

## California Tomato Research Institute – Final Report 2005

### **Project Title: Evaluation of EFS Varieties over Time of Harvest**

**Project Leader:** Michelle Le Strange  
UC Cooperative Extension  
4437 S. Laspina St., Ste. B  
Tulare, CA, 93274  
(559) 685-3309 Ext. 220

#### **Objectives:**

- 1) Evaluate EFS lines over harvest dates that span several weeks.
- 2) Determine yield and quality differences within and between the EFS varieties.

#### **Summary:**

Three sequential late-season field plantings of 10 Extended Field Storage (EFS) processing tomato varieties included multiple mechanical harvests to measure effects of delayed harvest on yield and fruit quality. Planting dates were arranged so that the second harvest coincided with the first harvest of the successive planting. This planting and harvest arrangement supplied information on variety performance over a range of time and temperature. The first two plantings set fruit under “normal” temperatures, but the third planting experienced “hotter than normal” temperatures during flowering and fruit set, which had a detrimental effect on yield. Overall average yield decreased by more than 5 tons/acre with each successive planting date. Average yields decreased with each successive harvest of the first two plantings, but not all varieties had a similar response. The third planting experienced a yield gain when harvested a week later, which was attributed to delayed ripening of green fruit. It was observed that the second harvest of the second planting outyielded the first harvest of the third planting by 6.9 tons. This result suggests a benefit of planting earlier to maximize fruit set during favorable temperatures and holding the fruit in the field rather than planting later, especially with some varieties. Samples were collected and sent to PTAB and the UC Davis Food Science Department’s laboratory for raw product analysis of soluble solids (°Brix), pH, and color. The UC lab also evaluated cooked samples and lycopene content. Of these parameters pH may be the limiting factor for extended field storage.

#### **Background:**

Certain processing tomato varieties have been bred for Extended Field Storage (EFS). Some of these are included in the UC statewide variety trials, however under that protocol the EFS lines are only harvested once and this procedure does not adequately address or evaluate a variety’s potential for extended field storage. It is well documented that yields of processing tomatoes decrease during periods when high-sustained air temperatures occur and disrupt fruit set. Perhaps some of the EFS varieties can set fruit well in the heat and/or store well in the field.

#### **Procedures:**

Three field trials (experiments) were established at the UC WSREC in Five Points, Fresno County. Seed companies were surveyed and asked to supply EFS varieties that they wanted to test, which resulted in ten varieties. Two additional varieties were included as standards: AB 2 and Halley 3155. The experiments were direct seeded on April 12, April 27, and May 21, 2005

and grown with typical commercial practices under furrow irrigation. Plot size was 43' of row on a 66" tomato bed. The trial was arranged in a split plot design for three separate harvest dates. Each variety was replicated four times within each harvest date. Experiments 1, 2, and 3 were grown side by side and were physically located in the same field. Irrigation cutoff for each experiment was approximately 30 days before harvest. Experiments 2 and 3 were vine trimmed on September 1<sup>st</sup> to remove growth in the furrows to minimize disrupting the growth of tomatoes on neighboring beds at harvest.

The plots were machine harvested for yield by a commercial crew and a representative sample of the plot was collected to separate green, sunburn, and rotten fruit. Rotten fruit included broken and soft fruit and results may be inflated due to stricter than normal PTAB grading standards on fruit blemishes (per my instructions) by an "untrained" sorting crew. Yields from mechanical harvest may slightly overestimate the actual yield of sound red fruit, but PTAB reports on Limited Use fruit from the harvested loads was never higher than 5% and more commonly averaged 1.5-3%.

Representative samples from each plot were collected for PTAB quality determinations and for cooked analysis at the Food Science (Diane Barrett's) laboratory on the UC Davis campus. The varieties and harvest dates for each planting date are listed below and in the results tables.

Varieties		
1) Halley 3155*	5) Hypeel 849	9) U 37
2) H 8504	6) PS 345	10) U 567
3) H 9780	7) Sun 6368	11) U 886
4) H 9997	8) Sun 6374	12) AB2*

\* standard varieties, not EFS lines

Experiment #	Planted (seeded)	Irrigation cutoff	Harvest #1	Harvest #2*	Harvest #3**
1	April 12, 2005	July 22	Aug 29 (139 DAS)	Sept 12	Sept 19
2	April 27, 2005	Aug 5	Sept 12 (138 DAS)	Sept 26	Oct 3
3	May 17, 2005	Aug 22	Sept 26 (132 DAS)	Oct 3***	---

\* 14 days after Harvest #1

\*\* 21 days after Harvest #1

\*\*\* only 7 days after Harvest #1

### Results and Discussion:

Each experiment (1, 2, & 3) has 5 tables of results (a, b, c, d, and e).

Tables 1a-3a	Yield and grades of tomatoes
Tables 1b-3b	PTAB quality determinations
Tables 1c-3c	Cooked (Lab) analysis of °Brix and pH
Tables 1d-3d	Cooked (Lab) analysis of Color
Tables 1e-3e	Lycopene determinations

*Experiments 1, 2, and 3 were grown next to each other in the same field. Because these were blocks planted side by side and not randomly intermingled within one field they could not be statistically analyzed as a single experiment. Therefore when comparisons are made between plantings these are not statistical comparisons, but only observations. When comparisons are made between harvests within the same planting date that are noted as statistically significant, these are statistical comparisons with 95% confidence that the differences are real.*

**Yield and Grades (Tables 1a-3a):** It was observed that overall average yield decreased more than 5 tons/acre with each successive planting date.

<b>Planting Date</b>	<b>Average yield of all varieties</b>
April 12	36.2 T/A
April 27	28.7 T/A
May 17	22.4 T/A

Average yields decreased with each successive harvest within the April planting dates but increased within the May date. The first two plantings set fruit under “normal” temperatures, but the third planting experienced “hotter than normal” temperatures during flowering and fruit set. The third planting gained yield when harvested a week later, which was attributed to a split fruit set and corroborated with a decrease in percent green fruit in the second harvest.

<b>Planting Date</b>	<b>Tons/Acre</b>				<b>% Green fruit</b>			
	<b>H#1</b>	<b>H#2</b>	<b>H#3</b>	<b>LSDs</b>	<b>H#1</b>	<b>H#2</b>	<b>H#3</b>	<b>LSDs</b>
April 12	38.0	36.8	33.7	<b>2.1</b>	1.9	1.7	1.6	<b>NS</b>
April 27	33.2	28.2	24.9	<b>1.6</b>	3.7	4.8	6.5	<b>1.2</b>
May 17	21.3	23.5		<b>2.0</b>	23.5	20.5		<b>2.6</b>

<b>Planting Date</b>	<b>HARVEST DATES</b>					<b>Average</b>
	<b>Aug 29</b>	<b>Sept 12</b>	<b>Sept 19</b>	<b>Sept 26</b>	<b>Oct 3</b>	
April 12	38.0	36.8	33.7			<b>36.2 T/A</b>
April 27		33.2		28.2	24.9	<b>28.7 T/A</b>
May 17				21.3	23.5	<b>22.4 T/A</b>

In the first two plantings the varieties did not perform the same across the harvest. In the earliest planting a couple of varieties increased in yield across harvests (H 8504 and PS 345); several varieties remained fairly constant (U 37, Hypeel 849, Sun 6368, and Halley 3155); a few varieties held through two harvests, but then dropped significantly (H 9780, H9997, AB 2, Sun 6374, U886; and one variety dropped significantly in yield at each harvest (U 567). In the second planting yields of the majority of varieties decreased with each successive harvest. A few exceptions were H 8504 which continued to increase or hold steady in yield; PS 345 held steady

for two harvests and then decreased significantly; and AB 2 and U 567 experienced significant yield loss with each successive harvest. In the third planting although varieties did not perform the same between the two harvests, there was too much variability within the experiment to detect statistical significance. Though yields are not exceptional in the first harvest, it appears that H 9997, Sun 6368, and U 886 had some ability to set fruit during the heat.

