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# 1984 FRESH MARKET STAKE TOMATO TRIAL



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Monica K. Wertz, William M. Brooks, Gregory L. DiCenzo  
and Gerald G. Myers

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## 1984 FRESH MARKET STAKE TOMATO TRIAL

Monica K. Wertz, William M. Brooks, Gregory L. DiCenzo,  
and Gerald G. Myers<sup>1</sup>

This is another report of a continuing series designed to evaluate currently used and new cultivars of fresh market tomatoes.

Trial Design. Ten cultivars were grown with 3 replications and 50 other cultivars were grown in non-replicated plots. Spacing was 48 inches between rows and 18 inches between plants within rows. There were 15 plants per single row plot, equivalent to 7,260 plants/A. Plants were pruned to the first cluster. Stakes were placed at two plant intervals and metal fence posts were positioned at the ends of each row.

Cultural Practices. Seed was sown on April 2, 1984. Seedlings were transplanted to 2¼" cell paks on April 10, moved outdoors to harden off on May 10, and field set on May 18. One thousand pounds/A 15-15-15 were broadcast and worked in after plowing. At field planting, each plant received ½ pint of 10-52-8 starter solution, mixed 3 pounds per 50 gallons of water. Weed control consisted of Treflan at 1 pound ai/A preplant incorporated and Sencor at ¼ pound ai/A after the plants were well established. Irrigation was applied at a rate of 1" per week as needed.

Weather Data. University Farm Weather Station - Columbus.

<u>Month</u>	<u>Mean Temperature (°F)</u>			<u>Precipitation</u>	
	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Rain(inches)</u>	<u>Deviation from Normal</u>
May	68.8	46.3	57.6	4.60	+0.17
June	85.6	60.6	73.1	1.27	-2.60
July	83.1	60.0	71.5	1.40	-2.57
August	85.6	61.0	73.3	2.27	-1.22
September	76.4	51.1	63.8	1.78	-1.13

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<sup>1</sup>Mailing address: Department of Horticulture, The Ohio State University, 2001 Fyffe Court, Columbus, Ohio 43210.

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## Participating Seed Companies

### Code

A-1	Abbott & Cobb, Inc., P.O. Box 307, Feasterville, PA 19047.
A-2	Agway Inc., Vegetable Seed Farm, Prospect, PA 16052
B-1	W. Atlee Burpee Co., 335 South Briggs Rd., Santa Paula, CA 93060.
C-1	A.L. Castle, Inc., P.O. Box 877, Morgan Hill, CA 95037.
F-1	Ferry-Morse Seed Co., P.O. Box 100, Mountain View, CA 94040.
F-2	University of Florida, Agricultural Research and Education Center, 5007 60th Street East, Bradenton, FL 33508 (Dr. Jay Scott)
H-1	Joseph Harris Co., Moreton Farm, 3670 Buffalo Rd., Rochester, NY 14624
L-1	Liberty Seed Co., P.O. Box 806, New Philadelphia, OH 44663.
N-1	New England Vegetable Growers Assoc., Inc., P.O. Box 477, Waltham, MA 02254
P-1	George W. Park Seed Co., Inc., Greenwood, SC 29647
P-2	Peto Seed Co., Inc., Box 4206, Saticoy, CA 93004-0206
S-1	Seeds of Tomorrow, 10 Creek Edge Rd., Davis, CA 95616

### Results and Discussion

The first harvest was made on July 20 and the last on September 18. For the first 2 weeks after field set in May, rainfall was above average and night temperatures were lower than normal. June followed with above average day and night temperatures, and little precipitation (2.60 inches below the average). The rest of the growing season was also extremely dry with 2.57, 1.22, and 1.13 inches below normal precipitation for July, August and September respectively. Although irrigation was applied, yield was still somewhat reduced. Plot location was excellent this year. The only major source of variability existed in the front end of the field where the first rep of the replicated trial was located. Some of these plants appeared to have suffered Sencor injury due to possible misapplication. Plants were visibly affected and yield in this rep was much lower than in reps 2 and 3. The lack of significant difference for No. 1 and Total Marketable Yields for the season reflects this extreme replicate variation.

