2003 Processing Tomato Variety Trials

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UC Statewide Processing Tomato Variety Evaluation Trials, 2003.

Summary of Yolo/Solano Counties
2003 Processing Tomato Variety Evaluation Trials

by

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2003 was a rough year for many tomato growers in our area. Twenty-four days of temperatures at or above 100°F during bloom and up to an inch of rainfall in late August were disastrous when profit margins were slim at best. Conditions are harsh when standard harvest equipment include a backhoe and a water truck along with the mechanical pickers and gondola tractors. As we look back on 2003, the spring had many rainy periods that increased expenses for foliar disease control as well.

And while the economic impact to an individual grower might be brutal, the overall impact on the industry was greatly buffered by being spread widely across the Central Valley and across a relatively long harvest season.

While crop insurance against rain damage may have been protective, the cultural practice of timely harvesting with minimizing field storing red ripe fruit on the vine is prudent. A long storage period increases fruit susceptibility to rots especially with wet weather conditions.

Even so, statewide production in 2003 was still 9.25 million tons. The drop was sufficient to reduce inventories and perhaps effective in raising hopes for higher prices in 2004.

For our Yolo County area, the rise in incidence of Fusarium wilt race 3 was apparent. The return of Phytophthora root rot was also prevalent.

Variety Evaluation Trials

Evaluation of varieties for local adaptation continued to be a part of the University of California farm advisor program. Our objective was to identify dependable, higher yielding and higher quality variety releases that can be grown over a wide geographic area under varying environmental conditions. The varieties were compared side-by-side in an experimentally sound designed test within local counties. Tests were conducted in a uniform fashion to compare local results with tests by UC farm advisors in other locations.

Entries:

Varieties were selected in consultation with processors and seed companies.

The early-maturity trial included 10 replicated and 9 observational varieties (table 1A). Variety standards were Heinz 9280, HyPeel 45 and APT 410. Two of the Heinz early lines, H 1100 and H 1400 were purportedly less susceptible to dodder.

In the mid-maturity trials, 18 replicated and 19 observational varieties were planted (table 1B). Mid-maturity standards were Heinz 8892, Halley, and La Rossa, the pear. CXD 221 was resistant to race 3 of Fusarium wilt. Most of the varieties had nematode and/or bacterial speck resistance.

Locations:

Our local variety evaluation program included three trials: one early-maturity trial near Winters with Button and Turkovich Ranches; a mid-maturity trial northwest of Woodland with Joe Muller and Sons and a transplanted mid maturity trial with J.H. Meek and Sons north of Davis.

Other UC tests were conducted by farm advisors representing Colusa, San Joaquin, Contra Costa, Stanislaus, Merced, Fresno and Kern counties.

Methods:

The direct seeded trials were planted with a tractor-mounted, research-plot planter at 20 or 15 seeds per foot, early vs. mid, respectively. All plots were 100' long.

In our transplant test, seedlings were commercially grown in a greenhouse. Plants were pulled from trays, counted, bundled and bagged ahead of the field planting. The grower's equipment and crew mechanically set the transplants.

Selected varieties were planted in each of 4 blocks while an additional group of observational varieties was planted in single plots. All cultural practices in these ~1 acre experimental sites were those of the cooperating grower and matched management of the remaining larger area of their commercial tomato field.

Field meetings were held at each trial site as fruit ripened to provide an opportunity to examine the performance of the varieties in side-by-side comparisons.

For fruit quality comparisons, near the date of mechanical harvest, ~7 pound sample of red ripe, non-defect fruit were selected from each plot and delivered to a local inspection station of the Processing Tomato Advisory Board. Color, °Brix (soluble solids) and pH were determined by PTAB with a procedure consistent with commercial grading. Additionally, similar samples were picked by the Diane Barrett Lab of the UC Davis Food Science and Technology Department to evaluate processing quality.

To measure yield, fruit was harvested into special weigh trailers using the grower's harvesting equipment and crew. A 5-gallon volumetric sample of unsorted fruit was taken from the mechanical harvester to evaluate fruit defects.

Analysis of variance statistical methods were used to help interpret the data. Combined statewide trial results provided information on variety adaptability across a range of conditions. Combined data from non-replicated individual trial sites allowed analysis between locations. Conclusions derived from non-replicated data should be viewed with much less confidence.

EARLY-MATURITY EVALUATION: WINTERS

Early-maturity varieties were evaluated in a Button and Turkovich field near Winters. We planted on 10 February into twin seed lines per bed in a class 1 soil (Table 2A). Substantial rainfall followed planting. Our seeding was deep (1.5 inches) with a rain-packed layer.

Emergence was slow and erratic compared to the remainder of the field. Vines grew and set well during the season. Vines weakened during fruit ripening. The trial was harvested on 30 July.

REPLICATED ENTRIES (WINTERS)

Table 4A early replicated—Winters: The trial averaged 46.2 tons per acre. The highest yielding group was led by AP 957 with 50 tons per acre, but included H 9280, APT 410, H 1400, HyPeel 45 and H 9997, all above 45 tons/acre.

HyPeel 45 had the highest soluble solids with 5.7%, but the high solids group included 5 others.

Fruit color was fair with a trial average of 23.8. The best-colored group included 4 varieties led by Calista with 23.0 and included CXD 224, H 9997 and APT 410, all with 23.3.

At the time of harvest, none of the varieties had a high percentage of green or pink-colored fruit, with many averaging 1% of each.

Sunburn was elevated in H 1100 and Calista with 20 and 17%, respectively. The trial average for sunburn was 8%.

Mold and blossom end rot (BER) levels were all low (except H 9997 with 2% BER), but none were significantly different from each other.

Table 4B early replicated— emergence, vine size, canopy cover and estimated maturity: Seedlings were counted in 2, 5' strips in the central portion of each plot prior to hand thinning. Emergence averaged only 11% and ranged from 6 to 19%. We planted too deeply for the subsequent soil conditions.

Vine size was difficult to judge with the twin row planting. The smaller vine varieties in this test included H 9280, H 1100 and Sun 6358.

Canopy cover ranged from 88 to 63%. The sparse-canopied varieties had higher levels of fruit with sun damage as listed in table 4A.

Visual rating of days to estimated harvest date was made relative to APT 410. The differences appeared to range from a day earlier to 2 days later; and without great separation.

NON-REPLICATED ENTRIES (WINTERS)

Table 5A early observational—Winters: The non-replicated yields averaged 47.4 tons per acre. The highest yielding variety was APT 410 with 55.5 tons per acre. The trial averaged 5.3 Brix with UG 8168 the highest at 6.1. UG 6168 also had the best color at 22 with a trial average of 23.4. Lowest pH was AGT 771 at 4.37. Percent pink, green, mold and BER were all low. Sunburn levels average 8% with HyPeel 45 and HMX 2853 the lowest at 5% each.

Table 5B early observational— emergence, vine size, canopy cover and estimated maturity: Emergence average 18% with a range from 9 to 32%. The varieties in the observational block covered the bed well, averaging 93% of the bed width. Fruit canopy cover averaged 79% with poorer cover with HA 3523 and HMX 2853 at only 60% each. All varieties appeared to have maturity similar to APT 410 or to be not more than 3 days later in our test.

MID-MATURITY EVALUATION: WOODLAND

Our local mid-maturity trial with Joe Muller and Sons northwest of Woodland was in a class 1, Yolo silt loam soil. Seeds were planted into moisture and capped on March 28 in single seed lines per bed. Seedlings emerged by April 10 (Table 2B). Initial irrigations were with sprinklers followed thereafter with furrow. Vines grew very vigorously during the season. Fruit set was during extended periods of high temperatures. Fruit set was good, but vine growth was excessive. Vines were mechanically trained twice. The trial was harvested by Cal Sun on August 21, prior to our 1-inch rainfall. Fruit maturity was not concentrated on vines, resulting in higher than normal levels of immature fruit at harvest.

REPLICATED ENTRIES (WOODLAND)

Table 6A mid replicated—Woodland: Yields averaged 39.8 tons per acre. Ten of the 16 varieties were in the top-yielding group, led by AB 2 with 44.4 tons per acre.

Brix averaged only 4.6. The highest Brix group was led by AB 2, CXD 221 and CPL 15-58, all with 4.9°. The top Brix group included 5 other varieties.

