4 infested field sites				TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014						
ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF # OF PLANTS	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
698	PD 07116	West Kern County	average	1.00	0.13	1.87	25.00	16.80	35.67	90.59
			std deviation	1.00	0.52	0.52	4.46	1.90	3.79	3.29
		Tulare County	average	1.33	0.80	1.80	24.60	15.40		88.90
			std deviation	1.15	0.86	0.68	3.72	1.76		11.10
699	PD 08039	West Kern County	average	1.33	0.20	2.00	24.07	16.53	29.00	82.54
			std deviation	0.58	0.56	0.53	3.67	1.64	5.29	7.18
		Tulare County	average	2.00	0.53	1.33	27.80	14.93		82.23
			std deviation	0.00	0.91	0.90	2.68	1.28		5.82
700	GA 2009100	West Kern County	average	1.67	0.27	1.87	27.13	17.40	34.00	86.22
			std deviation	0.58	0.70	0.35	3.96	1.80	6.56	13.16
		Tulare County	average	1.33	0.40	2.13	27.80	15.60		86.73
			std deviation	1.15	0.74	0.92	2.46	1.55		7.28
701	GA 2009037	West Kern County	average	0.67	0.27	2.13	28.53	17.40	32.33	75.37
			std deviation	1.15	0.70	0.52	4.03	1.40	6.03	5.98
		Tulare County	average	0.67	0.20	1.47	27.07	15.60		82.83
			std deviation	1.15	0.56	0.52	2.22	1.24		8.04
702	GA 2010074	West Kern County	average	2.00	1.00	1.87	26.87	15.67	35.33	84.30
			std deviation	0.00	1.13	0.74	6.82	2.38	6.66	9.31
		Tulare County	average	1.33	0.60	2.33	25.40	15.33		89.17
			std deviation	1.15	0.83	0.90	5.78	1.68		4.64
703	MD10-6	West Kern County	average	1.33	0.27	1.87	29.00	17.23	32.00	75.13
			std deviation	1.15	0.59	0.52	4.04	1.36	3.61	7.99
		Tulare County	average	1.67	0.73	1.13	25.47	13.80		89.03
			std deviation	0.58	0.88	0.83	4.93	2.34		4.33
704	LA11309062	West Kern County	average	1.33	0.40	1.93	23.33	16.20	21.67	69.13
			std deviation	0.58	0.74	0.46	4.27	1.90	4.62	20.77
		Tulare County	average	1.67	0.53	1.81	22.33	14.33		81.77
			std deviation	0.58	0.92	1.01	4.79	4.19		10.45
705	LA11309040	West Kern County	average	1.67	0.40	1.60	25.87	14.87	28.67	93.37
			std deviation	0.58	0.83	0.51	4.90	1.46	9.24	1.73
		Tulare County	average	2.00	0.87	2.27	25.60	14.13		85.83
			std deviation	0.00	0.83	0.80	2.35	1.06		5.57
706	LA11309005	West Kern County	average	1.00	0.13	1.87	29.47	17.33	34.00	84.78
			std deviation	1.00	0.52	0.35	3.34	1.35	4.36	5.99
		Tulare County	average	1.67	0.73	1.93	27.67	15.93		86.23
			std deviation	0.58	0.88	0.80	3.89	1.49		13.49
707	OA-185	West Kern County	average	1.67	0.47	2.13	25.40	15.73	28.00	72.16
			std deviation	0.58	0.99	0.52	5.32	1.49	9.64	11.71
		Tulare County	average	2.00	0.73	2.00	26.73	15.13		90.30
			std deviation	0.00	0.96	0.66	3.69	1.60		3.10

ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF # OF PLANTS	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
708	OA-173	West Kern County	average	1.33	0.33	1.87	30.20	15.73	34.67	82.88
			std deviation	1.15	0.72	0.35	3.61	4.23	6.81	13.33
		Tulare County	average	1.00	0.40	2.13	28.87	15.67		90.13
			std deviation	1.00	0.74	0.74	3.20	1.63		7.63
709	PX06520-42-2-1	West Kern County	average	2.33	0.73	2.33	21.53	16.92	25.33	65.97
			std deviation	0.58	1.10	0.49	2.67	1.38	5.03	14.06
		Tulare County	average	2.00	1.13	2.40	22.73	14.73		75.23
			std deviation	0.00	0.99	0.63	3.15	1.98		6.45
710	AU51038	West Kern County	average	0.67	0.13	1.93	28.87	16.67	32.67	88.34
			std deviation	1.15	0.52	0.26	3.72	1.54	5.69	11.18
		Tulare County	average	1.33	0.47	1.53	24.93	14.40		93.30
			std deviation	1.15	0.92	0.52	4.43	1.64		6.93
711	AU91411	West Kern County	average	1.67	0.40	1.93	28.93	16.87	26.33	81.28
			std deviation	0.58	0.91	0.59	5.42	1.55	14.01	10.55
		Tulare County	average	2.00	0.53	2.13	24.47	14.80		74.03
			std deviation	0.00	0.99	0.74	4.10	2.34		7.45
712	AU52034	West Kern County	average	1.67	0.67	2.00	25.53	16.93	32.33	76.02
			std deviation	0.58	1.05	0.53	5.73	1.44	6.66	10.62
		Tulare County	average	0.67	0.20	1.73	25.20	14.67		93.77
			std deviation	1.15	0.56	0.88	5.49	1.23		5.40
713	NM12Y1002	West Kern County	average	2.00	0.33	1.40	28.80	15.73	25.33	58.41
			std deviation	1.00	0.90	0.91	3.78	1.75	12.42	26.79
		Tulare County	average	1.00	0.53	2.07	24.87	14.53		82.90
			std deviation	1.00	0.64	0.96	6.05	1.64		9.01
714	NM12Y1004	West Kern County	average	1.33	0.27	0.80	34.00	16.60	35.67	79.50
			std deviation	1.15	0.70	0.68	3.57	1.24	2.08	8.15
		Tulare County	average	0.00	0.07	0.80	32.33	14.73		93.53
			std deviation	0.00	0.26	0.56	3.79	1.10		5.73
715	NM12Y1005	West Kern County	average	0.00	0.07	0.80	34.87	16.85	42.67	90.86
			std deviation	0.00	0.26	0.77	5.71	1.77	4.51	8.87
		Tulare County	average	0.00	0.00	0.20	33.60	15.20		92.50
			std deviation	0.00	0.00	0.41	2.82	1.38		6.50
716	MS 0043-28-1	West Kern County	average	2.00	0.67	1.60	26.00	16.13	32.00	84.32
			std deviation	0.00	0.90	0.51	6.12	2.07	7.81	15.29
		Tulare County	average	2.00	0.73	1.53	28.27	14.87		87.77
			std deviation	0.00	1.03	0.99	3.73	1.46		5.94