Results of the replicated trial can be found in Table 1. As in 1983, President led this group in Early No. 1 and Total Marketable yields, and again exhibited good fruit size. Bingo had excellent fruit size, but total yield was a bit low, and percent culls somewhat high. Vegas sized well also. Celebrity was highest in total No. 1 yield. Liberty yielded highest in marketable fruit for the season, but percent No. 1 fruit was lower and fruit size smaller. These results are consistent with our 1983 trial findings.

In the single plot trial, Cavalier had the best early yield and possessed excellent fruit size throughout the season. Bux Exp. Hyb. 8T351 also did very well early. Duke yielded extremely well again this year, appreciably topping all other cultivars in No. 1 and Total Marketable yield values for the season. Other high yielding cultivars included PSX 76680, Waltham 8117, PSR 72682, and Castlehy 1079. Large fruited lines for the season were Royal Flush and Duchess. Many of the non-replicated cultivars looked promising this year.

Disease Resistance, Fruit Quality, and Plant Habit. Disease resistances as noted by the seed companies for all cultivars tested are listed in Table 3. Fruit quality ratings taken at harvest time include internal appearance (based on color and wall thickness), green shoulder, and fruit defects including radial and concentric cracking, catfacing, zippering, and blotchy ripening. Plant habit classifications, where supplied by seed company, are noted in the final column. The cultivars in Table 3 are listed in the same order as they appear in Tables 1 and 2. All of the replicated lines faired well; Celebrity, Vegas, and Liberty had excellent external and internal fruit ratings, while Castlehy 1065 scored high for internal characteristics, but exhibited somewhat of a problem with radial cracking. For all cultivars, the extremely dry growing season should be taken into account since the stress induced more cracking problems than usual, especially radial cracking.

Best external and internal fruit ratings in the single plot trial were for Star Pak, Waltham 8257, Mountain Pride, (7065) Suncoast, Castlehy 1079, Sunray, and Champion. Three of the high yielding cultivars, Duke, PSX 76680, and PSR 72682 exhibited some blotchy or uneven ripening problems.

Table 1. Replicated Stake Trial: Yield, Grade, and Fruit Size of Tomato Cultivars, Columbus, Ohio, 1984

Cultivar*	Seed Source	Early Harvest to July 31					Total Harvest to September 18				
		Marketable Yield (Tons/Acre)		Percent by Weight		Fruit Size (oz.)	Marketable Yield (Tons/Acre)		Percent By Weight		Fruit Size (oz.)
		No. 1	Total	No. 1	Culls		No. 1	Total	No. 1	Culls	
President	P-2	4.52	6.27	69	5	5.92	20.86	30.73	65	4	6.16
Bingo	F-1	3.58	4.72	64	16	7.69	16.29	25.20	60	8	7.11
Pik-Red	H-1	3.03	4.06	72	4	5.32	20.40	29.86	66	3	7.81
Fresh Pak	H-1	2.71	3.70	72	2	5.31	19.98	31.24	61	5	5.99
Castlehy 1065	C-1	2.38	3.41	64	9	4.82	20.19	32.33	60	4	5.28
Vegas	F-1	2.06	3.36	57	8	6.52	14.98	25.56	56	4	6.29
Celebrity	P-2	1.86	2.81	63	5	5.33	22.08	30.20	71	3	6.26
HXP 2792	H-1	1.85	3.32	56	3	4.44	16.39	27.59	58	3	4.83
Count II	P-2	1.28	2.32	50	10	3.89	17.78	30.66	55	4	4.67
Liberty	A-1	0.89	1.77	44	12	3.38	19.10	35.52	52	4	4.41
LSD 5%		1.70	2.21			1.07	N.S.	N.S.			0.87

\* Cultivars ranked in decreasing order of early yield of U.S. No. 1 grade fruits. Data based on Mean of 3 replications.