Color averaged 25.9. H 2501 had the best color at 24, but the best color group included 5 others, all with < 25.6 color.

Ripening was not concentrated, with combined pink and green fruit averaging 25%. Percent sunburn, mold and blossom end rot were low.

Table 6B mid replicated—emergence, vine size, canopy cover and estimated maturity: Seedling emergence averaged 49%. AB 5 had 73% emergence, with 8 other varieties in the highest emergence group, all above 50%. Sun 6119 failed to emerge and was replanted with transplants.

Vine size tended to be robust in this test. AB 5 and H 2801 overgrew their row boundaries, 109 and 103%, respectively. The most compact varieties were La Rossa, transplanted Sun 6119, and Halley with 78, 80 and 85% growth across 5-foot centered, singe-row beds.

Canopy cover was evaluated prior to harvest. Most varieties in the trial provided good fruit shading (around 85%). Canopy was weakest with NDM 0098, La Rossa and H 2501 with 74% or less.

A visual estimate of days to harvest was assessed and compared to the standard H 8892. In this test, H 8892 was consistently one of the earliest varieties along with NDM 0098, H 2501, PS 296 and H 2601. La Rossa was the earliest. The late varieties were CXD 222, AB 5, H 9780, PX 849 and U 941, which appeared to be up to a week later than our standard H 8892. Because vines were large and green fruit so prevalent along with colored fruit, estimating maturity was difficult.

NON-REPLICATED ENTRIES (WOODLAND)

Table 7A: mid observational—Woodland: The highest yielding non-replicated variety was Sun 6360 with 52.3 tons per acre. The trial averaged 42.5 tons in the observational block.

The average Brix was 4.9. Halley, PX 607 and CPL 1056 each were at 5.3, the highest of the block.

Color levels averaged 24.8 with all varieties either 24 or 25 on the PTAB color meter, except BOS 52295 with 27.

Combined percent pink and green fruit averaged 17%. Sunburn was minor, except for CPL 1056 with 17% damage. Blossom end rot was detected in only 3 varieties, each with less than 1%.

Table 7B mid observational— emergence, vine size, canopy, and estimated maturity: Seedling emergence ranged from 17% with Sun 6360 to 81% for CPL 1056. The trial average was 48%.

Vine size ranged from a sprawling 110% with HMX 2855 to a more compact vine with La Rossa at 80%, in this trial site.

Canopy cover near the time of harvest was good with most of the varieties, but weak with CPL 1056, H 2401, La Rossa, UG 151 and HMX 2855, all at or below 75% cover in our test site.

A visual assessment of maturity ranged from 4 days earlier than H 8892 to 4 days later.

MID-MATURITY EVALUATION: DAVIS

Our second local mid-maturity variety trial evaluated transplants with J.H. Meek and Sons north of Davis in a class 2, Rincon silty clay loam soil. Seedling plugs were mechanically transplanted on 23 April in single lines per bed (Table 2C). Rain followed the planting and eliminated the need to sprinkler irrigate. Plants established quickly and grew well. A furrow irrigation system was exclusively used. Fruit set was good despite extended periods of high temperatures. Vines grew well and were mechanically trained. The trial was harvested on August 28, a week after an estimated 0.5-inch rainfall.

We included a comparison of double plants per plug vs single plants using varieties AB 2 and AB 5 within our variety test. Transplants were provided by Timothy, Stewart and Lekos Seeds from Westside Transplants.

REPLICATED ENTRIES (DAVIS)

Table 8A mid replicated—Davis: Yields averaged 50.6 tons per acre. Five of the 18 varieties were in the top-yielding group, which included NDM 0098, U 941, H 2601, H 8892 and AB 2, all with 55 plus tons per acre.

CPL 15-58 and PS 296 were the top Brix performers with 5.4 and 5.2°, respectively. Brix averaged 4.8.

Color averaged 23.7. H 2801 had the best color at 22.5, but the best color group included 11 others, all with < 23.9 color.

Percent pink, green, sunburn and blossom end rot were moderately low. Fruit size was large.

Mold averaged 7%. The varieties with high rots were AB 2 and CLP 15-58 with 12 and 11%, respectively, but the high rot group included 5 other varieties. The low-rot group included 9 varieties with H 2601, H 2801, H 2501 and H 9780 at the lowest with 2, 2, 3 and 3%, respectively.

Double plants per plug, in the case of AB 2 and AB 5, did not increase fruit yield or Brix in our test. We did not lose many plants at establishment. The double plants during the early growth period appeared smaller in stem diameter compared to the single-plant. Vine growth was larger and canopy cover similar to slightly better with the extra plant per plug.

Table 8B mid replicated—vine size, canopy cover and estimated maturity:

Vine size tended to be moderate to moderately large in this test. H 2801 and AB 5 were the largest vined varieties with 101 and 100%, respectively. The most compact varieties were Sun 6119, La Rossa, Halley HM 0830 and PS 296, all with less than 85% growth across 5-foot centered, singe-row beds.

Canopy cover averaged 82% with most varieties providing good fruit shading. Canopy was weakest with H 2501 and La Rossa, at 65% or less.

The earliest varieties by visual estimate were H 8892, La Rossa, AB 2 and NDM 0098. The late variety was H 9780, which appeared to be up to a week later than our standard H 8892.

NON-REPLICATED ENTRIES (DAVIS)

Table 9A: mid observational—Davis: The highest yielding non-replicated variety was U 729 with 58.9 tons per acre. The trial averaged 48.2 tons in the observational block.

The average Brix was 4.9 with CPL 1056 the highest at 5.5.

Color levels averaged 23.2 with several at 22. Halley had the highest color with 25.

H 2401 had the lowest pH at 4.17.

Combined percent pink and green fruit averaged 5.3%. Sunburn was minor with no variety with levels above 2%, except for CPL 1056 with 19% damage. Blossom end rot was minor.

Table 9B mid observational—vine size, canopy, and estimated maturity:

Vine size was large with Sun 6324 and CPL 4863 at 110 and 100% of the bed width, respectively. Vine size averaged 88% of the bed width.

Canopy cover near the time of harvest was fair with most of the varieties, averaging 78%. Weak cover varieties were CPL 1056 with 40%; UG 151 and H 2401 at 60%; and HMX 2855 Sun 6360 and La Rossa at 75%.

A visual assessment of maturity ranged from 1 day earlier than H 8892 to 7 days later. Halley was the latest, at 7 days behind H 8892.

LOCAL COMBINED TRIAL RESULTS

Table 10A mid replicated: Yields averaged 45.1 tons per acre when the two mid maturity trial averages were combined and compared. The varieties ranked relatively similar to each other whether transplanted or direct seeded. The variety by location interaction was statistically significant at the 95% confidence interval, suggesting that the location impacted relative performance for some varieties.

T**able 10B** mid replicated: Brix averaged 4.7 with the top Brix varieties CPL 155 and PS 296 with 5.1 and 5.0, respectively. Location influenced Brix levels. CXD 222 appeared to be one of the varieties that had higher relative Brix in the transplant location as compared to the direct seeded location.

STATEWIDE COMBINED TRIAL RESULTS

Statewide, 4 early maturity variety trials and 8 mid maturity trials were conducted to evaluate the same core set of varieties by our UC team of advisors. Varieties that perform well under this wider range of growing conditions can be expected to be more adaptable.

Statewide Early Replicated: Besides Winters, our statewide early maturity trials were also placed in Contra Costa (Brentwood), Fresno (Westside Field Station), and Colusa (Maxwell). All were direct seeded. Marketable yield averaged a very productive 45.9 tons/acre (table A1). The top yielding variety was AP 957 at 52.5 tons/acre. Location influences on varietal yield were significant (as the variety x location interaction indicates).

Brix was not well separated out amongst the varieties with HyPeel 45 leading the pack (at 5.5) along with 5 other varieties (Table A2). Brix performance was not influenced by trial location.

Statewide Early Observational: Marketable yield averaged 42.5 tons per acre (table B1). No statistical separation for yield could be made among the 9 varieties when analyzing across locations as the 'replication'.

Brix scores were also highly variable and no statistical separation could be made among the 9 varieties (Table B2).

