

1962 Variety Trials

TOMATO
SWEET POTATO

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Contents

	Page
Tomato variety trials - general	3
Tomato variety trials - by area	
Warsaw	3
Blacksburg	14
Sweet potato variety trials	20

1962 TOMATO VARIETAL TRIALS

Many new and promising tomato varieties and seedlings are being developed by agricultural experiment stations of several states, by the U. S. Department of Agriculture, and by commercial seedsmen. Tomato growers need information about varieties pertaining to adaptability, yield, disease-resistance, and processing qualities. Varieties differ widely in adaptation 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 at Warsaw in the Coastal Plain area of eastern Virginia and at Blacksburg in the mountainous section of western Virginia. Canning trials were conducted only at Warsaw which is within an important canning area of Virginia. If commercial tomato canning increases in western Virginia the canning trials will be conducted also in that area.

Both trials are in participation with the Southern Tomato Exchange Program (STEP), which is a cooperative tomato variety testing program at 42 locations in 17 states, Haiti, Mexico, and Puerto Rico. STEP has facilitated rapid testing and accurate evaluation of many new tomato selections.

1962 TOMATO VARIETY TRIALS FOR FRESH MARKET AND CANNING Warsaw, Virginia

Fresh market: F. H. Scott, H. M. Camper, Jr.
Canning: C. B. Wood, F. H. Scott, H. M. Camper, Jr.

Included in the fresh market trials were 6 breeding lines of the Southern Tomato Exchange Program and 2 check varieties, Rutgers and Homestead 24. Also in the fresh market trials were the relatively new varieties ES-24 and Success. Included in the canning trials were 5 breeding lines of the Southern Tomato Exchange Program and 1 check variety, Campbell 146. Also in the canning trials were the varieties Delsher, ES-24, and Success and the Virginia Agricultural Experiment Station's breeding line V-31. The experimental procedure and growing conditions were as follows:

Location: Richmond County near Warsaw, Virginia.
Elevation: 140 feet.
Soil: Sassafras sandy loam.
Soil pH: 7.0
Previous crop: Small grain.
Plot sizes: One row; records taken on 10 plants in fresh market plots and 16 plants in canning plots.
Plot design: Split plot
Replications: Four.
Spacing: Plants 3 feet apart in row, 5 feet between rows.
Fertilization: Applied at the rate of 1200 lb. per acre 5-10-10; 14 days before field setting broadcast at the rate of 700 lb., 6 days before placed in rows at the rate of 200 lb., 21 days after field setting sidedressed at the rate of 300 lb. Also 0.5 pint per plant at field setting of starter solution (3 lb. 10-52-17 to 100 gals. water).
Field planting date: April 24.

Cultivation: Frequently enough to control weeds.

Pesticides: Sevin dust, TDE-maneb dust, chlordane (in starter solution).

Growing conditions: Fairly good although lack of moisture probably reduced the July 20 harvest. For more details see Table No. 7.

Processing procedure: Harvests of "canning ripe tomatoes" were made weekly. The first harvest was on July 9 and the sixth and last harvest August 13. The fruit harvested at the first and last pickings was not sufficient in quantity for canning. From each entry of each harvest, except the first and sixth harvests, 12 pounds of U.S. No. 1 fruit were canned as whole tomatoes. The percent yield of peeled, cored, and trimmed fruit was calculated from each 12 pounds of U.S. No. 1 fruit. The canning procedure was as follows:

Preparation: Soaking in fresh water to remove dirt. Scalding in hot water at 195° F. for 45 seconds. Immersion in cold water. Peeling and coring.

Filling: Hand filling 11 ounces of tomatoes into #303 cans. Addition of 25 grain (NaCl) salt tablet to each can. Topping off each can with natural tomato juice derived from peeled and cored tomatoes. Leaving 3/8" headspace.

Exhausting: Steam exhaust to an average can temperature of 135° F. followed by closing.

Processing: Agitator cooker, 11 rpm, 9 minutes at 212° F., then air cooled.

Notes on Entries Tested for the Fresh Market

Rutgers, Homestead 24, STEP 348, STEP 352, and STEP 361 in the 1962 trials were also in the trials of 1961. New entries this season were STEP 372, STEP 388, STEP 390, ES-24, and Success.

The number of days between harvests ranged from 2 to 6 with an average period of 4.1 days. 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 37 days was considerably shorter than usual for our tomato trials in this area as a result of injury by disease. Gray leaf spot affected all the varieties and, with the exception of STEP 348 and STEP 372, the damage was serious. Dusting equipment used did not give adequate coverage of maneb and gray leaf spot spread beyond control. We are arranging to use spray equipment for the 1963 season.

In total marketable yield (Table No. 1) STEP 361 was relatively high and also highest in percent of U.S. 1's. No other entries were higher than Rutgers. Success was lowest in yield with STEP 388 and STEP 390 next lowest. STEP 372 was lowest in percent of U. S. 1's.

The average weight (Table No. 1) of fruit for all entries was within an acceptable range. STEP 348, STEP 352, and STEP 372 were the heaviest and STEP 388 was the lightest.

Shoulder observations (Table No. 1) were difficult because the breaker stage of maturity did not always reveal the ripe shoulder color. However, enough red ripe fruit was available to make reasonably accurate observations. STEP 372 had the best colored shoulders followed in order by STEP 348 and ES-24. STEP 361 and STEP 390 had fairly smooth shoulders while those of STEP 348 and STEP 372 were rather rough.

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 high this season, averaging nearly 34% of all fruit for the entire trial. STEP 388 and ES-24 had the lowest percent of cracked fruit while STEP 372 and Rutgers had the highest.

Firmness of the fruit (Table No. 1) was measured with an Asco Firmness Meter using a prestress weight of 800 grams, a test weight of 1500 grams, and a linear operation of 5 seconds. A relatively small number of red ripe fruit per entry was tested for firmness 30 hours after a harvest that was 91 days from field setting date. More fruit should have been tested from more harvests but lack of time prevented additional tests. Test indicated that ES-24 was the firmest with STEP 361 next. Other entries varied from average to slightly softer.

Disease observations (Table No. 1) were recorded 93 days after field setting. No symptoms of Fusarium wilt were observed. Some early blight was noted but gray leaf spot was the greatly predominant disease in the field. STEP 348 appeared to have the least amount of symptoms of gray leaf spot with STEP 372 next. Success and Homestead 24 were the most intensely affected.

Success and STEP 388 were somewhat earlier in maturity (Table No. 4) than the other entries and STEP 352 was slightly earlier.

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. Homestead 24 and ES-24 seemed somewhat more concentrated in yield than the others.

The general shape of entries was oblate spheroid with average ratio of 96% and ranging from 93% for ES-24 and Homestead 24 to 99% for STEP 348, STEP 372, and STEP 390.

Notes on Entries Tested for Canning

Results of the canned product evaluation show that of the 10 entries in the trials, Campbell 146 and ES-24 had superior canning characteristics. The canning quality of STEP 372, Delsher, STEP 348, and STEP 390 was average while the quality of V-31, STEP 388, Success, and STEP 361 was below average.

The yields per acre as well as the percent of No. 1's of the Campbell 146 was significantly higher than any of the other 9 entries. There was no significant difference in the yield among ES-24, STEP 372, Delsher, STEP 348, STEP 388, and STEP 361. The yield per acre as well as the percent of

No. 1's of V-31, STEP 390, and Success were among the lowest. The disease, gray leaf spot, caused lower yields for all entries.

In the chemical analysis of the canned product STEP 361, STEP 390, and Delsher were higher than any of the others in soluble solids while STEP 388 and Success were lowest. The pH of all entries was below 4.5 with STEP 348 having the highest of 4.43 and STEP 388 having the lowest of 4.18. There was no significant difference among entries in the total acid content, expressed as citric acid.

ES-24 had a vitamin C content that was significantly higher while the content of vitamin C found in V-31 was significantly lower than that of the others in the tests.

The yield of the canned product ranged from 87% to 91% of the weight of the raw product. ES-24, STEP 390, and Delsher had the highest percent and Success had the lowest.

Comments on Individual Entries

(For more details see Tables 1 to 6. "Over-all quality" ratings for fresh market trials include, in addition to characters of the fruit, scores on plant growth habit, foliage density, and size and scores on lack of disease.)

Campbell 146 - Fresh market: This "canning check" variety was not included in the fresh market trials.

Canning: The weighted over-all score was one of the highest because of the excellent color of the canned product. The wholeness of this variety was rated good while flavor was among the poorest. Yield of the canned product was good. The size was too large for 303 cans.

Delsher - Fresh market: This variety was not included in the fresh market trials.

Canning: The wholeness factor was good while color and flavor were a little above average. The percent soluble solids was among the highest and the ascorbic acid content was about average. The size was not as large as Campbell 146 but still too large for 303 cans. The percent raw stock recovered was the highest.