Table 2. Single Plot Stake Trial. Yield, Grade, and Fruit Size of Tomato Cultivars, Columbus, Ohio, 1984

Cultivar*	Seed Source	Early Harvest to July 31					Total Harvest to September 18				
		Marketable Yield (Tons/Acre)		Percent by Weight		Fruit Size (oz.)	Marketable Yield (Tons/Acre)		Percent By Weight		Fruit Size (oz.)
		No. 1	Total	No. 1	Culls		No. 1	Total	No. 1	Culls	
Cavalier	P-2	6.85	8.30	74	10	6.17	21.03	28.00	70	6	6.96
BUX Exp. hybrid 8T351	B-1	5.52	6.12	86	4	4.82	20.35	27.56	72	3	5.54
PSX 36579	P-2	4.79	6.15	76	2	6.66	18.95	29.69	62	4	6.54
Carmen	P-2	4.72	6.05	73	6	6.78	19.33	27.83	65	7	7.02
Jackpot	F-1	4.65	5.95	76	3	5.79	14.52	22.24	64	2	5.51
HXP 2798	H-1	4.50	5.23	84	2	5.40	13.09	25.63	49	3	6.10
BUX Exp. hybrid 1T923	B-1	4.45	6.03	71	4	4.63	17.45	25.39	66	4	5.13
Champion	L-1	3.94	5.54	69	3	4.64	22.07	37.82	56	4	6.27
Burpee's Early Pik hybrid	B-1	3.27	5.35	60	3	4.98	13.41	25.70	50	4	5.09
PSX 76680	P-2	3.27	4.79	67	2	5.87	31.44	43.29	71	2	6.10
Park's Whopper	P-1	2.86	4.16	57	2	4.37	20.79	32.02	64	2	5.15
GS-238 Red Express	A-2	2.86	3.19	81	9	5.28	27.85	38.33	73	10	5.64
Park's Extra Early	P-1	2.74	3.82	69	3	5.16	17.93	29.36	60	2	6.79
Atlantic City	F-1	2.69	3.73	59	18	5.87	20.74	29.72	63	10	6.44
Florida MH-1	P-2	2.61	3.68	67	6	4.52	14.50	35.16	40	3	4.34
Royal Flush	L-1	2.52	4.45	56	0	7.55	23.69	33.61	69	2	7.29
BUX #6-T2	B-1	2.45	3.31	74	0	5.12	9.94	20.09	48	3	5.29
Jet Star	H-1	2.20	3.00	67	8	5.22	15.00	27.95	52	3	5.12
Duchess	P-2	2.13	3.90	50	8	6.13	16.34	22.05	69	6	7.32
HXP 2793	H-1	2.10	2.64	80	0	4.84	28.97	38.94	72	3	4.91
Star Pak	H-1	2.06	3.12	65	0	4.52	18.76	30.10	60	3	5.31
Duke	P-2	2.06	2.40	86	0	4.80	41.19	59.58	68	2	6.06
PSX 74181	P-2	2.01	4.33	44	5	5.21	12.42	20.01	60	3	5.99
BUX Exp. hybrid 1T457	B-1	2.01	2.93	65	5	5.69	6.56	14.81	43	3	5.05
Lucky Draw	F-1	1.98	2.86	57	18	5.90	15.80	25.36	54	14	6.14
XP319	A-2	1.82	2.72	64	5	5.72	14.04	24.83	55	3	5.82
Bux Exp. hybrid 1T637	B-1	1.79	3.65	44	10	3.61	11.71	28.92	38	1	4.27
Better Bush	P-1	1.79	2.81	57	10	4.76	9.22	21.97	40	4	4.94
PSR 25981	P-2	1.69	2.32	66	9	5.12	22.48	34.20	63	4	6.75
Contessa	P-2	1.69	3.00	50	11	5.36	7.67	15.15	46	10	5.72
HXP 2790	H-1	1.62	2.86	57	0	4.72	22.19	32.89	65	3	5.72
HXP 2796	H-1	1.57	2.66	54	8	4.76	18.20	26.02	68	2	5.81