Statewide Mid Replicated: Along with Woodland and Davis, mid-maturity trials were also located in Stanislaus (Westley), Colusa (Grimes/Grimes), Merced (Le Grand), Kern (Bakersfield) and Fresno (UC Westside). Trials were direct seeded, except for one each at Grimes, Davis and Le Grand.

Combined marketable yield averaged 37.0 tons per acre. The top yield varieties were H 8892, U 941 and AB 5 with 43.3, 41.8 and 41.7 tons/acre (table C1). The Kern trial had high variation in yield.

Highest Brix group included CXD 221, CPL 155 and H 2801 with 5.6, 5.6 and 5.5, respectively (Table C2). The high yielding variety H 8892 had the lowest Brix ranking at 4.8. Location influence was significant.

Statewide Mid Observational: In the mid observational trial, 19 varieties were evaluated. Average yield was 37.5 tons per acre. CXD 223 with 43.4 tons/acre was in the top-yielding group along with 7 other varieties (table D1).

No statistically significant Brix separation could be made among the observational varieties in the test (Table D2).

Table 1A. Early Maturity Entries, 2003 Statewide UC Processing Tomato Variety Trial, Button and Turkovich Ranches, Winters.

	Company	replicated	10	observational	9
1	Campbell Soup	CXD 224	$VFFNP		
2	Harris Moran			HMX 2853	$VFFNP
3	Hazera Seed	CALISTA	$VFF	HA 3523	$VFFN
4	Heinz	H 1100	$VFFNP-D		
		H 9280	$VFFNP	**H 9280**	$VFFNP
		H 9997	$VFFNP		
		H 1400	$VFFNP-D		
5	Lipton			U 205	$VFFNP
6	Orsetti			BOS 40809	$VFFNP
				AGT 771	$VFFNP
7	Seminis	**APT 410**	$VFFNP	**APT 410**	$VFFNP
		HYPEEL 45	$VFFNP	**HYPEEL 45**	$VFFNP
		AP 957	$VFFNP		
8	Sun Seeds	SUN 6358	$VFFNP		
9	United Genetics			UG 8168	$VFFNP

BOLD LETTERS = trial standards

Code: Disease Resistance and Hybrid Status*

¢	=	OPEN POLLINATED
$	=	HYBRID
V	=	VERTICILLIUM WILT RESISTANT
F	=	RACE 1 FUSARIUM WILT RESISTANT
FF	=	RACE 1 AND 2 FUSARIUM WILT RESISTANT
FFF_3	=	RACE 1, 2 AND 3 FUSARIUM WILT RESISTANT
N	=	ROOT KNOT NEMATODE RESISTANT (SOME SPECIES)
P	=	BACTERIAL SPECK RESISTANT
D	=	DODDER TOLERANCE
TMV	=	TOBACCO MOSAIC VIRUS

***** Check with seed company to confirm disease resistance.

Table 1B. Mid-Maturity Varieties, 2003 UC Processing Tomato Variety Trial, Joe Muller and Sons & JH Meek and Sons.

	Company	18 replicated		19 Observational	
1	AB Seeds	AB 2	$VFFP		
		AB 5	$VFFNP		
2	Campbell Soup	CXD 221	$VFFF3NP	CXD 223	VFFNP
		CXD 222	$VFFNP		
3	CTRI	CPL 155	çVFFNP	CPL 1056	çVFFNP
				CPL 4863	çVFFN
4	Harris-Moran	HM 0830	$VFFN	HMX 1852	$VFFN
				HMX 2855	$VFFNP
6	Heinz	H-2501	$VFFNP	***H 8892***	$VFFN
		H-2601	$VFFNP	H-2401	$VFFNP
		H 2801	$VFFNP		
		H 8892	$VFFN		
		H-9780	$VFFNP		
7	Lipton	U 941	$VFFN	U 729	$VFFN
				U 886	$VFFN
8	Nippon Del Monte	NDM 0098	$VFFN TMV		
9	Orsetti	***Halley 3155***	$VFF	***Halley 3155***	$VFF
				AGT 210	$VFFN
				BOS 39422	$VFFNP
				BOS 47579	$VFFNP
				BOS 52295	$VFFNP
10	Seminis	PS 849	$VFFNP	PX 607	$VFFN
		PS 296 (2402	$VFFNP		
11	Sun Seeds	SUN 6119	$VFFN	Sun 6324	$VFFNP
				Sun 6360	$VFFNP
12	Syngenta	**La Rossa**	$VFF	**La Rossa**	$VFF
13	United Genetics			UG 151	$VFFN

BOLD LETTERS = trial standards

Table 2A. Plot Specifications, Early-Maturity, Winters, 2003

Cooperator:	Tony Turkovich and Martin Medina, Button & Turkovich Ranches, Winters
Location:	NE of Winters. NE intersection of Highway 128 x I-505. NW 1/4 of SW 1/4, Section 14, T8N, R1W, MDM. SCS sheet #66. Grower field i.d. 58.
Field Variety:	APT 410, twin-seed line on 5'-centered bed.
Plot Design:	Randomized complete block, 4 reps with additional non-replicated plots adjacent to 1st rep. All individual plots 500 square feet, 100' x 5'.
Planting Date:	Feb 10 into moisture, 1.5 inch planting depth.
Stand establishment:	~March 11
Field Meeting:	July 24
Fruit Quality Sample:	July 28, UCD Food Science Project July 25, PTAB
Harvest:	July 30
Soil type:	Brentwood silty clay loam, Class 1, Storie Index 81.
Soil Sample	10 February 2003

O-1 foot depth	Level
pH	6.6
EC	0.8
P (ppm)	9.6
Zn (ppm)	0.8
K exchangeable (meq/100 g)	0.6
Ca exchangeable (meq/100 g)	10.8
Mg exchangeable (meq/100 g)	11.3
Na exchangeable (meq/100g)	0.2

Fertilizer/Acre:	20 gpa 8-24-6 plus quart 5% zinc chelate at planting. Gypsum broadcast 2.5 tons/acre in fall 77 lbs/acre of 11-52-0 sidedress in fall ~150 lbs. N as UN 32 sidedressed at layby
Previous Crop:	2002, alfalfa for multiple years
Irrigation method:	sprinkler initially, followed by furrow
General:	Slow emergence from deep-planted seed in trial area. Good plant growth during season. Loss of canopy cover close to harvest. Good yield and respectable soluble solids level.

Table 2b. Plot Specifications, Direct-Seeded, Mid-Maturity, Woodland, 2003

Cooperator:	Frank, Tom and Louie Muller of Joe Muller and Sons, Woodland
Location:	NW Woodland ~0.38 mile west of CR 98, north of CR 19A T10N, R1E, MDM. SCS sheet #46.
Field Variety:	Halley, single rows, on beds with 5' centers
Plot Design:	Randomized complete block with 4 reps and additional non-replicated plots adjacent to 1st rep. Individual plot sizes, each 500 square feet.
Planting Date:	March 28 into moisture & capped with soil
Visible Stand:	April 10
Fruit Quality Sample:	August 19 for UCD Food Science August 14 for PTAB
Field Meeting:	August 19th
Harvest:	August 21
Soil type:	Yolo silt loam, class 1, Storie Index 100.
Fertilizer per Acre:	15 gallons 8-24-8 plus 1% zinc chelate under the seed line 160 lb. N as 28-0-0 plus 5 S, sidedressed in two applications
Previous Crops:	tomatoes, 2002
Irrigation method:	sprinkler through early seedling stage, furrow thereafter.
General:	Good growth, large, full sized vines. Crop developed well under high temperatures during fruit set.

Table 2c. Plot Specifications, Transplant, Mid-Maturity, Davis, 2003

Cooperator:	Steve Meek, J.H. Meek and Sons, Woodland
Location:	North Davis area, 1/4 mile south of CR 29, east of CR 99 (adjacent) SW 1/4 of NW 1/4, section 32, T9N, R2E, MDM. SCS sheet #60.
Field Variety:	Halley
Plot Design:	Randomized complete block with 4 reps Non-replicated plots adjacent to 1st rep. All individual plots 500 square feet (100' x 5')
Greenhouse:	Westside Transplants, Firebaugh
Planting Date:	23 April into good moisture, followed by rainfall
Field Meeting:	August 19th
Fruit Quality Sample:	26 August, Food Science 15 August, PTAB
Harvest	28 August
Soil type:	Rincon silty clay loam, class 2, Storie Index 73
Fertilizer per Acre:	150 lbs 5-25-26 sidedress in fall 12 gallons 10-34-0 plus 1% zinc chelate under the 'seed' line 5 gallons 3-18-18 with transplant water ~130 lbs. N as 28-0-0-5S, sidedress at layby
Previous Crops:	wheat in 2002
Irrigation method:	furrow
General:	Transplants established and grew well all season. High temperatures during fruit set. Good finish despite 0.5 inch of rainfall a week prior to harvest.

