TOMATO VARIETY TRIALS
FRESH MARKET
1963

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1963 TOMATO VARIETY TRIALS

New and promising tomato varieties are being developed continually by agricultural experiment stations of several states, by the U. S. Department of Agriculture, and by commercial seedsmen. Tomato growers need information about new varieties pertaining to adaptability, yield, disease-resistance, and processing qualities. Varieties differ widely in adaption to seasonal and soil conditions. Varieties suited to one part of the state may not be adaptable in another part. Consequently, fresh market variety tests are being conducted near Warsaw in the Coastal Plain area of eastern Virginia and near Blacksburg in the mountainous section of southwestern Virginia. Also, canning trials were conducted near Warsaw which is within an important canning area of Virginia. A few brief comments are made in this report about the canning qualities of entries that were included in both the fresh market and the canning trials. For more details on the canning qualities, see Virginia Agricultural Experiment Station Research Report No. 79.

The fresh market tomato trials are in participation with the Southern Tomato Exchange Program (STEP), which is a cooperative tomato variety testing program at 44 locations in 17 states, Haiti, Mexico, and Puerto Rico. STEP has facilitated rapid testing and accurate evaluation of many new tomato selections.

Acknowledgments

The cooperators are most grateful for valuable advice and assistance received from T. J. Nugent, plant pathologist of the Virginia Truck Experiment Station and from W. P. Judkins, head, Horticulture Department, C. B. Wood, associate professor of horticulture in food technology, and R. G. Henderson, professor of plant pathology of the Virginia Agricultural Experiment Station.

1963 FRESH MARKET TOMATO VARIETY TRIALS
Warsaw, Virginia

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Included in the trials were 8 numbered selections of the Southern Tomato Exchange Program and 2 check varieties, Rutgers and Homestead 24. Also in the trials were the varieties ES-24 and Heinz 1350.

Experimental Procedure and Growing Conditions

Location: V.P.I. Eastern Virginia Research Station, Richmond County, 2 miles north of Warsaw, Virginia.
Elevation: 140 feet.
Soil: Sassafras sandy loam; pH 6.5.
Previous crop: Small grain.
Plot sizes: One row; records taken on 10 plants.
Plot design: Split plot
Replications: Four
Spacing: Plants 2 feet apart in row and 5 feet between rows.
Fertilization: Applied at the rate of 1480 lb. per acre 5-10-10; 14 days before field setting broadcast at the rate of 680 lb., 8 days before setting placed in rows at the rate of 200 lb., and 23 days after field setting sidedressed at the rate of 600 lb. Also 0.5 pint per plant of starter solution (3 lb. 10-52-17 to 100 gals. water) applied at field setting.
Field planting date: April 23.
Cultivation: Frequently enough to control weeds.
Pesticides: Maneb plus Sevin or Malathion as spray and chlordane in starter solution.
Growing conditions: Scanty and erratic distribution of moisture seriously impaired the vigor and probably the yield of the planting. Irrigation was not available. See Table No. 4 for details of precipitation and temperature.

Miscellaneous Comments on Data Recorded

Rutgers, Homestead 24, STEP 372, STEP 388, STEP 390, and ES-24 in the 1963 trials were also in the trials of 1962. New entries this season were STEP 373, STEP 382, STEP 397, STEP 401, and Heinz 1350.

The number of days between harvests ranged from 2 to 12 with an average period of 6 days. The 2-day period was between the 1st and 2nd harvests to check earliness and the long 12-day period was caused by slow fruit maturity probably resulting from lack of moisture. Fruit was picked a little after the mature-green stage when a small spot of color showed on the blossom end which is usually called the "breaker" stage. During warm weather, a relatively small number of fruit had passed the breaker stage, a few even reaching red ripe.

The harvesting period of 43 days was shorter than usual for our tomato trials in this area probably as a result of dry weather. Apparently disease did not shorten the harvest period as there were no important diseases evident in the field.

Yield as related to other seasons was low in 1963. The average of Rutgers and Homestead 24 in yield of marketable fruit was 7.6 tons in 1963, 12.4 tons in 1962, and 16.9 tons in 1961.

The average weight (Table No. 1) of fruit for all entries was within an acceptable range of 4.5 oz. to 5.9 oz.

