

1960 Variety Trials

Tomato

Sweet Potato

F. H. Scott, Assistant Professor of Horticulture
L. W. Johnson, Assistant Professor of Horticulture in Food Technology

Research Report No. 47

March 1961

Virginia Agricultural Experiment Station
Virginia Polytechnic Institute
Blacksburg, Virginia

Contents

	page
Tomato varietal trials - general	3
Tomato varietal trials - by area	
Eastern Shore	3
Warsaw	14
Blacksburg, Southern tomato exchange program	24
Sweet potato varietal trials	29

1960 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 suitability for processing. 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, variety tests are being conducted on Eastern Shore and at Warsaw. Also a tomato variety trial, as a part of the Southern Tomato Exchange Program, is being conducted at Blacksburg.

Results of the Eastern Shore, Warsaw, and Blacksburg tomato variety trials follow.

1960 TOMATO VARIETAL TRIAL FOR FRESH MARKET AND CANNING Eastern Shore, Virginia

F. H. Scott, A. V. Watts, L. W. Johnson

Eleven varieties were grown for fresh market evaluation at the Eastern Shore sub-station of the Virginia Truck Experiment Station. Eight of these varieties were also grown for canning evaluations. The experimental procedure and growing conditions were as follows:

Location:	Accomack County near Painter, Virginia.
Elevation	30 feet.
Soil:	Sassafras fine sandy loam.
Soil pH:	6.2.
Plot size:	One row; records taken on 10 plants for fresh market and 20 plants for canning.
Plot design:	Split plot.
Replications:	Four.
Spacing:	Plants 3 feet apart in row, 5 feet between rows.
Fertilization:	250 lb. per acre of 5-10-10 placed in the row and mixed with the soil 3 days before setting plants. 750 lb. per acre of 5-10-10 sidedressed 3 weeks after setting plants.
Field planting date:	April 20.
Cultivation:	Frequently enough to eliminate weeds.
Insecticides:	Dieldrin 1½% dust to control flea beetles and DDT 5% dust to control tomato fruitworm.
Growing conditions:	See Table No. 7.

Processing Procedure

Weekly harvests were made of "canning ripe tomatoes." Thirty pounds of fruit graded into the same ratio of canning U. S. 1 and U. S. 2 as the total harvest were taken from each harvest and canned as peeled tomatoes. The #303 can yield of processed tomatoes derived from this weight of fruit was calculated. 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: Conventional process without agitation, 35
minutes at 212° F., then air cooled.

Notes on Varieties Tested for Fresh Market

The Eastern Shore tomato variety trials were conducted in 1958 and 1959 as well as this season. Data on processing were not taken in 1958 but were obtained in 1959 and 1960 on 8 varieties.

Varieties in the 1958 trials but dropped from the trials thereafter were Big Early Hybrid, Delaware 13-2, Early Prolific, Foremost E-21, and Homestead No. 2. Varieties in the trials in 1958 and 1959 but dropped this season were Century, Chesapeake, Valiant, and Rutgers (Rutgers was used as a check but now Homestead 24 is considered suitable as a check). Varieties in the trials for all 3 seasons were Campbell 146, Kokomo, Moreton Hybrid, and Texto 2. Varieties added to the trials for 1959 and 1960 were Delaware 14-2, Homestead 24 and Rhode Island Early. Varieties added to the 1960 trials were Ace, Pocomoke (Maryland 314), Pearson, and Stair.

It will be noticed from the following table no. 1 that while yields have been somewhat erratic Campbell 146, Delaware 14-2 and possibly Kokomo seem to be relatively high yielding varieties. In the 1960 fresh market trials, Delaware 14-2 and Campbell 146 were in the highest yielding group with Stair second, Homestead 24 third and in the lowest group were Rhode Island Early, Moreton Hybrid and Ace. It should be remembered, however, that Moreton Hybrid and Rhode Island Early are early varieties and Pocomoke second early. In U. S. 1's Delaware 14-2 was first in yield with Campbell 146 second, Stair third, and Ace last.

