Statewide Processing Tomato Variety Trials - Fresno County Results - 2007

Michelle Le Strange and Tom Turini, UCCE Farm Advisors, Tulare/Kings and Fresno Counties

Three early and 7 mid-season variety evaluation tests were conducted throughout the major processing tomato production regions of California during the 2007 season. The major objective is to conduct processing tomato variety field tests that evaluate fruit yield, °Brix (soluble solids %), color, and pH in various statewide locations. The data from all test locations are used to analyze variety adaptability under a wide range of growing conditions. All major production areas had at least one test to identify tomato cultivars appropriate for that specific region. The tests are designed and conducted with input from seed companies, processors, and other allied industry and are intended to aid in management decisions.

Procedures: Early maturity tests were planted in February or early March and mid-season lines were planted from March to May. New varieties are typically screened one or more years in non-replicated observational trials before being included in replicated trials. Tests were primarily conducted in commercial production fields with grower cooperators, however the Fresno trials were located at the UC West Side Research and Extension Center [WSREC] near Five Points.

Each variety was usually planted one-bed wide by 100 feet long. Plot design was a randomized complete block with four replications. The observational trial consisted of one non-replicated plot directly adjacent to the replicated trial. Seeding or transplanting was organized by the Farm Advisor at approximately 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. Test locations were primarily furrow irrigated. A field day to view the plots occurred at all sites.

2007 Statewide Results: Trial establishment by transplanting continues to increase over direct seeding (only 2 of the 10 locations were direct seeded), which mirrors changes taking place in the industry. Three of 10 locations were drip irrigated. Spring weather was warm and dry across all locations, and most trials had excellent stand establishment. The 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 early maturity trials escaped most insect or disease problems and average yield over all three locations was more than 41 tons/acre (data not shown). SUN 6366, H5003, BOS 66509, BOS 1411, and BOS 66508 had significantly better yields than the other entries in this test; SUN 6366 and BOS 1411 had the highest °Brix. Values for pH were high overall (4.48 average), but significant differences between varieties were observed.

In the replicated mid-maturity trial, SUN 6368, H8004, and H2005 yielded best. H2005 also had significantly higher °Brix than the other varieties. Significant differences were observed for color and pH. Like the early maturity trial pH was elevated with an average of 4.45.

Fresno County Results: In the early trial conducted at UC WSREC average yield was 46.3 T/A (**Table 1**). SUN 6366 and H5003 had significantly higher yield than the other entries in this test; they ranked 1st and 3rd in °Brix; they had the best color ratings, and fell in the middle of the pack in pH (however no significant differences were observed between varieties in color or pH in this trial).

Table 1: EARLY Season Processing Tomato Variety Trial - FRESNO County - 2007

Location:	UC WSREC, Five Points		
Seeded:	March 8, 2007	Irrigation Method:	Furrow
Irrigated:	March 9, 2007	Irrigation Cutoff:	July 6, 2007
Emergence:	March 23, 2007	Machine Harvest:	August 7, 2007
Soil:	Panoche clay loam	Plot size:	One 66-inch bed x 100' row

Code	VARIETY	Yield Tons/Acre			°Brix	PTAB Color	pH	% green	% sunburn	% rot	lbs per 50 fruit	TSWV* % plants
9	**SUN 6366**	55.4 (01)	A		6.0 (01)	23.3 (01)	4.50 (05)	1.0	5.8	9.6	8.2	5.3
6	**H5003**	54.4 (02)	A		5.5 (03)	23.8 (02)	4.50 (04)	1.6	8.3	7.6	7.0	6.2
4	**BOS 66509**	48.1 (03)		B	5.2 (07)	25.3 (09)	4.56 (09)	1.4	10.4	17.1	7.9	5.2
3	**BOS 66508**	45.6 (04)		B C	5.4 (04)	24.0 (04)	4.48 (02)	1.8	10.2	13.5	8.3	5.7
5	**H2206**	45.6 (05)		B C	5.4 (05)	24.0 (04)	4.46 (01)	1.7	7.1	10.1	5.4	1.7
8	**HMX 5883**	43.8 (06)		B C	5.1 (08)	24.8 (07)	4.50 (06)	3.2	7.7	12.8	8.7	3.7
1	**APT 410**	42.3 (07)		B C	5.3 (06)	24.8 (07)	4.54 (08)	1.7	7.4	18.1	8.2	3.0
7	**H9280**	41.1 (08)		C	5.0 (09)	23.8 (02)	4.51 (07)	2.5	13.9	15.6	8.4	2.2
2	**BOS 1411**	40.9 (09)		C	5.9 (02)	24.5 (06)	4.48 (02)	5.4	11.9	10.0	9.6	6.2
	AVERAGE	**46.3**			**5.4**	**24.2**	**4.50**	**2.2**	**9.2**	**12.7**	**8.0**	**4.4**
	LSD @ 0.05	5.9			0.3	N.S.	N.S.	2.1	NS	NS	0.7	3.2
	C.V. %	8.7			3.7	3.5	1.1	64.3	56.6	44.2	5.8	49.6

