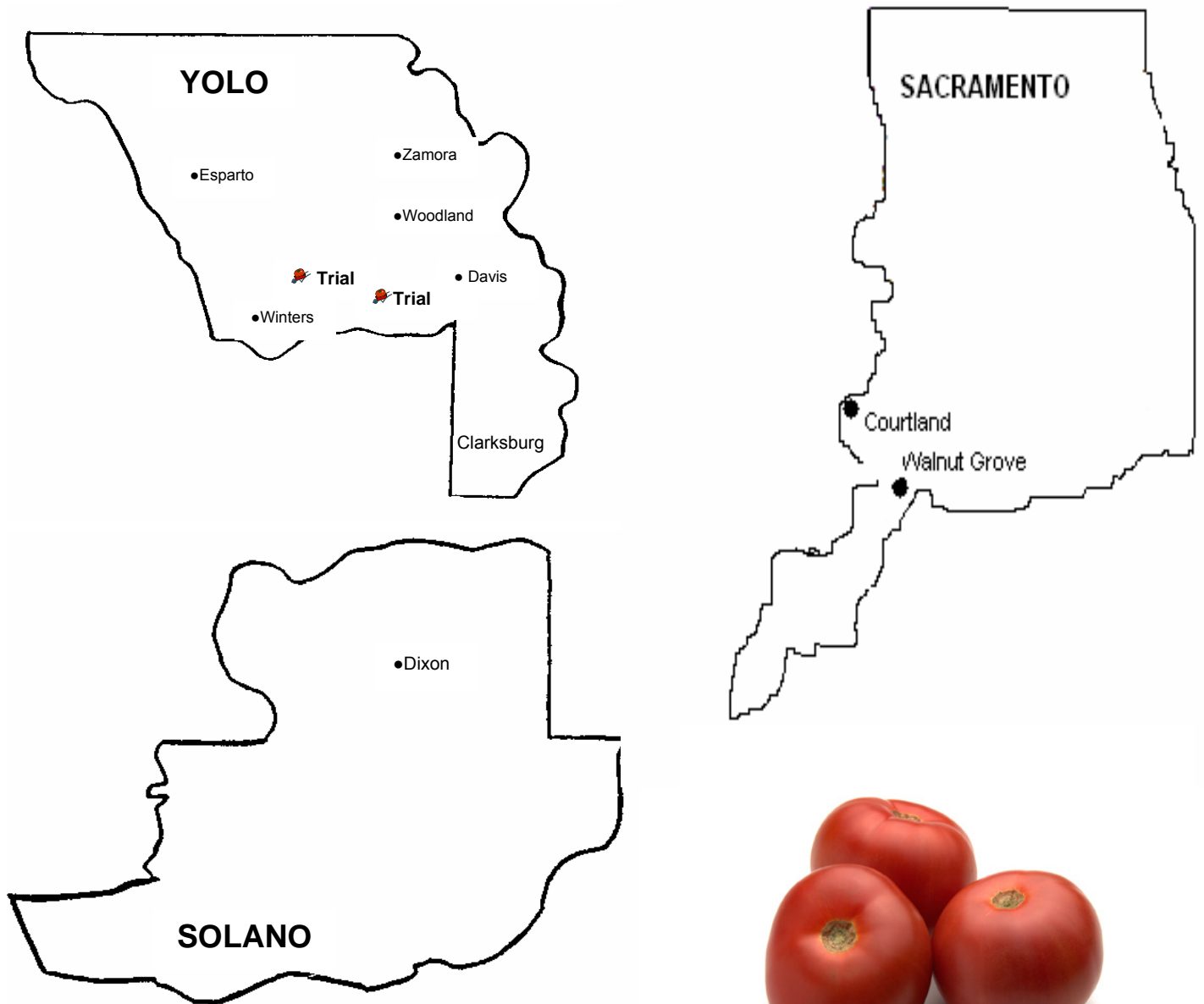


# 2004 PROCESSING TOMATO VARIETY TRIALS



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Respectfully submitted,

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Dec 2004

120 copies

Cooperative Extension in Agriculture and Home Economics. US Department of  
Agriculture, University of California and Yolo County Cooperating.

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## TABLE OF CONTENTS

SUMMARY OF 2004 YOLO/SOLANO/SACRAMENTO COUNTY TRIALS	1-5
Table 1A. Early Maturity Entries, Winters.....	6
Table 1B. Mid-Maturity Variety Entries, Davis.....	7
Table 2A. Plot Specifications, Early-Maturity, Winters .....	8
Table 2B. Plot Specifications, Mid-Maturity, Davis .....	9
Table 3. Fruit Quality Factor Definitions.....	10
<u>WINTERS, REPLICATED, <b>EARLY-MATURITY</b></u>	
Table 4. Yield, °Brix, color & defects at harvest.....	11
Table 5. Emergence, vine size, canopy and maturity.....	11
<u>DAVIS, REPLICATED, <b>MID-MATURITY</b></u>	
Table 6A. Yields, °Brix, color and defects at harvest .....	12
Table 6B. Emergence, vine size, canopy and maturity.....	13
<u>DAVIS, OBSERVATIONAL, <b>MID-MATURITY</b></u>	
Table 7A. Yields, °Brix, color and defects at harvest .....	14
Table 7B. Emergence, vine size, canopy and maturity.....	14
<u>STATEWIDE: <b>COMBINED YIELD AND BRX</b></u>	
Table 8A. Early Rep: Yield .....	15
Table 8B. Early Rep: Brix .....	16
Table 9A. Mid Rep: Yield .....	17
Table 9B. Mid Rep: Brix .....	18
Table 10A. Mid Observational: Yield .....	19
Table 10B. Mid Observational: Brix .....	19