Shoulder observations (Table No. 1) were difficult because the breaker stage of maturity did not always reveal the true shoulder color. Enough red ripe fruit were available at only one harvest to make reasonably accurate observations.

Fruit was considered cracked (Table No. 1) if there was one growth crack 0.5 inch long or if a total of all growth cracks was 1.0 inch. All fruit for the entire season were checked for growth cracks. Cracking rate was relatively low this year. The average percent cracked of all fruit of Rutgers and Homestead 24 was 5% in 1963 and 1961 and 45% in 1962.

Firmness of the fruit (Table No. 1) was measured with an Asco Firmness Meter using a prestress weight of 700 grams, a test weight of 1500 grams, and a linear operation of 5 seconds. Fruit for testing were from the 6th harvest which was 97 days after field setting. Test was made about 24 hours after harvest. Ten fruit at the breaker stage of maturity and 10 red ripe fruit per entry were tested. More fruit should have been tested from more harvests but lack of time prevented additional tests.

Disease observations (Table No. 1) were recorded 84 days after field setting by T. J. Nugent, plant pathologist, Virginia Truck Experiment Station. No symptoms of any important disease were observed. Probably an intense disease control program and dry weather contributed to this condition. However, the plants lacked vigor probably because of hot and dry weather. Later in the season there were a few minor symptoms of blotchy-ripening in the fruit of Rutgers.

The earliest maturing entry was 69 days from field setting and the latest about 77 days with an average of about 71 days (Table No. 3).

None of the entries seemed highly concentrated in yield although the intervention of dry weather during the period of probably highest yield may have obscured the results (Table No. 3).

The general shape of entries was oblate spheroid with average ratio of depth to width of 93% and ranging from 89% to 96%.

General Notes on Entries

STEP 410 produced the highest yield of total marketable fruit and STEP 390 and STEP 401 the lowest. STEP 410 also produced the highest yield of U. S. No. 1's while STEP 388, STEP 390, and STEP 401 produced the lowest.

In general rating of exterior appearance ES-24, Heinz 1350, and STEP 401 were best while STEP 372 was poorest.

In general rating of interior appearance STEP 410 was best and Rutgers poorest.

In general overall rating STEP 410, ES-24, and Heinz 1350 were best while STEP 372 and STEP 390 were fairly low.

In time of maturity all entries were mid-season except Heinz 1350 was early mid-season, STEP 401 was slightly-early mid-season and STEP 372 and Rutgers were late mid-season.

In average general shape, STEP 401 was flattest with a depth to width ratio of 89% and STEP 372 was the nearest globular with a ratio of 96%.

Comments on Individual Entries

(For more details see Tables 1 to 3. The comments below are based on statistical significance of yields and on weighted scores of other qualities for the fresh market as related to other entries in this trial. Comments on canning qualities were based on a canning trial adjoining the fresh market trial and, although the cultural practices for both trials were the same, there were some variation in the entries and time of harvest. The canning comments are not a part of this report and are given here for convenience only. For more details on the canning qualities see Virginia Agricultural Experiment Station Research Report No. 79.)

ES-24 - Average in total marketable yield, but little below average of U. S. 1's. Appearance of exterior of the fruit was pleasing but the interior was a little below average. The vines were rated only fair as the type of growth exposes some of the fruit. The general over-all score places this entry as one of the 3 best in the trials.
Canning qualities: Color of canned samples was among the poorest in the trial, but yield of canning grades and wholeness were above average.

Heinz 1350 - Total marketable and U. S. No. 1's yields were average. Appearance of exterior of the fruit was pleasing but the interior was a little below average. The vines were rather inadequate as considerable fruit was exposed. The general overall score places this entry as one of the 3 best in the trials.
Canning qualities: Yield of canning grades was rather low, but wholeness and color scores were among the best. Soluble solids was below average for the trials.

Homestead 24 - Total marketable and U. S. No. 1's yields of this "check" variety were average. Appearance of the exterior of the fruit was a little below average but the interior was a little above. The vines were satisfactory. The general overall score was average.
Canning qualities: This variety was not in the canning trials.

Rutgers - This "check" variety was average in total marketable and U. S. No. 1's yields. Appearance of the exterior of the fruit was a little below average and the interior was only fair. The vines were satisfactory. The general over-all score was average.
Canning qualities: This variety was not in the canning trials.

