

Project Title: UCCE Statewide Processing Tomato Variety Evaluation Trials, 2007

Project Leader: Scott Stoddard
Farm Advisor
UCCE Merced & Madera Counties
2145 Wardrobe Rd.
Merced, CA 95340
209-385-7403
csstoddard@ucdavis.edu

**Cooperating
DANR Personnel:**

Brenna Aegerter, Farm Advisor, San Joaquin County
Diane Barrett, Food Science & Technology CE Specialist, UCD
Janet Caprile, Farm Advisor, Contra Costa County
Tim Hartz, Vegetable Crops CE Specialist, UCD
Michelle LeStrange, Farm Advisor, Tulare & Kings Counties
Gene Miyao, Farm Advisor, Yolo, Solano, & Sacramento Counties
Jan Mickler, Farm Advisor, Stanislaus County
Joe Nunez, Farm Advisor, Kern County

Summary:

UCCE farm advisors conducted three early-maturity variety tests and seven mid-maturity tests in 2007. Spring weather was warm and dry across all locations, and most trials had excellent stand establishment. The one exception was the mid-maturity trial in San Joaquin County, where high winds shortly after transplanting resulted in almost complete stand loss. Insect pest pressure was generally low this season, but some of the mid-maturity locations were impacted by high powdery mildew pressure. The trials continue to increase in transplants relative to direct seed (only 2 of the 10 locations were direct seeded) and drip irrigation (3 of the 10 were drip irrigated), which mirrors changes taking place in the industry.

The early maturity trials escaped most insect or disease problems and yielded very well in all three locations, averaging more than 41 tons/acre. In the early trial, Sun 6366, H5003, BOS 66509, 1411, and 66508 had significantly better yields than the other entries in this test; SUN 6366 and BOS 1411 had the highest °Brix. Significant differences were observed for fruit pH between the varieties, though values were high for all, averaging 4.48. In the mid-season observation trial, 4 of 11 lines yielded significantly less when combining locations; large differences were also observed for Brix, but not color nor pH. In the replicated mid-maturity trial, best yields occurred with SUN 6368, H8004, and H2005, and H2005 also had significantly higher Brix than the other varieties. Significant differences were also seen for color and pH, and like the early maturity trial pH was elevated, averaging 4.45.

Objectives:

The major objective is to conduct processing tomato variety field tests that evaluate fruit yield, Brix, color, and pH in various statewide locations. The data are combined from all test locations to analyze variety adaptability under a wide range of growing conditions. These tests are designed and conducted with input from seed companies, processors, and other allied industry and are intended to generate information useful for making intelligent variety selection decisions.

Procedures:

Three early-maturity variety tests and seven mid-maturity tests were conducted in 2007. Participating counties and Farm Advisors are shown in Table 1. Variety entries and their disease resistances are listed in Table 2. As in 2005 and 2006, there were no observational lines in the early trial. Variety selections were made in the fall of 2006 based on input from tomato processors. Changes and/or additions were made by the seed companies based on seed availability.

Early maturity tests were planted in March and mid-maturity lines were planted from March to May. New varieties were usually screened one or more years in non-replicated observational trials before being selected for testing in the replicated trials. Tests were primarily conducted in commercial production fields with grower cooperators (the Fresno trials were located at the UC West Side Research and Extension Center (WSREC) near Five Points).

Each variety was planted in a one-bed by 100-foot long plot. Plot design was randomized complete block with four replications for the replicated trial. The observational trial consisted of one non-replicated plot directly adjacent to the replicated trial. The Farm Advisor organized seeding or transplanting at the same time that the rest of the field was planted. All cultural operations, with the exception of planting and harvest, were done by the grower cooperator using the same equipment and techniques as the rest of the field. Most test locations used transplants, and three locations this year were drip irrigated (Merced, Fresno 2, and Kern). A field day or arrangements for interested persons to visit the plots occurred at most locations.

Shortly before harvest, fruit samples were collected from all plots and submitted to an area PTAB station for soluble solids (reported as °Brix, an estimate of the soluble solids percentage using a refractometer), color (LED color), and pH determinations. These samples were hand picked ripe fruit directly off the plants or the harvester. The tomatoes in each plot were harvested with commercial harvest equipment, conveyed to a GT wagon equipped with weigh cells, and weighed before going to the trailers for processing.

Data were analyzed using analysis of variance procedures with SAS, both for each individual location and combining locations. In the combined analysis, the block effect was nested within each county. Significant difference tests were performed using Fisher's protected LSD at the 5% level. Because the San Joaquin County mid-maturity trial had such a poor stand, yield and PTAB data were not included in the over-location analysis. Results from hand harvesting are shown for illustration only. Furthermore, one mid-maturity variety, NUN 567, was also not included in the statistical analysis because of too many missing plots, though results are shown for the plots that were harvested.

Results:

Results are presented in the following order and include combined county, yield, °Brix, color, and pH for each trial: early maturity replicated (Table 3 a - e), mid-maturity observational (Table 4 a - f), and mid-maturity replicated (Table 5 a - f).