Table 3. Fruit Quality Factor Definitions

SOLUBLE SOLIDS OR °BRIX	A measure of mostly fruit sugars. Soluble solids are directly related to finished processed product yield of pastes and sauces. Soluble solids are estimated with a refractometer, and measured as °Brix.
PH	A measure of acidity. A level below 4.35 is desirable to prevent bacterial spoilage of finished product. pH rises as fruit matures.
COLOR	Measured with a Processing Tomato Advisory Board LED instrument simulating Agtron. Lower numbers correspond to better red fruit color.
PREDICTED PASTE BOSTWICK	Flow distance of tomato paste diluted to 12° Brix and heated prior to evaluation. Dilution to 12° Brix for Bostwick measurement is a standard method used by industry to evaluate product consistency. The lower the number, the thicker the product and therefore more desirable in consistency-oriented products such as catsup. Predicted paste Bostwick was estimated from microwave-cooked samples of juice Brix and juice-run Bostwick. Predicted Paste Bostwick = -11.53+(1.64 x juice Brix) + (0.5 x juice Bostwick)
PREDICTED CATSUP YIELD	Catsup yield with product specifications of 6 Bostwick (6 centimeter flow/30 seconds), 33% soluble solids has been predicted from UCD Food Science's developmental work by the following equations. Catsup yield = 2000 lbs (juice Brix) / (% tomato solids) % tomato solids =7.388+1.015(paste Bostwick) — 0.0138(paste Bostwick)^2 paste yield =2000 lbs (juice Brix) / (28 Brix) USDA color (cooked)= Larger numbers equal better color

FIELD SAMPLING PROCEDURE

Fruit quality determinations were obtained by collecting ~7 pound samples of ripe, non-defect fruit from each plot. A local grade station of the Processing Tomato Advisory Board evaluated our fruit samples for soluble solids (Brix), color and pH.

To determine finished product thickness, additional samples were collected by Sam Matoba and crew and evaluated in the Diane Barrett lab at the UC Davis Food Science and Technology Department as part of a California League of Food Processors-funded project. Two blocks of replicated varieties and all non-replicated plots were evaluated. °Brix, pH, titratable acidity (reported as percent citric acid), and juice Bostwick were the factors measured. The results of the Food Science project are in a separate report.

Fruit defects in the field were estimated by collecting ~5 gallons of unsorted fruit from the mechanical harvester. Fruit were separated into marketable red, pink, green, sun-damaged,

mold and blossom end rot categories. Measurements were on a weight basis and reported as percent.

Table 4A. Winters, Replicated, Early-Maturity: Yield, fruit quality and defects from processing tomato harvest (twin-row per bed), Button and Turkovich Ranches, 2003.

	Variety	Yield tons/A		Brix	PTAB color	pH	% pink	% green	% sun burn	% mold	% BER	lbs. per 50 fruit
1	AP 957	50.0	a	5.0	23.8	4.41	1	0	8	0	0.0	5.1
2	H 9280	49.0	a	4.8	23.8	4.42	1	1	3	0	0.0	6.9
3	APT 410	47.0	abc	5.5	23.3	4.44	1	1	7	0	0.3	6.2
4	H 1400	46.1	abc	5.4	24.8	4.32	1	2	8	0	0.2	5.1
5	HyPeel 45	45.9	abc	5.7	24.0	4.41	1	1	8	0	0.4	6.5
6	H 9997	45.6	abc	5.0	23.3	4.46	1	1	8	0	2.1	6.1
7	SUN 6358	41.1	bcd	5.4	24.0	4.43	1	1	6	0	0.3	5.4
8	H 1100	40.5	cd	5.6	24.5	4.47	0	0	20	0	0.2	6.5
9	CXD 224	39.5	cd	5.5	23.3	4.47	1	1	8	0	0.2	6.2
10	CALISTA	37.6	d	5.2	23.0	4.54	0	0	17	0	0.1	6.0
	LSD 5%	7.6		0.4	0.8	0.06	NS	NS	8	NS	NS	0.7
	% CV	12		6	2	1	99	80	63	199	366	8
	Average	46.2		5.3	23.8	4.44	1	1	9	0.2	0.4	6.0

Table 4B. Winters, Replicated, Early-Maturity: Emergence, vine size, canopy and maturity (twin-row per bed), Button and Turkovich Ranches, 2003.

	Replicated Variety	% seedling emergence	% bed cover	% fruit canopy cover	estimated harvest days (to APT 410)
1	AP 957	9	98	80	-1
2	*APT 410*	17	100	84	0
3	CALISTA	7	99	63	0
4	CXD 224	11	99	75	1
5	H 1100	11	93	68	0
6	H 1400	6	100	76	2
7	*H 9280*	11	89	85	-1
8	H 9997	9	95	76	2
9	*HyPeel 45*	19	96	88	0
10	SUN 6358	6	93	81	0
	LSD 5%	NS	5.2	14.2	1.9
	% CV	68	4	13	710
	average	11	81	67	60

Planting with small-plot planter was too deep resulting in slow and erratic emergence.

Table 5A. Winters, Non-Replicated, Early-Maturity: Yield, fruit quality, and defects at harvest from processing tomato test, (twin-seed line per bed) Button and Turkovich Ranches, 2003.

	Variety	Yield tons/A	Brix	PTAB color	pH	% pink	% green	% sun burn	% mold	% BER	lbs. per 50 fruit
1	APT 410	55.5	5.0	24	4.45	0	1	10	0	0	5.15
2	H 9280	50.7	5.3	24	4.43	2	1	6	0	0.4	6.90
3	HyPeel 45	50.5	5.0	24	4.43	1	1	5	1	0	6.05
4	HA 3523	49.9	5.1	24	4.41	1	0	8	0	0	4.45
5	AGT 771	48.7	5.0	24	4.37	3	0	9	0	0	5.60
6	BOS 40809	47.1	5.4	23	4.44	2	0	6	0	0.4	6.15
7	HMX 2853	46.2	5.0	23	4.40	1	1	5	1	0	5.20
8	UG 8168	39.6	6.1	22	4.46	0	0	11	0	0.5	5.75
9	U 205	38.3	5.4	23	4.55	0	0	12	0	0	6.55
	Average	47.4	5.3	23.4	4.44	1	1	8	0.3	0.1	5.76

	Replicated Variety	% seedling emergence	% bed cover	% fruit canopy cover	estimated harvest days (to APT 410)
1	AGT 771	32	100	70	2
2	*APT 410*	27	100	90	0
3	BOS 40809	9	90	85	2
4	HA 3523	10	90	60	2
5	*H 9280*	13	90	90	3
6	HMX 2853	25	95	60	0
7	*HYPEEL 45*	21	90	95	3
8	U 205	18	90	70	2
9	UG 8168	11	90	90	1
	average	18	93	79	2

Table 5B. Winters, Non-Replicated, Early-Maturity: Emergence, vine size, canopy cover
and fruit maturity, (single seed line per bed) Button and Turkovich Ranches, 2003.