Table 2. Single Plot Stake Trial. Yield, Grade, and Fruit Size of Tomato Cultivars, Columbus, Ohio, 1984

Cultivar*	Seed Source	Early Harvest to July 31					Total Harvest to September 18				
		Marketable Yield (Tons/Acre)		Percent by Weight		Fruit Size (oz.)	Marketable Yield (Tons/Acre)		Percent By Weight		Fruit Size (oz.)
		No. 1	Total	No. 1	Culls		No. 1	Total	No. 1	Culls	
Waltham 8257	N-1	1.33	2.28	58	1	5.19	28.17	38.89	71	2	6.27
(7067) Horizon	F-2	1.31	2.56	48	6	5.30	12.54	21.66	56	4	6.20
Liberator	L-1	1.31	1.67	74	6	6.13	17.64	26.06	64	6	6.15
Castlehy 1079	C-1	1.21	1.77	60	12	4.17	36.47	51.64	67	5	5.45
Beno #52	F-1	1.16	1.77	55	16	5.09	17.35	27.25	60	6	6.00
Florida 1B	F-2	1.06	1.94	54	2	3.39	23.14	27.37	80	6	5.66
Exp. 17	S-1	0.97	4.86	19	2	2.40	3.02	19.02	15	5	2.52
PSR 72682	P-2	0.90	1.38	50	23	4.80	32.69	44.55	69	6	5.89
Flora-Dade	P-2	0.85	2.28	35	5	3.76	20.55	41.50	47	4	4.64
Carmelita (Castlehy 1075)	C-1	0.82	1.43	58	10	4.29	27.93	35.82	74	5	6.00
Waltham 8117	N-1	0.80	1.04	72	6	4.30	38.86	51.76	74	2	5.60
Mountain Pride	P-2	0.75	1.04	66	8	4.59	21.25	29.84	69	3	5.96
(7065) Suncoast	F-2	0.70	0.87	72	10	4.80	15.39	19.94	73	6	7.28
Burpee's Big Girl	B-1	0.65	0.80	75	8	5.87	23.93	34.73	65	6	6.69
Hayslip	F-2	0.53	1.72	28	9	3.79	26.48	39.86	64	4	5.63
Sunray	H-1	0.51	0.63	78	4	4.62	25.56	33.37	75	2	5.69
Royal Ace	L-1	0.34	0.48	70	0	5.33	16.77	23.23	70	3	6.86
Cal-Ace	P-2	0.14	0.22	54	18	4.80	22.10	30.18	71	3	6.83

\*Cultivars ranked in decreasing order of early yield of U.S. No. 1 grade fruits.



Table 3. Fruit Disease Resistance<sup>1</sup>, Fruit Quality Ratings<sup>2</sup>, and Plant Habit<sup>3</sup>, For Staked Trial Cultivars