Early maturity replicated. Early maturity replicated results are presented in Tables 3 a - e. Significant differences were found among varieties for yield, Brix, LED color, and pH. Overall yields with the early varieties were excellent, especially in Yolo County where almost all varieties yielded more than 50 tons/acre. Best yields occurred with H5003 and Sun 6366. SUN 6366 and BOS had significantly better °Brix than the other varieties. Average pH was high at 4.48 with little difference between (Table 4e).

Significant variety by location interactions occurred only for yield and color. This indicates that some varieties performed better at different locations. Where significant, the variety by location LSD can be used to compare the performance of varieties across locations (Table 3b).

Mid observational. Mid-maturity observational results combining all locations are shown in Table 4a, and individual counties in Tables 4 b – e. San Joaquin County data are shown, but was not used in the statistical analysis because it is from one rep only and hand harvested. Because of missing plots at some locations, multiple LSD values were calculated to compare varieties and are shown in Table 4f. When all counties were combined, significant differences were found among varieties only for yield and Brix (Table 4a). High variability (CV 13.1%) in this test resulted in many varieties to yield statistically similar. Overall yields were lower than the early trial, but °Brix was similar at 5.2. Fruit pH was again elevated, and ranged from 4.44 to 4.54 (Table 4e). Because there was no replication in this test, variety by location interactions could not be performed.

Mid replicated. Mid-maturity replicated variety results combining all locations are shown in Table 5 a, and individual counties in Tables 5 b – e. San Joaquin County data are shown, but was not used in the statistical analysis because it is from one rep only and hand harvested. Because of missing plots at some locations, multiple LSD values were calculated to compare varieties and are shown in Table 5f. Additionally, NUN 567 was dropped out of the over-location analyses because of missing plots in many locations.

Significant differences were found for all parameters measured, though Merced and Fresno counties did not have significant differences for color. Averaged across all locations, significantly best yields occurred with SUN 6368, H8004, and H2005, at > 43 tons/A. As with the observational trial, yields were lower than the early trial (Fresno #2 and Stanislaus yielded poorly compared to the other locations).

Brix was significantly better in H2005 at 5.6% compared to the other varieties. The other varieties ranged between 5.4 to 4.8%. Stanislaus County posted the best average °Brix at 5.9. H2506 had the best fruit color with an LED rating of 21.3 (Table 5d). Fruit pH ranged from 4.35 to 4.53 (Table 5e), with H9780 and AB2 having significantly lowest pH.

Significant variety by location interactions occurred for yield, and °Brix. This indicates that certain varieties performed differently at different locations. H8004, for example, yielded relatively poorly in Stanislaus compared to the other locations.

Acknowledgements:

Many thanks to CTRI and participating seed companies for their continued support for this project. The cooperation from PTAB and support of the processors is also greatly appreciated. Many thanks to Gail Nishimoto for her help with the statistical analyses. And lastly, this project would not be possible without the many excellent grower cooperators who were involved with this project.

Table 1. Location, Advisor, planting method (DS = direct seed, TR = transplant), planting and harvest dates for the 2007 Statewide Processing Tomato Variety Trials.

Early Maturity					
County	Advisor	Plant method	Plant Date	Harvest date	Comments
Yolo	Gene Miyao	TR	3/17/07	7/20	Double lines, good growth, high yield. Furrow irrigated
Contra Costa	Janet Caprile & Brenna Aegerter	DS	3/12/07	8/1	Good stand and yield
Fresno	Michelle LeStrange	DS	3/23/07	8/7	Some incidence of TSWV. Sprinkle then furrow irrigated
Mid-Maturity					
Yolo	Gene Miyao	TR	4/25/07	8/23	Double lines, furrow irrigated, high yields.
San Joaquin	Brenna Aegerter	TR	5/8/07	10/13	Poor stand, hand harvest from only 1 rep. Furrow irrigated.
Stanislaus	Jan Mickler	TR	5/19	9/20	Furrow irrigated, some late season powdery mildew.
Merced	Scott Stoddard	TR	5/14/07	10/8	Drip irrigated, large plants trimmed 2x, late harvest with high mold.
Fresno 1	Michelle LeStrange	DS	3/18/07	8/7	UC WSREC. 2 – 12% TSWV. Early planted.
Fresno 2		TR	5/22/07	9/24	UC WSREC. Late planted, drip irrigation.
Kern	Joe Nunez	TR	4/18/07	8/22	Drip irrigated. Missing obs varieties 18-22.

Table 2. 2007 UCCE Processing Tomato Regional Variety Trial

Processor/seed company entries .