ES-24 - Fresh market: Ranking in the 5th group in yield this variety was rated best in over-all quality although the general appearance was only average. Firmness, low percent of cracking, and lack of internal faults contributed to the high rating.

Canning: The superior rating given for wholeness and the good rating for color placed this variety within the top group in the weighted over-all score. Its flavor scored among the lowest. The ascorbic acid content was the highest. The yield of canned product was excellent.

Homestead 24 - Fresh market: This "check" variety was third in yield in the trials and rated average in over-all quality.

Canning: This variety was not included in the canning trials.

Rutgers - Fresh market: This "check" variety was second in yield in the trials, but was rated poorest in over-all quality.

Canning: This variety was not included in the canning trials.

STEP 348 - Fresh market: Ranking fourth in yield this entry was rated a little below average in over-all quality, although the general appearance was slightly above average, the shoulder color was good, and the interior satisfactory. A high percent of cracking and rather rough shoulders reduced the rating. This entry appeared to be less affected by gray leaf spot than any others in the trials.

Canning: The wholeness was good. Color and flavor were a little above average. Ascorbic acid and soluble solids were below average. The yield per acre and the percent of No. 1's were about average.

STEP 352 - Fresh market: This entry was ranked in the 6th group for yield and rated average in over-all quality. The general appearance was only fair and interior rather poor, but shoulders and lack of cracking were fairly good. The plants were very large and somewhat sprawling.

Canning: This entry was not included in the canning trials.

STEP 361 - Fresh market: Ranked 1st in yield and percent of U. S. 1's, this entry also rated next to the best in over-all quality. Perhaps the most important faults are the interior which is rather poor in appearance and somewhat mushy and the rather deficient color of the shoulders. However, the relatively low percent cracking, smooth shoulders, high yield, and high percent of U.S. 1's resulted in this entry being selected as the best in the fresh market trials.

Canning: The canning qualities of this variety in the 1961 trials rated very high, however, this year it ranked lowest in weighted over-all score. This low score was due primarily to poor color and to wholeness characteristics. The flavor was the most desirable of all entries tested. Analysis showed that the percent soluble solids was the highest of any entries tested.

STEP 372 - Fresh market: This entry was ranked in the 5th group in yield with a rather poor over-all quality rating. It had many excellent characters but the highest percent cracking, and the lowest percent U. S. 1's in the trials and rather rough shoulders greatly reduced its quality rating. The general appearance was considered best in the trials, the shoulders were well colored, the interior was best in color and general appearance with thick cross walls and the plant was relatively low in symptoms of disease. This entry should be tested again.

Canning: The weighted over-all rating was good. Flavor was given a high score as well as wholeness. The color was acceptable. The ascorbic acid content was next to the highest.

STEP 388 - Fresh market: Ranking in yield in the group next to the lowest in the trials this entry was rated slightly above average in over-all quality. It had the lowest percent cracking in the trials, but the general appearance and shoulder color were poor and the interior was only fair. The vines were relatively small.

Canning: The weighted over-all score was in the lowest group because of

poor color and flavor. Chemical analysis showed that soluble solids and ascorbic acid were low. Yield per acre was only average and the percent of No. 1's was the lowest in the trials.

STEP 390 - Fresh market: This entry was ranked in yield in the group next to the lowest and rated slightly above average in over-all quality. The percent cracking was a little less than average and the shoulders were smooth. The general appearance was only fair, shoulder color rather poor, and interior color fairly poor with somewhat greenish gel.

Canning: Wholeness was above average, but color and flavor were below average, thus giving an over-all score of about average. The percent of soluble solids was high, but ascorbic acid was among the lowest. The yield per acre was low.

Success - Fresh market: Ranked lowest in yield this variety was rated next to poorest in over-all quality. The percent cracking was a little less than average, but the general appearance and color were rather poor. The interior was somewhat below average in general appearance and color with rather greenish gel and the outer and inner walls were rather thin.

Canning: The weighted over-all score was next to the lowest because of poor ratings in color, wholeness, and flavor. The yield per acre was the lowest of the ten entries tested.

V-31 - Fresh market: This entry was not included in the fresh market trials.

Canning: The flavor factor rated second highest while wholeness and color were below average giving a weighted over-all score of less than average. The percent soluble solids was about average but the ascorbic acid content was very low.

Table No. 1 - Eight Tomato Varieties or Breeding Lines of the Southern Tomato Exchange Program and Two Other Varieties, ES-24 and Success, Tested for Fresh Market Use in 1962 at Warsaw, Virginia. Yields, percent 1's, fruit weight, cracking, and ratings for shoulders, firmness and disease.

Variety or Breeding Line	Average yield per acre (1) (Means of 4 replications)			Percent U.S. 1's of total marketable	Average market- able fruit weight for season	Shoulder rating (2)		Cracking (3)			Firmness rating (4)	Lack of disease (5)	Seed source (6)
	Total market able	U.S. 1's	U.S. 2's U.S. 3's			Color	Smoothness	Total	Radial	Concentric			
	U.S. 1's U.S. 2's U.S. 3's												
STEP 361	cwt. 269 a	cwt. 176 a	cwt. 93 c	65	oz. 6.3	4	7	% 22	% 12	% 10	6	4	5
Rutgers	249 ab	126 bc	123 ab	51	6.6	5	4	54	49	5	5	4	1
Homestead 24	247 abc	137 b	110 bc	55	6.2	3	5	36	35	1	4	2	1
STEP 348	243 abcd	132 bc	111 bc	54	6.7	7	4	43	42	1	4	8	7
STEP 372	224 bcde	87 d	137 a	39	6.7	8	4	56	56	0	5	7	7
ES-24	218 bcde	111 c	107 bc	51	5.7	6	6	19	17	2	7	4	3
STEP 352	216 cde	115 bc	101 bc	53	6.7	5	6	29	26	3	4	3	6
STEP 388	213 e	114 c	99 c	54	5.6	2	5	16	11	5	5	3	5
STEP 390	203 e	110 c	93 c	54	6.0	3	7	30	22	8	5	4	4
Success	152 f	63 e	89 c	41	6.3	4	5	31	27	4	4	2	2

- (1) The superscriptions (a, b, c, d, e) indicate the statistical significance of the yield figures at the 5% level. In each column data bearing a particular superscript letter are significantly different from those not having this letter.
- (2) Shoulder rating: 1, very poor to 9, very good.
- (3) Cracking: Counts made at all harvests. Figures are the percent cracked fruits 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); 7 is considerably firmer (40 to 44 units).
- (5) The only important disease in the field was gray leaf spot. Rating for lack of gray leaf spot injury was 1, very intense and/or dead to 9, no symptoms evident.
- (6) Seed sources: 1 Asgrow Seed Company, 2 Corneli Seed Company, 3 Eastern States Farmers' Exchange, 4 Florida-Walter, 5 Florida-Walter and Hayslip, 6 Hawaii-Gilbert and McGuire, 7 S.E.V.B.L., Charleston, South Carolina-Andrus.

Table No. 2 - Fruit and Plant Descriptions* of Fresh Market Tomato Variety Trials, Warsaw, Virginia, 1962.

Variety or Breeding Line	Fruit											Plant				
	Exterior				Interior							Size	Growth habit	Foliage density	Vigor at field setting	Percent off-type
	General appearance	Color	Smoothness	Uniformity	General appearance	Color	Wall Thickness		Lack of mushiness	Faults						
							Outer	Cross		Lacking	Description					
(1)	(1)	(2)	(1)	(1)	(1)	(3)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(1)		
Step 361	5	5	4	4	3	3	6	4	4	5	FS	5	5	5	8	0
Rutgers	6	7	6	5	6	6	5	6	6	8	F	5	7	7	8	0
Homestead 24	8	5	7	8	5	5	4	4	7	8	F	5	7	5	8	0
STEP 348	6	6	5	6	7	8	6	6	6	9	-	5	6	7	7	0
STEP 372	9	5	5	9	9	9	6	9	7	9	-	7	7	7	8	0
ES-24	5	6	5	5	6	6	5	5	9	9	-	5	4	5	8	2.5
STEP 352	4	4	3	4	2	1	6	2	5	5	FS	9	3	4	8	2.5
STEP 388	1	5	4	3	4	5	4	4	7	6	FS	4	6	4	9	0
STEP 390	4	3	4	6	5	3	6	5	7	7	G	5	6	6	9	0
Success	2	2	2	2	4	4	2	2	3	7	GS	4	4	3	6	0

- * All descriptive numbers are ratings of 1 to 9 except in column "percent off-type"
- (1) Rating: 1, very poor to 9, very good.
 - (2) Rating: 1, very rough to 9, very smooth.
 - (3) Rating: 1, very thin to 9, very thick.
 - (4) Rating: 1, very mushy to 9, very firm.
 - (5) Rating (lack of distinct faults): 1, faults of such intensity that fruit is worthless to 9, no important faults evident in appearance.
 - (6) F, yellowish fiber. G, somewhat greenish gel. S, greenish-yellow plotching in outer wall.
 - (7) Rating: 1, very small to 9, very large.
 - (8) Rating: 1, very sprawling to 9, very erect.
 - (9) Rating: 1, very open and/or sparse to 9, very dense.