* the percentage of plants with TSWV per 100' row at harvest

Two midseason trials were conducted in 2007. One was seeded March 8 and grown with furrow irrigation (**Table 2**) and the other was transplanted May 22 and grown with furrow and subsurface drip irrigation (**Table 3**). Average yield dropped nearly 20 tons in the later planting due to a combination of factors: varieties performed less ably in the heat; irrigation scheduling did not always meet water demand of the crop; powdery mildew was more of a problem; and TSWV was present. SUN 6368 and H2005 performed consistently in both trials. Two varieties rose to higher ranking in the late planting: AB 8058 (TSWV resistant line) had highest yields, good color, slightly below average °Brix, and slightly higher than average pH. HMX 5839 had good yield performance, average color, below average °Brix, and higher than average pH. Other than those varieties the rankings in the 2 trials hardly changed.

Since TSWV was present in the tomato field, varieties were visually rated for presence of the disease in the March planting of the early and mid-season trials. Early trial ratings ranged from 1.7 to 6.2% and mid-season trial ratings ranged from 0.3 to 18.0% plants showing obvious TSWV symptoms. There were significant differences between varieties and the one resistant line in the trial (AB 8058) showed little to no TSWV symptoms.

A complete research report is posted at the VRIC website www.vric.ucdavis.edu. Click on Vegetable Information, Choose Tomato as the crop, scroll down to other and click on 2007 Statewide Processing Tomato Variety Evaluation trials. OR call a Farm advisor and ask them to mail you a copy. Results from the replicated Fresno trials are shown here.

Table 2: MID Season Processing Tomato Variety Trial #1 - FRESNO County - 2007

Location: UC WSREC, Five Points
Seeded: March 8, 2007
Irrigated: March 9, 2007
Emergence: March 23, 2007
Soil: Panoche clay loam
Irrigation Method: Furrow
Irrigation Cutoff: July 6, 2007
Machine Harvest: August 7, 2007
Plot size: One 66-inch bed x 100' row

Code	VARIETY	Yield Tons/Acre		°Brix	PTAB Color	pH	% green	% sunburn	% rot	lbs per 50 fruit	TSWV* % plants
10	**SUN 6368**	53.2 (01)	A	6.1 (01)	25.0 (05)	4.52 (08)	1.8	6.9	5.8	8.6	6.5
4	**H 2005**	51.5 (02)	A B	5.8 (04)	25.3 (08)	4.51 (07)	0.8	8.9	6.9	8.5	13.3
7	**H 9780**	49.8 (03)	A B C	5.8 (05)	25.0 (05)	4.41 (02)	2.9	12.2	4.7	9.5	6.5
2	**AB 8058**	48.0 (04)	A B C D	5.5 (07)	24.5 (02)	4.42 (03)	0.8	3.4	7.1	9.5	0.3
5	**H 2506**	46.5 (05)	B C D	5.6 (06)	23.5 (01)	4.50 (06)	1.4	11.8	8.5	9.1	7.0
6	**H 8004**	46.2 (06)	B C D	5.9 (02)	24.8 (04)	4.46 (04)	3.8	14.2	4.0	9.0	18.0
3	**HMX 5893**	44.9 (07)	B C D	5.3 (08)	26.0 (10)	4.58 (10)	2.0	12.2	7.3	9.5	4.3
1	**AB 2**	44.6 (08)	C D	5.8 (03)	25.0 (05)	4.37 (01)	2.5	8.5	5.4	10.7	7.0
8	**H 2601**	43.3 (09)	C D	5.2 (09)	25.5 (09)	4.48 (05)	3.7	11.4	3.4	8.9	9.8
9	**RED SPRING**	42.1 (10)	D	5.0 (10)	24.5 (02)	4.58 (09)	4.8	11.1	12.6	9.2	11.5
	AVERAGE	**47.0**		**5.6**	**24.9**	**4.48**	**2.4**	**10.0**	**6.6**	**9.2**	**8.4**
	LSD @ 0.05=	6.7		0.3	N.S.	0.08	2.7	6.7	5.8	1.1	5.8
	C.V.=	9.8		4.1	4.4	1.2	75.3	45.7	61.1	8.5	47.8

* the percentage of plants with TSWV per 100' row at harvest

Table 3: MID Season Processing Tomato Variety Trial #2 - FRESNO County - 2007

Location: UC WSREC, Five Points
Transplanted: May 22, 2007
Spacing: 14" between plants, 75 plants/plot
Soil: Panoche clay loam
Fertilizer: ~180 lbs N/A, 100 lbs P_2O_5
Irrigation Method: sprinkler, furrow twice, subsurface drip
Irrigation Cutoff: September 20, 2007
Machine Harvest: September 25, 2007
Plot size: One 66-inch bed x 100' row