TRIAL	COMPANY	VAR	CODE	Disease Resistance	days to maturity	processed use	Brix	std compared	vine size	fruit shape	trial years
Early Replicated	Seminis	APT 410	1	VFFNBsk	114	MultiUse	med	--	--	--	06, 07
Early Replicated	Orsetti Seeds	BOS 1411	2	VFF J	116	peel/dice	5.7	--	--	blocky	07
Early Replicated	Orsetti Seeds	BOS 66508	3	VFFNP	115	peel/dice	5	--	--	blocky	06, 07
Early Replicated	Orsetti Seeds	BOS 66509	4	VFFNP	108	peel/dice	5	--	--	block rnd	06, 07
Early Replicated	Heinz Seed	H2206	5	VF	105	product	5.2	9280		sm round	07
Early Replicated	Heinz Seed	H5003	6	VFFNP	115	MultiUse	5.2	HP45, 410	med	oval	06, 07
Early Replicated	Heinz Seed	H9280	7	VFFN	108		4.8		sm	blocky	06, 07
Early Replicated	Harris Moran	HMX 5883	8	VFFFNP	110	MultiUse	med/high	410	med/lg	blocky	06, 07
Early Replicated	Nunhems USA	SUN 6366	9	VFFNP	118	MultiUse	V. high	410	med/lg	blocky	07
Mid Replicated	AB Seeds	AB 2	1	VFFP	120	Multiuse	high	3155	med	sq	06, 07
Mid Replicated	AB Seeds	AB 8058	2	VFFN TSWV	125	paste	med	?	med	blocky	06, 07
Mid Replicated	Harris Moran	HMX 5893	3	VFFNP	125			HY 303	lg		07
Mid Replicated	Heinz Seed	H 2005	4	VFFNP	128	MultiUse	5.8	H9780	lg	oval	06, 07
Mid Replicated	Heinz Seed	H 2506	5	VFFNP	122	MultiUse	5.5	AB2		elongate	07
Mid Replicated	Heinz Seed	H 8004	6	VFFNP	125	MultiUse	5.6	H 9780	lg	elongate	06, 07
Mid Replicated	Heinz Seed	H 9780	7	VFFNP	138	MultiUse	5.5	--	lg	blocky	06, 07
Mid Replicated	Heinz Seed	H 2601	8	VFFNP	122	pear	5	--	lg	pear	06, 07
Mid Replicated	Nunhems USA	RED SPRING	9	VFFN Bsp	123	Peel, solid	med	H 2601	lg	pear	06, 07
Mid Replicated	Nunhems USA	SUN 6368	10	VFFN Bsp	125	peel, solids	high	AB2	m/lg	blocky	06, 07
Mid Replicated	Nunhems USA	NUN 567	11	VFFNPSw	130	MultiUse	med	H 9665	Med	blocky	06, 07
MID Observed	HED Seed	HT 1058	12	FN	115	peel, solids	high	--	compact	sq round	'07
MID Observed	HED Seed	HT 1075	13	VFFN	115	peel, solids	high	--	--	pear	07
MID Observed	Nippon Del Monte	NDM 4464	14	VFFNB	125	paste	5.1	3155	med	sq round	06, 07
MID Observed	Nippon Del Monte	NDM 5578	15	VFFB	122	multi	5.3	3155	med	sq round	07
MID Observed	Nunhems USA	NUN 877	16	VFFNP	123	multi use	med	3155	med	blocky	07
MID Observed	Nunhems USA	NUN 889	17	VFFNP	125	multi use	med	3155	med	blocky	07
MID Observed	Seminis	PX 1723	18	VFFNBsk-O	125	Peel/dice	high	9557	lg	blocky	07
MID Observed	Harris Moran	HMX 5894	19								07
MID Observed	Orsetti Seeds	BOS 67374	20	VFFNPJ	125	Peel/dice	5.1	--		blocky	07
MID Observed	United Genetics	UG 4305	21	VFFN							07
MID Observed	United Genetics	UG 36003	22	VFFN Bsk							07

Varieties in **BOLD** are standards.

P = Bsk = Bsp = Bacterial Speck
 TSWV = tomato spotted wilt virus
 FFF fusarium Race 3
 LV = powdery mildew (Leveillula)
 J = jointless

Check with seed supplier to confirm resistance.

TABLE 3a. PROCESSING TOMATO EARLY MATURITY VARIETY TRIALS 2007
STATEWIDE 3 LOCATIONS

VARIETY	Yield tons/acre		Brix %	Color	pH
937 SUN 6366	52.6 (01)	A	5.8 (01)	23.9 (06)	4.48 (05)
883 H5003	51.4 (02)	A B	5.4 (03)	22.8 (01)	4.47 (03)
938 BOS 66509	49.4 (03)	B C	5.1 (07)	23.5 (04)	4.51 (09)
950 BOS 1411	48.3 (04)	C D	5.7 (02)	24.0 (07)	4.45 (01)
921 BOS 66508	45.5 (05)	D E	5.2 (05)	22.8 (01)	4.47 (02)
935 HMX 5883	43.4 (06)	E F	4.9 (08)	24.7 (09)	4.50 (07)
732 APT 410	43.2 (07)	E F	5.2 (06)	23.4 (03)	4.50 (07)
951 H2206	41.7 (08)	F	5.3 (04)	24.3 (08)	4.49 (06)
637 H9280	36.7 (09)	G	4.7 (09)	23.6 (05)	4.48 (04)
MEAN	45.8		5.2	23.7	4.48
LSD @ 0.05=	3.1		0.3	0.7	0.03
C.V.=	8.3		6.4	3.6	0.9
VARIETY X LOCATION					
LSD @ 0.05=	5.4		N.S.	1.2	N.S.

Numbers in parentheses (x) represent relative ranking within a column.

LSD = Least significant difference at the 95% confidence level. Means followed by the same letter are not significantly different.

NS = not significant.

CV = coefficient of variation (%), a measure of the variability in the experiment.

Variety x location LSD = LSD when comparing varieties across locations.