Table No. 3 - Ten Tomato Varieties Tested for Canning Characteristics in 1962 at Warsaw, Virginia. Total yield for canning and chemical and organoleptic evaluation of the canned product.

Variety	Average Canning Yield/Acre (Means of 4 replications)			Organoleptic Evaluation (1) (Co-op technical panel)				Chemical Analysis (2) (Mean of duplicates)			
	Total market- able *	Percent U.S. 1's	Percent U.S. 2's	*Color	Whole- ness *	* Flavor	Weighted overall score	*Percent soluble solids	*Percent acid as (3) citric	Ascorbic * acid mg/100 ml.	pH *
Campbell 146	cwt. 340 a	50	50	4.2 a	4.1 bc	3.0 c	4.1	5.3 abc	.65 a	24.9 de	4.31 abc
ES-24	286 b	41	59	3.9 a	4.6 a	3.1 c	4.1	5.0 bc	.65 a	35.2 a	4.30 bc
STEP 372	283 b	43	57	3.3 bc	4.2 b	3.8 ab	3.7	5.1 bc	.64 a	31.9 ab	4.40 ab
Delsher	269 b	47	53	3.5 b	4.1 bc	3.5 abc	3.7	5.5 ab	.64 a	25.7 cde	4.39 ab
STEP 348	269 b	40	60	3.3 bc	4.1 bc	3.4 abc	3.6	5.3 abc	.65 a	29.9 bc	4.43 a
STEP 388	257 b	25	75	2.9 d	3.9 bc	3.3 abc	3.3	4.8 cd	.65 a	26.2 cd	4.18 d
STEP 361	255 b	36	64	2.8 d	2.7 e	3.8 a	2.9	5.7 a	.65 a	23.5 de	4.43 a
V-31	202 c	34	66	3.0 cd	3.8 c	3.7 ab	3.4	5.3 abc	.64 a	21.1 e	4.36 abc
STEP 390	187 c	32	68	3.3 bc	4.2 bc	3.3 abc	3.6	5.5 ab	.65 a	23.7 de	4.35 abc
Success (Su)	145 d	35	65	3.1 cd	3.5 d	3.2 bc	3.2	4.4 d	.65 a	22.0 de	4.25 cd

- * The superscripts (a, b, c, d) indicate the statistical significance at the 1% level of each characteristic. For example, in each column, data bearing an "a" superscript are significantly different from those not having an "a", those having "b" are significantly different from those not having a "b", etc.
- (1) Organoleptic evaluation replicated 3 times for each variety, and rated for overall average as follows: Color 30, wholeness 20, flavor 5, scoring on basis 1 (low) to 5 (high) using six judges.
- (2) Chemical analyses from 2 cans for each of 3 harvests.
- (3) Percent acid as citric - total acidity.

Note: Seed sources were the same as those for fresh market.

Table No. 4 - Percent Marketable Yield at Each Harvest of Total Marketable Yield of Tomatoes in Replicated Fresh Tomato Trials for 1962 Season at Warsaw, Virginia

Variety or breeding line	Approximate percent of total yield at each harvest									
	6/26 63*	7/2 69*	7/5 72*	7/10 77*	7/13 80*	7/18 85*	7/20 87*	7/24 91*	7/27 94*	8/2 100*
Success	1	12	13	12	4	16	5	18	12	7
STEP 388	1	10	12	14	5	22	4	10	12	10
STEP 352	1	5	7	6	6	17	7	20	14	17
Homestead 24	**	6	7	7	4	26	9	24	10	7
STEP 361	**	4	7	10	3	15	7	17	19	18
STEP 390	**	4	6	6	4	14	5	22	21	18
ES-24	**	3	3	7	3	20	10	26	17	11
STEP 348	**	2	3	4	3	13	9	27	18	22
Rutgers	**	1	3	6	4	10	7	12	21	36
STEP 372	0	1	3	3	3	14	9	21	17	29
Average	**	4	6	8	4	17	7	20	16	18

* Days from field setting

** Less than 0.5%

Table No. 5 - Percent Marketable Yield at Each Harvest of Total Marketable Yield of Tomatoes in Replicated Canning Tomato Trials for 1962 Season at Warsaw, Virginia.

Variety or breeding line	Approximate percent of total yield at each harvest					
	7/9	7/16	7/23	7/30	8/6	8/12
STEP 348	4	4	13	43	27	9
STEP 361	6	12	12	28	33	9
STEP 372	3	4	13	39	31	10
STEP 388	11	16	20	31	20	2
STEP 390	5	13	16	31	30	5
Success	14	19	16	33	17	1
ES-24	4	8	18	43	23	4
Campbell 146	6	8	15	41	26	4
Delsher	4	8	13	28	34	13
V-31	7	7	17	44	21	4

Table No. 6 - Percent of Raw Stock Recovered for Canning at Each Harvest.
Canning Tomato Trials 1962 at Warsaw, Virginia.

Variety	Percent of raw stock remaining for canning after peeling, trimming and coring at each harvest			
	Ave. for 7/24 & 7/31	7/24	7/31	8/7
		%	%	%
Delsher	91	90	91	88
ES-24	91	89	92	85
STEP 390	91	92	89	82
Campbell 146	90	91	89	86
STEP 372	89	90	87	80
STEP 348	89	90	81	79
V-31	88	87	88	86
STEP 388	88	89	87	-
STEP 361	88	88	87	-
Success	87	89	85	-

Table No. 7 - Climatological Data in 1962 at Warsaw, Virginia.

For week ending	Temperature			Precipitation* (inches)	For week ending	Temperature			Precipitation* (inches)
	Max.	Min.	Ave.			Max.	Min.	Ave.	
Apr. 28	88	42	68	0	June 23	94	59	76	1.46
May 5	87	45	67	0.59	June 30	89	57	73	0.07
May 12	88	36	64	0.38	July 7	91	57	73	0.41
May 19	97	51	71	0	July 14	92	56	78	0.05
May 26	94	56	76	0.46	July 21	90	63	74	1.90
June 2	91	57	72	2.12	July 28	88	52	73	0.16
June 9	86	52	70	1.08	Aug. 4	89	60	74	2.10
June 16	90	60	73	2.74					

* Area was not irrigated.

1962 TOMATO VARIETY TRIALS FOR THE FRESH MARKET
Blacksburg, Virginia

F. H. Scott

This western Virginia tomato variety trial was conducted as a part of the Southern Tomato Exchange Program.

Six STEP selections and one named variety were grown for evaluation at the Virginia Agricultural Experiment Station. The experimental procedure and growing conditions were as follows:

Location: Montgomery County near Blacksburg, Virginia.

Elevation: 2040 feet.

Soil: Groseclose silt loam.

Soil pH: 6.5

Previous crop: Corn

Plot size: One row of 12 plants (30 x 6 feet). Data taken on center 10 plants in each row.

Plot design: Split plot.

Replications: Four.

Spacing: Plants 2.5 feet apart in row and 6 feet between rows.

Fertilization: Applied at the rate of 1200 lb. per acre 5-10-10; 21 days before field setting broadcast at the rate of 700 lb., 12 days before placed in rows at the rate of 200 lb., 21 days after field setting sidedressed at the rate of 300 lb. Also 0.5 pint per plant at field setting of starter solution (3 lb. 20-10-50 to 100 gals. water).

Field planting date: May 22.

Cultivation: Frequently enough to control weeds, except, as a result of shortage of labor, the field became very weedy by September 10 probably reducing the yields of the last 2 harvests.

Fungicides: Zineb.

Insecticides: Chlordane (in starter solution) and Malathion.

Growing conditions: See Table No. 11.

Notes on Varieties Tested

The yields of marketable fruit in tomato variety trials in this area are usually high as compared to other areas of Virginia. This season's average yield at Blacksburg of 22.3 tons was nearly 94% higher than the comparable average yield at Warsaw of 11.5 tons. The average yield at Blacksburg for the period 1958-1962 was 20.5 tons.

Homestead 24, STEP 348, STEP 352, and STEP 361 in the 1962 trials were also in the trials of 1961. New entries this season were STEP 372, STEP 388, and STEP 390.

The number of days between harvests ranged from 5 to 8 with an average of 7 days, 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.

In total marketable yield (Table No. 8) STEP 352 was highest with STEP 348 next, although STEP 348 and STEP 352 were both in the highest yield of U.S. 1's. STEP 361 and STEP 388 produced the lowest yield.