Table No. 1. Total fresh marketable yield by hundredweights per acre of tomato varieties at Painter, Virginia, 1958-1960.

Variety	Yearly			Averages		
	1958	1959	1960	1958-59	1959-60	1958-59-60
Ace	-	-	30	-	-	-
Big Early Hybrid	159	-	-	-	-	-
Campbell 146	231	153	135	192	144	173
Century	152	106	-	129	-	-
Chesapeake	177	143	-	160	-	-
Delaware 13-2	187	-	-	-	-	-
Delaware 14-2	-	167	137	-	152	-
Early Prolific	190	-	-	-	-	-
Foremost E-21	149	-	-	-	-	-
Homestead 2	185	-	-	-	-	-
Homestead 24	-	167	90	-	129	-
Kokomo	171	170	82	171	126	141
Pocomoke	-	-	49	-	-	-
Moreton Hybrid	155	129	34	142	82	106
Pearson D. F.	-	-	56	-	-	-
Rhode Island Early	-	83	36	-	60	-
Rutgers	178	117	-	148	-	-
Stair	-	-	115	-	-	-
Texto 2	164	152	61	158	106	126
Valiant	155	122	-	139	-	-
Average	173	137	75	155	114	137

Fruit size was unusually large for this area in the 1960 season with marketable fruit averaging 6.7 ounces and ranging from 4.7 ounces for Stair to 8.2 ounces for Pearson.

Early blight was quite prevalent in 1960 but no other diseases were generally apparent. Early blight ranged from very intense for Pocomoke and Rhode Island Early to no symptoms for Delaware 14-2 and Texto 2. Three of the 4 varieties most intensely affected were early maturing. Early blight seems to develop with the maturing of the plant.

Notes on Varieties Tested for Canning

Variety additions and deletions to the trials are discussed under notes on varieties tested for fresh market, while description of plants and fruit characters will be found under comments on individual varieties.

Canned product evaluation resulted in Homestead 24 and Texto 2 being placed superior to any other varieties in the trials. Yield wise Homestead 24 was third highest of all varieties tested and Texto 2 was in the below average yield grouping. The canned product evaluation of Delaware 14-2, Campbell 146, Stair, and Ace was judged about average. Of this group Delaware 14-2 was the heaviest yielder of total marketable fruit, Campbell 146 was second while Stair and Ace were both below average in yield. The

remaining varieties, Kokomo and Pocomoke were judged below average in the canned product evaluations. Yield-wise Kokomo was about average while Pocomoke was the lowest yielding variety in the trials.

In the chemical analyses performed on the canned product Stair was significantly high in soluble solids, while Pocomoke was significantly low. Ascorbic acid levels were not exceptionally different in any varieties from those grown during previous years, however, Pocomoke and Delaware 14-2 did exhibit the highest levels during the 1960 season. The average pH of all varieties was below 4.5 this season. See tables no. 3 and 6 for additional data on the 1960 Painter canning tomato trials.

Comments on Individual Varieties

Delaware 14-2 - Fruit: Slightly above average in uniformity and over-all smoothness, average in red color, well above medium weight, and quite firm. Shoulders medium smooth, slightly above medium in coloring, and with less cracking than any variety in the trials. Canning characters: Color of canned product about average. Wholeness about average; flavor somewhat above average. Fruit size too large for #303 can. Yield of total cannable tomatoes greatest on third week (July 27) of harvest, and was the highest yielding variety in the trials. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock was below average. The low #303 can yields were probably due to the excessively large size of the fruit which required quartering to fit into a #303 can.
Vine: Large, fairly erect to somewhat recumbent, dense foliage, and quite uniform.
Disease: No symptoms of early blight; no other diseases in the field.
Yield: Highest U. S. 1's yield in trials and grouped with Campbell 146 as highest in total yield.