TABLE 3b. PROCESSING TOMATO EARLY MATURITY VARIETY TRIALS
 REPLICATED YIELD TRIALS 2007 (STATEWIDE AND BY COUNTY)
 YIELD (TONS/ACRE)

VARIETY	Yield	Statewide			Contra Costa
	tons/acre	3 LOCATIONS	Yolo	Fresno	
937 SUN 6366	52.6	A	55.7	55.4	46.7
883 H5003	51.4	A B	55.8	54.4	44.1
938 BOS 66509	49.4	B C	56.1	48.1	44.1
950 BOS 1411	48.3	C D	55.0	40.9	48.9
921 BOS 66508	45.5	D E	50.2	45.6	40.7
935 HMX 5883	43.4	E F	45.8	43.8	40.5
732 APT 410	43.2	E F	46.6	42.3	40.7
951 H2206	41.7	F	42.6	45.6	37.0
637 H9280	36.7	G	37.4	41.1	31.8
MEAN	45.8		49.5	46.3	41.6
LSD @ 0.05=	3.1		5.4	5.9	5.3
C.V.=	8.3		7.5	8.7	8.7
VARIETY X LOCATION LSD @ 0.05=	5.4				

TABLE 3c. PROCESSING TOMATO EARLY MATURITY VARIETY TRIALS
 REPLICATED YIELD TRIALS 2007
 (STATEWIDE AND BY COUNTY)
 % BRIX

VARIETY	Brix	Statewide			Contra Costa
	%	3 LOCATIONS	Yolo	Fresno	
937 SUN 6366	5.8	A	5.1	6.0	6.5
950 BOS 1411	5.7	A B	5.1	5.9	6.1
883 H5003	5.4	B C	4.9	5.5	5.9
951 H2206	5.3	C D	4.7	5.4	5.7
921 BOS 66508	5.2	C D	4.6	5.4	5.6
732 APT 410	5.2	C D	4.8	5.3	5.5
938 BOS 66509	5.1	D E	4.4	5.2	5.8
935 HMX 5883	4.9	E F	4.3	5.1	5.3
637 H9280	4.7	F	4.2	5.0	4.8
MEAN	5.2		4.7	5.4	5.7
LSD @ 0.05=	0.3		0.6	0.3	0.5
C.V.=	6.4		8.9	3.7	6.1
VARIETY X LOCATION LSD @ 0.05=	N.S.				

TABLE 3d. PROCESSING TOMATO EARLY MATURITY VARIETY TRIALS
 REPLICATED YIELD TRIALS 2007 (STATEWIDE AND BY COUNTY)
 COLOR

VARIETY	Color	Statewide			
		3 LOCATIONS	Yolo	Fresno	Contra Costa
883 H5003	22.8	A	23.5	23.8	21.3
921 BOS 66508	22.8	A	23.3	24.0	21.3
732 APT 410	23.4	A B	24.3	24.8	21.3
938 BOS 66509	23.5	A B	24.5	25.3	20.8
637 H9280	23.6	B	25.0	23.8	22.0
937 SUN 6366	23.9	B C	26.5	23.3	22.0
950 BOS 1411	24.0	B C D	25.8	24.5	21.8
951 H2206	24.3	C D	25.8	24.0	23.3
935 HMX 5883	24.7	D	27.0	24.8	22.3
MEAN	23.7		25.1	24.2	21.8
LSD @ 0.05=	0.7		1.6	N.S.	0.7
C.V.=	3.6		4.4	3.5	2.4
VARIETY X LOCATION LSD @ 0.05=	1.2				

TABLE 3e. PROCESSING TOMATO EARLY MATURITY VARIETY TRIALS
 REPLICATED YIELD TRIALS 2007 (STATEWIDE AND BY COUNTY)
 PH

VARIETY	pH	Statewide			
		3 LOCATIONS	Yolo	Fresno	Contra Costa
950 BOS 1411	4.45	A	4.39	4.48	4.49
921 BOS 66508	4.47	A B	4.44	4.48	4.50
883 H5003	4.47	A B	4.40	4.50	4.52
637 H9280	4.48	A B	4.43	4.51	4.50
937 SUN 6366	4.48	A B	4.43	4.50	4.51
951 H2206	4.49	B C	4.47	4.46	4.55
732 APT 410	4.50	B C	4.45	4.54	4.52
935 HMX 5883	4.50	B C	4.49	4.50	4.52
938 BOS 66509	4.51	C	4.47	4.56	4.52
MEAN	4.48		4.44	4.50	4.51
LSD @ 0.05=	0.03		0.03	N.S.	N.S.
C.V.=	0.9		0.5	1.1	0.9
VARIETY X LOCATION LSD @ 0.05=	N.S.				