STEP 372 - Total marketable and U. S. No. 1's yields were average. Appearance of the exterior of the fruit was rather poor and the interior was a little below average. The vines were fairly satisfactory. The general over-all score was below average.
Canning qualities: Yield of U. S. No. 1's canning grade was the lowest in the trial, but flavor was among the best.

STEP 373 - Total marketable and U. S. No. 1's yields were average. Appearance of the exterior of the fruit and interior were average. The vines were satisfactory. The general over-all score was average.
Canning qualities: Yield of canning grades was below average, but color was above average and flavor was among the best in the trials. Fruit of this entry was easy to core.

STEP 382 - Total marketable and U. S. No. 1's yields of this F_1 hybrid were average. Appearance of the exterior and interior of the fruit were average. The vines were rather inadequate in foliage cover. The general over-all score was average.
Canning qualities: This hybrid was not in the canning trials.

STEP 388 - Total marketable yield was average, but U. S. No. 1's yield was below average. Appearance of the exterior of the fruit was average but the interior was a little below average. The vines, with a fairly compact, low growth, were very satisfactory. The general over-all score was average.
Canning qualities: This entry was not in the canning trials.

STEP 390 - Low in total marketable and U. S. No. 1's yields. Appearance of the exterior and interior of the fruit was average. The vines were fairly satisfactory. The general over-all score was below average.
Canning qualities: This entry was not in the canning trials.

STEP 397 - Total marketable and U. S. No. 1's yields were a little above average. Appearance of the exterior of the fruit was a little below average but the interior was average. The vines were fairly satisfactory. The general over-all score was average.
Canning qualities: Excellent color and good flavor, but difficult to core. Many of the fruit were too large for a 303 size can.

STEP 401 - Low in total marketable and U. S. No. 1's yields. Appearance of the exterior of the fruit was pleasing and the interior a little above average. The vines were rather inadequate as considerable fruit was exposed. The general over-all score was below average.
Canning qualities: Yield of canning grades was above average, but color and wholeness were below average.

STEP 410 - Highest in the trials of total marketable and U. S. No. 1's yields. Appearance of the exterior of the fruit was average but the interior was the best in the trials. The vines, with a fairly compact, low growth, were very satisfactory. The general over-all score places this entry as one of the 3 best in the trials.
Canning qualities: Yield of canning grades was quite high, but percent yield during processing was rather low mainly because of green shoulders which were trimmed off. Many of the fruit were too large for a 303 size can. The pH was much higher than desirable.

Table No. 1 - Eight Tomato Numbered Selections of the Southern Tomato Exchange Program and Four Tomato Varieties Tested for Fresh Market Qualities at Warsaw, Virginia. (Yields, % 1's, fruit weight, % cracking, and seed sources and ratings of shoulders, firmness, and disease.)

Entry	Average yield per acre (1) (means of 4 replications)			Percent U.S. 1's of total marketable	Average marketable fruit weight for season	Shoulder rating (2)		Cracking (3)			Firmness rating (4)	Lack of disease (5)	Seed source (6)
	Total marketable U.S. 1's U.S. 2's U.S. 3's	U.S. 1's	U.S. 2's U.S. 3's			Color	Smoothness	Total	Radial	Concentric			
	cwt.	cwt.	cwt.	%	oz.			%	%	%			
STEP 410	230 a	156 a	74 a	68	5.5	4	5	6	5	1	7	9	3
STEP 397	185 b	132 ab	53 abc	71	5.9	5	4	2	1	1	6	9	6
STEP 372	175 bc	114 bc	61 ab	65	5.9	4	4	3	3	0	6	9	6
STEP 382	170 bc	93 bc	77 a	55	5.2	7	6	1	1	0	4	9	5
ES-24	168 bc	91 c	77 a	54	4.7	7	7	2	2	0	6	9	2
Heinz 1350	159 bc	95 bc	64 ab	60	4.7	5	4	1	1	0	5	9	7
Homestead 24	155 bc	92 bc	63 ab	59	5.0	4	4	5	2	3	5	9	1
Rutgers	149 bc	115 bc	34 c	77	5.4	6	4	2	2	0	3	8	1
STEP 373	146 bc	99 bc	47 bc	68	4.9	5	5	1	1	0	3	9	6
STEP 388	142 bc	89 c	53 abc	63	4.7	5	5	2	1	1	7	9	4
STEP 390	127 c	80 c	47 bc	63	5.7	5	5	3	1	2	6	9	3
STEP 401	127 c	83 c	44 bc	65	4.5	6	6	0	0	0	5	9	8

(1) The superscriptions (a, b, c) indicate the statistical significance of the yield figures at the 5% level. In each column, data bearing a particular letter are significantly different from those not having this letter. Yields were adjusted for missing plants.