## **Summary of Yolo/Solano Counties 2004 Processing Tomato Variety Evaluation Trials**

by

Gene Miyao, UC Farm Advisor  
Mark Kochi, Field Assistant, Yolo County,  
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Weather conditions were generally favorable for our 2004 tomatoes. No appreciable spring rainfall occurred after late March in our area. Temperatures were warm in April. Climate during the growing season was without extended heat spells. Only 16 days were at or above 100°F through September. No days were above 100°F prior to early August. And rainfall was not an issue during harvest. First fall-timed rains began in late October. With persistent storms in the late fall months, not all tillage work including fall bedding was completed. Depending on springtime weather, potential soil compaction from spring tillage may affect the 2005 production.

Fusarium wilt is poised to become a more prevalent disease in our lower Sacramento Valley. It's unlike the disease will affect most tomato growers, but a cause for concern is the spread to many more fields and the increase in severity within fields. The resistant varieties to Fusarium wilt, race 3 will likely become increasingly important within the next few years.

Statewide production in 2004 was 11.67 million tons even with some fields left unharvested. The big volume year was the second highest in our state's history, behind the 1999 crop of 12.2 million tons. With sluggish prices for raw product, it's clear that growers will continue to scale the yield barriers while looking for cost reduction approaches.

The adoption of drip irrigation is increasing with some estimates between 5 to 10% of the acres. To think our northern California area with relatively cheap and generally abundant water supply would convert is an interesting development. The technology will continue to advance our industry.

### **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 12 replicated varieties (table 1A). Included in the local test was H 1100, which was one of the grower's commercial varieties surrounding the test plot. Variety standards were Heinz 9280, HyPeel 45 and APT 410. No non-replicated varieties were evaluated in this year's early test.

In the mid-maturity trial, 18 replicated and 12 observational varieties were included (table 1B). Mid-maturity standards were Heinz 8892, H 9665, Halley, and La Rossa, the pear. Most of the varieties had nematode and/or bacterial speck resistance.

## **Locations:**

Our local variety evaluation program included two trials: one early-maturity trial near Winters with Button and Turkovich Ranches and a transplanted mid-maturity trial with J.H. Meek and Sons west of Davis.

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

## **Methods:**

The early-maturity trial was direct seeded at 20 seeds per foot per seed line with a tractor-mounted, research-plot planter. Twin lines were a foot apart from each other, centered on the bed.

The mid-maturity trial 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. Skips were filled on the day of the planting. Transplants that did not survive were replaced over a 2-week period. Few replacement plants were needed.

All plots were 100' long and centered on a 5' bed. A short alley separated blocks within a row.

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 from the entire length of the plots were 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.

Statistical analysis of variance methods were used to help interpret the data. Combined statewide trial results from other county locations 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 northeast of Winters. We planted on 14 February into twin seed lines per bed in a class 1 soil (Table 2A). Substantial rainfall followed planting. Seeds were caught in a thick, rain-packed crust and required multiple passes with a mechanical crust breaker to aid emergence. The high seeding rate of 40 seeds per linear foot of bed provided an adequate stand by March 12. The rows surrounding the trial were replanted with ENP 113 transplants on March 21. Vines grew and set well during the season. Vines weakened during fruit ripening. The trial was harvested on 26 July.

**Table 4** early replicated—yield, fruit quality and defects: The trial averaged 44.9 tons per acre. The highest yielding group was led by U 250 with 48.3 tons per acre, but included 7 other varieties in the top rank.

HyPeel 45 had the highest soluble solids with 5.4% but also in the high Brix group was AGT 771 and H 5003 with 5.2 and 5.1%, respectively.

Fruit color was fair with a trial average of 25.0. The best-colored group included 4 varieties led by H 9997 with 23.3.

Fruit pH was lowest with PX 740 at 4.37, but included 5 others in the best ranking pH group.

Sunburn damaged fruit averaged 8%. Sunburn was elevated in HA 3523, HyPeel 45 and Calista with 16, 14 and 12%, respectively.

Mold level averaged 3% and was highest in H 1100 with 7%.

Blossom end rot (BER) levels were all low as were pink and green fruit levels.

The cleanest harvesting fruit was notably PX 740.

**Table 5** 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 24% and ranged from 11 to 33%. The low emergence was mostly due to a packed soil crust from a windy rainstorm followed by drying winds during a critical emergence window.

Vine size was difficult to judge with the twin row planting. The smaller-vined varieties in this test were H 1100, U 250, Sun 6358, and UG 8168, all below 87%. The larger-vined varieties included Calista and H 5003, both at 99%.

Canopy cover for fruit protection from sun damage ranged from 86 to 66%. The sparse-canopied varieties tended to have higher levels of fruit with sun damage as listed in table 4.

Visual rating of days to estimated harvest date was made relative to APT 410. The differences appeared to range from 0 to 5 days later on average, but without statistically significant separation because of high variation.