TABLE 4a. PROCESSING TOMATO MID MATURITY VARIETY TRIALS 2007
 COMBINED OBSERVATION DATA
 STATEWIDE 6 LOCATIONS**

VARIETY	Yield tons/acre		Brix %	Color	pH
956 NUN 877	40.6 (01)	A	5.3 (05)	21.7 (01)	4.47 (04)
960 UG 4305*	40.3 (02)	A	5.3 (06)	22.2 (04)	4.49 (08)
955 NDM 5578	39.8 (03)	A	5.3 (04)	21.7 (01)	4.44 (01)
949 NDM 4464	39.5 (04)	A	4.8 (11)	22.3 (05)	4.47 (06)
957 NUN 889	39.4 (05)	A	4.9 (09)	21.8 (03)	4.49 (09)
924 BOS 67374*	38.9 (06)	A B	5.4 (03)	23.2 (11)	4.46 (03)
953 HT 1058	36.6 (07)	A B C	4.9 (10)	22.8 (10)	4.44 (02)
954 HT 1075	33.6 (08)	B C D	5.5 (02)	22.3 (05)	4.48 (07)
958 PX 1723*	31.5 (09)	C D	5.8 (01)	22.6 (08)	4.47 (05)
959 HMX 5894*	31.5 (10)	C D	5.1 (07)	22.6 (08)	4.53 (10)
961 UG 36003*	30.8 (11)	D	5.0 (08)	22.4 (07)	4.54 (11)
MEAN	36.9		5.2	22.3	4.48
LSD @ 0.05 (to compare 6 loc varieties vs 6 loc varieties)=	5.61		0.51	N.S.	N.S.
LSD @ 0.05 (to compare 6 loc varieties vs 5 loc varieties)=	5.89		0.53	N.S.	N.S.
LSD @ 0.05 (to compare 5 loc varieties vs 5 loc varieties)=	6.15		0.56	N.S.	N.S.
C.V.=	13.1		8.4	3.9	2.0

* 1 missing plot (Kern)

** San Joaquin County data not included in statistical analysis

Numbers in parentheses represent relative ranking within a column.

LSD @ 0.05 = least significant difference at 95% probability level.

NS = not significant.

C.V.= coefficient of variation.

TABLE 4b. PROCESSING TOMATO MID MATURITY VARIETY TRIALS 2007
 COMBINED OBSERVATION DAT (STATEWIDE AND BY COUNTY)
 YIELD (TONS/ACRE)

VARIETY	Yield		Yield						
	tons/acre		Fresno #1	Fresno #2	Kern	Merced	Stan- islaus	Yolo	San Joaquin (2)
956 NUN 877	40.6	A	46.1	31.6	36.3	40.3	31.5	57.9	65.9
960 UG 4305*	40.3	A	39.0	28.0		45.9	35.1	54.7	60.1
955 NDM 5578	39.8	A	45.8	27.9	40.3	40.5	28.4	55.7	61.9
949 NDM 4464	39.5	A	44.6	31.0	38.1	35.0	36.9	51.3	64.8
957 NUN 889	39.4	A	42.0	28.0	35.9	46.0	30.5	54.2	59.2
924 BOS 67374*	38.9	A B	38.2	24.2		47.9	20.9	64.8	63.4
953 HT 1058	36.6	A B C	35.3	32.0	41.6	33.7	30.3	46.6	46.9
954 HT 1075	33.6	B C D	30.8	19.8	29.3	34.9	33.6	53.4	48.0
958 PX 1723*	31.5	C D	25.1	17.7		40.1	22.6	53.5	54.9
959 HMX 5894*	31.5	C D	29.1	26.0		32.9	22.8	47.9	63.9
961 UG 36003*	30.8	D	31.9	22.8		29.3	29.8	41.6	
MEAN	36.9								
LSD @ 0.05 (to compare 6 loc varieties vs 6 loc varieties)=	5.61								
LSD @ 0.05 (to compare 6 loc varieties vs 5 loc varieties)=	5.89								
LSD @ 0.05 (to compare 5 loc varieties vs 5 loc varieties)=	6.15								
C.V.=	13.1								

* 1 missing plot (Kern)

(2) San Joaquin County data not included in statistical analysis

Observation varieties were not replicated so the statistical analysis could be performed on the combined data only.

TABLE 4c. PROCESSING TOMATO MID MATURITY VARIETY TRIALS 2007
 COMBINED OBSERVATION DATA (STATEWIDE AND BY COUNTY)
 % BRIX

VARIETY	Brix	Statewide							
	%	6 LOCATION	Fresno #1	Fresno #2	Kern	Merced	Stan- islaus	Yolo	San Joaquin (2)
958 PX 1723	5.8	A	6.1	6.0		6.1	6.7	4.5	5.2
954 HT 1075	5.5	A B	5.5	5.5	4.9	5.9	5.8	5.2	4.8
924 BOS 67374	5.4	A B C	5.8	5.0		4.4	6.9	5.0	4.8
955 NDM 5578	5.3	A B C	5.7	4.9	5.3	5.5	6.1	4.4	5.0
956 NUN 877	5.3	B C D	5.4	4.9	5.1	5.8	6.2	4.4	4.4
960 UG 4305	5.3	B C D	5.5	4.9		5.9	5.7	4.6	4.6
959 HMX 5894	5.1	B C D	5.5	4.6		5.8	5.7	4.2	4.6
961 UG 36003	5.0	B C D	5.4	5.0		5.8	5.1	4.1	
957 NUN 889	4.9	C D	5.7	4.9	4.6	5.2	5.1	4.1	4.7
953 HT 1058	4.9	C D	5.0	5.0	4.3	6.4	4.6	4.2	4.4
949 NDM 4464	4.8	D	5.2	5.0	4.7	4.5	5.4	4.0	4.7
MEAN	5.2								
LSD @ 0.05 (to compare 6 loc varieties vs 6 loc varieties)=	0.51								
LSD @ 0.05 (to compare 6 loc varieties vs 5 loc varieties)=	0.53								
LSD @ 0.05 (to compare 5 loc varieties vs 5 loc varieties)=	0.56								
C.V.=	8.4								

* 1 missing plot (Kern) (2) San Joaquin County data not included in statistical analysis
 Observation varieties were not replicated so the statistical analysis could be performed on the combined data only.