**Fruit size/weight:** Average weight of fruit decreased with each successive planting date and small fruit size was particularly noticeable in several varieties in the May planting. In the first planting average fruit size remained fairly constant over harvests with a slight tendency to gain in size. In the second planting average fruit size decreased in the third harvest. In the third planting average fruit size dropped significantly between harvests.

**Green fruit:** The earliest planting had the least amount of green fruit of the 3 planting dates and was consistently low (less than 2%) across harvests. The latest planting contained much higher amounts of green fruit (22% average) than the previous two plantings indicating a split fruit set, which was attributed to high temperatures during fruiting. The amount of green fruit decreased at the second harvest, which helped boost yields.

**Sunburn and rot:** Both sunburn and rot percentages increased across planting dates and harvests. Sunburn percentage was relatively low among all varieties ranging from 2.1 to 6.2 percent across all experiments. Rotten (includes broken and extremely soft) fruit percentage ranged from 7.3 to 36.8 and the worst amount of rotten fruit was observed in the middle planting. Though it is expected that rotten fruit would increase as field storage increased, this data should be used as an indicator of soft and rotten fruit to compare one variety against another, rather than the exact number of % rots reported, since this figure may be inflated due to stricter than normal PTAB grading standards.

#### **PTAB Quality Determinations (Tables 1b-3b):**

**PTAB °Brix** - It was observed that the average °brix (soluble solids) for all varieties combined decreased with successive planting dates (5.44, 5.32, and 5.27). The overall trend was a decrease in °brix with successive harvests within a planting date, but this trend was not always statistically significant. The earliest planting showed the biggest drop in soluble solids among harvests (5.63, 5.40, and 5.29). Soluble solids in the latest planting also dropped significantly (5.34 to 5.20); remarkable considering there was only one week between harvests. However, harvest date had no impact on °brix in the middle planting. Soluble solids varied considerably among varieties. The majority of the varieties had decreased soluble solids levels with date of planting and extended field storage. There were a few exceptions. In all plantings the °brix of U 886 increased (or remained the same) with successive harvests. In the second planting several varieties also increased in soluble solids over time of harvest: U 567, PS 345, H 8504, and H9997. Variety rankings stayed fairly consistent between planting dates. Sun 6374, Sun 6468, AB 2, H 9780, and Halley 3155 consistently ranked at the top, while H 9997, U 37, and PS 345 consistently ranked at the bottom of the list.

**PTAB Color** - On average color tended to decrease (higher on the rating scale) with successive harvests within a planting date. Individual varieties had various levels of fluctuation of color. H9997 was consistently the reddest variety; PS 345 was often least red.

**PTAB pH** - A pH of 4.35 is desirable in the industry to reduce bacterial contamination by *Clostridium botulinum*. No trend was observed between plant dates: average pH was 4.43, 4.49, and 4.42. In the first and second plantings pH tended to increase by one tenth (0.10) in the second harvest and remain steady in the third harvest. Varieties performed similarly over the harvest dates, however there were differences between varieties. H 8504 had the lowest pH and H9997 had the highest pH on average in the first two plantings, however in the third planting these varieties were ranked with several others.

**UCD Food Science Lab Analysis Tables (Cooked Analysis Tables 1c-e to 3c-e):** This information was primarily collected for the benefit of the seed companies and the processors. Each variety has specific uses within the industry and the desirable qualities of a variety may be specific to the processor.

**Lab °Brix** - *This measures refractive index, which picks up not only soluble solids, but also organic and amino acids; the higher the number the better. A value greater than 5.0 is desirable.* Lab results seemed to follow similar trends as in PTAB °brix, i.e. variety rankings changed little between plantings and in the earliest planting °brix decreased with successive harvests. This trend was not consistent in the later plantings. Soluble solids varied considerably among varieties and °brix decreased with each successive harvest for the majority of varieties. Once again U 567 increased in solids over harvest but only in the second planting along with U886.

**Lab pH** - *The industry wants a pH less than 4.6 to prevent the growth of Clostridium botulinum.* Average pH over the combined varieties was similar at each planting date (4.59, 4.60, and 4.56). pH tended to increase with each successive harvest within a plant date and sometimes reached undesirable levels. AB 2 and H 8504 had the lowest pH.

**Bostwick** - *This is an indicator of the consistency, or literally the distance the sample flows down a trough in 30 sec.; the lower the number the better.* Results show a trend for the Bostwick to increase over harvests within a planting date. Bostwick averages were similar between the first two plantings, but lower in the last planting which is explained by the higher percentage of green fruit at harvest.

From the °Brix and Bostwick readings the predicted paste Bostwick is calculated by equation as are the paste and catsup yields.

**Cooked Color** - *The redder the better, of course! Two different methods are used for this evaluation. The first method uses the Agron E-5M and LED (similar to the procedures used at inspection stations) and the second method uses the Hunter colorimeter from which L, a and b values are obtained. Higher a values are better; this tells you red to green color. USDA values are generated from the a and b numbers by equation and a value of 50 is the target.* Using the USDA color determination, varieties performed consistently between plantings and all varieties fell within an acceptable range of 49.0 to 52.1 for all readings.

**Lycopene** - *The higher the better. Lycopene synthesis continues to occur in tomato fruit after fruit maturity is reached and is dependent upon air temperature. If plants are exposed to temperatures greater than 90°F, then lycopene production temporarily stops until temperatures drop.* The only consistent trend in the lycopene values is that the overall average increased with each successive planting date, which is expected because of temperature (according to Diane Barrett). There was no trend with successive harvests within planting date, i.e. in the first experiment lycopene decreased with successive harvests, whereas in the second experiment lycopene increased with successive harvests. Rankings among varieties between planting dates were not as consistent as for the other determinations, which is explained by the lycopene relationship with temperature.

**Cooked analysis (UCD Lab) summary:** The interaction between variety and harvest was rarely significant for any of the cooked analysis determinations indicating that varieties performed similarly over time within a planting.

**Conclusions:**

The goal of this research project was to evaluate performance of EFS varieties over length of time in the field and to observe differences between planting dates. The grower’s main interest would be tonnage, sunburn and rotten fruit, and soluble solids (°Brix). A processor’s interest would be solid red fruit with low pH and high soluble solids. Under the growing conditions of 2005 a later harvest of an earlier planting yielded more tonnage than an earlier harvest in a later planting date. Tonnage and rotten fruit changed significantly over time, whereas soluble solids (°Brix), though they decreased slightly, were fairly stable. In general PTAB pH was very similar at each planting date and tended to increase by one tenth (0.10) with each successive harvest. Green fruit at harvest helped lower pH of the third planting. Lab pH showed similar trends, however pH values were higher and reached undesirable levels (>4.6) with extended field storage. Better performing varieties for each planting date can be selected from the results tables. None of the varieties were exceptional in setting fruit under hot temperatures, but a few of them performed better than the majority of the others.