(2) Shoulder ratings: 1, very poor; 9, very good.

(3) Cracking: Figures are the percent cracked fruit of all fruit harvested.

(4) Firmness rating: 5 is average firmness for the trials (within a range of 63 to 67 units); 4 is slightly softer (68 to 72 units); 3 is considerably softer (73 to 77 units); 6 is slightly firmer than average (58 to 62 units); 7 is considerably firmer (53 to 57 units).

(5) Lack of disease: Rating for disease is 1, very intense and/or dead to 9, no symptoms evident.

(6) Seed sources: 1, Asgrow Seed Co., 2, Eastern States Farmers Exchange; 3, Florida-Walter; 4, Florida-Walter and Hayslip; 5, Missouri-Lambeth; 6, S.E.V.B.L., Charleston, S.C.-Andrus; 7, Twilley Seedsmen; 8, U.S.D.A., Beltsville, Md.-Webb.

Table No. 2 - Fruit and Plant Descriptions* of Entries in the Fresh Market Tomato Variety Trials, Warsaw, Virginia, 1963.

Entry	Fruit											Plant		
	Exterior				Interior			Faults		Wall thickness				
	General appearance (1)	Color (1)	Smoothness (2)	Uniformity (1)	General appearance (1)	Color (1)	Lack of mushiness (3)	Lacking (4)	Description (5)	Outer (6)	Cross (6)	Size (7)	Growth habit (8)	Foliage density (9)
STEP 410	7	6	5	6	8	8	5	9	-	6	5	4	5	6
STEP 397	5	2	3	4	6	5	7	8	F	5	6	6	5	6
STEP 372	1	3	1	1	3	3	5	9	-	5	8	8	6	8
STEP 382	4	7	4	4	6	6	3	9	-	5	3	5	3	3
ES-24	7	5	8	8	3	2	5	9	-	5	2	4	4	4
Heinz 1350	9	6	7	8	4	4	4	9	-	4	4	3	4	3
Homestead 24	4	5	5	4	6	5	8	8	F	6	4	5	6	6
Rutgers	3	4	3	5	3	4	3	6	B	6	5	6	6	6
STEP 373	5	3	3	4	6	5	5	9	-	4	4	7	6	6
STEP 388	5	8	6	3	4	4	6	6	F	7	4	4	6	5
STEP 390	4	7	4	4	5	4	3	9	-	6	7	4	4	6
STEP 401	8	7	6	7	7	6	6	9	-	4	4	3	4	3
Average	5	5	5	5	5	5	5	8	-	5	5	5	5	5

* All descriptive numbers are ratings of 1 to 9, as related to other entries in this trial.

(1) Rating: 1, very poor; 9, very good.
(2) Rating: 1, very rough; 9, very smooth.
(3) Rating: 1, very mushy; 9, very firm.
(4) Rating (lack of distinct faults): 1, faults of such intensity that fruit is worthless; 9, no important faults evident in appearance.
(5) Description (of fault): B, mild symptoms of blotchy ripening; F, fiber cream color or yellowish.
(6) Rating: 1, very thin; 9, very thick.
(7) Rating: 1, very small; 9, very large.
(8) Rating: 1, very sprawling; 9, very erect.
(9) Rating: 1, very open and/or sparse and/or type of growth exposes much of fruit to direct sun light; 9, very dense with fruit well covered.

Table No. 3 - Percent Marketable Yield at Each Harvest of Total Marketable Yield for the Season of Tomatoes in Replicated Fresh Tomato Trials for 1963 Season at Warsaw, Virginia.