TABLE 4d. PROCESSING TOMATO MID MATURITY VARIETY TRIALS 2007
 COMBINED OBSERVATION DATA (STATEWIDE AND BY COUNTY)
 COLOR

VARIETY	Color	Fresno #1	Fresno #2	Kern	Merced	Stan- islaus	Yolo	San Joaquin (2)
955 NDM 5578	21.7	23	21	21	21	20	24	25
956 NUN 877	21.7	23	21	22	21	19	24	24
957 NUN 889	21.8	23	21	22	22	20	23	25
960 UG 4305	22.2	24	21		22	20	24	25
949 NDM 4464	22.3	26	21	22	21	20	24	24
954 HT 1075	22.3	23	22	23	22	21	23	24
961 UG 36003	22.4	23	22		23	20	24	
958 PX 1723	22.6	24	21		22	20	26	25
959 HMX 5894	22.6	24	22		21	20	26	26
953 HT 1058	22.8	24	22	23	21	21	26	25
924 BOS 67374	23.2	26	21		24	19	26	25
MEAN	22.3							
LSD @ 0.05=	N.S.							
C.V.=	3.9							

* 1 missing plot (Kern)

(2) San Joaquin County data not included in statistical analysis

TABLE 4e. PROCESSING TOMATO MID MATURITY VARIETY TRIALS 2007
 COMBINED OBSERVATION DATA (STATEWIDE AND BY COUNTY)
 PH

VARIETY	pH	Fresno #1	Fresno #2	Kern	Merced	Stan- islaus	Yolo	San Joaquin (2)
955 NDM 5578	4.44	4.42	4.48	4.36	4.44	4.39	4.52	4.39
953 HT 1058	4.44	4.48	4.49	4.34	4.44	4.35	4.55	4.41
924 BOS 67374	4.46	4.38	4.99		4.34	4.37	4.29	4.36
956 NUN 877	4.47	4.54	4.47	4.43	4.43	4.39	4.53	4.44
958 PX 1723	4.47	4.51	4.58		4.43	4.41	4.50	4.26
949 NDM 4464	4.47	4.51	4.50	4.42	4.42	4.35	4.64	4.37
954 HT 1075	4.48	4.54	4.57	4.40	4.42	4.41	4.52	4.40
960 UG 4305	4.49	4.56	4.64		4.34	4.38	4.58	4.37
957 NUN 889	4.49	4.54	4.52	4.42	4.48	4.40	4.57	4.37
959 HMX 5894	4.53	4.60	4.53		4.52	4.45	4.64	4.53
961 UG 36003	4.54	4.65	4.59		4.43	4.52	4.56	
MEAN	4.48							
LSD @ 0.05=	N.S.							
C.V.=	2.0							

* 1 missing plot (Kern)

(2) San Joaquin County data not included in statistical analysis

Table 4f. LSD values for combined mid-maturity observation varieties, 2007.

Variable	Error Mean Square	Degrees of Freedom		t value	count 1	count2	LSD
			for Error				
Yield	23.28469		45	2.0141	6	6	5.61
Yield	23.28469		45	2.0141	5	6	5.89
Yield	23.28469		45	2.0141	5	5	6.15
Brix	0.190574		45	2.0141	6	6	0.51
Brix	0.190574		45	2.0141	5	6	0.53
Brix	0.190574		45	2.0141	5	5	0.56

TABLE 5a. PROCESSING TOMATO MID-SEASON MATURITY VARIETY TRIALS 2007 STATEWIDE 6 LOCATIONS**

VARIETY	Yield tons/acre		Brix %	Color	pH
923 SUN 6368*	45.0 (01)	A	5.4 (05)	23.5 (10)	4.45 (05)
545 H 8004	43.4 (02)	A B	5.4 (06)	22.5 (02)	4.42 (03)
944 H 2005*	43.2 (03)	A B C	5.6 (01)	22.7 (05)	4.47 (07)
866 H 9780	42.4 (04)	B C D	5.4 (03)	23.3 (08)	4.35 (01)
942 AB 8058*	41.2 (05)	C D	5.0 (08)	22.5 (03)	4.45 (06)
868 AB 2*	41.0 (06)	D	5.4 (02)	23.2 (06)	4.36 (02)
865 H 2601	38.7 (07)	E	5.1 (07)	23.2 (06)	4.48 (08)
943 HMX 5893*	36.6 (08)	E F	5.0 (09)	23.5 (09)	4.53 (10)
922 RED SPRING	36.0 (09)	F	4.8 (10)	22.5 (03)	4.53 (09)
952 H 2506*	35.4 (10)	F	5.4 (04)	21.3 (01)	4.45 (04)
933 NUN 567 (2)	35.6	see note below	4.8	23.0	4.47
MEAN	40.3		5.3	22.8	4.45
LSD @ 0.05=	2.1		0.2	0.6	0.04
C.V.=	9.3		6.1	4.4	1.5
VARIETY X LOCATION					
LSD @ 0.05=	5.2		0.4	N.S.	N.S.