Code	VARIETY	Yield Tons/Acre		°Brix	PTAB Color	pH	% green	% sunburn	% rot	% mold	lbs per 50 fruit
2	**AB 8058**	32.5 (01)	A	5.0 (06)	21.8 (02)	4.55 (07)	3.5	5.9	6.9	0.0	9.6
10	**SUN 6368**	31.6 (02)	A B	4.9 (08)	23.5 (10)	4.52 (05)	0.3	12.7	6.1	0.3	8.7
4	**H 2005**	29.5 (03)	A B C	5.6 (01)	22.0 (03)	4.57 (09)	2.5	25.5	5.1	1.1	7.6
3	**HMX 5893**	29.2 (04)	A B C	5.0 (07)	22.3 (04)	4.55 (08)	1.7	13.8	5.3	0.6	7.5
7	**H 9780**	28.2 (05)	B C D	4.9 (09)	23.3 (09)	4.42 (02)	3.0	27.8	7.6	0.0	8.7
6	**H 8004**	27.8 (06)	B C D E	5.1 (05)	22.5 (07)	4.52 (03)	3.6	25.0	1.8	0.0	7.9
8	**H 2601**	27.7 (07)	C D E	5.2 (04)	22.3 (04)	4.54 (06)	9.2	17.4	6.5	0.0	7.6
5	**H 2506**	25.7 (08)	C D E	5.3 (03)	21.0 (01)	4.52 (04)	3.0	15.5	11.7	1.5	7.8
9	**RED SPRING**	25.1 (09)	D E	4.8 (10)	22.3 (04)	4.66 (10)	5.5	23.8	13.3	0.3	7.6
1	**AB 2**	24.2 (10)	E	5.4 (02)	22.8 (08)	4.40 (01)	1.8	13.8	10.6	1.8	9.8
	MEAN	**28.2**		**5.1**	**22.4**	**4.52**	**3.4**	**18.1**	**7.5**	**0.6**	**8.3**
	LSD @ 0.05=	3.9		0.5	0.9	0.07	3.2	10.7	NS	NS	1.5
	C.V.=	9.6		6.4	2.8	1.1	64.1	40.6	63.8	>100	12.8

Table 4: MID Season Processing Tomato Variety Trials - OBSERVATION PLOTS

Trial #1: Direct Seeded March 8, 2007 Harvested August 7, 2007

Code	VARIETY	Yield T/A	°Brix	PTAB Color	pH	% green	% sunburn	% rot	lbs per 50 fruit
11	**NUN 567**	38.6	5.5	23	4.56	1.35	15.67	5.53	9.0
12	**HT 1058**	35.3	5.0	24	4.48	1.27	4.85	21.29	6.8
13	**HT 1075**	30.8	5.5	23	4.54	6.48	10.41	9.76	6.8
14	**NDM 4464**	44.6	5.2	26	4.55	1.60	4.61	0.00	8.1
15	**NDM 5578**	45.8	5.7	23	4.42	0.86	5.41	4.82	9.8
16	**NUN 877**	46.1	5.4	23	4.54	4.33	13.55	2.59	7.2
17	**NUN 889**	41.9	5.7	23	4.54	3.08	8.32	7.39	7.2
18	**PX 1723**	25.1	6.1	24	4.51	1.10	23.91	11.85	8.5
19	**HMX 5894**	29.1	5.5	24	4.60	2.00	13.95	10.23	9.4
20	**BOS 67374**	38.2	5.8	26	4.38	5.25	6.14	13.61	7.5
21	**UG 4305**	39.0	5.5	24	4.56	3.10	8.02	10.94	8.5
22	**UG 36003**	31.9	5.4	23	4.65	0.03	7.37	12.96	7.5
	MEAN	**37.2**	**5.5**	**23.8**	**4.5**	**2.5**	**10.2**	**9.2**	**8.0**

Trial #2: Transplanted May 22, 2007 Harvested September 25, 2007

Code	VARIETY	Yield T/A	°Brix	PTAB Color	pH	% green	% sunburn	% rot	% mold
11	**NUN 567**	29.9	4.5	22	4.58	1.3	5.4	7.5	3.5
12	**HT 1058**	32.0	5.0	22	4.49	3.0	19.4	11.0	1.2
13	**HT 1075**	19.8	5.5	22	4.57	10.4	20.7	3.5	3.5
14	**NDM 4464**	31.0	5.0	21	4.50	2.8	15.9	0.0	0.0
15	**NDM 5578**	27.9	4.9	21	4.48	10.6	11.1	3.8	0.0
16	**NUN 877**	31.6	4.9	21	4.47	5.6	14.8	6.5	0.0
17	**NUN 889**	28.0	4.9	21	4.52	4.0	19.3	16.3	0.0
18	**PX 1723**	17.7	6.0	21	4.58	8.0	19.1	10.0	0.0
19	**HMX 5894**	26.0	4.6	22	4.53	2.9	18.9	8.0	0.0
20	**BOS 67374**	24.2	5.0	21	4.99	7.7	20.8	8.6	0.0
21	**UG 4305**	28.0	4.9	21	4.64	1.6	16.0	5.7	0.0
22	**UG 36003**	22.8	5.0	22	4.59	2.3	18.1	6.7	7.6
	MEAN	37.2	5.0	21.4	**4.6**	**5.0**	**16.6**	**7.3**	**1.3**