The average weight (Table No. 8) of fruit for all entries was within an acceptable range. STEP 352 produced the heaviest fruit and STEP 388 the lightest.

Shoulder observations (Table No. 8) were made at all harvests except the first. In color of shoulders all entries were about average except STEP 388 was rather poor. In smoothness of shoulders STEP 361 was a little above average and Homestead 24 and STEP 388 a little below.

Fruit was considered cracked (Table No. 8) 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 cracks. Average percent cracking of 6.6% for the trials was relatively low. The highest percent cracking was expressed in Homestead 24 and STEP 390 and the lowest in STEP 361, STEP 372, and STEP 388.

Firmness of the fruit (Table No. 8) 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. A relatively small number of 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. This test indicated that STEP 388 and STEP 390 were the firmest and STEP 372 was the softest.

The only important disease (Table No. 8) in the field was early blight. STEP 348 showed the least affect of this disease with STEP 372 next. It is interesting to notice that these 2 selections placed in the same relative position as it related to gray leaf spot in the Warsaw trials. Homestead 24 and STEP 388 were the most intensely affected.

None of the entries could have been classified as early in maturity although STEP 388 was somewhat earlier than the others. (Table No. 10)

None of the entries were highly concentrated (Table No. 10) in yield although Homestead 24, STEP 352, and STEP 361 were somewhat more concentrated than the others.

The general shape of entries was oblate spheroid to globular, with an average ratio of 96% and ranging from 93% for Homestead 24, STEP 388, and STEP 390 to 100% for STEP 372.

Comments on Individual Entries

(For more details see Tables 8 to 10. "Over-all quality" ratings include, in addition to characters of the fruit, scores on plant growth habit, foliage density, and size and scores on lack of disease.)

Homestead 24 - Ranked next to the lowest group in total yield and rated poorest in over-all quality. This variety was included in the trials as a check.

STEP 348 - Ranked second in total yield and, along with STEP 352, first in U.S. 1's, this entry was rated as one of the 2 entries next to the best in the trials in over-all quality. The color was uniformly good although the general appearance and shoulders were only average, and a relatively small number of the fruit approached an angular shape. The interior was satisfactory and there were less symptoms of disease than any other entry. This entry was considered to be the best in the trials.

STEP 352 - Ranked first in total yield and, along with STEP 348, first in U.S. 1's, this entry was rated slightly below average in over-all quality. The general appearance, although a little rough, was considered average as were the shoulders. The interior was mushy but the appearance was acceptable. The plants were very large, somewhat sprawling, and slightly lacking in foliage cover. Lack of disease symptoms was among the 3 best in the trials. This entry was considered to be next to the best in the trials.

STEP 361 - Ranking in the lowest group in total yield, but in the second group in U.S. 1's, this entry was rated as one of the 2 entries next to the best in the trials in over-all quality. The exterior of the fruit was uniformly very good in color and quite smooth, but the general appearance of the interior was rather poor and the color, with somewhat greenish gel and yellowish fiber, was considerably below average. Most of the culled fruit in the later harvests were the result of small size.

STEP 372 - Ranked in the third group or about average in total yield and in the second group in U. S. 1's, this entry was rated best in the trials in over-all quality. Although the shoulders were average and general appearance slightly below average, color was good, cracking low, and the interior in general appearance and color was the best of the entries. Lack of disease symptoms was among the 3 best in the trials.

STEP 388 - Ranking lowest in total yield and in U.S. 1's, this entry was rated about average in over-all quality. Perhaps the firmest fruit in the trials, relatively low in amount of cracking, and with acceptable interior, this entry produced rough fruit that was rather poor in general appearance and color. Disease symptoms were intense.

STEP 390 - Ranked in the third group or about average in total yield and in the second group in U.S. 1's, this entry was rated next to the lowest in over-all quality. Although the shoulders and general appearance were average, the fruit was rather poor in color and somewhat rough. The interior was fair, but the outer walls were a little thin and the color marred by a rather greenish gel and some yellowish fiber.

Table No. 8 - Seven Tomato Varieties or Breeding Lines of the Southern Tomato Exchange Program Tested for Fresh Market Use in 1962 at Blacksburg, Virginia. Yields, percent 1's, fruit weight, cracking, and ratings for shoulders, firmness, and disease.

Variety or breeding line	Average yield per acre (1) (means of 4 replications)			Percent of U.S. 1's 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			Color	Smoothness	Total	Radial	Concentric			
	U.S. 1's U.S. 2's U.S. 3's												
STEP 352	cwt. 553 a	cwt. 414 a	cwt. 139 a	75	oz. 5.2	7	5	6	1	5	6	6	4
STEP 348	535 ab	426 a	109 a	80	5.1	6	5	6	4	2	5	7	5
STEP 390	460 abc	320 ab	140 a	70	4.9	6	5	10	1	9	7	4	2
STEP 372	445 abc	353 ab	92 a	79	4.8	6	5	4	3	1	3	6	5
Homestead 24	411 bcd	298 abc	113 a	73	4.7	5	4	12	3	9	5	3	1
STEP 361	390 cde	318 ab	72 a	82	4.5	6	6	4	0	4	5	4	3
STEP 388	334 cde	218 bc	116 a	65	4.4	4	4	4	1	3	7	3	3

- (1) The superscriptions (a, b, c, d, e) indicate the statistical significance of the yield figures at the 5% level. In each column data bearing a particular superscript letter are significantly different from those not having this letter.
- (2) Shoulder rating: 1, very poor to 9, very good.
- (3) Cracking: Counts made at all harvests. Figures are the percent cracked fruits of all fruit harvested.
- (4) Firmness rating: 5 is average firmness for the trials (within a range of 64 to 68 units); 3 is softer than average (74 to 78 units); 4 is slightly softer than average (69 to 73 units); 6 is slightly firmer (59 to 63 units); 7 is firmer than average (54 to 58 units).
- (5) 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 Company, 2 Florida-Walter, 3 Florida-Walter and Hayslip, 4 Hawaii-Gilbert and McGuire, 5 S.E.V.B.L., Charleston, S.C.-Andrus.

Table No. 9 - Fruit and Plant Descriptions of Fresh Market Tomato Variety Trials, Blacksburg, Virginia, 1962.

Variety or breeding line	Fruit											Plant		
	Exterior				Interior							Size (7)	Growth habit (8)	Foliage density (9)
	General appearance (1)	Color (1)	Smoothness (2)	Uniformity (1)	General appearance (1)	Color (1)	Wall Thickness		Lack of mushiness (4)	Faults				
							Outer (3)	Cross (3)		Lacking (5)	Description (6)			
STEP 352	5	5	4	6	5	6	5	5	2	9	-	9	4	4
STEP 348	5	7	5	7	6	6	6	6	5	9	-	7	5	6
STEP 390	5	4	4	7	5	6	4	5	5	7	GF	6	5	6
STEP 372	4	7	5	7	7	7	5	5	5	9	-	7	5	7
Homestead 24	5	5	4	7	4	5	5	4	5	8	F	6	6	5
STEP 361	6	8	6	7	2	4	5	5	6	5	GFC	6	5	5
STEP 388	4	4	3	6	5	5	5	5	7	9	-	5	6	6

* All descriptive numbers are ratings of 1 to 9.

(1) Rating: 1, very poor to 9, very good.

(2) Rating: 1, very rough to 9, very smooth.

(3) Rating: 1, very thin to 9, very thick.

(4) Rating: 1, very mushy to 9, very firm.

(5) Rating (lack of distinct faults): 1, faults of such intensity that fruit is worthless to 9, no important faults evident in appearance.

(6) C, creamy colored core. F, yellowish fiber. G, somewhat greenish gel.

(7) Rating: 1, very small to 9, very large.

(8) Rating: 1, very sprawling to 9, very erect.

(9) Rating: 1, very open and/or sparse to 9, very dense.

Table No. 10 - Percent Marketable Yield at Each Harvest of Total Marketable Yield of Tomatoes in Replicated Fresh Tomato Trials for 1962 Season at Blacksburg, Virginia.

Variety or breeding line	Approximate % of total yield at each harvest							
	8/1 71*	8/9 79*	8/14 84*	8/22 92*	8/29 99*	9/5 106*	9/11 112*	9/19 120*
STEP 388	**	3	7	18	39	22	9	2
STEP 361	**	2	4	8	32	32	15	7
STEP 348	**	2	2	5	23	24	25	19
STEP 352	0	1	4	13	32	30	14	6
Homestead 24	0	1	3	13	41	24	14	4
STEP 372	0	1	3	5	23	23	32	13
STEP 390	**	1	2	10	27	31	23	6
Average	**	2	3	10	30	27	19	9

* Days from field setting.

** Less than 0.5%.

Table No. 11 - Climatological and Irrigation Data in 1962 at Horticulture Farm, Blacksburg, Virginia.