Hutmacher et al.- August, 2014 SUMMARY REPORT

"Field Evaluation Support and Variety Screening Evaluations - Fusarium) – Hutmacher, University of California

2014 commercial entries - FOV tests				WEST KERN SITE FIELD FOV 4 SCREENING - May to July 2014				page 13		
Race 4 infested field sites				TULARE COUNTY SITE FOV 4 SCREENING - May to August 2014						
ENTRY #	EXPERIMENTAL CULTIVAR OR COMMERCIAL VARIETY	LOCATION		WHOLE PLOT FOLIAR FOV INDEX RATING	PLANT AVERAGE FOLIAR FOV INDEX RATING	ROOT VASCULAR STAIN INDEX RATING	PLANT HEIGHT (inches) AT 7-8 WKS POST PLANTING	MAIN STEM NUMBER OF NODES	AVERAGE # OF PLANTS PER PLOT	SURVIVAL PERCENT AT 7 WEEKS AFTER EMERGENCE
717	MS 0045-14-5	West Kern County	average	1.67	0.53	2.07	30.07	16.53	34.00	81.08
			std deviation	0.58	0.92	0.46	4.96	1.30	3.61	9.89
		Tulare County	average	2.00	1.07	1.67	26.73	13.93		92.90
			std deviation	0.00	1.10	0.49	4.20	1.49		3.98
718	MS 0040-19-4	West Kern County	average	2.00	0.73	1.73	26.40	16.60	29.67	74.81
			std deviation	0.00	1.10	0.70	4.31	1.76	1.53	1.83
		Tulare County	average	1.33	0.73	2.13	24.07	14.40		85.37
			std deviation	1.15	0.88	0.84	3.95	1.68		6.31
719	DP-393	West Kern County	average	1.67	0.40	1.93	24.40	15.00	36.33	87.64
			std deviation	0.58	0.83	0.46	4.48	2.14	6.03	11.56
		Tulare County	average	1.67	0.73	2.20	26.13	14.07		85.97
			std deviation	0.58	0.80	0.86	3.91	1.49		10.77
720	SG 105	West Kern County	average	2.00	1.13	2.00	25.67	16.13	32.00	77.74
			std deviation	0.00	1.13	0.85	3.58	1.85	6.24	11.15
		Tulare County	average	2.00	1.00	1.80	25.60	15.33		85.67
			std deviation	0.00	0.84	0.94	2.97	1.45		10.94
721	FM 958	West Kern County	average	0.33	0.13	1.93	23.60	18.00	30.67	68.18
			std deviation	0.58	0.35	0.26	4.12	1.47	6.35	15.91
		Tulare County	average	1.00	0.46	0.77	17.61	15.46		81.30
			std deviation	0.00	0.52	0.60	3.86	2.40		7.04
722	UA 222	West Kern County	average	0.67	0.27	1.67	26.67	17.73	28.67	92.32
			std deviation	1.15	0.70	0.72	3.60	1.39	4.51	7.37
		Tulare County	average	1.00	0.27	1.40	23.67	16.13		85.90
			std deviation	1.00	0.70	0.63	3.87	1.19		6.94
723	DP 491	West Kern County	average	1.00	0.27	2.00	23.20	16.13	26.67	73.05
			std deviation	1.00	0.59	0.53	5.77	2.45	6.81	19.51
		Tulare County	average	2.00	0.87	1.87	21.67	14.00		89.87
			std deviation	0.00	1.13	0.64	6.62	1.89		4.92
	DP-340 (duplicate of #620)	West Kern County	average	2.60	1.57	2.43	15.52	15.26	13.40	34.76
			std deviation	1.14	1.16	0.51	3.07	1.91	5.31	8.40
		Tulare County	average	1.89	2.03	2.57	18.08	14.87		22.69
			std deviation	0.85	0.81	0.39	4.65	1.60		4.75
	DP-744 (duplicate of #683)	West Kern County	average	3.60	1.96	2.16	10.24	14.00	4.69	10.62
			std deviation	0.55	1.02	0.55	2.88	2.78	3.08	3.58
		Tulare County	average	3.13	2.34	3.35	8.91	11.71		15.90
			std deviation	1.07	1.16	1.08	3.34	3.79		2.72
	Phy-802 RF(duplicate of #612)	West Kern County	average	0.29	0.17	1.06	29.83	17.23	37.00	90.74
			std deviation	0.76	0.57	0.54	2.73	1.35	4.32	5.31
		Tulare County	average	0.19	0.09	0.88	27.15	16.80		86.53
			std deviation	0.24	0.05	0.47	3.46	1.55		5.16