#### **MID-MATURITY EVALUATION: DAVIS (TRANSPLANTS)**

Our local mid-maturity variety trial evaluation was transplanted with J.H. Meek and Sons west of Davis in class 1 & 2 soils which included a combination of Brentwood silty clay loam, Rincon silty clay loam and Capay silty clay. Seedling plugs were mechanically transplanted on 27 April in single lines per bed (Table 2B). Weather conditions were

poor during planting with high temperatures and strong, drying winds. Despite the conditions, we lost few plants. Plants established well and grew quickly. The field was sprinkler irrigated once before switching to furrows. Vine growth and fruit set were very good. Verticillium wilt was prevalent. Root rot was noted late. Vines weakened at harvest with sun damage on many varieties. The trial was harvested on August 21.

#### REPLICATED ENTRIES (DAVIS)

**Table 6A** mid replicated— yield, fruit quality and defects: Yields averaged 50.1 tons per acre. Six of the 18 varieties were in the top-yielding group, led by U 941 with 54.1 tons per acre. La Rossa was in the top-yielding group as was Halley. CTRI's open pollinated variety, CPL 4863-N yielded 49.3 tons per acre.

Brix averaged 4.8. The top Brix variety was H 5803 with 5.5°. H 8892 had the lowest Brix with an uncharacteristic level of 4.3.

Color averaged 24.9. H 2501 had the best color at 23.5, but the best color group included 5 others, all with < 24.6 color.

Fruit pH was lowest with PS 296 at 4.29, but the best group included 5 others with values less than 4.37.

Sunburn level was high, averaging 16%. Seven varieties were in the highest group with levels 18% or more which included Sun 6360, U 005, H 9665, H 2401, H 2501, H 2601 and H 5803. Conversely, Halley had only 8% damage.

Of the other defects, mold was low, but blossom end rot was 2 to 3% in a number of varieties.

**Table 6B** mid replicated— vine size, canopy cover and estimated maturity: Vine size was moderate with an average of 83% in this test. The large-vined varieties were H 9665 and H 5803 at 98%. The most compact varieties were Sun 6119, CPL 4863-N, Halley, Red Sky, PS 607, PS 297 and La Rossa at 78% or less growth across a 5-foot centered, single-row bed. PS 607 may have performed better in a twin-row planting.

Canopy cover was evaluated shortly before harvest. Canopy cover at time of harvest of 80% or more is desirable, while levels below 50% are usually problematic for fruit protection from sun damage. All varieties in the trial grew well during the season, but many lost substantial canopy during the fruit ripening period. Canopy was weak with U 005, H 9665, H 2501 and H 2601 all with 50% or less. Canopy cover was best with Halley, PS 296, PS 607 and H 8892 with levels all above 80%.

A visual estimate of days to harvest was assessed and compared to the standard H 8892. In this test, H 8892 was one of the earlier varieties along with UG 151, Red Sky, CPL 4863, Sun 6119, La Rossa, H 2401 and PS 296. The late varieties appeared to be H 9665, H 5803, H 5503 and H 2501 which appeared to be up to a week later than our standard H 8892.

#### NON-REPLICATED ENTRIES (DAVIS)

**Table 7A:** mid observational—Davis: The highest yielding non-replicated variety was PX 345 with 66.8 tons per acre. The observational block averaged 56.0 tons per acre.

The average Brix was 5.0 with CXD 236 having the highest at 5.5.

Color levels averaged 24.4 with CXD 236 also with the best color at 21.

Fruit pH levels averaged 4.41 with AB 2 at the lowest level with 4.31.

Sunburn was prevalent, averaging 16%. PX 345, AB 2 and HMX 3859 had the lowest level of sunburn-damaged fruit, all below 8%. Sun damage was extreme on HMX 3863, NDM 0098, U 258 and Sun 6366 with 24 to 32% sun burnt fruit.

Blossom end rot was also prevalent with some varieties at 3 and 4%.

**Table 7B** mid observational— vine size, canopy, and estimated maturity: Vine size ranged from 100% with NDM 0098 to a compact 70% with BOS 7025, Sun 6366, Sun 6365 and BOS 52295.

Canopy cover near the time of harvest was best with PX 345, BOS 47721, BOS 7025 and CXD 236, all at 90%. Vines were weakest with NDM 0098, HMX 3863 and U 258, all at or below 50%.

A visual assessment of maturity ranged from 6 days earlier than H 8892 to 8 days later.

### **STATEWIDE COMBINED TRIAL RESULTS**

Statewide, 4 early maturity variety trials and 6 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 should 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 39.9 tons/acre (table 8A). The top yielding variety was H 5003. Location influences on varietal yield were significant (as the variety x location interaction indicates). The extra statistical notations with LSD values were done to accommodate two varieties not planted in all locations.

AGT 771 lead the best Brix group with 5.7, but included HyPeel 45 and H 5003 with 5.6 and 5.5, respectively (Table 8B). Brix performance was not influenced by trial location. Colusa had remarkably high Brix levels averaging 5.9.

**Statewide Mid Replicated:** Along with local trial near Davis, mid-maturity trials were also located in Stanislaus, Colusa (Grimes), Merced (Le Grand), Kern and Fresno (UC Westside). Trials were direct seeded in Kern and Fresno while transplanted in all other trial locations.