Campbell 146 - Fruit: Slightly below average in uniformity, but somewhat above average in over-all smoothness, of average red color, slightly above medium weight, and average firmness. Shoulders medium smoothness and red color, and slightly less than average cracking. Canning characters: Color of canned product about average. Wholeness about average; flavor below average. Fruit size ideal for #303 can. Yield of total cannable tomatoes greatest on third week (July 27) of harvest, and was the second highest yielding variety in the trials. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds canning ripe raw stock was above average.
Vine: Rather large, fairly erect, rather dense foliage and quite uniform.
Disease: Mildly affected by early blight; no other diseases in the field.
Yield: Second highest U. S. 1's in trials and grouped with Delaware 14-2 as highest total yield.
Comment: Interior is slow in coloring, taking from 3 to 5 days longer than Rutgers.

Stair - Fruit: Slightly below average in uniformity, but average over-all smoothness and red color and average in firmness with weight well below medium. Shoulders were best in the trials, being quite smooth and good

red coloring with a relatively small number cracked. Canning characters: Color of canned product below average, the poorest of any variety in the trials. Wholeness above average; flavor slightly above average. Fruit size suitable for #303 can. Yield of total cannable tomatoes greatest on third week (July 27) of harvest. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock was about average.

Vine: Rather large, erect, dense foliage and slightly above average in uniformity.

Disease: Mildly affected by early blight; no other diseases in the field.

Yield: Third highest U. S. 1's in trials and second highest in total yield.

Comment: Weight of fruit was lowest in trials and in other seasons when the average weight is considerably below this season's high average (6.7 oz.) the fruit may be too small. Yield was rather concentrated; one harvest 90 days after field setting produced 43% of total yield for the season. This variety seems to have several good characters and should be studied further.

Homestead 24 - Fruit: Average in uniformity and in over-all smoothness, red color, firmness, and weight. Shoulders medium smoothness, red coloring, and cracking. Canning characters: Color of canned product outstandingly superior. Wholeness above average; flavor below average. Fruit size satisfactory for #303 can. Yield of total cannable tomatoes greatest on third week (July 27) of harvest. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock was above average.

Vine: Slightly above medium size, fairly erect to somewhat recumbent, dense foliage, and quite uniform.

Disease: Considerably affected by early blight; no other diseases in the field.

Yield: Ranked fourth in U. S. 1's and third in total yield.

Comment: This variety was used as a check in the place of Rutgers.

Kokomo - Fruit: Average in uniformity and in over-all smoothness, red color, firmness, and weight. Shoulders slightly above medium smoothness and medium red coloring and cracking. Canning characters: Color of canned product about average. Wholeness below average; flavor above average. Fruit size ideal for #303 can. Yield of total cannable tomatoes greatest on third week (July 27) of harvest. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock was above average.

Vine: Large, erect, dense foliage and unusually uniform.

Disease: Mildly affected by early blight; no other diseases in the field.

Yield: Ranked fifth in U. S. 1's and fourth in total yield.

Texto 2 - Fruit: Well above average in uniformity, somewhat above average in over-all smoothness, average in red color, slightly above average in weight, and softer than average. Shoulders medium smoothness but fairly poor coloring and slightly above average in number of cracked fruit. Canning characters: Color of canned product about average.

Wholeness above average; flavor about average. Fruit size suitable for #303 can. Yield of total cannable tomatoes greatest on third week (July 27) of harvest. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock was much below average.

Vine: Rather large, fairly erect to somewhat recumbent, rather dense, and quite uniform.

Disease: No symptoms of early blight; no other diseases in the field.

Yield: Ranked in group with Pearson as sixth in U. S. 1's and fifth in total yield.

Pearson D. F. - Fruit: Average in uniformity and average in firmness but somewhat rough and rather poor red color. Weight well above medium being highest in the trials. Shoulders medium in smoothness, red coloring, and cracking. Canning characters were not evaluated.