**EXPT. 1 Seeded April 12, 2005**

**Harvest 1: AUG 29 (139 DAS)**

**Harvest 2: SEPT 12**

**Harvest 3: SEPT 19**

**Table 1a: Yield and grades**

Variety & code	Yield Tons/A				50 red fruit (lbs)				% Greens				% Sunburn				% Rots			
	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG
2. H 8504	43.7	44.6	49.5	45.9	7.0	7.0	7.4	7.1	1.8	1.8	1.4	1.7	1.3	4.4	2.4	2.7	3.6	2.9	6.1	4.2
3. H 9780	46.0	43.0	38.4	42.5	8.4	8.4	8.3	8.3	2.5	1.9	2.8	2.4	2.3	3.5	6.3	4.0	5.9	5.8	19.3	10.3
6. PS 345	40.6	38.4	43.9	41.0	8.5	8.2	9.4	8.7	2.3	1.9	1.1	1.8	4.7	4.1	5.6	4.8	4.2	7.0	17.5	9.6
4. H 9997	45.0	40.1	35.5	40.2	6.9	6.6	7.9	7.1	1.3	1.3	0.3	1.0	2.5	8.3	11.9	7.6	7.2	7.7	25.2	13.4
9. U 37	37.3	43.3	36.7	39.1	7.9	8.4	8.2	8.1	1.9	2.0	1.8	1.9	2.1	6.0	9.5	5.9	8.0	7.3	11.7	9.0
5. Hypeel 849	36.3	34.5	38.6	36.5	8.5	8.5	7.9	8.3	1.2	1.5	0.8	1.2	2.3	4.8	6.9	4.7	4.7	16.1	14.1	11.6
7. Sun 6368	33.2	34.2	33.2	33.5	6.7	7.2	7.8	7.2	1.4	2.2	1.4	1.7	1.4	4.4	10.2	5.3	7.0	8.7	17.8	11.2
12. AB 2	35.1	35.0	26.7	32.3	9.3	8.8	9.0	9.0	2.3	1.1	2.5	2.0	0.4	4.8	6.7	4.0	10.3	13.5	33.2	19.0
8. Sun 6374	33.6	34.9	26.1	31.5	7.5	7.2	7.9	7.5	1.8	1.8	1.8	1.8	3.3	3.3	3.9	3.5	8.4	13.1	28.4	16.6
11. U 886	33.6	34.6	25.1	31.1	8.1	8.1	8.3	8.1	2.7	1.8	2.2	2.2	2.5	2.2	3.5	2.8	9.3	20.3	32.0	20.5
1. Halley 3155	32.1	29.8	29.6	30.5	7.7	8.0	8.1	7.9	1.8	2.0	1.0	1.6	0.9	3.5	4.0	2.8	8.8	14.4	20.6	14.6
10. U 567	39.2	29.7	20.9	29.9	7.9	8.7	8.3	8.3	1.6	1.1	1.9	1.5	1.4	5.6	3.7	3.5	10.0	32.7	31.4	24.7
average	38.0	36.8	33.7	36.2	7.9	7.9	8.2	8.0	1.9	1.7	1.6	1.7	2.1	4.6	6.2	4.3	7.3	12.5	21.4	13.7
LSD 5% (Var)	4.2				0.5				NS				2.0				4.9			
LSD (Har)	2.08				0.242				NS				0.98				2.43			
LSD (Var X Har)	7.2				NS				NS				3.4				8.4			
CV %	14.3				7.5				65.0				56.5				43.8			

**EXPT. 2 Seeded April 27, 2005**

Harvest 1: SEPT 12 (138 DAS)

Harvest 2: SEPT 26

Harvest 3: OCT 3

**Table 2a: Yield and grades**

Variety & code	Yield Tons/A				50 red fruit (lbs)				% Greens				% Sunburn				% Rots			
	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG
2. H 8504	33.2	34.4	36.3	34.7	7.0	6.8	7.2	7.0	2.6	5.7	5.4	4.6	3.3	4.1	5.4	4.2	4.7	7.8	21.9	11.5
4. H 9997	44.0	30.3	28.0	34.1	6.7	6.8	5.8	6.4	1.0	2.4	4.5	2.6	6.9	10.1	10.1	9.0	7.6	30.2	49.3	29.0
6. PS 345	34.6	36.7	26.7	32.7	8.8	9.3	8.1	8.7	5.1	6.7	7.9	6.6	4.3	3.1	8.8	5.4	7.9	12.5	38.3	19.5
7. Sun 6368	36.6	32.2	28.8	32.5	6.9	6.9	7.3	7.0	4.3	3.7	3.0	3.7	2.5	4.7	5.1	4.1	6.0	17.5	31.3	18.3
9. U 37	35.0	29.4	29.9	31.4	8.7	8.2	7.8	8.2	2.8	5.7	3.6	4.0	5.3	6.3	10.1	7.2	4.3	10.3	19.1	11.2
3. H 9780	35.8	31.5	26.2	31.2	8.4	8.8	7.9	8.4	4.8	6.9	7.6	6.5	3.8	3.7	5.0	4.2	5.6	12.6	25.4	14.5
8. Sun 6374	32.7	30.4	27.4	30.1	7.5	7.6	7.2	7.4	2.9	3.2	4.4	3.5	3.8	3.6	6.7	4.7	11.0	22.5	31.7	21.7
5. Hypeel 849	32.1	26.4	23.8	27.4	8.4	9.3	8.5	8.7	4.6	2.9	4.4	4.0	2.6	4.8	3.9	3.8	5.3	19.3	38.6	21.0
11. U 886	30.2	25.3	19.6	25.0	7.6	8.3	6.3	7.4	4.2	4.9	14.6	7.9	4.2	3.6	4.0	3.9	15.7	24.2	38.1	26.0
1. Halley 3155	28.0	24.7	19.8	24.2	8.3	8.6	7.6	8.2	5.1	3.8	3.4	4.1	2.7	4.7	4.4	3.9	7.6	26.4	51.8	28.6
12. AB 2	27.4	16.4	19.8	21.2	8.6	9.4	6.7	8.2	4.2	5.8	8.4	6.1	3.0	1.1	2.6	2.2	14.1	34.5	45.7	31.4
10. U 567	28.5	20.9	12.3	20.6	8.1	8.8	5.7	7.5	2.2	6.3	11.1	6.5	5.2	5.7	6.9	5.9	23.5	40.5	50.2	38.1
<b>average</b>	<b>33.2</b>	<b>28.2</b>	<b>24.9</b>	<b>28.7</b>	<b>7.9</b>	<b>8.2</b>	<b>7.2</b>	<b>7.8</b>	<b>3.7</b>	<b>4.8</b>	<b>6.5</b>	<b>5.0</b>	<b>4.0</b>	<b>4.6</b>	<b>6.1</b>	<b>4.9</b>	<b>9.4</b>	<b>21.5</b>	<b>36.8</b>	<b>22.6</b>
LSD 5% (Var)				3.2				0.6				2.5				2.1				6.8
LSD (Har)		1.60				0.315				1.245				1.03				3.41		
LSD (Var X Har)	5.6				1.1				4.3				3.6				NS			
CV %				13.8				10.0				61.5				52.2				37.3

**EXPT. 3 Seeded May 17, 2005**

Harvest 1: SEPT 26 (132 DAS)

Harvest 2: OCT 3 (only 7 days later)