*Data is **non-replicated** and should be viewed with much less confidence than replicated tests.*

Table 6A. Woodland, Replicated, Mid-Maturity: Yield, quality and defects from processing tomato variety trial (single row), Joe Muller and Sons, Woodland,

	Replicated Variety	Yield tons/A		Brix	PTAB color	pH	% pink	% green	% sun burn	% mold	% BER	lbs per 50 fruit
1	AB 2	44.4	a	4.9	25	4.27	10	12	1	2	0.0	8.78
2	NDM 0098	44.1	ab	4.6	25	4.33	4	7	2	2	0.1	7.48
3	H 2501	43.4	ab	4.6	24	4.30	11	10	2	1	0.0	7.79
4	AB 5	43.0	ab	4.7	26	4.28	8	20	0	1	0.1	6.43
5	PS 296	42.9	ab	4.8	26	4.24	11	11	1	1	0.1	7.35
6	U 941	42.7	ab	4.4	27	4.39	9	19	1	1	0.0	7.99
7	H 8892	42.5	ab	4.1	25	4.37	7	15	1	2	0.0	7.43
8	HM 0830	41.9	ab	4.8	26	4.41	6	11	0	1	0.0	8.01
9	H 2601	41.7	abc	4.4	26	4.38	11	18	0	1	0.3	7.28
10	H 2801	41.1	abcd	4.8	25	4.41	11	11	2	1	0.0	7.59
11	Halley 3155	40.6	bcd	4.7	26	4.33	7	13	1	1	0.0	7.85
12	La Rossa	38.1	cde	4.4	26	4.37	5	8	1	3	0.1	7.49
13	PX 849	37.7	de	4.5	27	4.31	12	16	1	2	0.0	7.80
14	CXD 221	37.7	de	4.9	27	4.38	6	14	1	4	0.0	8.45
15	CPL 15-58	37.5	de	4.9	27	4.36	13	16	1	3	0.0	9.26
16	SUN 6119	35.3	ef	4.5	28	4.37	11	15	2	1	0.0	7.25
17	H 9780	32.3	fg	4.6	27	4.33	14	26	1	1	0.1	8.84
18	CXD 222	30.6	g	4.6	26	4.36	15	28	0	2	0.0	8.10
	LSD 5%	3.7		0.2	1.2	0.04	5	5.13	NS	1.8	NS	0.8
	% CV	7		3	3	1	37	24	124	79	314	7
	Average	39.8		4.6	25.9	4.34	9.5	15.0	1.0	1.6	0.0	7.8

Differences in maturity influenced yield outcome
Sun 6119 transplanted due to poor stand with direct seeding
Fusarium wilt and Fusarium foot rot reduced yield
Sunburn levels likely reduced in some varieties from field bindweed cover 2003.

Table 6B. Woodland, Replicated, Mid-Maturity: Emergence, vine size, canopy cover and fruit maturity notes (single row), Joe Muller and Sons, Woodland, 2003.

	Replicated Variety	% seedling emergence	% vine size	% canopy cover	estimated harvest days (to H 8892)
1	AB 2	68	93	90	2
2	AB 5	73	109	94	6
3	CPL 15-58	67	101	88	3
4	CXD 221	47	98	89	4
5	CXD 222	55	99	93	7
6	H 2501	37	89	74	0
7	H 2601	44	95	79	2
8	H 2801	40	103	83	4
9	***H 8892***	42	93	84	0
10	H 9780	40	99	89	5
11	***Halley 3155***	55	85	83	2
12	HM 0830	39	89	80	3
13	***La Rossa***	41	78	73	-3
14	NDM 0098	61	89	66	0
15	PS 296	60	86	79	1
16	PX 849	55	98	93	5
17	SUN 6119*	1	80	79	3
18	U 941	61	94	93	5
	LSD 5%	22	6.8	7.5	2.3
	% CV	21	5	6	6
	Average	49	93	84	2.6

* subsequently replanted with transplants

vine size: 100= large vine 50= 50% bed cover

canopy 100= complete cover 50= 50% fruit shaded

Table 7A. Woodland, Non-Replicated, Mid-Maturity: Yield, fruit quality and defects from processing tomato variety test, Joe Muller and Sons, Woodland, 2003.

	Non-Rep variety	Yield tons/A	°Brix	PTAB color	pH	% pink	% green	% sun burn	% mold	% BER	lbs per 50 fruit
1	U 729	49.9	4.6	25	4.42	7	9	2	0	0.8	9.8
2	CPL 1056	35.8	5.3	25	4.41	8	7	17	3	0	8.3
3	CPL 4863	42.1	5.1	25	4.38	9	9	2	2	0	6.7
4	PX 607	37.6	5.3	25	4.44	15	17	2	0	0	8.8
5	La Rossa	41.7	4.9	25	4.43	6	4	3	0	0.4	7.9
6	BOS 52295	42.4	5.0	27	4.32	7	16	2	2	0	8.0
7	AGT 210	38.7	4.9	25	4.38	9	14	3	2	0	6.7
8	HM 1852	42.0	5.0	24	4.40	5	10	2	2	0	8.0
9	*Halley 3155*	38.7	5.3	25	4.40	6	12	2	1	0	7.0
10	CXD 223	45.8	4.7	25	4.43	6	12	3	1	0	8.2
11	H 2401	42.3	4.6	25	4.27	8	8	1	1	0	6.0
12	SUN 6324	40.7	5.1	24	4.46	8	12	0	3	0	7.4
13	SUN 6360	52.3	4.7	24	4.34	5	8	1	1	0	7.8
14	U 886	41.1	5.0	25	4.41	9	17	2	0	0	7.4
15	UG 151	40.6	4.7	24	4.44	3	3	1	1	0	7.0
16	*H 8892*	45.0	4.8	24	4.31	3	10	3	0	0	7.4
17	BOS 39422	43.8	5.1	25	4.33	6	8	2	2	0.8	7.0
18	HMX 2855	42.8	4.9	25	4.49	8	5	2	5	0	9.0
19	BOS 47579	44.3	4.9	25	4.35	4	10	0	2	0	7.0
	Average	42.5	4.9	24.8	4.39	7	10	3	2	0.1	7.7

*Data is **non-replicated** and should be viewed with much less confidence than replicated tests.*

Table 7B Woodland, Non-Replicated, Mid-Maturity: Emergence, vine size, canopy cover, and fruit maturity notes, Joe Muller and Sons, Woodland, 2003.

	Non-Rep variety	% Seedling emergence	vine size	canopy cover	Maturity (days relative to H 8892)
1	U 729	68	95	85	1
2	CPL 1056	81	85	60	-1
3	CPL 4863	49	100	80	0
4	PX 607	33	95	80	4
5	**La Rossa**	39	80	70	-4
6	BOS 52295	60	95	90	4
7	AGT 210	46	95	90	3
8	HM 1852	34	90	80	-1
9	***Halley 3155***	50	95	85	2
10	CXD 223	63	105	90	4
11	H 2401	52	100	60	-1
12	SUN 6324	41	105	90	4
13	SUN 6360	17	95	90	1
14	U 886	49	100	90	4
15	UG 151	51	95	70	-2
16	***H 8892***	42	100	85	0
17	BOS 39422	45	100	80	2
18	HMX 2855	39	110	75	0
19	BOS 47579	60	100	90	2
	average	48	97	81	1

vine size: 100= large vine 50= 50% bed cover

canopy 100= complete cover 50= 50% fruit shaded

*Data is **non-replicated** and should be viewed with much less confidence than replicated tests.*

Table 8A. Davis, Replicated, Mid-Maturity: Yield, quality and defects from processing tomato variety trial (transplant), JH Meek and Sons,

	Replicated Variety	Yield tons/A		Brix	PTAB color	pH	% pink	% green	% sun burn	% mold	% BER	lbs per 50 fruit
1	NDM 0098	58.1	a	4.6	23	4.38	2	1	2	7	0.1	9.0
2	U 941	56.7	ab	4.3	25	4.42	3	2	1	9	1.3	8.6
3	H 2601	55.9	abc	4.4	24	4.40	4	2	0	2	0.4	7.7
4	H 8892	55.3	abcd	4.2	23	4.37	3	2	1	10	0.1	8.0
5	AB 2	55.2	abcd	4.9	23	4.29	3	1	2	12	0.1	8.9
6	AB 5 (double)	54.0	abcd	4.6	24	4.26	3	3	1	5	0	6.1
7	AB 5	53.4	bcde	4.8	23	4.29	2	2	0	4	0	6.6
8	AB 2 (double)	52.5	cdef	5.0	23	4.25	4	2	1	8	0.1	8.9
9	H 2501	51.7	def	4.7	23	4.34	6	2	2	3	0.4	8.7
10	La Rossa	49.7	efg	4.4	24	4.34	3	2	4	8	0.3	8.7
11	PS 296	49.4	efg	5.2	24	4.31	4	1	3	7	0	8.2
12	Halley	49.4	efg	4.9	24	4.33	6	4	0	6	0.4	7.7
13	H 2801	49.1	fg	4.9	23	4.40	3	2	1	2	0.2	7.7
14	PX 849	49.0	fg	4.8	26	4.27	5	5	1	4	0	8.2
15	H 9780	47.1	gh	4.9	25	4.29	6	6	1	3	0.8	7.9
16	SUN 6119	46.5	ghi	4.9	25	4.35	5	2	1	6	0	8.5
17	HM 0830	46.5	ghi	4.9	24	4.44	3	2	2	10	0.5	8.7
18	CXD 222	46.1	ghi	5.0	24	4.34	5	6	0	8	0.1	8.6
19	CPL 15-58	43.8	hi	5.4	24	4.35	6	2	1	11	0	8.6
20	CXD 221	42.5	i	5.0	24	4.42	4	4	1	7	0	8.5
	LSD 5%	4.1		0.2	1.3	0.08	NS	2.2	2.0	4.4	0.7	1.2
	% CV	6		3	4	1	51	58	104	47	199	10
	average	50.6		4.8	23.7	4.34	4.0	2.6	1.4	6.5	0.2	8.2