Combined marketable yield averaged 39.9 tons per acre, coincidentally the same as the early trial average. The top yielding varieties were U 941, H 8892, H 5503, H 2401 and H 9665, ranging from 45.1 to 42.4 tons per acre (table 9A). Location influence was significant. The Kern trial had an extremely high variation in yield.

Highest Brix group included H 5803, Halley, PS 296 and PX 607 with 5.7 to 5.6 levels (Table 9B). The Stanislaus trial combined high yield with an average of 5.7 Brix. Variety by location interaction was significant.



**Statewide Mid Observational:** In the mid observational trials, 12 varieties were evaluated. Average yield was 40.6 tons per acre. U 232 and PX 345 with 47.9 tons/acre were in the top-yielding group along with 3 other varieties (table 10A).

The highest Brix levels were 5.9 from both BOS 47721 and Sun 6365, but included in the top group were 5 others (Table10B).

**Table 1B.** Mid-Maturity Varieties, 2004 UC Processing Tomato Variety Trial, JH Meek and Sons.

Company	<b>BOLD LETTERS = trial standards</b>			
	<b>18</b>		<b>12</b>	
	<b>replicated</b>		<b>observational</b>	
1 CTRI	CPL 4863-N	ϕVFFN		
2 Campbell			CXD 236	\$VFFN
3 Harris Moran			HMX 3859	\$VFFNP
			HMX 3863	\$VFFNP
4 Heinz	H 2401	\$VFFNP		
	H 2501	\$VFFNP		
	H 2601	\$VFFNP		
	H 5503	\$VFFNP		
	H 5803	\$VFFNP		
	<b>H 8892</b>	\$VFFN		
	<b>H 9665</b>	\$VFFNP		
5 Lipton	U 005	\$VFFNP	U 232	\$VFFNP
	U 941	\$VFFN	U 258	\$VFFNP
6 Nippon Del Monte			NDM 0098	\$VFFN
7 Orsetti	<b>Halley 3155</b>	\$VFF	BOS 47721	\$VFFN
			BOS 52295	\$VFFNP
			BOS 7025	\$VFFNP
8 Rogers	<b>La Rossa</b>	\$VFF		
9 Seminis	PS 296	\$VFFNP	PX 345	\$VFFNP
	PS 607	\$VFFN		
10 Sunseeds	Sun 6119	\$VFFN	Sun 6365	\$VFFNP
	Sun 6360	\$VFFNP	Sun 6366	\$VFFNP
	Red Sky	\$VFFP		
11 <u>United Genetics</u>	UG 151	\$VFFN		

**Table 2A. Plot Specifications, Early-Maturity, Winters, 2004**

Cooperator: Tony Turkovich and Martin Medina,  
Button & Turkovich Ranches, Winters

Location: NE of Winters, ~ 3/4 mile north of CR 31 and 1/2 mile west of I-505.  
SW 1/4 of NE 1/4, Section 3, T8N, R1W, MDM. SCS sheet #66.

Field Variety: ENP 113, transplanted, twin-seed line on 5'-centered bed. Replanted  
over direct seeded H 1100.

Plot Design: Randomized complete block, 4 reps with all individual plots 500 square  
feet, 100' x 5'.

Planting Date: Feb 14 into moisture.

Stand establishment: ~March 12

Field Meeting: July 15

Fruit Quality Sample: July 19, UCD Food Science Project  
July 19, PTAB

Harvest: July 26

Soil type: Brentwood silty clay loam, Class 1, Storie Index 81.

Soil Sample 14 February 2004

O-1 foot depth	Level
pH	6.5
EC	0.6
P (ppm)	10.2
Zn (ppm)	1.0
K exchangeable (ppm)	234
K exchangeable (meq/100 g)	0.6
Ca exchangeable (meq/100 g)	12.5
Mg exchangeable (meq/100 g)	8.4
Na exchangeable (meq/100g)	0.2

Fertilizer/Acre: 20 gpa 8-24-6 plus quart 5% zinc chelate at planting.  
~150 lbs. N as UN 32 sidedressed at layby

Previous Crop: 2003 wheat

Irrigation method: sprinkler initially, followed by furrow

General: Low percent emergence with severe soil crusting from rainfall and  
dry wind conditions. Adequate stand was achieved because of high  
seeding rate. Good growth during season. Patchy incidence of  
spotted wilt virus in area. Delayed harvest. Good yields.

**Table 2b. Plot Specifications, Transplant, Mid-Maturity, Davis, 2004**

Cooperator:	Steve Meek, J.H. Meek and Sons, Woodland
Location:	West Davis area, ~1 mile NW of CR 95 x Russell Blvd. North of UC Davis' Russell Ranch & LTRAS project. SW 1/4 section 9, T8N, R1E, MDM. SCS sheet #67.
Field Variety:	AB 2
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:	27 April under 95°F conditions and drying, strong northerly winds
Field Meeting:	18 August
Fruit Quality Sample:	16 August, Food Science 15 August, PTAB
Harvest	21 August
Soil type:	Brentwood silty clay loam, class 1, Storie Index 81; Rincon silty clay loam, class 2, Storie Index 73; and Capay silty clay, Storie Index 50.
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:	cucumbers for seed production in 2003
Irrigation method:	furrow
General:	Transplants established and grew well despite hot and dry weather conditions at planting. Good vine growth during season and good fruit set. Canopy loss during fruit ripening with number of varieties with high sunburn damaged fruit. High yields.