Entry	Approximate % of total yield at each harvest							
	7/1 69*	7/3 71*	7/9 77*	7/12 80*	7/17 85*	7/29 97*	8/5 104*	8/12 111*
Heinz 1350	1	2	8	14	7	59	8	1
STEP 401	0	3	5	6	14	68	4	**
ES-24	0	1	5	5	3	69	16	1
STEP 382	**	**	4	3	15	65	11	2
STEP 373	0	1	2	7	11	66	12	1
STEP 410	0	**	4	1	16	44	29	6
STEP 388	0	0	4	4	15	55	18	4
STEP 390	0	**	3	2	14	59	20	2
STEP 397	0	**	2	6	3	68	19	2
Homestead 24	0	**	1	3	10	62	20	4
Rutgers	0	0	**	2	15	47	33	3
STEP 372	0	0	**	1	9	66	21	3
Averages	**	1	3	4	11	60	18	3

* Days from field setting.
** Less than 0.5%.

Table No. 4 - Climatological Data in 1963 at the V.P.I. Eastern Virginia Research Station, 2 miles north of Warsaw, Virginia.

For week ending	Temperature			Precip-itation* (inches)
	Max.	Min.	Ave.	
Mar. 30	82	38	61	0.22
Apr. 6	92	32	62	0.02
Apr. 13	67	32	51	T
Apr. 20	90	34	64	T
Apr. 27	84	36	58	T
May 4	87	33	58	0.26
May 11	97	46	71	0
May 18	81	37	62	1.40
May 25	85	41	64	0.67
June 1	80	50	67	0.38
June 8	91	59	72	5.80

For week ending	Temperature			Precip-itation* (inches)
	Max.	Min.	Ave.	
June 15	95	55	75	0.79
June 22	88	51	70	0.25
June 29	94	53	77	0.04
July 6	95	53	77	T
July 13	91	53	72	T
July 20	98	63	81	0.42
July 27	99	61	78	0.03
Aug. 3	98	67	82	0.21
Aug. 10	94	59	78	0.02
Aug. 17	93	52	75	0
Aug. 24	93	63	78	1.40

* Field was not irrigated. T means trace, an amount too small to measure.

1963 TOMATO VARIETY TRIALS FOR THE FRESH MARKET
Blacksburg, Virginia

F. H. Scott

The southwestern Virginia tomato variety trials were conducted as a part of the Southern Tomato Exchange Program.

Eight STEP selections and two check varieties, Rutgers and Homestead 24, were grown for evaluation at the Virginia Agricultural Experiment Station.

Experimental Procedure and Growing Conditions

Location: V.P.I. Horticulture Farm, Montgomery County, 5 miles south of Blacksburg, Virginia.
Elevation: 2040 feet.
Soil: Groseclose silt loam; pH 6.2.
Previous crop: Small grain.
Plot size: One row of 12 plants (20 x 6 feet). Data taken on center 10 plants in each row.
Plot design: Split plot.
Replications: Four
Spacing: Plants 20 inches apart in row and 6 feet between rows.
Fertilization: Applied at the rate of 1200 lb. per acre 5-10-5; 21 days before field setting broadcast at the rate of 700 lb., 12 days befort setting placed in rows at the rate of 200 lb., and 10 days after field setting side-dressed at rate of 300 lb. Also 0.5 pint per plant of starter solution (3 lb. 10-52-17 to 100 gals. water) applied at field setting.
Field planting date: May 21.
Cultivation: Frequently enough to control weeds.
Pesticides: Maneb plus Malathion (when needed) as spray and chlordane in starter solution.
Growing conditions: See Table No. 8.

Miscellaneous Comments on Data Recorded

STEP 372, STEP 388, and STEP 390 in the 1963 trials were also in the 1962 trials. Homestead 24 was in the trials in 1962 and 1963 and Rutgers in 1963 as check varieties. New entries this season were STEP 373, STEP 382, STEP 397, STEP 401, and STEP 410.

There was a one-week interval between each harvest, which was too long a period during warm weather, but available time permitted no shorter intervals. Fruit was picked a little after the mature-green stage when a small spot of color showed on the blossom end which is usually called the "breaker" stage. During warm weather, a considerable number of fruit had passed the breaker stage with a relatively few even reaching red ripe.