* asterisked varieties are missing one plot for yield

Varieties 545 and 923 are missing 1 plot for Brix, Color and pH

Note: Some varieties have missing plots. To make pairwise comparisons of variety means see LSD Table 5 for the proper LSD to use.

** San Joaquin County not included in the statistical analysis.

2) NUN 567 not included in the statistical analysis because of too many missing plots.

Numbers in parentheses (x) represent relative ranking within a column.

LSD = Least significant difference at the 95% confidence level. Means followed by the same letter are not significantly different.

NS = not significant.

CV = coefficient of variation (%), a measure of the variability in the experiment.

Variety x location LSD = LSD when comparing varieties across locations.

TABLE 5b. PROCESSING TOMATO MID-SEASON MATURITY VARIETY TRIALS
 REPLICATED YIELD TRIALS 2007 (STATEWIDE AND BY COUNTY)
 YIELD (TONS/ACRE)

VARIETY	Yield	Statewide							
	tons/acre	6 LOCATIONS	Fresno #1	Fresno #2	Kern	Merced	Stan- islaus	Yolo	San Joaquin (1)
923 SUN 6368*	45.0	A	53.2	31.6	41.4	47.4	35.2	61.2	64.9
545 H 8004	43.4	A B	46.2	27.8	45.2	54.1	27.4	59.9	56.5
944 H 2005*	43.2	A B C	51.5	29.5	46.5	41.7	30.7	59.3	45.1
866 H 9780	42.4	B C D	49.8	28.2	40.8	45.0	29.9	60.5	45.3
942 AB 8058*	41.2	C D	48.0	32.5	28.7	41.2	32.9	64.3	61.4
868 AB 2*	41.0	D	44.6	24.2	38.8	41.3	32.9	64.0	60.8
865 H 2601	38.7	E	43.3	27.7	40.9	41.9	24.8	53.8	40.3
943 HMX 5893*	36.6	E F	44.9	29.2	38.3	34.1	26.0	47.2	37.5
922 RED SPRING	36.0	F	42.1	25.1	32.4	36.5	27.3	52.6	46.2
952 H 2506*	35.4	F	46.5	25.7	39.1	27.9	23.8	49.1	40.5
933 NUN 567 (2)		see note below	38.6	29.9	32.4	29.9	30.9	51.5	35.8
MEAN	40.3		47.0	28.2	38.7	40.5	29.2	56.7	--
LSD @ 0.05=	2.1		6.7	3.9	9.0	5.3	4.3	2.5	--
C.V.=	9.3		9.8	9.6	16.1	9.0	10.1	3.0	--
VARIETY X LOCATION									
LSD @ 0.05=	5.2								

* asterisked varieties are missing one plot for yield

Note: Some varieties have missing plots. To make pairwise comparisons of variety means see LSD Table 5c for the proper LSD to use.

- 1) San Joaquin County data not included in the statistical analysis.
- 2) NUN 567 not included in the statistical analysis because of too many missing plots.

TABLE 5c. PROCESSING TOMATO MID-SEASON MATURITY VARIETY TRIALS
 REPLICATED YIELD TRIALS 2007 (STATEWIDE AND BY COUNTY)
 % BRIX

VARIETY	Brix		Statewide						
	%	6 LOCATIONS	Fresno #1	Fresno #2	Kern	Merced	Stanislaus	Yolo	San Joaquin (1)
944 H 2005	5.6	A	5.8	5.6	5.1	6.1	6.4	4.8	5.5
868 AB 2	5.4	B	5.8	5.4	4.3	6.1	6.0	5.0	4.8
866 H 9780	5.4	B	5.8	4.9	4.8	5.9	6.5	4.8	5.7
952 H 2506	5.4	B	5.6	5.3	5.1	6.2	6.0	4.4	5.1
923 SUN 6368*	5.4	B	6.1	4.9	4.7	6.1	6.1	4.6	4.8
545 H 8004*	5.4	B	5.9	5.1	4.6	5.6	6.3	5.0	5.1
865 H 2601	5.1	C	5.2	5.2	4.4	5.6	5.7	4.7	4.6
942 AB 8058	5.0	C	5.5	5.0	3.9	5.6	5.8	4.3	4.5
943 HMX 5893	5.0	C D	5.3	5.0	4.2	5.5	5.6	4.4	4.9
922 RED SPRING	4.8	D	5.0	4.8	4.3	4.9	5.4	4.6	4.5
933 NUN 567 (2)		see note	5.5	4.5	4.2	5.2	5.4	4.1	5.0
MEAN	5.3		5.6	5.1	4.5	5.7	5.9	4.6	--
LSD @ 0.05=	0.2		0.3	0.5	0.5	0.7	0.4	0.3	--
C.V.=	6.1		4.1	6.4	7.0	8.0	5.0	4.4	--
VARIETY X LOCATION LSD @ 0.05=	0.4								

* Varieties 545 and 923 are each missing 1 plot

Note: Some varieties have missing plots. To make pairwise comparisons of variety means see LSD Table 5e for the proper LSD to use.

- 1) San Joaquin County data not included in the statistical analysis.
- 2) NUN 567 not included in the statistical analysis because of too many missing plots.