For week ending	Temperature			Precipitation (inches)	For week ending	Temperature			Precipitation (inches)
	Max.	Min.	Ave.			Max.	Min.	Ave.	
May 26	88	55	71	0.98	July 28	85	45	68	2.22*
June 2	85	55	68	1.21	Aug. 4	84	57	71	2.55
June 9	79	49	66	0.14	Aug. 11	85	47	71	0.08
June 16	82	47	67	0.76	Aug. 18	81	50	68	0.53
June 23	88	56	71	0.73	Aug. 25	93	50	72	0.19
June 30	85	48	68	0.52	Sept. 1	90	54	71	0
July 7	86	54	69	1.34	Sept. 8	89	47	69	1.69
July 14	89	52	73	0.39	Sept. 15	88	46	70	0
July 21	87	58	75	0.02	Sept. 22	73	31	57	1.70

* Including 1 inch irrigation.

SWEET POTATO VARIETY TRIALS - 1962
Eastern Shore, Virginia

F. H. Scott, C. B. Wood, A. V. Watts, E. M. Dunton, Jr.

The following data are a part of the results obtained from sweet potato variety trials conducted by the Virginia Agricultural Experiment Station in cooperation with The Virginia Truck Experiment Station. The trials participated in the National Sweet Potato Cooperators variety testing program. Five entries in the replicated trials and 14 entries in the observational plantings were supplied by the National Sweet Potato Cooperators. The 1962 season was the fourth in this series of trials.

Ten varieties or numbered seedlings of sweet potatoes were grown for evaluation at the Eastern Shore Branch of the Virginia Truck Experiment Station. A description of the experimental procedure and growing conditions and comments on data recorded are as follows:

Location: Accomack County near Painter, Virginia

Elevation: 30 feet.

Soil: Sassafras sandy loam. Soil pH 6.1.

Plot size: Five rows 30 feet long each. Yield records taken on center row.

Replications: Four.

Spacing: Plants 12 inches apart in rows 36 inches apart.

Fertilization: Beds were fertilized immediately after bedding by broadcasting 8-8-8 over the soil covering the roots at the rate of 4 ounces per square yard. Field was fertilized 33 days after field setting by sidedressing 3-9-12 at the rate of 1000 pounds per acre.

Fungicides: Just before bedding roots were dipped momentarily in a solution of 4 lb. of captan 50% wettable powder in 30 gals. of water. Just before field setting, the lower parts of the clipped sprouts were dipped in a solution of 6 lb. of Fermate in 30 gals. of water.

Field planting date: May 16.

Harvest date: September 26.

Cultivation: Frequently enough to control weeds.

Growing conditions: See Table No. 15.

Processing: Roots for processing were selected in the field at harvest time and were canned within 3 days of harvest. The roots ranged in diameter from 1 to 2 inches and in length from 2 to 5 inches. During processing the peel was removed by a ferris wheel type lye peeler and rod reel washer with a 17% lye bath at 212° F. During trimming operation, roots were kept in a cold water bath until packed in No. 3 (404 x 307) vacuum cans, 16 ounces per can. Syrup, consisting of 2/3 sucrose and 1/3 corn syrup and having a 30° Brix, was used for those roots that were packed in syrup. A vacuum of 27 inches was obtained on all cans for the vacuum pack at the time of closing. Both the syrup and vacuum packs were processed for 45 minutes at 240° F. Eight weeks after processing each variety was evaluated organoleptically for chromaticity (hue and saturation), uniformity, attractiveness, wholeness, lack of fibrousness, texture, and eating quality.

Notes on data recorded: Yields were recorded for sizes considered prime for the area of these trials. These were not "grade" sizes, but sizes we considered best suited to the area's market. Additional data were recorded on total marketable size. The total marketable size does not include over-size and jumbos which have little value in this area. Also yield data were recorded on small fresh, large canning, over-size and jumbos, and culls. Yield ratings are given in this report under the heading "Comments on Individual Entries." These ratings reflect our opinion of yield sizes most likely to bring satisfactory prices in the area of these trials. The ratings were based on statistically significant yield groupings at the 1% level and on a value of 50% for prime fresh size, 30% for prime canning, and 20% for total marketable size. Also under the heading "Comments on Individual Entries" are fresh market quality and sprout production ratings. The quality ratings for the fresh market were based on our observations, giving a value of about 46% for shape and smoothness, 36% skin color, and 18% raw flesh color. Sprout production ratings were based on observations at the first pulling. This trial did not participate in the regional sprouting tests of the National Sweet Potato Cooperators and actual sprout counts were not made. The sprout ratings do not express objective measurements, but only opinions.

Notes on Entries Tested for the Fresh Market

In total yield and in yield of prime sizes for canning, Nemagold was highest and B6521 lowest. In the fresh market prime sizes, Georgia Red produced the highest yield with B6708 next and L8-92 the lowest.

In quality all entries rated fairly well except V2158 was a little low and Georgia Red and L4-89 were considered to be rather poor.

Carotene content was relatively very high in L8-67 and high in L8-92, Centennial, and V2158. The content was lowest in Georgia Red.

The percent dry matter was highest in L4-89 and relatively low in V2158 and B6708.

Sprout production was rather high for Nemagold, Georgia Red, C. S. Goldrush, and V2158. It was somewhat low for L8-67.

Soil rot was rather intense in the field with L8-67 and L8-92 having the highest number of affected roots and L4-89 having no roots with symptoms of the disease. Mottle necrosis affected only Georgia Red and this entry was considerably damaged by the disease.

Notes on Entries Tested for Canning

In over-all canning qualities of 10 varieties in the trial V2158 and L8-67 rated the highest followed by C. S. Goldrush and L8-92. The color of these varieties was orange and dark orange with V2158 and L8-67 being brightest. The wholeness of V2158, L8-67, and L8-92 was excellent.

The canning quality of Nemagold and Centennial was only average for both the syrup and vacuum packs, while B6521, L4-89, Georgia Red and B6708 received scores that were below average.

Industrial processing characters for each of the replicated varieties may be found in Table No. 13.

Comments on Individual Entries

B6521 - Shape was generally satisfactory, but a relatively few had side roots. Skin was copper color and raw flesh varied from salmon color to deep salmon streaked with cream. Quality for the fresh market was rated good but the most profitable yield rating for this area was somewhat low. This entry was given the lowest rating in the trials for baking quality. The high amount of oversize and culls resulted in the low yield. When canned, the over-all appearance was poor due to lack of uniformity in color, low chromaticity, and poor wholeness and eating quality was poor. This entry does not offer much potential as a processing variety.

The production of sprouts was fair. Leaf shape was somewhat similar to Nemagold but were a deeper green and the plant growth was much heavier.

B6708 - The spindle shape was fair, but a considerable number had side roots. The skin was coppery-rose in color and the raw flesh was mixed, being light salmon and light cream and there was a lighter area near the surface. Quality for the fresh market was rated a little above medium and the most profitable yield rating for this area was considered fairly high. When canned, the color and appearance as well as the eating quality were the poorest of all varieties included in the trial.

Plants were supplied by T. J. Nugent of the Virginia Truck Experiment Station so we made no sprout production observations. The over-all color and size of the plants were somewhat similar to Goldrush although purpling of the veins was not so pronounced.

Centennial - This variety was used as a check. The root shape was fairly satisfactory, although a little too rough and many were a little too long. The skin was a tannish-copper with a satiny luster. The raw flesh was orange with a lighter area near the surface. Quality for the fresh market was rated good and the most profitable yield rating for this area was considered to be a little more than average. When canned, chromaticity was average while uniformity of color and attractiveness was below average. Eating quality, lack of fibrousness, and texture were a little above average while wholeness was excellent. Has average processing characteristics.

The production of sprouts was only fair. The vines are large and heavy.

Georgia Red - The shape was mostly spindle and fairly rough with deep eyes and a relatively small number had side roots. The skin color varied between roots, being coppery-rose, rose, and purplish rose. The raw flesh was light salmon mottled with cream. Quality for this area's fresh market was rated somewhat low, but the most profitable yield rating for this area was considered to be a little more than average. This entry, when baked, received a low rating in appearance. When canned, the color was almost a yellow that was lacking in uniformity and attractiveness. While wholeness was a little above average, lack of fibrousness, texture and eating quality were only average. Has poor processing characters.

The production of sprouts was prolific. The plants made a rather heavy growth and the over-all leaf color was medium green. Perhaps the best thing about this variety was the high percent of fresh market sizes that are considered prime for this area. However, the roots were not attractive because of the deep eyes and variation in color. The yield would have been higher if it had not been for mottle necrosis and some soil rot.