**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. <u>Predicted Paste Bostwick</u> = $-11.53 + (1.64 \times \text{juice Brix}) + (0.5 \times \text{juice Bostwick})$
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. <u>Catsup yield</u> = $2000 \text{ lbs (juice Brix)} / (\% \text{ tomato solids})$ <u>% tomato solids</u> = $7.388 + 1.015(\text{paste Bostwick}) - 0.0138(\text{paste Bostwick})^2$ <u>paste yield</u> = $2000 \text{ lbs (juice Brix)} / (28 \text{ Brix})$ USDA color (cooked)= Larger numbers equal better color

### FIELD SAMPLING PROCEDURE

Fruit quality determinations were obtained by collecting ~7 pound sample 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 4.** Winters, Replicated, Early-Maturity: Yield, fruit quality and defects (twin-row per bed), Button and Turkovich Ranches, 2004.

Variety	Yield tons/A		Brix	PTAB color	pH	% pink	% green	% sun burn	% mold	% end rot	lbs per 50 fruit
1 U 250	48.3	A	4.5	27.0	4.45	2	2	11	4	0	7.21
2 H 9280	47.6	AB	4.3	25.0	4.42	1	1	7	4	0	6.80
3 PX 740	47.1	AB	4.8	25.5	4.37	1	2	3	0	0	5.80
4 UG 8168	47.0	AB	4.9	25.0	4.41	1	1	3	3	0	5.86
5 H 5003	46.5	AB	5.1	24.0	4.44	1	0	5	2	0	5.73
6 H 9997	46.3	AB	4.7	23.3	4.45	1	1	5	2	0	6.09
7 H 1100	45.7	ABC	4.9	26.0	4.41	2	1	7	7	1	6.99
8 APT 410	44.7	ABC	4.7	24.8	4.45	1	1	11	2	0	6.72
9 HyPeel 45	44.1	BC	5.4	26.3	4.40	1	2	14	3	1	6.89
10 HA 3523	44.1	BC	4.5	24.0	4.55	1	2	16	3	0	5.79
11 Calista	42.0	CD	4.6	25.0	4.52	1	2	12	3	0	6.17
12 Sun 6358	42.0	CD	4.7	24.5	4.42	1	2	7	3	1	6.01
13 AGT 771	38.4	D	5.2	24.3	4.44	1	1	9	4	0	5.89
LSD 5%	4.1		0.30	1.2	0.05		0.9	4.6	2.6		0.76
% CV	6		4	3	1		49	38	61		8
average	44.9		4.8	25.0	4.44	1.0	1.4	8.4	3.0	0.3	6.3

**Table 5.** Winters, Replicated, Early-Maturity: Emergence, vine size, canopy and maturity (twin-row per bed), Button and Turkovich Ranches, 2004.

Variety	Replicated	% seedling emergence	% bed cover	% fruit canopy cover
1 AGT 771		33	91	75
2 APT 410		21	94	78
3 H 1100		31	79	73
4 Calista (3303)		28	99	66
5 H 5003		33	99	76
6 H 9280		26	90	79
7 H 9997		16	88	71
8 HA 3523		28	94	71
9 HyPeel 45		16	94	79
10 PX 740		27	93	84
11 Sun 6358		11	85	83
12 U 250		24	84	78
13 UG 8168		16	86	86
LSD 5%		12	7.9	7.0
% CV		36	6	6
average		24	90	77

**Table 6A.** Davis, Replicated, Mid-Maturity: Yield, quality and defects from processing tomato variety trial (transplant), JH Meek and Sons,

Variety	Yield		Brix	PTAB		% pink	% green	% defects			lbs per 50 fruit
	tons/A			color	pH			sun burn	% mold	% BER	
1 U 941	54.1	a	4.7	25	4.41	1	0	13	0	2	7.2
2 H 5803	54.0	a	5.5	25	4.39	2	1	18	1	1	6.2
3 La Rossa	53.9	a	4.7	25	4.43	1	1	12	2	3	8.4
4 H 8892	53.8	a	4.3	25	4.38	0	0	12	0	1	5.3
5 Halley	53.7	a	5.1	26	4.34	1	1	8	2	0	7.7
6 H 5503	52.8	ab	4.8	25	4.36	1	1	11	1	1	5.4
7 PS 296	50.8	bc	5.2	26	4.29	1	1	11	0	0	6.6
8 UG 151	50.7	bc	4.5	25	4.53	1	0	15	0	0	7.1
9 Sun 6119	50.5	bc	4.5	27	4.44	2	1	12	1	0	6.3
10 H 9665	50.1	bcd	4.7	25	4.41	1	1	21	1	0	6.2
11 H 2401	49.7	cd	4.7	25	4.30	0	1	21	0	1	5.1
12 CPL 4863-N	49.3	cd	4.7	25	4.36	1	1	11	1	2	5.4
13 Red Sky	49.0	cd	5.0	24	4.42	0	1	14	1	1	5.9
14 Sun 6360	48.2	cde	4.8	24	4.46	0	0	24	1	2	7.7
15 H 2501	47.5	de	4.8	24	4.41	2	1	23	0	0	7.3
16 U 005	45.7	e	4.9	26	4.33	2	1	24	1	0	6.7
17 PS 607	45.3	ef	5.1	25	4.39	2	1	13	0	0	7.7
18 H 2601	42.6	f	5.1	25	4.50	0	1	22	1	3	6.7
LSD 5%	2.8		0.25	1.1	0.08	NS	NS	7.4			1.5
% CV	4		4	3	1	102	108	33	94	114	16
average	50.1		4.82	24.9	4.40	1	0.6	16	0.8	1.1	6.6

Woodland, 2004.