**Table 3a: Yield and grades**

Variety & code	Yield Tons/A			50 red fruit (lbs)			% Greens			% Sunburn			% Rots		
	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG
4. H 9997	28.5	24.9	26.7	7.0	6.2	6.6	17.7	15.8	16.8	7.5	5.8	6.7	7.5	16.4	11.9
7. Sun 6368	24.0	28.6	26.3	7.3	6.6	7.0	18.9	15.8	17.3	3.5	8.1	5.8	11.6	11.6	11.6
11. U 886	25.8	25.2	25.5	7.4	6.8	7.1	20.8	19.6	20.2	4.1	4.9	4.5	8.2	15.7	11.9
12. AB 2	23.1	26.4	24.8	8.1	7.4	7.8	14.2	10.7	12.4	4.8	3.5	4.1	10.5	20.1	15.3
9. U 37	19.0	27.1	23.1	7.4	7.1	7.3	19.8	12.8	16.3	5.0	4.1	4.6	10.0	13.2	11.6
2. H 8504	23.2	20.2	21.7	7.3	6.2	6.8	24.1	28.7	26.4	4.6	4.3	4.4	6.9	10.0	8.4
6. PS 345	19.5	22.4	20.9	7.5	6.6	7.0	33.0	34.3	33.7	3.8	4.5	4.2	5.2	8.0	6.6
10. U 567	16.7	21.1	20.4	6.7	7.0	6.8	26.3	15.5	20.9	9.5	4.6	7.0	10.7	14.0	12.3
3. H 9780	18.1	22.2	20.2	7.8	7.5	7.7	43.1	30.5	36.8	1.9	4.5	3.2	5.1	9.4	7.3
5. Hypeel 849	16.9	23.4	20.1	6.6	5.6	6.1	22.1	18.6	20.4	2.8	4.1	3.4	4.2	8.2	6.2
8. Sun 6374	21.0	18.5	19.7	6.9	5.1	6.0	20.3	23.6	22.0	8.5	8.2	8.4	11.1	13.7	12.4
1. Halley 3155	16.8	21.6	19.2	7.9	7.1	7.5	21.8	20.1	20.9	2.4	6.9	4.7	10.4	18.3	14.4
<b>average</b>	<b>21.3</b>	<b>23.5</b>	<b>22.4</b>	<b>7.3</b>	<b>6.6</b>	<b>7.0</b>	<b>23.5</b>	<b>20.5</b>	<b>22.0</b>	<b>4.9</b>	<b>5.3</b>	<b>5.1</b>	<b>8.4</b>	<b>13.2</b>	<b>10.8</b>
LSD 5% (Var)			4.9			0.9		6.5				NS			5.6
LSD (Har)		2.01			0.379			2.65			NS			2.28	
LSD (Var X Har)	NS			NS			NS			NS		NS	NS		
CV %			22.1			13.4		29.6				92.4			51.8

**EXPT. 1 Seeded April 12, 2005**

Harvest 1: AUG 29 (139 DAS)

Harvest 2: SEPT 12

Harvest 3: SEPT 19

**Table 1b: PTAB quality - sorted by °BRIX Average**

Variety & code	°BRIX				COLOR				pH			
	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG
8. Sun 6374	6.20	6.20	6.13	6.18	24.3	24.0	25.3	24.5	4.31	4.45	4.57	4.44
7. Sun 6368	6.28	5.98	5.45	5.90	25.0	24.3	26.0	25.1	4.34	4.41	4.50	4.42
12. AB 2	5.98	5.78	5.65	5.80	24.8	23.0	26.5	24.8	4.31	4.41	4.39	4.37
1. Halley 3155	6.15	5.65	5.13	5.64	24.5	24.8	25.5	24.9	4.32	4.42	4.39	4.38
3. H 9780	5.68	5.48	5.45	5.53	26.5	25.3	26.0	25.9	4.29	4.39	4.50	4.40
11. U 886	5.38	5.35	5.40	5.38	24.0	24.0	25.3	24.4	4.42	4.56	4.52	4.50
2. H 8504	5.45	5.30	5.18	5.31	25.8	24.3	26.0	25.3	4.28	4.35	4.42	4.35
5. Hypeel 849	5.78	5.00	5.10	5.29	25.5	23.8	24.8	24.7	4.34	4.51	4.47	4.44
6. PS 345	5.30	5.23	5.18	5.23	26.8	27.3	26.3	26.8	4.34	4.49	4.51	4.44
9. U 37	5.33	4.98	5.15	5.15	25.8	27.0	26.0	26.3	4.34	4.49	4.35	4.39
10. U 567	5.10	5.00	4.95	5.02	25.5	26.5	26.3	26.1	4.45	4.54	4.59	4.53
4. H 9997	4.90	4.88	4.70	4.83	23.8	22.8	24.8	23.8	4.43	4.61	4.61	4.55
<b>average</b>	<b>5.63</b>	<b>5.40</b>	<b>5.29</b>	<b>5.44</b>	<b>25.2</b>	<b>24.7</b>	<b>25.7</b>	<b>25.2</b>	<b>4.35</b>	<b>4.47</b>	<b>4.49</b>	<b>4.43</b>
LSD 5% (Var)				0.22				1.2				0.06
LSD (Har)		0.108				0.609				0.031		
LSD (Var X Har)	0.37				NS				NS			
CV %				4.90				6.0				1.69

EXPT. 2 Seeded April 27, 2005

Harvest 1: SEPT 12 (138 DAS)

Harvest 2: SEPT 26

Harvest 3: OCT 3

Table 2b: PTAB quality - sorted by °BRIX Average

Variety & code	°BRIX				COLOR				pH			
	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG
8. Sun 6374	6.05	5.93	5.45	5.81	23.8	23.5	24.8	24.0	4.42	4.55	4.58	4.52
12. AB 2	5.65	5.60	5.55	5.60	22.8	24.3	23.0	23.3	4.36	4.43	4.49	4.43
7. Sun 6368	5.73	5.75	5.28	5.58	23.0	23.5	25.5	24.0	4.39	4.51	4.57	4.49
3. H 9780	5.58	5.38	5.45	5.47	23.3	25.0	24.8	24.3	4.37	4.45	4.46	4.43
11. U 886	5.28	5.30	5.43	5.33	23.0	23.0	22.5	22.8	4.50	4.59	4.55	4.55
1. Halley 3155	5.50	5.20	5.23	5.31	23.0	25.0	25.8	24.6	4.39	4.52	4.47	4.46
10. U 567	5.00	5.33	5.45	5.26	24.0	24.0	24.5	24.2	4.53	4.65	4.62	4.60
5. Hypeel 849	5.20	5.33	5.15	5.23	23.5	24.3	24.3	24.0	4.46	4.60	4.53	4.53
6. PS 345	5.18	5.13	5.25	5.18	24.5	25.0	26.0	25.2	4.41	4.54	4.51	4.49
2. H 8504	5.03	5.25	5.20	5.16	22.5	23.8	25.3	23.8	4.29	4.39	4.42	4.37
9. U 37	5.10	5.03	4.98	5.03	23.8	24.3	26.0	24.7	4.40	4.50	4.49	4.46
4. H 9997	4.83	4.85	4.95	4.88	21.8	22.0	24.0	22.6	4.51	4.66	4.59	4.59
<b>average</b>	<b>5.34</b>	<b>5.34</b>	<b>5.28</b>	<b>5.32</b>	<b>23.2</b>	<b>24.0</b>	<b>24.7</b>	<b>24.0</b>	<b>4.42</b>	<b>4.53</b>	<b>4.52</b>	<b>4.49</b>
LSD 5% (Var)				0.15				1.0				0.04
LSD (Har)	----- NS -----				----- 0.51 -----				----- 0.018 -----			
LSD (Var X Har)	0.26				NS				NS			
CV %	3.50				5.2				0.94			

EXPT. 3 Seeded May 17, 2005

Harvest 1: SEPT 26 (132 DAS)

Harvest 2: OCT 3 (only 7 days later)