Cultivar <sup>4</sup>	Disease Resistance	Persistent Green Shoulder <sup>5</sup>	Concentric Cracking	Radial Cracking	Catface or Styler Scar	Zippering	Blotchy or Uneven Ripening	Core Size	Internal Appearance <sup>6</sup>	Plant Habit
<u>Replicated Stake:</u>										
President	AF <sub>1+2</sub> NTV	3	4.5	3	4.5	5	4	3.5	3.5	Det.
Bingo	AF <sub>1+2</sub> TV	-	3.5	3.5	4	4	3.5	3	3	Semi-Det.
Pik-Red	F <sub>1+2</sub> V	4	5	3	3.5	4	4.5	4	4	Det.
Fresh Pak	F <sub>1</sub> NV	3	3	3	4	5	3.5	3	4	Det.
Castlehy 1065	AF <sub>1+2</sub> NSTV	4	5	3.5	5	5	4	4.5	4.5	Det.
Vegas	AF <sub>1+2</sub> V	4	4	4	5	4	4.5	4	5	
Celebrity	AF <sub>1+2</sub> NTV	4	4	4	5	5	4.5	4.5	4.5	Det.
HXP 2792	F <sub>1+2</sub> V	-	4	4	5	5	3	4	4	Det.
Count II	AF <sub>1+2</sub> SV	4	4.5	3	5	5	4.5	4	5	Det.
Liberty	F <sub>1+2</sub> V	4	5	4	5	4	5	4.5	4.5	Det.
<u>Single Plot Stake:</u>										
Cavalier	AF <sub>1+2</sub> NSTV	-	5	3.5	5	4	4.5	2.5	3	Det.
BUX Exp. hybrid 8T351	FV	3	4	4	5	4	3.5	2.5	3	Det.
PSX 36579	F <sub>1+2</sub> NTV	4	4.5	3.5	5	5	3.5	3	3	
Carmen	AF <sub>1+2</sub> NSTV	4	3	4	5	5	3	3.5	3.5	Det.
Jackpot	AF <sub>1+2</sub> NSV	4	4.5	4.5	5	5	4	3	3	Det.
HXP 2798	F <sub>1+2</sub> V	3	4	2	5	5	3	4.5	5	Det.
BUX Exp. hybrid 1T923	FV	4	4	3.5	5	5	3	2.5	3	Det.
Champion	F <sub>1</sub> NTV	4	5	4	5	5	4.5	4.5	4.5	Inde.
Burpee's Early Pik hybrid	FV	5	5	5	5	5	5	4	4	Inde.
PSX 76680	F <sub>1+2</sub> NTV	3.5	5	4	5	5	2	3	4	
Park's Whopper	F <sub>1</sub> NTV	4.5	4.5	4	5	5	5	3	3.5	Inde.
GS-238 Red Express	F <sub>1+2</sub> NV	4	5	3	5	4	5	3.5	4	Det.
Park's Extra Early	F <sub>1</sub> NTV	4	4	3	5	5	4	3.5	4	Semi-Det.
Atlantic City	AF <sub>1+2</sub> SV	-	2.5	2.5	5	4	4	3	3.5	
Florida MH1	AF <sub>1+2</sub> S	4	4	4	4	4	3.5	4	4	Det.
Royal Flush	F <sub>1</sub> NV	4	5	4	5	4	3.5	2.5	3.5	Det.
BUX #6-T2	FTV	4	4	3	5	5	5	5	4	Inde.
Jet Star	F <sub>1</sub> V	-	4.5	4.5	5	5	5	4.5	4	Inde.
Duchess	F <sub>1+2</sub> NSV	3	4.5	4	5	5	3	2.5	3.5	Det.
HXP 2793	F <sub>1+2</sub> V	4	5	3	4	3	4	2.5	3.5	Det.
Star Pak	F <sub>1+2</sub> V	3.5	4	3	5	5	5	5	5	Inde.
Duke	AF <sub>1+2</sub> SV	4	5	4	5	5	2	3.5	4	Det.