**Table 6B.** Davis, Replicated, Mid-Maturity: vine size, canopy cover and fruit maturity notes (transplant), JH Meek and Sons, Woodland, 2004

<b>Replicated</b>		% bed	% fruit	estimated
Variety		cover	canopy	harvest
			cover	days
				(to H 8892)
1	U 941	90	75	4
2	H 5803	98	53	6
3	La Rossa	78	79	0
4	H 8892	93	81	0
5	Halley	75	90	3
6	H 5503	88	69	5
7	PS 296	78	88	2
8	UG 151	85	65	0
9	Sun 6119	73	75	0
10	H 9665	98	45	7
11	H 2401	90	55	1
12	CPL 4863-N	75	65	0
13	Red Sky	75	78	0
14	Sun 6360	78	65	3
15	H 2501	83	50	5
16	U 005	85	43	4
17	PS 607	75	84	4
18	H 2601	88	50	3
	LSD 5%	9.1	8.3	2.8
	% CV	8	9	11
	average	83	67	2.5



**Table 7A.** Davis, Non-Replicated, Mid-Maturity: Yield, fruit quality and defects

	Non-rep variety	Yield tons/A	□Brix	PTAB color	pH	% pink	% green	% sun burn	% mold	% BER	lbs per 50 fruit
1	PX 345	66.8	4.7	28	4.30	5	2	5	0	4	9.3
2	U 232	60.1	5.1	25	4.37	0	0	10	1	3	5.6
3	AB 2	59.9	5.2	23	4.31	2	0	8	1	0	11.0
4	U 258	56.9	4.3	24	4.43	0	0	26	0	0	5.3
5	BOS 7025	56.8	5.0	24	4.50	3	3	14	0	0	6.9
6	BOS 47721	56.3	5.2	25	4.39	3	3	10	2	0	6.4
7	NDM 0098	56.0	5.0	22	4.42	0	0	32	1	2	7.7
8	BOS 52295	55.9	5.1	25	4.32	1	0	13	0	2	6.1
9	CXD 236	55.0	5.5	21	4.42	1	0	13	2	1	7.2
10	Sun 6366	54.6	5.3	24	4.47	0	0	24	0	0	6.4
11	HMX 3859	54.6	5.3	25	4.42	4	1	7	2	3	7.8
12	Sun 6365	48.3	5.1	26	4.38	0	1	16	1	2	8.4
13	HMX 3863	46.5	4.6	25	4.64	1	0	31	1	2	5.8
	average	56.0	5.0	24.4	4.41	2	1	16	1	1	7.2

as transplants, JH Meek and Sons, Woodland, 2004.

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

**Table 7B** Davis, Non-Replicated, Mid-Maturity: vine size, canopy cover, and fruit maturity notes, transplants, JH Meek and Sons, Woodland,

	Observational variety	% vine size	% fruit canopy cover	maturity relative to H 8892 (days)
1	BOS 7025	70	90	2
2	Sun 6366	70	65	-4
3	BOS 47721	80	90	4
4	HMX 3863	80	40	-6
5	Sun 6365	70	80	-3
6	PX 345	90	90	8
7	NDM 0098	100	30	-3
8	CXD 236	80	90	-1
9	U 232	80	60	0
10	BOS 52295	70	80	-1
11	U 258	80	50	0
12	HMX 3859	90	80	-1
	average	80	70	0

2004.

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

Table 8A. UC Statewide combined early maturity trial, yields, 2004.

Variety	Yield (Tons/A)					
	Combined Locations		Yolo	Colusa	Fresno	Contra Costa
H 5003	46.7	A	46.5	38.3	37.1	64.9
APT 410	42.1	B	44.7	44.8	26.0	53.0
UG 8168	41.9	B	47.0	41.2	29.7	49.8
Hypeel 45	40.5	B C	44.1	37.2	30.8	50.0
AGT 771	39.7* <sup>v</sup>	B C	38.4	29.5	ND <sup>w</sup>	51.0
U 250	39.5*	B C	48.3	ND	32.0	38.2
PX 740	39.3	B C	47.1	43.4	29.9	36.9
H 9997	39.1	B C	46.3	40.2	34.5	35.5
Calista	39.0	B C	42.0	34.1	32.1	47.6
Sun 6358	38.0	C D	42.0	40.9	26.1	43.1
H 9280	37.6	C D	47.6	43.9	27.9	31.2
HA 3523	35.6	D	44.1	33.5	25.4	39.4
MEAN	39.9		44.8	38.8	30.1	45.0
LSD 1 <sup>x</sup> @ 0.05 =	3.3		4.2	5.5	4.6	10.4
LSD 2 <sup>y</sup> @ 0.05 =	3.5					
LSD 3 <sup>z</sup> @ 0.05 =	3.8					
C.V.=	11.7		6.6	9.9	10.6	16.1
VARIETY X LOCATION LSD @ 0.05=	6.5					

<sup>v</sup> \* = The arithmetic mean of 12 plots over 3 locations (least squares mean could not be estimated because the entire variety was missing from one location. All other means are Calculated from 16 plots over 4 locations.