Table 3b: PTAB quality - sorted by °BRIX Average

Variety & code	°BRIX			COLOR			pH		
	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG
8. Sun 6374	5.83	5.75	5.79	22.5	25.0	23.8	4.43	4.46	4.45
12. AB 2	5.53	5.48	5.50	23.8	24.0	23.9	4.39	4.41	4.40
7. Sun 6368	5.63	5.33	5.48	22.8	25.3	24.0	4.42	4.38	4.40
1. Halley 3155	5.50	5.28	5.39	24.0	27.5	25.8	4.43	4.35	4.39
11. U 886	5.33	5.40	5.36	23.3	24.0	23.6	4.46	4.45	4.46
5. Hypeel 849	5.28	5.18	5.23	25.5	26.5	26.0	4.41	4.44	4.42
2. H 8504	5.28	5.05	5.16	22.5	24.3	23.4	4.37	4.42	4.40
3. H 9780	5.20	5.08	5.14	28.3	27.3	27.8	4.39	4.40	4.39
10. U 567	5.20	4.98	5.09	25.0	26.8	25.9	4.48	4.49	4.48
6. PS 345	5.10	5.05	5.08	27.0	31.3	29.1	4.42	4.36	4.39
9. U 37	5.25	4.85	5.05	23.3	24.5	23.9	4.40	4.45	4.43
4. H 9997	5.03	4.98	5.00	21.0	22.0	21.5	4.44	4.50	4.47
<b>average</b>	<b>5.34</b>	<b>5.20</b>	<b>5.27</b>	<b>24.1</b>	<b>25.7</b>	<b>24.9</b>	<b>4.42</b>	<b>4.43</b>	<b>4.42</b>
LSD 5% (Var)			0.19			1.4			0.04
LSD (Har)	----- 0.079 -----			----- 0.591 -----			----- NS -----		
LSD (Var X Har)	NS			2.0			0.06		
CV %	3.68			5.8			1.06		



**EXPT. 1 Seeded April 12, 2005**

Harvest 1: AUG 29 (139 DAS)

Harvest 2: SEPT 12

Harvest 3: SEPT 19

**Table 1c: Cooked (Lab) Analysis - Sorted by °BRIX Average**

Variety & code	°BRIX				pH				Bostwick* (cm)				Predicted Paste Bostwick				28 Brix Paste Yield				Predicted Catsup Yield			
	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG
8. Sun 6374	6.3	6.1	6.1	6.2	4.45	4.53	4.70	4.56	14.7	14.8	16.3	15.2	6.1	5.8	6.6	6.2	450.0	433.3	436.0	439.8	962.7	947.3	904.7	938.2
7. Sun 6368	6.2	5.7	5.6	5.8	4.57	4.49	4.67	4.58	15.6	15.4	17.1	16.0	6.4	5.5	6.1	6.0	440.3	409.7	396.7	415.6	929.3	910.7	851.0	897.0
12. AB 2	6.1	5.5	5.6	5.7	4.21	4.43	4.58	4.41	16.2	16.3	16.1	16.2	6.5	5.6	5.7	6.0	433.7	393.0	402.3	409.7	905.3	868.3	883.0	885.6
1. Halley 3155	6.0	5.4	5.3	5.6	4.68	4.48	4.66	4.61	15.1	16.3	17.2	16.2	5.9	5.5	5.7	5.7	431.0	388.3	375.0	398.1	934.7	865.3	826.0	875.3
11. U 886	5.5	5.3	5.4	5.4	4.38	4.61	4.87	4.62	15.2	15.1	16.6	15.6	5.1	4.6	5.6	5.1	393.0	376.3	386.0	385.1	902.3	893.7	853.7	883.2
3. H 9780	5.7	5.2	5.2	5.4	4.34	4.50	4.76	4.53	14.2	14.2	15.9	14.8	4.9	4.2	4.9	4.6	404.7	374.0	369.0	382.6	946.7	920.7	859.3	908.9
5. Hypeel 849	5.6	5.0	5.2	5.3	4.65	4.55	4.70	4.64	14.0	15.1	15.7	14.9	4.7	4.3	4.9	4.6	402.3	359.7	373.7	378.6	951.3	877.0	870.7	899.7
2. H 8504	5.6	5.3	4.9	5.3	4.24	4.39	4.53	4.39	13.4	12.8	13.9	13.4	4.3	3.5	3.5	3.8	397.7	376.3	352.3	375.4	970.7	976.0	913.7	953.4
6. PS 345	5.4	5.2	5.1	5.2	4.73	4.54	4.68	4.65	14.1	13.9	14.7	14.2	4.4	3.9	4.2	4.2	386.0	368.7	364.3	373.0	934.0	928.3	895.0	919.1
9. U 37	5.4	5.0	5.0	5.1	4.51	4.55	4.70	4.59	15.4	15.5	15.9	15.6	5.0	4.5	4.6	4.7	385.7	359.3	357.0	367.3	891.3	864.0	850.0	868.4
10. U 567	5.2	5.0	4.7	5.0	4.64	4.67	4.84	4.72	12.6	13.8	14.7	13.7	3.3	3.5	3.5	3.4	371.3	354.7	335.7	353.9	984.3	924.0	872.0	926.8
4. H 9997	5.1	4.8	4.6	4.8	4.56	4.79	4.93	4.76	14.5	15.2	15.9	15.2	4.1	3.9	3.9	4.0	364.0	340.3	326.3	343.6	904.0	857.0	818.3	859.8
<b>average</b>	<b>5.7</b>	<b>5.3</b>	<b>5.2</b>	<b>5.4</b>	<b>4.50</b>	<b>4.54</b>	<b>4.72</b>	<b>4.59</b>	<b>14.6</b>	<b>14.9</b>	<b>15.8</b>	<b>15.1</b>	<b>5.0</b>	<b>4.6</b>	<b>4.9</b>	<b>4.9</b>	<b>405.0</b>	<b>377.8</b>	<b>372.9</b>	<b>385.2</b>	<b>934.7</b>	<b>902.7</b>	<b>866.4</b>	<b>901.3</b>
LSD 5% (Var)				0.2				0.16				0.7				0.4			13.9					31.5
LSD (Har)	-----	0.176	-----		-----	0.080	-----		-----	0.369	-----		-----	0.188	-----		-----	6.96	-----		-----	15.76	-----	
LSD (Var X Har)	NS				NS				NS				NS				NS				NS			
CV %				3.8				3.7				5.2				8.2			3.9					3.7

\* average of 2 readings

**EXPT. 2 Seeded April 27, 2005**

Harvest 1: SEPT 12 (138 DAS)