Copperskin Goldrush - This variety was used as a check. The somewhat variable spindle shape was considered fair. The skin was copper color and the raw flesh varied between salmon and light orange with streaks of deep cream and a lighter area near the surface. Quality for the fresh market was rated good and the most profitable yield rating for this area was considered average. When canned, chromaticity, uniformity of color, attractiveness, and lack of fibrousness were well above average while texture and eating quality were somewhat lower. Wholeness was good. Has good processing characters.

The production of sprouts was prolific. The vines were medium in size with this variety's distinctive general leaf color of a fairly light yellowish-green.

L4-89 - The shape was spindle but variable, somewhat rough with a tendency to elongate. The skin color varied among roots; most were tan but a considerable number were coppery-tan. The raw flesh was salmon streaked and mottled with cream color with a lighter area near the surface. Quality for the fresh market was considered good and the most profitable yield rating for this area was considered average. When canned, unattractive and of poor color because of unsatisfactory chromaticity and lack of uniformity. Lack of fibrousness and texture were a little above average while the eating quality was about average. Wholeness was well above average. Has poor processing characters.

The sprout production was fair. The roots of this variety had the highest percent of dry matter in the trials. The vines, in general appearance were somewhat similar to Goldrush but there was not as much yellow in the green of the leaves.

L8-67 - The spindle shape was very good and rather smooth. The predominant color of the skin was rose with a satiny luster, but colors were mixed between roots and on roots. Some roots were a coppery-rose, others copper with a slight rose tint, and a relatively few were tan. Some individual roots were both coppery-rose and rose. About 5% showed some russetting. The raw flesh was a uniform deep orange; possibly too deep. The carotene content was the highest of any in the trials. Quality for the fresh market was rated good and the most profitable yield rating for this area was considered average. When canned, chromaticity, lack of fibrousness, wholeness, and texture received an excellent rating. Uniformity of color, attractiveness and eating quality received a score just under excellent. Has good processing characters.

The vines were somewhat similar in appearance to Goldrush and L4-89 except, like L4-89, there was not as much yellow in the green of the leaves as Goldrush. The production of sprouts was fair.

L8-92 - The shape was a little irregular, but generally, a very good thick-spindle shape. The skin was mostly rose color, but some roots were a coppery-rose and some individual roots were both coppery-rose and rose. The raw flesh was a uniform deep orange. Quality for the fresh market was rated good but the most profitable yield rating for this area was considered to be a little less than average. This entry was rated high in baking quality. When canned, chromaticity, wholeness, lack of fibrousness, and texture received ratings that were well above average, while color, uniformity, attractiveness, and eating quality were just above average. Has good processing characters.

The sprout production was fairly poor. The vines made a rather heavy growth and the general color was medium green to slightly lighter green. The leaf undersurface veins and the petioles were green.

Nemagold - This variety was used as a "local" check. Shape mostly spindle and relatively smooth. Skin tan and raw flesh a fairly uniform salmon. Quality for this area's fresh market was rated good and the most profitable yield rating for this area was considered to be fairly high. When canned, wholeness, texture, and eating quality were well above average while chromaticity, color uniformity, and lack of fibrousness were only a little above average. Attractiveness was just average. Has average processing characters.

Production of sprouts was prolific. The leaves are small, distinctly shouldered, and green with pale green veins and petioles. The long, slender, sparsely leaved vines result in the discontinuation of cultivation early in the growing season but before there is enough cover to shade out weeds. This, growers say, is an important fault of Nemagold. However, the high yield of prime-size attractive roots makes this an important commercial variety in Virginia.

V2158 - The shape was somewhat rough spindle. The skin had a satiny luster but was variable in color; copper, copper tinted rose, and tannish-copper. The raw flesh was light orange in color with cream colored spots and a lighter area near the surface. Quality for the fresh market was rated a little below medium, but the most profitable yield rating for this area was a little above average. Produced the highest percent of canning prime sizes and, along with Nemagold, the highest amount. When canned, chromaticity, attractiveness, and wholeness were excellent. Uniformity of color, lack of fibrousness, texture, and eating qualities received ratings that were well above average. Has good processing characters.

The sprout production was prolific. Rather heavy vine growth with medium green leaves and green veins and petioles.

Table No. 12 - Ten Sweet Potato Varieties or Numbered Selections Tested in 1962 on Eastern Shore (Accomack County), Virginia. Yields, plant stand, culls, carotene, and dry matter.

Variety or selection number	Plant stand	Average Yields Per Acre*				Jumbo and over-size per acre*	Culls per acre*	Percent of total marketable		Carotene mg./100 g. (dry basis)	Percent dry matter
		Total marketable	Size Selections (2)					Prime fresh	Prime canning		
			Fresh market. prime size	Canning prime size	Small fresh mkt. or large canning						
		(1)	(3)	(4)	(5)	(6)	(7)				
Nemagold (ck)	plt. 113	cwt. 300	cwt. 112	cwt. 167	cwt. 131	cwt. 4	cwt. 68 mr	% 37	% 56	mg. 26.4	% 26.96
B6708	112	256	126	110	85	27	82 mrd	49	43	22.8	23.76
L8-67	115	243	85	115	80	7	115 rm	35	47	44.5	24.38
V2158	116	240	98	156	55	5	109 mr	41	65	37.4	23.03
Centennial (ck)	117	238	116	109	65	58	63 mr	49	46	39.1	26.29
L8-92	108	233	67	109	77	9	149 rm	29	47	39.9	26.97
L4-89	108	226	114	92	91	31	59 m	50	41	27.1	29.02
C.S. Goldrush (ck)	118	226	87	104	88	9	83 mr	38	46	32.8	25.13
Georgia Red	115	225	157	67	68	32	48 nmrd	70	30	16.6	26.84
B6521	110	152	81	50	46	63	126 mrd	53	33	29.2	27.13

* Means of 4 replications. Adjusted for missing plants.

- (1) Total marketable: Diameter 1 to 3.75 inches, length 3 to 10 inches, weight not over 20 oz.
- (2) Size selections are 3 sizes most likely to be of interest to Virginia growers. They are not "grade" sizes, but are considered to be the best sizes for the market indicated. As each of the 3 sizes were re-selected from the "total marketable" roots, the sum of the 3 sizes would not necessarily equal the "total marketable" amount.
- (3) Prime fresh market size: Diameter 2 to 3.25 inches, length 4.25 to 7 inches.
- (4) Prime canning size: Diameter 1 to 2 inches, length 3 to 6.5 inches.
- (5) Small fresh market or large canning size: Diameter 1.75 to 2.25, length 3 to 7 inches.
- (6) Jumbo and oversize: More than diameter of 3.75 inches or length of 10 inches or weight of 20 ounces.
- (7) Culls: The letters following the numbers indicate the main causes of culls. The first letter is the most important cause. Letters are: d, side roots; m, misshapened; n, mottle necrosis; r, soil rot.

Table No. 13 - Mean Evaluation of Canned Sweet Potatoes from 1962 Replicated Variety Trials on Eastern Shore of Virginia. Processed within three days of harvest time.

Variety or selection number	Weighted over-all score	Color		Attractiveness	Lack of fibrousness	Texture	Eating quality	Wholeness
		Chromaticity	Uniformity					
Syrup pack								
L8-67	8	8	8	8	8	8	8	8
V2158	8	8	7	8	8	8	7	8
C.S. Goldrush	7	7	7	7	8	7	6	8
L8-92	7	7	7	7	7	7	7	8
Nemagold	6	6	6	5	7	7	7	8
Centennial	6	5	5	4	7	6	6	8
B6521	6	6	5	5	6	6	5	7
L4-89	5	4	3	3	6	6	6	8
Georgia Red	5	3	4	4	6	6	5	7
B6708	4	2	4	3	5	6	5	7
Vacuum pack								
V2158	7	8	7	7	8	8	6	8
L8-67	7	8	7	7	8	7	7	8
L8-92	7	8	8	7	7	7	7	8
C.S. Goldrush	7	7	7	6	8	7	6	6
Nemagold	6	5	6	5	6	7	6	6
Centennial	5	5	5	4	7	6	5	8
B6521	5	5	5	4	6	5	4	5
L4-89	5	3	4	3	7	6	5	7
Georgia Red	4	3	4	3	5	7	5	5
B6708	4	2	3	2	6	5	4	6

All varieties were processed September 28th. Pack scored by technical panel of 6 judges during 2 replications, November 20 and 21. Scoring on basis of 1, lowest to 9, highest with weighted over-all score below 5 indicating below commercial acceptability. Factors for over-all score as follows: Chromaticity 10, Uniformity 15, Attractiveness 25, Lack of fibrousness 10, Texture 10, Eating quality 10, Wholeness 20.