<sup>w</sup> ND = Not determined. The variety was not evaluated at the specified location.

<sup>x</sup> LSD 1 =Least significant difference for comparing means of a ll varieties except AGT 771 and U 250

<sup>y</sup> LSD 2 = Least significant difference for comparing means of AGT 771 and U 250 to a ll other varieties

<sup>z</sup> LSD 3 = Least significant difference for comparing means of AGT 771 to U 250



Table 8B. UC Statewide combined early maturity trials, Brix, 2004.

Variety	Brix %	Yolo	Colusa	Fresno	Contra Costa
AGT 771	5.7* <sup>U</sup> A	5.2	6.4	ND	5.3
Hypeel 45	5.6 A	5.4	6.4	5.4	5.3
H 5003	5.5 A	5.1	6.4	5.4	5.2
PX 740	5.3 B	4.8	6.2	5.0	5.2
APT 410	5.2 B C	4.7	6.1	5.1	4.8
UG 8168	5.1 C D	4.9	5.8	5.0	4.8
Sun 6358	5.0 C D E	4.7	5.9	4.8	4.6
HA 3523	5.0 D E	4.5	5.8	4.8	4.8
H 9997	5.0 D E	4.7	5.7	4.8	4.6
Calista	4.9 E	4.6	5.7	4.7	4.5
H 9280	4.6 F	4.3	5.1	4.5	4.6
U 250	4.6* F	4.5	ND <sup>V</sup>	4.6	4.8
MEAN	5.1	4.8	5.9	4.9	4.9
LSD 1 <sup>W</sup> @ 0.05					
=	0.15	0.3	0.3	0.3	0.3
LSD 2 <sup>X</sup> @ 0.05 =	0.16				
LSD 3 <sup>Y</sup> @ 0.05 =	0.18				
C.V.=	4.3	4.2	3.7	4.4	4.8

VARIETY X

LOCATION

LSD @ 0.05= NS<sup>Z</sup>

<sup>U</sup> \* = The arithmetic mean of 12 plots over 3 locations (least squares mean could not be estimated because the entire variety was missing from one location. All other means are Calculated from 16 plots over 4 locations.

<sup>V</sup> ND = not determined. The variety was not evaluated at the specified location

<sup>W</sup> LSD 1 =Least significant difference for comparing means of all varieties except AGT 771 and U 250.

<sup>X</sup> LSD 2 = Least significant difference for comparing means of AGT 771 and U 250 to all other varieties.

<sup>Y</sup> LSD 3 = Least significant difference for comparing means of AGT 771 to U 250.

<sup>Z</sup> NS = Not significant.

Table 9A. UC Statewide Combined Mid maturity, replicated trials, Yield, 2004

Variety	Yield (Tons/A)						
	6 Locations Combined	Yolo	Colusa	Stanislaus	Fresno	Kern	Merced
U 941	45.1 A	54.1	42.4	44.4	52.9	27.4	49.5
H 8892	43.2 A B	53.8	42.0	46.1	46.3	22.9	48.1
H 5503	43.0 A B	52.8	41.2	45.3	48.4	26.5	44.0
H 2401	42.9 A B C	49.7	41.2	40.3	50.1	21.8	54.5
H 9665	42.4 A B C D	50.1	41.5	39.6	39.6	27.4	56.4
H 5803	40.9 B C D E	54.0	40.6	36.4	41.4	23.0	50.0
Sun 6360	40.3 B C D E	48.2	35.8	42.1	47.6	22.5	45.9
PS 296	40.1 C D E	50.8	35.1	53.2	37.1	22.1	42.4
H 2501	39.9 D E	47.5	33.5	40.0	43.0	25.7	50.0
H 2601	39.6 D E	42.6	39.9	40.9	37.8	24.3	52.1
Red Sky	39.2 E	49.0	34.6	41.6	41.2	25.5	43.4
UG 151	38.9 E	50.7	32.6	43.1	41.0	20.3	45.8
Halley 3155	38.7 E	53.7	34.4	42.0	36.7	24.0	41.4
CPL 4863-N	38.7 E	49.3	39.5	40.1	37.5	18.3	47.4
U 005	38.3 E	45.7	35.4	41.3	35.9	25.2	46.5
Sun 6119	38.1 E F	50.5	34.5	39.3	36.5	19.4	48.2
La Rossa	35.4 F G	53.9	28.0	35.9	34.2	26.3	33.8
PX 607	34.0 G	45.3	29.7	35.8	35.4	19.2	38.3
MEAN	39.9	50.1	36.8	41.5	41.2	23.4	46.5
LSD @ 0.05=	2.9	2.8	4.5	7.7	6.1	N.S.	8.2
C.V.=	12.7	4.0	8.7	13.0	10.5	32.9	12.4
VARIETY X LOCATION LSD @ 0.05=	7.1						

Table 9B. UC Statewide combined mid maturity, Replicated, Brix, 2004.