Harvest 2: SEPT 26

Harvest 3: OCT 3

**Table 2c: Cooked (Lab) Analysis - sorted by °BRIX Average**

Variety & code	°BRIX				pH				Bostwick* (cm)				Predicted Paste Bostwick				28 Brix Paste Yield				Predicted Catsup Yield			
	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG
12. AB 2	5.8	5.2	5.4	5.5	4.38	4.64	4.47	4.49	16.1	18.0	16.8	16.9	6.0	6.0	5.8	5.9	411.7	371.7	388.3	390.6	890.7	800.7	852.3	847.9
8. Sun 6374	5.8	5.5	5.0	5.4	4.46	4.64	4.71	4.60	15.0	16.3	19.4	16.9	5.4	5.6	6.4	5.8	411.7	393.0	359.7	388.1	925.3	869.7	768.7	854.6
7. Sun 6368	5.5	5.4	5.3	5.4	4.38	4.67	4.58	4.54	15.7	17.5	17.4	16.9	5.3	6.2	5.8	5.8	393.0	388.0	376.3	385.8	886.0	829.3	823.7	846.3
3. H 9780	5.5	5.2	5.4	5.4	4.42	4.62	4.55	4.53	12.9	14.5	12.6	13.3	3.9	4.3	3.6	3.9	393.0	371.3	386.0	383.4	984.3	909.3	996.7	963.4
10. U 567	4.9	5.2	5.6	5.2	4.62	4.86	4.64	4.71	13.2	13.2	12.2	12.9	3.2	3.7	3.7	3.5	352.3	373.7	397.3	374.4	944.3	958.0	1017.7	973.3
11. U 886	5.0	5.2	5.4	5.2	4.53	4.80	4.75	4.70	14.1	15.5	14.6	14.7	3.7	4.7	4.6	4.3	357.0	371.3	383.3	370.6	912.0	874.3	914.0	900.1
2. H 8504	5.3	5.1	5.1	5.2	4.36	4.60	4.53	4.50	12.5	13.2	13.4	13.0	3.4	3.4	3.5	3.4	378.7	361.7	364.3	368.2	991.3	953.0	944.3	962.9
1. Halley 3155	5.3	5.0	5.1	5.1	4.43	4.67	4.55	4.55	15.6	17.6	16.9	16.7	5.0	5.5	5.3	5.2	378.7	357.3	364.0	366.7	877.3	798.3	825.3	833.7
5. Hypeel 849	5.1	5.0	5.2	5.1	4.50	4.78	4.72	4.67	13.4	15.1	15.2	14.6	3.6	4.3	4.6	4.1	366.3	359.3	369.0	364.9	946.3	878.3	881.7	902.1
6. PS 345	5.1	5.0	5.2	5.1	4.46	4.70	4.58	4.58	13.8	14.8	13.8	14.2	3.8	4.1	3.9	3.9	364.3	359.3	371.3	365.0	927.3	889.0	933.3	916.6
9. U 37	4.9	4.8	4.8	4.8	4.46	4.70	4.59	4.58	15.1	15.9	16.1	15.7	4.0	4.3	4.5	4.3	350.0	343.0	345.3	346.1	870.3	837.3	831.3	846.3
4. H 9997	4.4	4.7	4.2	4.4	4.63	4.90	4.84	4.79	14.0	15.1	17.3	15.5	2.7	3.7	4.1	3.5	314.3	335.7	302.3	317.4	878.3	857.3	771.3	835.7
<b>average</b>	<b>5.2</b>	<b>5.1</b>	<b>5.1</b>	<b>5.2</b>	<b>4.47</b>	<b>4.72</b>	<b>4.63</b>	<b>4.60</b>	<b>14.3</b>	<b>15.6</b>	<b>15.5</b>	<b>15.1</b>	<b>4.2</b>	<b>4.6</b>	<b>4.6</b>	<b>4.5</b>	<b>372.6</b>	<b>365.4</b>	<b>367.3</b>	<b>368.4</b>	<b>919.5</b>	<b>871.2</b>	<b>880.0</b>	<b>890.2</b>
LSD 5% (Var)				0.3				0.07				1.5				0.5			18.6					54.8
LSD (Har)			NS		-----	0.033	-----		-----	0.733	-----		-----	0.260	-----		-----	NS	-----		-----	27.39	-----	
LSD (Var X Har)	0.4				NS				NS				NS				32.1				NS			
CV %				5.4				1.6				10.3				12.3			5.4					6.6

\* average of 2 readings

EXPT. 3 Seeded May 17, 2005

Harvest 1: SEPT 26 (132 DAS)

Harvest 2: OCT 3 (only 7 days later)

Table 3c: Cooked (Lab) Analysis - sorted by °BRIX Average

Variety & code	°BRIX			pH			Bostwick* (cm)			Predicted Paste Bostwick			28 Brix Paste Yield			Predicted Catsup Yield		
	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG
8. Sun 6374	5.6	5.2	5.4	4.63	4.52	4.58	14.4	15.8	15.1	4.8	4.9	4.9	397.7	374.0	385.8	933.3	870.7	902.0
7. Sun 6368	5.4	5.4	5.4	4.69	4.51	4.60	16.0	13.7	14.8	5.3	4.1	4.7	383.7	383.0	383.3	869.3	957.7	913.5
2. H 8504	5.1	5.3	5.2	4.53	4.51	4.52	10.9	10.6	10.7	2.3	2.5	2.4	366.3	381.0	373.7	1063.3	1083.0	1073.2
1. Halley 3155	5.3	5.2	5.2	4.51	4.53	4.52	13.3	14.4	13.9	3.7	4.2	4.0	376.3	368.7	372.5	958.7	909.0	933.8
5. Hypeel 849	5.2	5.2	5.2	4.61	4.62	4.62	11.9	12.7	12.3	2.9	3.4	3.1	368.7	374.0	371.3	1014.3	982.7	998.5
12. AB 2	5.3	5.0	5.2	4.57	4.45	4.51	13.9	17.7	15.8	4.1	5.5	4.8	378.7	357.3	368.0	938.7	805.0	871.8
10. U 567	5.2	5.1	5.1	4.66	4.54	4.60	10.7	11.0	10.8	2.4	2.3	2.3	371.7	361.7	366.7	1073.7	1055.7	1064.7
3. H 9780	5.1	5.1	5.1	4.56	4.46	4.51	11.2	11.0	11.1	2.4	2.3	2.3	361.7	361.7	361.7	1040.7	1054.7	1047.7
6. PS 345	5.0	5.1	5.1	4.52	4.51	4.52	11.9	13.7	12.8	2.6	3.7	3.1	357.0	364.3	360.7	1006.7	946.0	976.3
4. H 9997	4.8	5.2	5.0	4.63	4.61	4.62	12.1	11.0	11.6	2.4	2.5	2.4	343.0	369.0	356.0	986.3	1055.0	1020.7
11. U 886	5.1	4.6	4.9	4.71	4.56	4.64	12.7	16.2	14.5	3.3	4.1	3.7	366.7	328.3	347.5	975.3	827.3	901.3
9. U 37	5.0	4.4	4.7	4.56	4.51	4.53	12.8	17.4	15.1	3.1	4.4	3.8	359.7	316.7	338.2	964.3	786.0	875.2
<b>average</b>	<b>5.2</b>	<b>5.1</b>	<b>5.1</b>	<b>4.60</b>	<b>4.53</b>	<b>4.56</b>	<b>12.6</b>	<b>13.7</b>	<b>13.2</b>	<b>3.3</b>	<b>3.6</b>	<b>3.5</b>	<b>369.3</b>	<b>361.6</b>	<b>365.4</b>	<b>985.4</b>	<b>944.4</b>	<b>964.9</b>
LSD 5% (Var)			NS			0.10			2.6			0.9			NS			102.2
LSD (Har)	---- NS ----			---- 0.040 ----			---- 1.07 ----			---- 0.401 ----			---- NS ----			---- 41.73 ----		
LSD (Var X Har)	NS			NS			NS			NS			NS			NS		
CV %			6.8			1.8			17.1			23.4			6.8			9.1

\* average of 2 readings

EXPT. 1 Seeded April 12, 2005

Harvest 1: AUG 29 (139 DAS)