TABLE 5d. PROCESSING TOMATO MID-SEASON MATURITY VARIETY TRIALS
 REPLICATED YIELD TRIALS 2007 (STATEWIDE AND BY COUNTY)
 COLOR

VARIETY	Color	Statewide							
		6 LOCATIONS	Fresno #1	Fresno #2	Kern	Merced	Stan- islaus	Yolo	San Joaquin (1)
952 H 2506	21.3	A	23.5	21.0	21.0	20.8	19.0	22.5	24.0
545 H 8004*	22.5	B	24.8	22.5	22.8	21.0	19.7	24.3	24.0
922 RED SPRING	22.5	B	24.5	22.3	22.8	21.8	19.5	24.5	25.0
942 AB 8058	22.5	B	24.5	21.8	23.5	22.5	19.3	23.8	26.0
944 H 2005	22.7	B C	25.3	22.0	22.5	21.3	20.8	24.5	23.0
865 H 2601	23.2	C D	25.5	22.3	23.5	22.5	20.5	24.8	23.0
868 AB 2	23.2	C D	25.0	22.8	24.3	22.3	20.8	24.0	24.0
866 H 9780	23.3	C D	25.0	23.3	24.0	22.0	20.3	25.0	23.0
943 HMX 5893	23.5	D	26.0	22.3	24.5	22.5	20.3	25.5	25.0
923 SUN 6368*	23.5	D	25.0	23.5	24.0	22.5	20.2	26.0	26.0
933 NUN 567 (2)		see note	23.0	22.0	23.5	22.5	20.5	24.8	25.0
MEAN	22.8		24.9	22.4	23.3	22.0	20.1	24.5	--
LSD @ 0.05=	0.6		N.S.	0.9	1.6	N.S.	1.0	1.3	--
C.V.=	4.4		4.4	2.8	4.8	5.8	3.3	3.7	--
VARIETY X LOCATION LSD @ 0.05=	N.S.								

* Varieties 545 and 923 are each missing 1 plot

Note: Some varieties have missing plots. To make pairwise comparisons of variety means see LSD Table 5e for the proper LSD to use.

- 1) San Joaquin County data not included in the statistical analysis.
- 2) NUN 567 not included in the statistical analysis because of too many missing plots.

TABLE 5e. PROCESSING TOMATO MID-SEASON MATURITY VARIETY TRIALS
 REPLICATED YIELD TRIALS 2007 (STATEWIDE AND BY COUNTY)
 PH

VARIETY	pH	Statewide							
		6 LOCATIONS	Fresno #1	Kern	Stanislaus	Merced	Fresno #2	Yolo	San Joaquin (1)
866 H 9780	4.35	A	4.41	4.35	4.27	4.33	4.42	4.31	4.33
868 AB 2	4.36	A	4.37	4.31	4.30	4.37	4.40	4.38	4.33
545 H 8004*	4.42	B	4.46	4.38	4.32	4.40	4.52	4.44	4.32
952 H 2506	4.45	B C	4.50	4.38	4.38	4.39	4.52	4.51	4.42
923 SUN 6368*	4.45	B C	4.52	4.46	4.37	4.38	4.52	4.46	4.37
942 AB 8058	4.45	B C	4.42	4.42	4.41	4.42	4.55	4.52	4.40
944 H 2005	4.47	C	4.51	4.41	4.42	4.42	4.57	4.51	4.48
865 H 2601	4.48	C	4.48	4.43	4.50	4.36	4.54	4.55	4.48
922 RED SPRING	4.53	D	4.58	4.45	4.43	4.49	4.66	4.55	4.55
943 HMX 5893	4.53	D	4.58	4.53	4.45	4.52	4.55	4.53	4.39
933 NUN 567 (2)		see note	4.56	4.42	4.41	4.48	4.58	4.57	4.23
MEAN	4.45		4.48	4.41	4.39	4.42	4.52	4.48	--
LSD @ 0.05=	0.04		0.08	0.07	0.11	0.05	0.07	0.15	--
C.V.=	1.5		1.2	1.0	1.7	0.8	1.1	2.2	--
VARIETY X LOCATION LSD @ 0.05=	N.S.								

* Varieties 545 and 923 are each missing 1 plot

Note: Some varieties have missing plots. To make pairwise comparisons of variety means see LSD Table 5e for the proper LSD to use.

- 1) San Joaquin County data not included in the statistical analysis.
- 2) NUN 567 not included in the statistical analysis because of too many missing plots.

Table 5f. LSD values for combined mid-maturity replicated varieties, 2007.

Variable	Error Mean Square	Degrees of Freedom for Error	t value	count 1	count2	LSD
Yield	13.9430	156	1.9753	24	24	2.13
Yield	13.9430	156	1.9753	24	23	2.15
Yield	13.9430	156	1.9753	4	4	5.22
Brix	0.1016	160	1.9749	24	24	0.18
Brix	0.1016	160	1.9749	24	23	0.18
Brix	0.1016	160	1.9749	4	4	0.45
Color	1.0019	160	1.9749	24	24	0.57
Color	1.0019	160	1.9749	24	23	0.58
pH	0.0043	160	1.9749	24	24	0.04
pH	0.0043	160	1.9749	24	23	0.04