Doubles= 2 plants per plug
Harvest 7 days after rainfall > 0.5 inches
Elevated mold levels

Woodland, 2003.

Table 8B. Davis, Replicated, Mid-Maturity: vine size, canopy cover and fruit maturity notes (transplant), JH Meek and Sons, Woodland, 2003

	Replicated Variety	vine size	fruit canopy cover	estimated harvest days (to H8892)
1	AB 2	90	79	1
2	AB 5	100	88	3
3	CPL 15-58	85	90	4
4	CXD 221	96	89	5
5	CXD 222	86	88	4
6	H 2501	84	60	3
7	H 2601	96	75	2
8	H 2801	101	75	5
9	*H 8892*	96	84	0
10	H 9780	94	88	7
11	*Halley*	81	89	3
12	HM 0830	83	88	3
13	*La Rossa*	81	65	0
14	NDM 0098	90	78	1
15	PS 296	84	79	2
16	PX 849	89	88	5
17	SUN 6119	80	78	3
18	U 941	88	86	3
19	AB 2 (double)	96	90	3
20	AB 5 (double)	105	90	4
	LSD 5%	4.2	8.0	1.4
	% CV	3	7	3
	average	90	82	3

bed cover 100= full cover
canopy cover 90 = 90%

Table 9A. Davis, Non-Replicated, Mid-Maturity: Yield, fruit quality and defects from processing tomato variety test, transplants, JH Meek and Sons, Woodland, 2003.

	Non-Rep variety	Yield tons/A	°Brix	PTAB color	pH	% pink	% green	% sun burn	% mold	% BER	lbs per 50 fruit
1	U 729	58.9	4.9	24	4.45	5	4	0	4	0.0	9.3
2	SUN 6360	56.6	4.5	22	4.40	1	1	2	12	0.0	8.3
3	H 8892	54.3	4.5	22	4.37	0	0	2	6	0.0	7.6
4	H 2401	54.1	4.7	24	4.17	4	3	2	3	0.0	5.6
5	CXD 223	52.7	4.7	23	4.43	3	2	1	8	0.0	7.9
6	UG 151	52.1	4.4	23	4.46	3	1	2	20	0.0	8.3
7	U 886	51.0	4.7	22	4.19	6	3	0	11	1.2	8.5
8	BOS 52295	48.9	5.3	24	4.29	2	3	0	8	0.8	5.9
9	CPL 4863	48.6	4.7	23	4.45	2	3	2	14	0.4	7.6
10	La Rossa	48.5	4.6	24	4.35	1	4	1	5	0.0	7.2
11	SUN 6324	48.2	4.6	24	4.44	3	1	1	13	0.0	7.6
12	BOS 47579	47.7	5.2	23	4.38	5	3	0	14	0.0	8.7
13	Halley	45.0	5.3	25	4.48	3	2	0	6	0.0	6.0
14	BOS 39422	44.2	5.1	23	4.28	4	6	2	15	0.8	8.7
15	AGT 210	42.7	5.4	23	4.33	2	4	2	4	0.0	7.8
16	HMX 2855	42.7	4.9	24	4.40	3	1	0	19	0.0	9.0
17	HM 1852	42.1	4.7	23	4.37	3	3	2	29	1.2	8.0
18	PX 607	40.6	5.4	23	4.40	3	3	2	14	0.0	8.4
19	CPL 1056	36.7	5.5	22	4.46	1	1	19	24	1.9	8.2
	average	48.2	4.9	23.2	4.37	2.9	2.4	2.1	12.1	0.3	7.8

*Data is **non-replicated** and should be viewed with much less confidence than replicated tests.*

Table 9B Davis, Non-Replicated, Mid-Maturity: vine size, canopy cover, and fruit maturity notes, transplants, JH Meek and Sons, Woodland, 2003.

	Observational variety	vine size	% canopy cover	estimated harvest days (to H8892)
1	Halley	80	85	7
2	H 8892	95	80	0
3	PX 607	80	80	4
4	HMX 2855	90	75	4
5	BOS 39422	80	80	5
6	HM 1852	85	80	2
7	CPL 4863	100	85	4
8	SUN 6324	110	90	5
9	CPL 1056	70	40	-1
10	UG 151	95	60	2
11	BOS 47579	85	80	5
12	AGT 210	85	90	5
13	SUN 6360	90	75	0
14	U 729	95	85	6
15	CXD 223	95	80	3
16	U 886	90	85	5
17	La Rossa	85	75	2
18	H 2401	90	60	5
19	BOS 52295	80	90	3
	average	88	78	3

*Data is **non-replicated** and should be viewed with much less confidence than replicated tests.*

Table 10A. Local Combined, Replicated, Mid-Maturity Trials: Yield, JH Meek and Sons & Joe Muller and Sons, Davis and Woodland, 2003.

	VARIETY	Yield tons/A								Direct Seed	Transplant
1	NDM 0098	51.1	A							44.1	58.1
2	AB 2	49.8	A	B						44.4	55.2
3	U 941	49.7	A	B						42.7	56.7
4	H 8892	48.9	A	B						42.5	55.4
5	H 2601	48.8	A	B	C					41.7	55.9
6	AB 5	48.2		B	C					43.0	53.4
7	H 2501	47.5		B	C	D				43.4	51.7
8	PS 296	46.2			C	D	E			42.9	49.4
9	H 2801	45.1				D	E	F		41.1	49.1
10	Halley 3155	45.0				D	E	F		40.6	49.4
11	HM 0830	44.2					E	F		41.9	46.5
12	La Rossa	43.9					E	F		38.1	49.7
13	PX 849	43.3						F	G	37.7	49.0
14	SUN 6119	40.9							G H	35.3	46.5
15	CPL 155	40.6							G H	37.5	43.8
16	CXD 221	40.1							H	37.7	42.5
17	H 9780	39.7							H	32.3	47.1
18	CXD 222	38.3							H	30.6	46.1
	LSD @ 0.05=	2.7								3.7	4.2
	C.V.=	6.1								6.5	5.8
	MEAN	45.1								39.9	50.3
	VARIETY X LOCATION LSD @ 0.05=	3.9									

Comment: The general ranking of the combined data fits fairly well with the individual yield results from each of the mid maturity tests, whether transplanted or direct seeded.

Table 10B. Local Combined, Replicated, Mid-Maturity Trials: Brix, JH Meek and Sons & Joe Muller and Sons, Davis and Woodland, 2003.