Variety	Brix (%)		Yolo	Colusa	Stanis	Fresno	Kern	Merced
	6 Locations	Combined						
H 5803	5.7	A	5.5	5.3	6.3	5.6	6.7	5.1
Halley 3155	5.7	A	5.1	5.5	5.9	5.8	6.5	5.3
PS 296	5.7	A B	5.2	5.2	6.3	5.9	6.0	5.4
PX 607	5.6	A B C	5.1	5.3	6.1	5.4	6.3	5.3
H 2501	5.5	B C D	4.8	5.4	5.9	5.4	6.5	5.0
Sun 6119	5.4	C D E	4.5	5.1	6.2	5.3	6.3	5.1
Red Sky	5.4	D E F	5.0	5.2	5.6	5.3	6.4	4.9
La Rossa	5.4	D E F G	4.7	5.3	6.0	5.3	6.0	4.8
UG 151	5.3	E F G H	4.5	5.1	5.4	5.3	6.5	4.8
H 2401	5.2	E F G H	4.7	4.9	5.5	5.6	6.2	4.6
Sun 6360	5.2	F G H	4.8	4.8	5.4	5.1	6.3	4.8
H 2601	5.2	F G H	5.1	5.2	5.3	5.2	5.6	4.9
U 941	5.2	F G H	4.7	4.8	5.6	5.4	5.9	4.8
U 005	5.2	G H I	4.9	5.0	5.5	5.0	5.8	4.9
H 8892	5.2	H I	4.3	5.0	5.7	5.5	6.1	4.5
H 9665	5.2	H I	4.7	4.8	5.7	5.2	6.1	4.6
H 5503	5.1	H I	4.8	4.9	5.5	5.3	5.7	4.7
CPL 4863-N	5.0	I	4.7	5.0	5.4	5.0	5.6	4.5
MEAN	5.3		4.8	5.1	5.7	5.4	6.1	4.9
LSD @ 0.05=	0.2		0.3	0.3	0.5	0.5	N.S.	0.3
C.V.=	6.1		3.7	4.0	6.3	6.0	8.6	5.0
VARIETY X LOCATION LSD @ 0.05=	0.5							

Table 10 A. UC Statewide combined mid maturity, observational trial, yield, 2004.

Variety	Yield (Tons/A)		Colusa	Fresno	Kern	Merced	Stanislaus	Yolo
	6 Locations Combined							
U 232	47.9	A	37.5	50.4	19.0	58.2	62.4	60.2
PX 345	47.9	A	36.2	49.9	12.9	74.0	47.7	66.8
U 258	43.7	A B	34.6	42.9	30.1	48.8	48.8	56.9
HMX 3859	42.3	A B C	31.1	48.5	25.1	43.9	50.3	54.6
BOS 52295	40.6	A B C	33.1	48.0	20.6	44.1	41.5	55.9
NDM 0098	39.8	B C	37.9	33.3	30.1	34.5	46.9	56.1
Sun 6366	39.0	B C	33.3	47.2	20.7	26.0	52.0	54.7
BOS 47721	38.3	B C	32.7	37.4	19.6	38.1	45.6	56.3
HMX 3863	38.1	B C	24.8	39.4	24.4	54.3	38.9	46.5
BOS 7025	37.4	B C	29.0	39.2	19.2	35.2	44.9	56.8
CXD 236	37.0	B C	32.0	35.0	26.1	29.7	44.2	55.0
Sun 6365	35.1	C	31.4	30.2	16.3	47.7	36.7	48.3
MEAN	40.6		32.8	41.8	22.0	44.5	46.6	55.7
LSD @ 0.05=	8.0							
C.V.=	17.0							

Table 10 B. UC Statewide combined, mid maturity, observational trial, Brix, 2004.

Variety	Brix (%)		Colusa	Fresno	Kern	Merced	Stanislaus	Yolo
	6 Locations Combined							
BOS 47721	5.9	A	6.2	5.4	7.3	5.2	5.9	5.2
Sun 6365	5.9	A	5.7	5.9	6.9	5.5	6.1	5.1
BOS 7025	5.8	A B	5.6	5.6	7.3	5.7	5.8	5.0
Sun 6366	5.8	A B C	5.5	5.5	7.3	5.1	6.1	5.3
HMX 3859	5.7	A B C D	5.6	5.7	6.0	5.7	5.9	5.3
NDM 0098	5.5	A B C D E	5.7	5.2	6.8	4.9	5.5	5.0
CXD 236	5.5	A B C D E	5.8	5.4	5.1	5.5	5.7	5.5
U 232	5.4	B C D E	4.7	6.1	6.7	4.6	5.2	5.1
BOS 52295	5.4	C D E F	5.6	5.1	6.7	4.5	5.3	5.1
PX 345	5.3	D E F	5.3	5.0	7.0	4.6	5.0	4.7
U 258	5.1	E F	5.2	5.1	6.1	4.6	5.3	4.3
HMX 3863	5.0	F	4.5	4.9	5.8	4.6	5.3	4.6
MEAN	5.5		5.5	5.4	6.6	5.0	5.6	5.0
LSD @ 0.05=	0.4							
C.V.=	7.0							