The yields of marketable fruit in tomato variety trials in this area are usually high as compared to other areas of Virginia. This season the average yield at Blacksburg was 17.4 tons. The average yield for the 6-year period, 1958-1963, was 20 tons.

Yield appeared to be about average for the past 3 seasons. Homestead 24 yield of marketable fruit was 12.6 tons in 1961, 20.6 tons in 1962, and 16.6 tons in 1963 which is also the average yield for the 3 seasons.

The average weight (Table No. 5) of fruit for all entries was within a range of 4.0 oz. to 5.4 oz.

Shoulder observations (Table No. 5) were difficult because the breaker stage of maturity did not always reveal the true shoulder color. Observations were made at the 2nd through the 6th harvests as there were enough red ripe fruit to make reasonably accurate observations.

Fruit was considered cracked (Table No. 5) if there was one growth crack 0.5 inch long or if a total of all growth cracks was 1.0 inch. All fruit for the entire season were checked for growth cracks. Cracking rate was relatively low this season. The average percent cracked of all fruit of Rutgers and Homestead 24 was 12.5% in 1963, 35.5% in 1961, and 29.5% in 1960. (Rutgers was not in the 1962 trials.)

Firmness of the fruit (Table No. 5) was measured with an Asco Firmness Meter using a prestress weight of 800 grams, a test weight of 1700 grams, and a linear operation of 5 seconds. Ten fruit at the pink stage of maturity from a harvest 92 days from field setting were tested for firmness. More fruit should have been tested from more harvests but lack of time prevented additional tests.

Disease observations were recorded 99 days after field setting. The only important disease (Table No. 5) in the field was early blight.

Maturity of the fruit of all entries was probably delayed a few days by a cool, overcast period shortly after field setting. The earliest maturing entry was 71 days from field setting (Table No. 7).

None of the entries were highly concentrated in yield (Table No. 7).

The general shape of entries was oblate spheroid to globular, with an average ratio of depth to width of 95% and ranging from 91% to 100%.

General Notes on Entries

STEP 382 produced the highest yield of both total marketable and U. S. 1's with STEP 410 second in both grades. STEP 388, STEP 372, and STEP 401 made up the lowest yield group in these grades.

In general rating of exterior appearance STEP 382 was best and STEP 410 poorest.

In general rating of interior appearance STEP 397 was best and STEP 388 poorest.

In general over-all rating STEP 382 was highest with STEP 397 next.

In time of maturity all entries were mid-season except STEP 401 was early mid-season and STEP 410 and Rutgers were late mid-season.

In average general shape, STEP 388 was flattest with a depth to width ratio of 91% and STEP 373 and STEP 382 were globular.

STEP 373 was rather seriously affected by early blight 71 days after field setting while other entries range from no symptoms to only slight symptoms, but 4 weeks later the affect of early blight on STEP 373 was only average for the field while STEP 388 and Homestead 24 were much more intensely affected.

Comments on Individual Entries

(For more details see Tables 5 to 7. The comments below are based on statistical significance of yields and on weighted scores of other qualities as related to other entries in this trial)

Homestead 24 - The total marketable yield of this "check" variety was a little below average and the yield of U. S. 1's was about average. Appearance of exterior and interior of the fruit was a little below average. The vines were satisfactory. The general over-all rating was a little below medium.

Rutgers - The total marketable yield of this "check" variety was a little below average and the yield of U. S. 1's was about average. Appearance of the exterior and interior of the fruit was a little below average. The vines were fairly satisfactory. The general over-all rating was a little below medium.

STEP 372 - A little below average in total marketable and U. S. 1's yields. Appearance of the exterior of the fruit was a little below average and the interior was average. The vines were only fairly satisfactory as they were somewhat lacking in uniformity of size. The general over-all rating was a little below medium.

STEP 373 - The total marketable yield was a little below average and the yield of U. S. 1's was about average. The appearance of the exterior of the fruit was average and the interior was very good although the gel was a little off-color. The vines were fairly satisfactory. The general over-all rating was medium.

STEP 382 - Highest in the trials of total marketable and U. S. 1's yields. The appearance of the exterior of the fruit was also best in the trials but the interior was a little below average. The vines were unsatisfactory as the rather sprawling growth and relatively sparse foliage exposed many of the fruit. The general over-all rating, however, was the highest in the trials.