		°Brix		Direct Seed	Transplant
1	CPL 155	5.1	A	4.9	5.4
2	PS 296	5.0	A B	4.8	5.2
3	CXD 221	5.0	B C	4.9	5.0
4	AB 2	4.9	B C D	4.9	4.9
5	Halley 3155	4.8	C D E	4.7	4.9
6	HM 0830	4.8	C D E	4.8	4.9
7	H 2801	4.8	C D E	4.8	4.9
8	CXD 222	4.8	D E	4.6	5.0
9	AB 5	4.8	D E	4.7	4.8
10	H 9780	4.7	D E	4.6	4.9
11	PX 849	4.7	E F	4.5	4.8
12	H 2501	4.7	E F	4.6	4.7
13	SUN 6119	4.7	E F	4.5	4.9
14	NDM 0098	4.6	F G	4.6	4.6
15	La Rossa	4.4	G H	4.4	4.4
16	H 2601	4.4	G H	4.4	4.4
17	U 941	4.3	H	4.4	4.3
18	H 8892	4.1	I	4.1	4.2
	LSD @ 0.05=	0.2		0.2	0.2
	C.V.=	3.4		3.4	3.4
	MEAN	4.7		4.6	4.8

VARIETY X LOCATION
LSD @ 0.05= 0.2

TABLE A1
EARLY MATURITY PROCESSING TOMATO VARIETY TRIALS, 2003
REPLICATED
(STATEWIDE AND BY COUNTY)
YIELD (TONS/ACRE)

	VARIETY	tons/acre					Yolo	Colusa	Fresno	Contra Costa
1	AP 957	52.5	A				50.1	62.8	46.8	50.3
2	H 9997	48.7		B			45.6	57.8	37.4	53.9
3	H 9280	48.0		B			49.0	53.2	41.6	48.1
4	H 1400	46.9		B	C		46.1	59.5	34.2	47.8
5	APT 410	46.3		B	C		47.0	49.8	37.3	51.4
6	H 1100	46.3		B	C		40.5	54.1	39.5	51.1
7	SUN 6358	45.4		B	C		41.1	52.1	44.1	44.4
8	HYPEEL 45	43.8			C	D	45.9	49.2	31.6	48.7
9	CALISTA	41.1				D E	37.6	44.6	40.1	42.1
10	CXD 224	39.4				E	39.5	41.7	31.7	44.8
	LSD @ 0.05=	3.7					8.0	8.0	9.5	4.3
	C.V.=	11.5					12.4	10.5	17.0	6.2
	MEAN	45.9					44.2	52.5	38.4	48.2
	VARIETY X LOCATION LSD @ 0.05=	7.4								

TABLE A2
EARLY MATURITY PROCESSING TOMATO VARIETY TRIALS, 2003
REPLICATED
(STATEWIDE AND BY COUNTY)
°BRIX

	VARIETY	°Brix			Yolo	Colusa	Fresno	Contra Costa
1	HYPEEL 45	5.5	A		5.7	5.2	5.3	5.7
2	CXD 224	5.4	A		5.5	5.2	5.3	5.6
3	SUN 6358	5.4	A		5.4	5.2	5.5	5.5
4	H 1400	5.4	A		5.4	5.3	5.0	5.8
5	APT 410	5.3	A		5.5	5.1	5.5	5.3
6	H 1100	5.3	A		5.6	5.1	4.8	5.6
7	H 9997	5.0		B	5.0	4.8	5.1	5.0
8	AP 957	4.9		B	5.0	4.9	4.7	5.1
9	CALISTA	4.9		B	5.2	4.7	4.9	4.8
10	H 9280	4.8		B	4.8	4.6	4.6	5.1
	LSD @ 0.05=	0.2			0.5	0.3	0.5	0.5
	C.V.=	6.1			6.0	4.8	7.0	6.2
	MEAN	5.2			5.3	5.0	5.0	5.3
	VARIETY X LOCATION LSD @ 0.05=	N.S.						

TABLE B1
EARLY MATURITY PROCESSING TOMATO VARIETY TRIALS, 2003
OBSERVATIONAL
(STATEWIDE AND BY COUNTY)
YIELD (TONS/A)

	VARIETY	AVE YIELD	Colusa	Contra Costa	Fresno	Yolo
1	UG 8168	48.4	50.3	53.3	42.5	47.3
2	HYPEEL 45	44.5	42.3	45.0	40.5	50.3
3	H 9280	44.0	49.0	50.5	29.7	46.7
4	APT 410	43.3	50.0	47.7	34.2	41.5
5	BOS 40809	41.7	47.3	46.7	32.1	40.8
6	HMX 2853	41.1	45.7	57.2	25.2	36.2
7	U205	40.2	46.8	41.2	37.5	35.2
8	AGT 771	40.1	41.8	47.4	42.3	28.8
9	HA 3523	39.0	39.0	32.1	52.9	32.1
	LSD @ 0.05=	N.S.				
	C.V.=	17.0				
	MEAN	42.5				

TABLE B2
EARLY MATURITY PROCESSING TOMATO VARIETY TRIALS, 2003
OBSERVATIONAL
(STATEWIDE AND BY COUNTY)
°BRIX

	VARIETY	AVE BRIX	Colusa	ContraCosta	Fresno	Yolo
1	APT 410	5.7	6.0	5.2	5.9	5.6
2	HMX 2853	5.5	4.8	5.8	6.0	5.4
3	AGT 771	5.5	5.2	6.5	4.4	6.0
4	UG 8168	5.4	5.0	5.4	5.5	5.6
5	U205	5.3	5.0	6.0	5.0	5.1
6	HA 3523	5.1	4.3	5.9	4.9	5.3
7	HYPEEL 45	5.0	4.4	5.0	4.9	5.8
8	BOS 40809	4.9	4.8	4.5	5.2	5.2
9	H 9280	4.8	4.5	5.0	5.0	4.6
	LSD @ 0.05=	N.S.				
	C.V.=	9.3				
	MEAN	5.2				

TABLE C1
2003 PROCESSING TOMATO MID-SEASON MATURITY VARIETY TRIALS
REPLICATED YIELD TRIALS
(STATEWIDE AND BY COUNTY)
YIELD (TONS/ACRE)

	VARIETY	Yield tons/A	Statewide	Yolo DS	Yolo Tr	Colusa DS	Colusa Tr	Stanis DS	Fresno DS	Kern DS	Merced Tr
1	H 8892	43.3	A	42.5	55.4	26.6	34.7	60.6	54.7	31.2	40.7
2	U 941	41.8	AB	42.7	56.7	23.9	33.7	56.3	54.0	31.8	35.2
3	AB 5	41.7	AB	43.0	53.4	29.0	34.1	53.4	48.1	33.2	39.7
4	NDM 0098	39.8	BC	44.1	58.1	30.1	23.2	47.3	50.3	26.9	38.8
5	H 2501	38.8	CD	43.4	51.7	24.2	34.6	46.8	53.2	23.7	33.2
6	AB 2	38.1	CDE	44.4	55.2	28.2	29.8	52.1	45.1	19.5	30.5
7	PS 296	37.8	CDE	42.9	49.4	33.0	28.9	54.7	40.2	23.5	29.8
8	PX 849	37.1	DE	37.7	49.0	25.0	34.8	50.3	45.5	23.2	31.4
9	H 2801	37.1	DE	41.1	49.1	25.5	36.3	38.1	47.3	22.4	36.6
10	H 2601	36.7	DE	41.7	55.9	22.6	25.2	46.0	48.5	19.3	34.6
11	H 9780	36.2	EFG	32.3	47.1	29.2	30.9	46.2	50.1	19.2	34.4
12	CXD 222	34.8	FGH	30.6	46.1	26.0	24.8	51.4	46.0	23.4	30.1
13	Halley 3155	34.7	FGH	40.6	49.4	26.3	27.7	46.8	42.3	18.0	26.5
14	HM 0830	34.5	GH	41.9	46.5	27.7	26.1	50.1	36.0	18.8	28.6
15	La Rossa	32.8	H	38.1	49.7	20.7	21.2	44.4	44.8	14.0	29.4
16	CXD 221	30.6	I	37.7	42.5	25.4	21.3	35.9	34.7	18.3	28.9
17	CPL 155	30.6	I	37.5	43.8	29.6	23.3	43.0	27.3	11.8	28.4
18	SUN 6119*	39.3		35.3	46.5	---	31.0	44.7	45.7	---	28.4
	LSD @ 0.05=	2.1		3.7	4.2	N.S.	5.9	8	6.6	7.4	5.6
	C.V.=	11.6		6.5	5.8	17	14.4	11.6	10.3	23	12.2
	MEAN	37.0		39.9	50.3	26.7	28.9	48.2	45.2	22.6	32.5