Harvest 2: SEPT 12

Harvest 3: SEPT 19

Table 1d: Cooked Color - sorted by USDA color

Variety & code	LED				Agtron E-5M				Hunter L				Hunter a				Hunter b				USDA color			
	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG
4. H 9997	18.7	19.0	19.7	19.1	28.0	27.7	29.3	28.3	23.6	24.0	23.8	23.8	29.9	29.7	29.9	29.8	12.9	12.8	13.1	13.0	50.7	50.6	50.6	50.6
11. U 886	19.7	19.7	20.0	19.8	30.3	30.8	30.2	30.4	24.0	24.2	23.9	24.0	29.8	29.6	29.4	29.6	13.0	13.5	13.2	13.3	50.6	50.1	50.1	50.3
2. H 8504	20.3	19.7	20.3	20.1	31.3	30.3	31.3	31.0	24.7	24.7	24.9	24.8	29.4	29.8	29.3	29.5	13.3	13.5	13.7	13.5	50.0	50.3	49.7	50.1
12. AB 2	19.7	20.0	20.0	19.9	30.3	31.8	31.8	31.3	24.4	24.7	24.8	24.6	29.9	29.9	29.3	29.7	13.3	13.9	13.9	13.7	50.6	50.0	49.5	50.0
8. Sun 6374	19.3	19.0	19.7	19.3	31.3	32.5	32.7	32.2	24.8	25.3	25.2	25.1	29.5	29.8	30.0	29.8	13.6	14.0	13.9	13.8	49.9	49.8	50.2	50.0
3. H 9780	20.3	20.0	20.0	20.1	32.3	31.7	31.0	31.7	25.1	24.6	24.5	24.7	28.9	29.7	29.6	29.4	13.2	13.6	13.5	13.4	49.7	50.2	50.0	50.0
10. U 567	20.3	20.3	21.0	20.6	32.3	31.2	31.5	31.7	24.3	24.7	24.7	24.6	29.5	29.4	29.4	29.4	13.6	13.6	13.6	13.6	49.9	49.8	49.8	49.8
7. Sun 6368	19.3	19.7	21.0	20.0	32.0	31.8	35.2	33.0	24.7	25.1	25.6	25.1	30.1	29.9	29.5	29.9	14.0	13.9	14.2	14.0	50.1	50.1	49.2	49.8
5. Hypeel 849	19.3	19.7	20.7	19.9	30.0	31.2	33.2	31.4	24.4	24.6	25.0	24.7	29.4	29.2	29.3	29.3	13.2	13.7	13.7	13.5	50.1	49.5	49.7	49.8
6. PS 345	20.7	21.0	21.0	20.9	33.7	33.0	32.0	32.9	24.8	25.3	25.1	25.1	29.5	29.4	29.6	29.5	14.0	14.0	13.8	13.9	49.6	49.4	49.9	49.6
9. U 37	21.0	21.0	21.3	21.1	34.0	34.3	34.7	34.3	24.8	25.5	25.8	25.4	29.9	29.0	29.0	29.3	13.4	14.1	14.1	13.8	50.5	48.9	49.0	49.5
1. Halley 3155	19.3	20.0	21.3	20.2	31.3	32.8	33.0	32.4	24.4	24.8	24.7	24.6	28.7	29.0	29.0	28.9	13.4	14.0	13.7	13.7	49.3	49.0	49.3	49.2
<b>average</b>	<b>19.8</b>	<b>19.9</b>	<b>20.5</b>	<b>20.1</b>	<b>31.4</b>	<b>31.6</b>	<b>32.2</b>	<b>31.7</b>	<b>24.5</b>	<b>24.8</b>	<b>24.8</b>	<b>24.7</b>	<b>29.5</b>	<b>29.5</b>	<b>29.4</b>	<b>29.5</b>	<b>13.4</b>	<b>13.7</b>	<b>13.7</b>	<b>13.6</b>	<b>50.1</b>	<b>49.8</b>	<b>49.8</b>	<b>49.9</b>
LSD 5% (Var)				0.6				1.1								0.3				0.2				0.3
LSD (Har)	-----	0.045	-----		-----	0.546	-----		-----	0.152	-----		-----	NS	-----		-----	0.103	-----		-----	0.170	-----	
LSD (Var X Har)	NS				1.9				0.5				0.5				0.4				0.6			
CV %				3.2				3.7								1.1				1.6				0.7

EXPT. 2 Seeded April 27, 2005

Harvest 1: SEPT 12 (138 DAS)

Harvest 2: SEPT 26

Harvest 3: OCT 3

Table 2d: Cooked Color - sorted by USDA color

Variety & code	LED				Agtron E-5M				Hunter L				Hunter a				Hunter b				USDA color			
	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG	H1	H2	H3	AVG
11. U 886	19.0	18.3	18.3	18.6	29.7	28.8	29.3	29.3	24.0	23.8	24.1	24.0	30.0	30.5	29.6	30.0	13.5	13.1	13.2	13.3	50.5	51.3	50.3	50.7
4. H 9997	18.7	19.0	20.0	19.2	27.5	29.5	29.7	28.9	23.6	24.0	24.0	23.9	30.5	29.8	29.2	29.8	13.2	12.9	13.0	13.0	51.2	50.7	49.9	50.6
2. H 8504	18.7	19.3	20.0	19.3	30.3	30.5	31.0	30.6	24.6	24.5	24.9	24.7	30.0	30.4	29.5	30.0	13.7	13.6	13.6	13.6	50.4	51.0	49.9	50.4
3. H 9780	19.0	20.0	20.0	19.7	31.2	29.3	31.3	30.6	24.6	24.9	25.0	24.8	29.8	29.5	29.8	29.7	13.3	13.3	13.5	13.4	50.4	50.2	50.2	50.3
10. U 567	20.0	19.7	19.0	19.6	31.7	31.0	31.8	31.5	24.6	24.6	24.5	24.6	29.5	30.1	29.4	29.7	13.7	13.3	13.1	13.4	49.8	50.8	50.1	50.3
5. Hypeel 849	19.0	19.0	20.0	19.3	30.8	31.0	32.0	31.3	24.4	24.6	24.8	24.6	30.0	29.8	29.4	29.7	13.8	13.6	13.5	13.6	50.3	50.3	49.8	50.1
8. Sun 6374	19.0	19.3	20.3	19.6	31.8	32.7	34.0	32.8	24.9	25.2	25.3	25.1	29.9	30.0	29.0	29.6	14.0	13.8	13.9	13.9	49.9	50.3	49.2	49.8
12. AB 2	19.0	20.7	20.0	19.9	31.5	32.3	31.7	31.8	24.7	25.0	24.6	24.7	29.4	29.6	29.1	29.4	13.6	13.6	13.5	13.6	49.8	50.0	49.6	49.8
9. U 37	19.7	20.3	21.3	20.4	32.8	33.7	34.7	33.7	25.1	25.4	25.6	25.3	29.9	29.5	29.1	29.5	13.9	13.7	14.0	13.9	50.0	49.9	49.1	49.6
1. Halley 3155	19.0	20.3	21.7	20.3	30.8	32.7	34.7	32.7	24.3	24.7	25.1	24.7	29.9	28.9	28.4	29.1	13.7	13.5	13.7	13.6	50.3	49.4	48.8	49.5
7. Sun 6368	19.0	19.0	21.3	19.8	33.2	32.7	34.7	33.5	25.2	25.1	25.6	25.3	29.9	29.4	29.1	29.5	14.1	13.8	14.1	14.0	49.8	49.7	48.9	49.5
6. PS 345	19.7	20.7	20.7	20.3	32.2	34.0	34.0	33.4	25.1	25.3	25.5	25.3	29.6	29.2	29.2	29.3	13.8	13.9	14.0	13.9	49.8	49.3	49.2	49.4
<b>average</b>	<b>19.1</b>	<b>19.6</b>	<b>20.2</b>	<b>19.7</b>	<b>31.1</b>	<b>31.5</b>	<b>32.4</b>	<b>31.7</b>	<b>24.6</b>	<b>24.8</b>	<b>24.9</b>	<b>24.7</b>	<b>29.9</b>	<b>29.7</b>	<b>29.2</b>	<b>29.6</b>	<b>13.7</b>	<b>13.5</b>	<b>13.6</b>	<b>13.6</b>	<b>50.2</b>	<b>50.2</b>	<b>49.6</b>	<b>50.0</b>
LSD 5% (Var)				0.7				1.3								0.5				0.2				0.5
LSD (Har)	-----	0.368	-----		-----	0.636	-----		-----	0.131	-----		-----	0.256	-----		-----	0.102	-----		-----	0.254	-----	
LSD (Var X Har)	1.3				NS				NS				NS				NS				NS			
CV %				4.0				4.3								1.9				1.6				1.1