STEP 388 - A little below average in total marketable and U. S. 1's yield. The appearance of the exterior of the fruit was a little below average, as a result mainly of poor color, and the interior was only fair also because of poor color. The vines were satisfactory. The general over-all rating was a little below medium.

STEP 390 - A little below average in total marketable and U. S. 1's yield. Appearance of the exterior and interior of the fruit was a little below average as the gel was somewhat off-color. The vines were fairly satisfactory. The general over-all rating was a little below medium.

STEP 397 - The total marketable yield was a little above average and the yield of U. S. 1's was about average. The appearance of the exterior of the fruit was a little above average and the interior was excellent, being the best in the trials. The vines were fairly satisfactory. The general over-all rating was a little above medium.

STEP 401 - A little below average in total marketable and U. S. 1's yields. Appearance of exterior of the fruit was a little below average, but the interior was a little above. The average weight of the fruit was a little too low. The vines were fairly satisfactory although the edges of many of the leaflets curled upward. This entry was the earliest in the trials and could probably be classed as early mid-season. The general over-all rating a little below medium.

STEP 410 - Relatively high in yields of both total marketable and U. S. 1's. The appearance of the exterior of the fruit was unsatisfactory because of roughness but the interior was a little above average. The vines were satisfactory, being uniform and neat. This entry was later than all others except Rutgers and could probably be classed as late mid-season. The general over-all rating was medium.

Table No. 5 - Eight Tomato Numbered Selections of the Southern Tomato Exchange Program and Two Tomato Varieties Tested for Fresh Market Qualities at Blacksburg, Virginia. (Yields, % 1's, fruit weight, % cracking, and seed sources and ratings of shoulders, firmness, and disease.)

Entry	Average yield per acre (1) (means of 4 replications)			Percent U.S. 1's of total marketable	Average marketable fruit weight for season	Shoulder rating (2)		Cracking (3)			Firmness rating (4)	Lack of disease (5)	Seed source (6)
	Total marketable U.S. 1's U.S. 2's U.S. 3's	U.S. 1's	U.S. 2's U.S. 3's			Color	Smoothness	Total	Radial	Concentric			
	cwt.	cwt.	cwt.	%	oz.			%	%	%			
STEP 382	440 a	311 a	129 ab	71	4.9	6	6	5	1	4	5	8	4
STEP 410	428 ab	281 ab	147 a	66	5.4	4	3	8	5	3	6	7	2
STEP 397	359 bc	233 bc	126 ab	65	5.1	5	5	11	6	5	5	7	5
Rutgers	332 c	226 bc	106 bc	68	5.4	5	5	15	6	9	5	6	1
Homestead 24	331 c	223 bc	108 bc	67	4.4	4	4	10	7	3	5	3	1
STEP 373	327 c	237 bc	90 c	72	4.3	5	5	16	8	8	5	6	5
STEP 390	323 c	198 c	125 ab	61	4.7	5	5	12	4	8	5	6	2
STEP 388	313 c	200 c	113 bc	64	4.6	4	4	5	2	3	4	3	3
STEP 372	308 c	211 c	97 c	69	5.0	5	4	19	9	10	5	8	5
STEP 401	303 c	190 c	113 bc	63	4.0	5	5	6	1	5	5	6	6

(1) The superscriptions (a, b, c) indicate the statistical significance of the yield figures at the 5% level. In each column, data bearing a particular letter are significantly different from those not having this letter.

(2) Shoulder ratings: 1, very poor; 9, very good.

(3) Cracking: Figures are the percent cracked fruit of all fruit harvested.

(4) Firmness rating: 5 is average firmness for the trials (within a range of 50 to 54 units); 4 is slightly softer (55 to 59 units); 6 is slightly firmer (45 to 49 units).

(5) Lack of disease: The only important disease in the field was early blight. Rating for lack of early blight was 1, very intense and/or dead to 9, no symptoms evident.

(6) Seed sources: 1, Asgrow Seed Co.; 2, Florida-Walter; 3, Florida-Walter and Hayslip; 4, Missouri-Lambeth; 5, S.E.V.B.L., Charleston, S.C.-Andrus; 6, U.S.D.A., Beltsville, Md.-Webb.

Table No. 6 - Fruit and Plant Descriptions* of Entries in the Tomato Variety Trials, Blacksburg, Virginia, 1963.