Table No. 14 - Sweet Potato Replicated Trials - Percent Yield After Peeling

Variety or selection number	Weight before peeling	Weight after peeling	Percent yield by weight
Centennial	38.30	30.10	79
B6708	34.50	26.90	78
V2158	49.90	38.70	78
C.S. Goldrush	41.50	29.70	72
L4-89	43.10	31.00	72
L8-92	42.50	30.00	71
L8-67	48.60	34.20	70
Nemagold	44.90	31.40	70
Georgia Red	45.40	31.10	69
B6521	41.00	28.40	69

Table No. 15 - Climatological and Irrigation Data in 1962 at Painter, Virginia.

For week ending	Temperature			Precipitation (inches)	For week ending	Temperature			Precipitation (inches)
	Max.	Min.	Ave.			Max.	Min.	Ave.	
Apr. 7	71	28	53	1.01	July 7	87	58	72	0.45
Apr. 14	74	42	55	2.60	July 14	89	56	78	0.01
Apr. 21	63	35	47	0.52	July 21	89	61	75	1.20
Apr. 28	86	40	66	0	July 28	88	54	75	1.07*
May 5	86	49	67	0.70	Aug. 4	84	65	74	1.51*
May 12	85	48	65	0.41	Aug. 11	78	58	77	1.00
May 19	90	45	66	0	Aug. 18	87	55	74	0.30
May 26	91	51	74	0.89	Aug. 25	92	53	76	1.42
June 2	86	52	72	3.29	Sept. 1	91	60	75	0.47
June 9	82	51	68	0.56	Sept. 8	89	48	72	1.20
June 16	86	56	71	1.19	Sept. 15	88	54	73	0
June 23	92	59	76	1.32	Sept. 22	76	41	63	1.73
June 30	86	61	74	2.20	Sept. 29	73	45	63	1.34

* Precipitation includes 0.5 inch irrigation for week ending July 28 and 1.0 inch for week ending August 4.

Sweet Potato Replicated Variety Trials Baking Tests

Baking Procedure

Four roots per entry were selected for uniform size and shape from storage 76 days after harvest.

Roots of each entry were weighed before and after baking.

Baked without foil wrap in a preheated oven for 15 minutes at 400° F. and then reduced to 375° F. and baked until roots were soft.

Roots were cooled to room temperature.

Roots were arranged at random in 2 replications of 2 roots per entry per replication and then organoleptically rated by a panel of 4 judges.

Comment: Flavor and "mouth-feel" of a sweet potato is difficult to evaluate because it is a very subjective measurement. This is particularly true of flavor and moistness. Much depends on what the judge has been "conditioned" to like. More moistness, within reasonable limits, deserves a higher score according to the "Southern" panel that served in this test, but the opposite might be the reaction of a "Northern" panel.

Table No. 16 - Mean Evaluation of Baked Sweet Potatoes from 1962 Replicated Variety Trials on Eastern Shore of Virginia. (1)

Variety name	Color		Attractiveness	Lack of fibrousness	Texture	Flavor	Moistness	Weighted over-all score (2)	Percent loss of weight in baking	Baking time (3)
	Intensity	Uniformity								
L8-92	7	7	8	5	5	5	5	7	20	M
C. S. Goldrush	5	6	7	5	5	5	6	7	18	A
V2158	6	5	6	5	5	5	6	6	21	L
Centennial	6	5	6	5	5	5	5	6	14	L
L8-67	7	4	5	4	5	5	5	6	23	M
L4-89	5	4	5	5	5	5	5	5	20	M
B6521	4	5	6	4	4	3	4	5	15	A
Nemagold	4	5	5	4	4	3	3	5	21	M
Georgia Red	2	2	3	4	5	5	5	4	18	M
B6708	2	2	3	4	4	4	6	3	19	L

(1) Ratings: Comparative evaluation of the 10 entries in the trial with a score of 5 as average and 1 as poorest possible and 9 as best possible scores.

(2) Factors weighted for over-all scores are as follows:

- Color intensity 10
- Color uniformity 15
- Attractiveness (eye appeal) 25
- Lack of fibrousness 15
- Texture 15
- Flavor 10
- Moistness 10

(3) Baking time: A, average time for the 10 entries. M, more than average. L, less than average.

Observational Sweet Potato Plantings

One row of 30 plants per entry was field set. The description of growing conditions and kind of data recorded is the same as the replicated trials except the harvest date was September 25. The very small plantings resulted in the yield data having very little meaning. Information obtained from the observational plantings gives only a vague indication of the characteristics of the entries and is given in this report only as a matter of interest in the possibility of future more elaborate testing.

Notes on Entries Tested

V52-13 was rated highest in quality. NC 188 and Centennial (a check entry) were considered to have good quality. For canning qualities, NC 188 was rated excellent and Red Goldrush, L9-56, and L9-66 rated good. Not enough roots were available for canning E-867-2, L7-17, L9-39, and V52-13.

Carotene content was relatively very high in L9-66 and M-0-3-6-2 and low in B6806 and Nugget.

Percent dry matter was high in L9-56 and low in NC 188.

Sprout production ratings were rather obscure because of the few roots bedded and the method of observation (See "data recorded" in replicated trials report). However, under these conditions, it appeared that sprout production was adequate for Nemagold, L9-56, NC 198, C. S. Goldrush, Tanhoma, and Red Goldrush but rather poor for E-867-2, L7-17, T-7, and L9-39.

Comments on Individual Observational Entries

B6806. Skin color: Copper splashed with coppery-rose. Flesh color: Salmon. Shape: Irregular, but generally thick-spindle. Quality: Rather poor. Yield: Slightly less than average. Sprouts: Fair. Canning quality: Lack of uniformity in color was the chief fault. It appears this entry would not be suitable for processing.

Centennial. (Check variety, see replicated trials report for description). Quality: Good. Yield: Slightly more than average. Canning qualities: See replicated trials report.

E-867-2. Skin color: Tan. Raw flesh color: Salmon. Quality: Slightly below medium. Yield: Somewhat low. Canning quality: Insufficient number of roots for processing evaluations.

Copperskin Goldrush. (Check variety, see replicated trials report for description). Quality: Medium. Yield: Slightly more than average. Canning qualities: See replicated trials report.

Red Goldrush. (Seed stock from 1961 trials which had been supplied by G. A. Marston, a grower in James City County. County Agent M. W. Bryant said this strain, a "red" Goldrush, had been grown around Toano, Virginia). Skin color: Copper. Raw flesh color: Light salmon mottled cream. Shape: Rough

spindle, many roots having prominent longitudinal depressions. Quality: Very poor. Yield: Low. Sprouts: Prolific. Canning qualities: Scored higher in the vacuum pack than in the syrup pack due principally to attractiveness, uniformity of color and eating qualities. This variety was better than average.

HM 550. Skin color: Tan. Raw flesh color: Salmon with lighter area near surface. Shape: Somewhat irregular spindle. Quality: Rather poor. Yield: Low. Sprouts: Fair. Canning qualities: Has characteristics that are below average in the syrup pack and poor in the vacuum pack. Discoloration that occurred after opening cans, caused it to be given a low rating. Comment: A representative of a large processing company said with a small sample they found that cross-section slices can be processed without breaking up.

L7-17. Skin color: Mixed on each root, being copper and tannish copper. Raw flesh color: Deep salmon. Quality: Slightly below medium. Yield: Somewhat low. Comment: Considerable veining. Canning qualities: Insufficient number of roots for processing evaluations.

L9-39. Skin color: Copper. Raw flesh color: Light salmon with lighter area near surface. Quality: Slightly below medium. Yield rating: Very high. Comment: Considerable number of roots were cracked. Sprouts: Poor. Canning qualities: Insufficient number of roots for processing evaluations.

L9-56. Skin color: Purple with rose tints. Raw flesh color: Deep salmon. Quality: Slightly below medium. Yield: Slightly about average. Sprouts: Prolific. Comment: Some roots were rather angular in shape. Canning qualities: Uniformity of color, chromaticity, attractiveness, and lack of fibrousness were well above average. Wholeness was excellent in the syrup pack and average in the vacuum pack. This entry has good processing characteristics.

L9-66. Skin color: Copper. Raw flesh color: Dark salmon. Quality: Slightly above medium. Yield: High. Sprouts: Fair. Comment: Scuffs rather easily. Canning qualities: Uniformity, color, lack of fibrousness and texture were good. Chromaticity, attractiveness and wholeness were above average in both vacuum and syrup packs.

M-0-3-6-2. Skin color: Tan. Raw flesh color: Deep salmon. Shape: Fairly good spindle but a considerable number of cracked roots. Quality: Rather poor. Yield: Slightly more than average. Sprouts: Rather prolific. Canning qualities: Below average rating although more desirable in the syrup than in the vacuum pack, but unattractive because of poor chromaticity.

M-7-2-8. Skin color: Tan. Raw flesh color: Light salmon. Quality: Slightly below medium. Yield: Very low. Sprouts: Rather prolific. Canning qualities: Slightly below average but more desirable in the syrup than in the vacuum pack.