EXPT. 3 Seeded May 17, 2005

Harvest 1: SEPT 26 (132 DAS)

Harvest 2: OCT 3 (only 7 days later)

Table 3d: Cooked Color - sorted by USDA color

Variety & code	LED			Agtron E-5M			Hunter L			Hunter a			Hunter b			USDA color		
	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG	H1	H2	AVG
4. H 9997	17.3	17.7	17.5	27.3	28.0	27.7	23.9	24.0	24.0	31.2	30.3	30.8	12.9	12.8	12.9	52.1	51.2	51.6
2. H 8504	18.3	18.7	18.5	30.7	30.0	30.3	24.6	25.1	24.9	30.4	30.0	30.2	13.4	13.5	13.4	51.1	50.5	50.8
11. U 886	18.3	19.3	18.8	29.8	29.7	29.8	24.3	24.1	24.2	30.6	29.4	30.0	13.2	13.1	13.2	51.3	50.1	50.7
3. H 9780	19.0	19.3	19.2	32.0	30.8	31.4	25.4	25.1	25.2	30.2	30.0	30.1	13.5	13.5	13.5	50.7	50.5	50.6
10. U 567	19.3	19.3	19.3	32.3	32.3	32.3	25.2	25.3	25.3	30.6	29.5	30.1	13.5	13.6	13.5	51.1	50.0	50.6
5. Hypeel 849	18.7	18.3	18.5	30.5	31.0	30.8	24.8	25.0	24.9	30.3	29.6	30.0	13.4	13.7	13.5	50.9	50.0	50.5
7. Sun 6368	18.3	19.0	18.7	31.0	32.0	31.5	24.9	25.4	25.1	30.6	29.4	30.0	13.6	13.8	13.7	51.0	49.6	50.3
1. Halley 3155	18.7	19.3	19.0	30.7	32.3	31.5	24.5	24.9	24.7	30.4	29.1	29.8	13.4	13.6	13.5	51.0	49.6	50.3
8. Sun 6374	18.0	19.7	18.8	32.2	34.0	33.1	25.6	25.2	25.4	30.4	29.2	29.8	13.8	13.6	13.7	50.7	49.6	50.2
12. AB 2	19.0	20.7	19.8	31.3	33.3	32.3	24.6	25.0	24.8	30.6	28.5	29.5	13.5	13.5	13.5	51.2	49.0	50.1
9. U 37	19.0	20.0	19.5	31.0	32.7	31.8	24.9	24.8	24.8	30.4	28.8	29.6	13.6	13.5	13.5	50.8	49.3	50.1
6. PS 345	19.7	19.7	19.7	33.7	33.3	33.5	25.5	25.6	25.6	30.4	29.3	29.9	13.8	14.0	13.9	50.6	49.2	49.9
<b>average</b>	<b>18.6</b>	<b>19.3</b>	<b>18.9</b>	<b>31.0</b>	<b>31.6</b>	<b>31.3</b>	<b>24.9</b>	<b>25.0</b>	<b>24.9</b>	<b>30.5</b>	<b>29.4</b>	<b>30.0</b>	<b>13.5</b>	<b>13.5</b>	<b>13.5</b>	<b>51.0</b>	<b>49.9</b>	<b>50.5</b>
LSD 5% (Var)			0.9			1.9			0.5			NS			0.3			0.9
LSD (Har)	----	0.347	----	----	0.761	----	----	NS	----	----	1.003	----	----	NS	----	----	0.347	----
LSD (Var X Har)	NS			NS			NS			NS			NS			NS		
CV %			3.9			5.1			1.9			2.3			1.9			1.5

**EXPT. 1 Seeded April 12, 2005**

**Table 1e: Cooked Lycopene**

Variety & code	Lycopene			
	H1	H2	H3	AVG
4. H 9997	89.4	74.2	70.4	78.0
8. Sun 6374	69.7	75.9	81.4	75.7
11. U 886	75.3	66.1	66.8	69.4
5. Hypeel 849	63.7	61.4	69.3	64.8
3. H 9780	55.0	64.1	73.8	64.3
12. AB 2	62.4	58.9	65.1	62.1
7. Sun 6368	77.6	56.7	51.5	61.9
10. U 567	66.2	61.7	53.1	60.3
1. Halley 3155	66.0	60.5	52.9	59.8
2. H 8504	65.2	55.0	58.6	59.6
6. PS 345	61.7	53.2	59.4	58.1
9. U 37	56.1	52.7	57.5	55.4
<b>average</b>	<b>67.4</b>	<b>61.7</b>	<b>63.3</b>	<b>64.1</b>
LSD 5% (Var)				8.4
LSD (Har)	-----	4.175	-----	
LSD (Var X Har)	14.5			
CV %				13.9

**Harvest 1: AUG 29 (139 DAS)**

**Harvest 2: SEPT 12**

**Harvest 3: SEPT 19**

**EXPT. 2 Seeded April 27, 2005**

**Table 2e: Cooked Lycopene**

Variety & code	Lycopene			
	H1	H2	H3	AVG
5. Hypeel 849	70.5	76.6	81.2	76.1
7. Sun 6368	65.3	76.0	84.1	75.1
8. Sun 6374	74.3	65.5	80.7	73.5
4. H 9997	65.3	94.5	53.2	71.0
11. U 886	73.2	77.8	61.7	70.9
1. Halley 3155	63.1	72.3	76.1	70.5
12. AB 2	60.1	55.6	88.6	68.1
10. U 567	55.6	70.9	77.2	67.9
3. H 9780	68.7	60.1	72.5	67.1
2. H 8504	68.9	67.1	62.8	66.3
6. PS 345	55.1	67.9	70.5	64.5
9. U 37	56.4	57.7	74.2	62.8
<b>average</b>	<b>64.7</b>	<b>70.2</b>	<b>73.5</b>	<b>69.5</b>
LSD 5% (Var)				NS
LSD (Har)	-----	7.19	-----	
LSD (Var X Har)	NS			
CV %				22.0

**Harvest 1: SEPT 12 (138 DAS)**

**Harvest 2: SEPT 26**

**Harvest 3: OCT 3**

**EXPT. 3 Seeded May 17, 2005**

**Table 3e: Cooked Lycopene**

Variety & code	Lycopene		
	H1	H2	AVG
4. H 9997	101.2	75.6	88.4
8. Sun 6374	86.9	84.0	85.4
7. Sun 6368	84.4	75.9	80.2
1. Halley 3155	91.7	59.8	75.7
2. H 8504	76.8	68.2	72.5
5. Hypeel 849	85.5	57.4	71.5
11. U 886	83.1	57.9	70.5
3. H 9780	67.5	73.4	70.5
12. AB 2	75.6	60.2	67.9
9. U 37	74.8	58.0	66.4
10. U 567	67.0	64.2	65.6
6. PS 345	64.4	51.4	57.9
<b>average</b>	<b>79.9</b>	<b>65.5</b>	<b>72.7</b>
LSD 5% (Var)			NS
LSD (Har)	----	7.40	----
LSD (Var X Har)	NS		
CV %			21.4

**Harvest 1: SEPT 26 (132 DAS)**

**Harvest 2: OCT 3 (only 7 days later)**