VARIETY X LOCATION
LSD @ 0.05= 6.0

*Missing data from some locations

TABLE C2
2003 PROCESSING TOMATO MID-SEASON MATURITY VARIETY TRIALS
REPLICATED YIELD TRIALS
(STATEWIDE AND BY COUNTY)
°BRIX

	VARIETY	BRIX		Yolo DS	Yolo Tr	Colusa DS	Colusa Tr	Stanis DS	Fresno DS	Kern DS	Merced Tr
1	CXD 221	5.6	A	4.9	5.0	6.2	6.5	5.3	5.1	6.5	5.3
2	CPL 155	5.6	A	4.9	5.4	6.1	6.4	5.0	4.8	6.8	5.4
3	H 2801	5.5	A B	4.8	4.9	6.1	6.4	5.4	5.0	6.3	5.1
4	HM 0830	5.4	B C	4.8	4.9	6.2	5.7	5.2	5.4	6.2	5.2
5	AB 2	5.4	B C	4.9	4.9	6.1	5.9	5.2	4.7	6.4	5.2
6	Halley 3155	5.3	C D	4.7	4.9	6.1	6.0	4.8	5.1	6.2	4.9
7	H 2501	5.3	C D	4.6	4.7	5.8	6.1	5.0	4.9	6.2	5.3
8	H 9780	5.3	C D	4.6	4.9	5.8	6.0	5.0	4.7	6.2	5.0
9	AB 5	5.3	C D	4.7	4.8	6.2	5.8	5.2	4.8	5.8	5.0
10	PS 296	5.3	C D	4.8	5.2	5.3	6.0	5.2	4.5	6.2	5.5
11	PX 849	5.2	D E	4.5	4.8	6.3	5.6	4.9	4.8	5.6	5.2
12	CXD 222	5.2	D E	4.6	5.0	5.7	5.9	5.2	4.8	5.6	5.4
13	La Rossa	5.1	E F	4.4	4.4	5.6	5.8	4.7	4.9	6.3	4.8
14	NDM 0098	5.1	E F	4.6	4.6	5.6	5.7	4.9	4.9	5.7	5.0
15	U 941	5.1	E F	4.4	4.3	6.1	5.4	4.7	5.1	5.6	5.2
16	H 2601	5.0	F	4.4	4.4	5.6	5.5	4.8	4.5	5.7	4.9
17	H 8892	4.8	G	4.1	4.2	5.7	5.4	4.8	4.8	5.4	4.4
18	SUN 6119	5.1		4.5	4.9	5.8	5.7	5.1	4.8		5.2
	LSD @ 0.05=	0.2		0.2	0.2	0.4	0.3	0.3	N.S.	0.7	N.S.
	C.V.=	6.1		3.4	3.4	5.0	3.3	4.5	8.4	7.6	9.5
	MEAN	5.3		4.6	4.8	5.9	5.9	5.0	4.9	6.0	5.1
	VARIETY X LOCATION LSD @ 0.05=	0.4									

DS = DIRECT SEED
TR = TRANSPLANT

TABLE D1
MID MATURITY PROCESSING TOMATO VARIETY TRIALS, 2003
OBSERVATIONAL
(STATEWIDE AND BY COUNTY)
YIELD (TONS/A)

	VARIETY	Yield Tons/A		Colusa DS	Colusa Tr	Fresno DS	Kern DS	Merced Tr	Stanis DS	Yolo DS	Yolo Tr
1	CXD 223	43.4	A	37.2	26.6	58.8	19.8	35.7	70.6	45.8	52.7
2	H 8892	42.4	A B	26.8	36.2	56.7	19.6	39.4	61.4	45.0	54.3
3	U 729	41.2	A B C	27.4	24.6	54.6	37.1	33.0	44.3	49.9	58.9
4	SUN 6360	40.6	A B C D	31.1	20.9	53.8	26.7	37.9	45.6	52.3	56.6
5	HMX 2855	39.7	A B C D	21.3	38.1	48.5	20.4	34.4	69.3	42.8	42.7
6	SUN 6324	39.5	A B C D	24.0	22.0	55.5	30.3	40.7	54.6	40.7	48.2
7	H 2401	39.1	A B C D E	21.6	35.9	48.8	16.4	33.7	59.7	42.3	54.1
8	U 886	38.7	A B C D E	26.1	29.4	55.3	27.1	21.1	58.6	41.1	51.0
9	CPL 4863	37.8	B C D E	24.0	29.2	53.8	/	38.3	44.0	42.1	48.6
10	BOS 47579	37.4	B C D E	28.5	26.6	48.2	23.0	33.8	47.5	44.3	47.7
11	BOS 52295	37.3	B C D E	29.4	22.2	50.5	17.3	33.2	54.5	42.4	48.9
12	UG 151	36.8	C D E	19.8	22.4	39.5	32.2	32.6	55.2	40.6	52.1
13	HM 1852	35.9	C D E F	18.7	22.2	50.2	25.6	36.4	50.1	42.0	42.1
14	PX 607	35.6	D E F	30.9	30.9	40.1	25.7	28.8	50.0	37.6	40.6
15	Halley 3155	35.5	D E F	30.7	14.6	45.5	25.7	30.3	53.6	38.7	45.0
16	BOS 39422	35.2	D E F	32.0	22.2	44.8	16.5	33.1	44.9	43.8	44.2
17	La Rossa	33.9	E F	29.2	21.1	47.5	10.5	23.3	49.6	41.7	48.5
18	AGT 210	31.0	F	31.8	20.3	31.5	15.1	29.3	38.8	38.7	42.7
19	CPL 1056	30.4	F	24.8	21.1	34.5	13.0	27.1	50.1	35.8	36.7
	LSD @ 0.05=	5.5									
	C.V.=	14.9									
	MEAN	37.5									

DS = direct seed
Tr = transplants

TABLE D2
MID MATURITY PROCESSING TOMATO VARIETY TRIALS, 2003
OBSERVATIONAL
(STATEWIDE AND BY COUNTY)
BRIX

	VARIETY	Statewide average	Colusa DS	Colusa Tr	Fresno DS	Kern DS	Merced Tr	Stanis DS	Yolo DS	Yolo Tr
1	La Rossa	5.4	5.9	6.3	5.2	6.3	5.7	4.6	4.9	4.6
2	Halley 3155	5.5	6.1	6.0	5.3	6.3	5.0	4.9	5.3	5.3
3	H 8892	5.2	5.9	6.0	4.9	6.1	4.7	4.5	4.8	4.5
4	SUN 6324	5.4	5.7	6.7	4.7	5.7	5.8	5.1	5.1	4.6
5	CPL 1056	5.4	5.4	6.1	4.7	6.4	5.1	4.7	5.3	5.5
6	HM 1852	5.3	5.3	5.9	4.5	6.6	4.9	5.2	5.0	4.7
7	U 729	5.3	5.9	6.3	4.5	5.5	5.8	4.7	4.6	4.9
8	CXD 223	5.3	5.6	6.6	4.8	6.5	5.2	4.6	4.7	4.7
9	CPL 4863	5.4	6.2	6.3	4.4	---	5.0	5.1	5.1	4.7
10	HMX 2855	5.5	6.1	6.3	5.3	6.6	5.0	4.6	4.9	4.9
11	H 2401	5.3	6.0	5.6	4.9	6.6	5.0	4.7	4.6	4.7
12	U 886	5.4	6.0	5.9	4.7	6.1	6.0	4.9	5.0	4.7
13	AGT 210	5.5	5.6	6.3	4.9	6.7	5.3	5.1	4.9	5.4
14	BOS 39422	5.4	5.9	5.5	4.1	6.4	5.3	5.5	5.1	5.1
15	BOS 47579	5.5	5.1	6.4	4.8	6.4	5.6	5.8	4.9	5.2
16	BOS 52295	5.6	5.9	6.4	5.3	6.5	5.1	5.1	5.0	5.3
17	PX 607	5.6	6.1	6.0	4.5	5.8	6.1	5.4	5.3	5.4
18	SUN 6360	5.1	5.9	5.9	4.6	6.0	4.9	4.6	4.7	4.5
19	UG 151	5.1	5.6	5.2	4.2	6.1	5.2	5.1	4.7	4.4
	LSD @ 0.05=	N.S.								
	C.V.=	6.2								
	MEAN	5.4								

DS = direct seed
Tr = transplants