Entry	Fruit										Plant		
	Exterior				Interior								
							Faults		Wall thickness				
	General appearance (1)	Color (1)	Smoothness (2)	Uniformity (1)	Color (1)	Lack of mushiness (3)	Lacking (4)	Description (5)	Outer (6)	Cross (6)	Size (7)	Growth habit (8)	Foliage density (9)
STEP 382	7	7	9	4	3	7	9	-	7	5	7	3	3
STEP 410	2	6	2	2	6	8	9	-	9	6	4	8	7
STEP 397	7	9	4	4	9	6	9	-	5	4	6	4	5
Rutgers	4	6	5	5	4	5	9	-	6	5	6	6	6
Homestead 24	3	3	4	3	4	5	6	G-F	3	4	4	6	5
STEP 373	5	5	7	8	8	4	8	G	5	6	5	5	5
STEP 390	3	4	6	6	5	4	7	G	5	4	4	4	5
STEP 388	4	2	5	6	2	6	9	-	2	4	3	7	6
STEP 372	4	4	5	4	6	3	9	-	8	6	6	5	4
STEP 401	2	6	2	2	6	8	9	-	9	5	3	6	5
Average	5	5	5	5	5	5	8	-	5	5	5	5	5

* All descriptive numbers are ratings of 1 to 9, as related to other entries in this trial.

(1) Rating: 1, very poor; 9, very good.
(2) Rating: 1, very rough; 9, very smooth.
(3) Rating: 1, very mushy; 9, very firm.
(4) Rating (lack of distinct faults): 1, faults of such intensity that fruit is worthless; 9, no important faults evident in appearance.
(5) Description (of fault): F, fiber cream color or yellowish; G, gel was not the satisfactory translucent reddish-amber color.
(6) Rating: 1, very thin; 9, very thick.
(7) Rating: 1, very small; 9, very large.
(8) Rating: 1, very sprawling; 9, very erect.
(9) Rating: 1, very open and/or sparse and/or type of growth exposes much of fruit to direct sunlight; 9, very dense with fruit well covered.

Table No. 7 - Percent Marketable Yield at Each Harvest of Total Marketable Yield for the Season of Tomatoes in Replicated Fresh Tomato Trials for 1963 Season at Blacksburg, Virginia.

Entry	Approximate % of total yield at each harvest							
	7/31 71*	8/7 78*	8/14 85*	8/21 92*	8/28 99*	9/4 106*	9/11 113*	9/18 120*
STEP 401	1	7	7	27	24	20	12	2
STEP 382	**	6	4	12	27	27	18	6
STEP 373	**	5	2	11	29	23	21	9
Homestead 24	**	4	3	16	35	25	15	2
STEP 397	**	4	3	16	30	23	19	5
STEP 390	0	4	3	11	25	26	22	9
STEP 372	**	3	1	6	23	30	20	17
STEP 388	0	3	3	19	29	27	15	4
STEP 410	0	1	3	10	24	29	21	12
Rutgers	**	1	2	6	21	28	28	14
Averages	**	4	3	13	27	26	19	8

* Days from field setting.
** Less than 0.5%.

Table No. 8 - Climatological and Irrigation Data in 1963 at the V.P.I. Horticulture Farm, 5 miles south of Blacksburg, Virginia.

For week ending	Temperature			Precipitation (inches)
	Max.	Min.	Ave.	
May 18	79	43	60	1.22
May 25	78	37	59	1.06*
June 1	77	49	63	0.78
June 8	85	46	67	1.31
June 15	92	50	72	0
June 22	81	47	66	0.90
June 29	87	47	69	0.26
July 6	93	48	72	0.22
July 13	85	48	68	0.47
July 20	91	56	74	1.27

For week ending	Temperature			Precipitation (inches)
	Max.	Min.	Ave.	
July 27	89	58	71	0.85
Aug. 3	95	59	74	0.07
Aug. 10	92	53	73	0.30
Aug. 17	88	42	67	0.60
Aug. 24	91	56	73	1.04*
Aug. 31	87	52	68	0.47
Sept. 7	87	45	67	1.44
Sept. 14	85	50	67	0.10
Sept. 21	86	46	65	0

* Including 1-inch irrigation.