M-9-41-54. Skin color: Variation between roots, some roots purple and others purplish-rose. Quality: Rather poor. Yield: Low. Sprouts: Rather prolific. Canning qualities: Poor for a syrup pack and only average for a vacuum pack.

NC 188. Skin color: Copper. Raw flesh color: Dark salmon. Quality: Good. Yield: Very high. Sprouts: Somewhat poor. Canning qualities: Excellent for both vacuum and syrup packs. Chromaticity, uniformity, attractiveness of color were very good. Lack of fibrousness and whole-ness were good.

NC 198. Skin color: Rose. Raw flesh color: Salmon. Shape: Rather smooth spindle but a considerable number were too long. Quality: Slightly above medium. Yield: Average. Sprouts: Prolific (This is different from the results of other tests). Canning qualities: Appeared better than average in syrup pack, but very unsatisfactory in the vacuum pack, because of poor color.

Nemagold. ("Local" check, see replicated trials report for description). Quality: Medium. Yield: High. Canning qualities: See replicated trials report.

Nugget. (Check variety, more fully described in 1961 progress report). Skin color: Tannish-copper. Raw flesh color: Salmon. Quality: Medium. Yield: Average. Sprouts: Rather poor. Canning qualities: Insufficient number of roots for processing evaluations.

T-7. Skin color: Purple with some rose tints. Raw flesh color: Light salmon mottled cream. Shape: Rough spindle with deep rough eyes. Quality: Poor. Yield: Very low. Canning qualities: Has poor canning possibilities because of poor yellow color that is unattractive for both packs.

Tanhoma. Skin color: Copper splashed with tan. Raw flesh color: Deep salmon with lighter area near surface. Shape: Irregular spindle. Quality: Poor. Yield: Very low. Sprouts: Prolific. Canning qualities: Has very poor canning possibilities, as poor color and lack of attractiveness leaves much to be desired.

V52-13. Skin color and texture: Coppery-tan and exceptionally smooth. Raw flesh color: Dark salmon. Shape: Rather smooth and generally satisfactory spindle shape. Quality: Excellent. Yield: Fairly high. Sprouts: Plants were received so no sprouting records were possible. Canning qualities: Insufficient number of roots for processing evaluations. Comment: The most generally attractive appearing roots in the trial at harvest time. However, 50 days after harvest the skin appeared somewhat rough with minute wrinkles which considerably reduced the attractiveness.

Table No. 17 - Sweet Potato Observational Plantings of Twenty Varieties or Numbered Selections in 1962 on Eastern Shore (Accomack County), Virginia. Yields, plant stand, culls, carotene, and dry matter.

Variety or selection number	Plant stand	Yields per acre*				Jumbo and over-size per acre*	Culls per acre*		Percent of total marketable		Carotene mg/100 g. (dry basis)	Percent dry matter
		Total marketable	Size selections (2)				Cracked	Other	Prime fresh	Prime canning		
			Fresh market prime size	Canning prime size	Small fresh mkt. or large canning							
(1)	(3)	(4)	(5)	(6)	(7)	Prime fresh	Prime canning	Carotene mg/100 g. (dry basis)	Percent dry matter			
L9-39	plt. 30	cwt. 369	cwt. 177	cwt. 127	cwt. 148	cwt. 14	cwt. 3	17 ms	48	34	27.0	25.80
NC 188	27	361	194	101	107	126	0	33 m	54	28	36.0	24.13
Nemagold (ck)	28	351	121	185	192	0	0	62 mr	34	53	26.4	26.96
L9-56	27	303	122	121	114	32	0	30 m	40	40	35.3	31.84
L9-66	27	301	139	137	86	15	0	41 m	46	46	37.7	26.85
Nugget (ck)	29	282	138	35	108	69	16	58 s	49	12	20.3	26.28
V52-13	29	264	157	69	102	0	8	162 ms	59	26	32.9	27.21
NC-198	30	259	103	86	51	51	0	97 m	40	33	-	-
Centennial (ck)	28	258	114	135	66	63	0	42 mr	44	52	39.1	26.29
C.S. Goldrush (ck)	30	252	90	136	111	0	0	37 mr	36	54	32.8	25.13
B6806	30	231	101	91	0	30	0	35 m	44	39	18.4	25.63
M-0-3-6-2	28	229	133	91	87	30	15	66 m	58	40	37.3	27.16
E-867-2	30	208	24	132	59	6	1	58 sm	12	63	28.9	30.10
L7-17	26	188	53	123	60	0	16	55 vsm	28	65	33.6	29.37
M-9-41-54	26	174	79	56	61	41	0	101 sm	45	32	-	-
HM-550	29	170	38	73	54	7	0	40 st	22	43	24.0	30.66
Tanhoma	28	138	63	61	59	0	0	54 nm	46	44	-	-
Red Goldrush	29	133	33	110	55	0	0	79 um	25	83	28.2	27.90
M-7-2-8	27	122	35	73	54	0	0	134 nms	29	60	30.8	26.93
T-7	27	113	51	64	61	0	0	53 urm	45	57	23.2	27.56

* Adjusted to plant stand.

- (1) Total marketable: Diameter 1 to 3.75 inches, length 3 to 10 inches, weight not over 20 oz.
- (2) Size selections are 3 sizes most likely to be of interest to Virginia growers. They are not "grade" sizes but are considered to be the best sizes for the market indicated. As each of the 3 sizes were re-selected from the "total marketable" roots, the sum of the 3 sizes would not necessarily equal the "total marketable" amount.
- (3) Prime fresh market size: Diameter 2 to 3.25 inches, length 4.25 to 7 inches.
- (4) Prime canning size: Diameter 1 to 2 inches, length 3 to 6.5 inches.
- (5) Small fresh market or large canning size: Diameter 1.75 to 2.25, length 3 to 7 inches.
- (6) Jumbo and oversize: More than diameter of 3.75 inches or length of 10 inches or weight of 20 ounces.
- (7) Culls: The letters following the numbers indicate the main cause of culls. The first letter is the most important cause. Letters are: a, angular; s, small; m, misshapened; n, mottle necrosis; r, soil rot; t, strings; u, rough; v, veining.

Table No. 18 - Mean Evaluation of Canned Sweet Potatoes from 1962 Observational Variety Trials on Eastern Shore of Virginia. Processed within three days of harvest time.

Variety or selection number	Weighted over-all score	Color		Attractiveness	Lack of fibrousness	Texture	Eating quality	Wholeness
		Chromaticity	Uniformity					
Syrup pack								
NC 188	8	9	9	9	7	5	7	7
L9-56	7	7	8	7	7	3	6	8
L9-66	7	5	7	6	7	7	7	6
Red Goldrush	7	7	5	6	7	6	5	7
NC 198	7	7	5	6	7	5	7	6
M-7-2-8	6	4	6	5	7	6	5	8
M-0-3-6-2	6	4	5	4	7	6	7	8
B6806	6	5	2	4	7	8	7	7
HM 550	6	2	7	3	7	4	7	8
T-7	6	1	8	1	7	5	7	9
M-9-41-54	5	3	5	3	6	7	7	6
Tanhoma	5	5	1	2	5	6	7	6
Vacuum pack								
NC 188	8	9	9	9	6	5	4	8
Red Goldrush	7	7	7	8	6	4	5	7
L9-56	7	7	7	7	7	6	5	5
L9-66	7	6	7	6	7	6	4	6
M-7-2-8	6	4	6	5	6	6	4	5
M-9-41-54	5	4	4	4	6	7	5	6
M-0-3-6-2	5	3	6	4	4	5	4	7
T-7	5	1	6	3	6	4	5	7
B6806	5	5	2	5	5	6	2	6
Tanhoma	5	3	3	3	7	7	4	5
HM-550	5	5	1	4	7	4	3	6
NC 198	4	2	3	1	7	5	3	7

All varieties were processed September 28th. Pack scored by technical panel of 6 judges during 2 replications, November 20 and 21. Scoring on basis of 1, lowest to 9, highest with weighted over-all score below 5 indicating below commercial acceptability. Factors for over-all score as follows: Chromaticity 10, Uniformity 15, Attractiveness 25, Lack of fibrousness 10, Texture 10, Eating quality 10, Wholeness 20.

Table No. 19 - Sweet Potato Observational Plantings - Percent Yield After Peeling.

Variety or selection number	Weight before peeling	Weight after peeling	Percent yield by weight
L9-56	38.60	33.00	86
HM-550	34.30	28.60	83
L9-66	27.10	22.50	83
M-0-3-6-2	33.80	25.90	77
Tanhoma	28.30	21.80	77
Red Goldrush	36.10	27.40	76
M-9-41-54	22.00	16.60	76
M-7-2-8	37.30	27.50	74
NC 198	28.80	21.40	74
NC 188	38.40	28.50	74
B6806	33.40	24.50	73
T-7	17.00	12.40	73