Vine: Slightly above medium size, fairly erect, dense foliage, and quite uniform.

Disease: Intensely affected by early blight; no other diseases in the field.

Yield: Ranked in group with Texto 2 as sixth in U. S. 1's and fifth in total yield.

Comment: This variety, said to be grown considerably in California, was included in this trial at the request of growers. Based on one-year yield record, Pearson does not seem well adapted to conditions of this trial.

Pocomoke (Maryland 314) - Fruit: Slightly below average in uniformity, somewhat rough, average red color, weight well below medium, and quite firm. Shoulders slightly above medium in smoothness and red coloring with a relatively small number cracked. Canning characters: Color of canned product above average with the second highest rating in the trials. Wholeness lowest of any variety in the trials; flavor about average. Yield of total cannable fruit greatest on third week (July 27) of harvest, and was the lowest yielding variety in the trials. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds canning ripe raw stock greatest for any variety in trials.

Vine: Slightly below medium size, somewhat inclined to sprawl, slightly open foliage with fruit exposed, and somewhat above average in uniformity.

Disease: Early blight so intense that all plants were dead or seriously injured 84 days after field setting; no other diseases in the field.

Yield: In the group with Moreton Hybrid and Rhode Island Early that was next to lowest U. S. 1's in the trials and was next to lowest in total yield.

Comment: Yield was fairly concentrated; in relation to total yield for the season; the harvest 85 days after field setting produced 36% and the next harvest 24% making a total in 5 days of 60%.

Rhode Island Early - Fruit: Well below average in uniformity, average in over-all smoothness and red color, well below average in weight, and softer than average. Shoulders medium in smoothness and red coloring but slightly above average in cracking. Canning characters were not evaluated.

Vine: Slightly below medium size, very sprawling, very open foliage,

and slightly above average in uniformity.

Disease: Early blight so intense that all plants were dead or seriously injured 84 days after field setting; no other diseases in the field.

Yield: In the group with Pocomoke and Moreton Hybrid that was next to lowest in the trials of U. S. 1's and was in the group with Moreton Hybrid and Ace that was lowest in total yield.

Comment: The total yield for this variety was low, but as it is quite early the later harvests are not so important. The first and second harvests totaled the highest in the trials. These trials are not well suited for testing this variety as the plants should be spaced closer and perhaps fertilized more heavily and the vines supported. If these trials are continued in 1961, this variety will be deleted.

Moreton Hybrid (said to be F₁) - Fruit: Slightly below average uniformity, somewhat rough, slightly below average red color, medium weight, and rather soft. Shoulders average in smoothness and red coloring, but highest percent of cracked fruit in the trials. Canning characters were not evaluated.

Vine: Slightly above medium size, somewhat inclined to sprawl, rather open foliage and slightly above average in uniformity.

Disease: Intensely affected by early blight; no other diseases in the field.

Yield: In the group with Pocomoke and Rhode Island Early that was next to lowest in the trials of U. S. 1's and was in the group with Rhode Island Early and Ace that was lowest in total yield.

Comment: The total yield for this variety was low, but as it is early the later harvests are not so important. The first and second harvests totaled next to the highest in the trials.

Ace - Fruit: Slightly above average in uniformity, average smoothness, red color and firmness, and well above medium weight. Shoulders average in smoothness and red coloring, but next to highest percent of cracked fruit in the trials. Canning characters: Color of canned product about average. Wholeness and flavor slightly above average. Fruit size suitable for #303 can. Yield of total cannable fruit greatest on third week (July 27) of harvest. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock above average.

Vine: Medium size, fairly erect, dense foliage but fruit considerably exposed, and quite uniform.

Disease: Mildly affected by early blight; no other diseases in the field.

Yield: Lowest U. S. 1's in trial and was in the group with Rhode Island Early and Moreton Hybrid that was lowest in total yield.