Table 3. Fruit Disease Resistance<sup>1</sup>, Fruit Quality Ratings<sup>2</sup>, and Plant Habit<sup>3</sup>, For Staked Trial Cultivars

Cultivar <sup>4</sup>	Disease Resistance	Persistent Green Shoulder <sup>5</sup>	Concentric Cracking	Radial Cracking	Catface or Styler Scar	Zippering	Blotchy or Uneven Ripening	Core Size	Internal Appearance <sup>6</sup>	Plant Habit
Single Plot Stake (continued)										
PSX 74181	F <sub>1</sub> +2V	4	4.5	4	5	5	4.5	2	3	
BUX Exp. hybrid 1T457	FV	3	3	3.5	5	5	4.5	3	3.5	Det.
Lucky Draw	AF <sub>1</sub> +2V	3.5	4.5	3.5	5	5	2	3.5	4	Semi-Det.
XP319		5	4.5	2.5	4	5	4	2.5	3	
BUX Exp. hybrid 1T637	F <sub>1</sub> TV	4	4	3.5	5	5	4.5	3.5	4	Inde.
Better Bush	F <sub>1</sub> NV	-	5	3	5	4	5	4	3.5	Inde.
PSR 25981	F <sub>1</sub> +2NTV	4	4	3	4	5	5	3.5	4	
Contessa	AF <sub>1</sub> +2NST	3	4.5	4	5	5	4.5	3.5	4	Det.
HXP 2790	F <sub>1</sub> +2V	4	4.5	4	5	5	2	3.5	3.5	Det.
HXP 2796	F <sub>1</sub> +2V	3	4	2.5	5	4	4	2.5	3.5	Det.
Waltham 8257	F <sub>1</sub> V	5	5	4.5	5	4.5	5	4	4	Inde.
(7067) Horizon	F <sub>1</sub> +2SV	5	5	4.5	5	5	4	3.5	4	Semi-Det.
Liberator		3	4	4	5	5	2	2.5	3	
Castlehy 1079		-	5	4	4.5	5	5	4	4.5	
Beno #52		-	2	2	5	5	4	3.5	4	
Florida 1B	F <sub>1</sub> +2SV	3.5	4	3.5	5	5	4.5	4	4	Det.
EXP. 17	F <sub>1</sub> V	5	5	5	5	5	5	4	4	Inde.
PSR 72682	F <sub>1</sub> +2V	3	5	4	5	5	2	4	4	
Flora Dade	F <sub>1</sub> +2SV	3	5	4	5	5	3.5	4.5	4	Semi-Det.
Carmelita (Castlehy 1075)	F <sub>1</sub> NTV	2.5	5	4.5	5	5	5	3	4	Inde.
Waltham 8117	F <sub>1</sub> +2V	5	4.5	4	5	4.5	5	3.5	3	Inde.
Mountain Pride	F <sub>1</sub> +2V	-	5	5	5	5	4.5	4	4.5	Det.
(7065) Suncoast	F <sub>1</sub> +2SV	5	4.5	4	5	5	4.5	4	5	Semi-Det.
Burpee's Big Girl	FV	4	4	4	5	5	4.5	3	4	Inde.
Hayslip	F <sub>1</sub> +2SV	3	4	4	5	5	4	3.5	4	Semi-Det.
Sunray	AF <sub>1</sub>	5	5	4	5	5	5	5	5	Det.
Royal Ace		3	4.5	4	5	5	2.5	3	3.5	
Cal-Ace	AF <sub>1</sub> V	-	4.5	3.5	5	5	2.5	3	2.5	Det.

<sup>1</sup>Disease Resistance Codes: A = Alternaria Stem Canker, F<sub>1</sub> = Fusarium Wilt (race 1), F<sub>2</sub> = Fusarium Wilt (race 2), N = Root Knot Nematode, S = Stemphyllium (gray leaf spot), T = TMV, V = Verticillium

<sup>2</sup>Quality Ratings for all variables were made on a 1 to 5 scale where 5 indicates no problem and 1 is a severe problem.

<sup>3</sup>Plant Habit Abbreviations: Inde. = Indeterminate, Det. = Determinate, Semi-Det. = Semi-Determinate; noted where information was supplied.

<sup>4</sup>Cultivars are in the order they appear in Tables 1 and 2.

<sup>5</sup>No rating means the cultivar has the uniform ripening gene (no dark green shoulder).

<sup>6</sup>Internal appearance is based on internal color, and wall thickness.

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