Comment: This variety, said to be grown considerably in California, was included in this trial at the request of growers. Based on one-year yield records, Ace does not seem well adapted to the conditions of this trial.

Table No. 2 - Eleven Tomato Varieties or Seedlings Tested in 1960 at Painter, Virginia. Yields, fruit weight, shoulder rating, cracking, and early blight.

Variety	Average Yield Per Acre* (Means of 4 replications)			Average marketable fruit weight for season	Shoulder rating (1)		Cracking (2)				Firmness (3)	Disease rating Early blight (4)	Seed source (5)
	Total marketable	U.S. 1's	U.S. 2's U.S. 3's		Color	Smoothness	Total	Radial	Concentric	Radial & concentric			
	U.S. 1's U.S. 2's U.S. 3's												
Delaware 14-2	cwt. 137 ^a	cwt. 96 ^a	cwt. 41 ^{ab}	oz. 7.8	6	5	17	7	7	3	1.4	9	3
Campbell 146	135 ^a	85 ^{ab}	50 ^a	7.3	5	5	31	13	10	8	3.8	7	2
Stair	115 ^{ab}	80 ^{abc}	35 ^{abc}	4.7	7	7	22	12	5	5	4.1	7	5
Homestead 24	90 ^{bc}	65 ^{bcd}	25 ^{bcd}	6.9	5	5	38	19	9	10	2.7	5	1
Kokomo	82 ^{bcd}	52 ^{cde}	30 ^{bcd}	7.0	5	6	39	20	10	9	2.3	7	1
Texto 2	61 ^{cde}	37 ^{def}	24 ^{bcd}	7.2	4	5	52	21	16	16	4.3	9	4
Pearson D. F.	56 ^{cde}	35 ^{def}	21 ^{cde}	8.2	5	5	39	8	24	7	3.8	3	8
Pocomoke	49 ^{de}	34 ^{ef}	15 ^{de}	4.9	6	6	19	17	1	1	1.6	1	7
Rhode Island Early	36 ^e	21 ^{ef}	15 ^{de}	5.0	5	5	48	13	21	14	4.4	1	9
Moreton Hybrid	34 ^e	22 ^{ef}	12 ^e	6.8	5	5	62	26	8	28	5.0	3	6
Ace	30 ^e	17 ^f	13 ^{de}	7.7	5	5	57	35	5	17	3.3	7	8

* The superscriptions (a, b, c, d, e, f) 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.

- (1) Shoulder ratings: Observations made at all harvests. Ratings: 1, very poor to 9, very good.
- (2) Cracking: Counts made at all harvests. Figures are the percent of all fruit harvested.
- (3) Firmness: Average units per variety as tested by Asco Firmness Meter; 1.4 was firmest and 5.0 softest.
- (4) Disease: Observations made 84 days after field setting. No symptoms of Fusarium wilt or Southern blight (sclerotium rot) were observed. Early blight was only disease of any importance, which was rated: 1, very intense and/or dead to 9, no symptoms.
- (5) Seed sources: 1 Asgrow Seed Co., 2 Campbell Soup Co., 3 Delaware-Brasher, 4 Glecklers Seedmen, 5 Indiana-Johnson, 6 Joseph Harris Co., 7 Maryland-Stark, 8 Peto Seed Co., 9 Rhode Island-Griffiths.

Table No. 3. Eight Tomato Varieties Tested for Canning Characteristics in 1960 at Painter, 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 (2) (Co-op technical panel)				Chemical Analysis (3) (Mean of duplicates)			
	Total market- able (1A)	U.S. 1's (1A)	U.S. 2's (1A)	Color	Whole- ness	Flavor	Weighted overall score	% Soluble solids (1A)	% Acid as citric (1B)	Ascorbic acid mg/100 ml. (1A)	pH (1B)
	cwt.	cwt.	cwt.								
Delaware 14-2	249.4 ^a	191.8 ^a	57.6 ^a	3.49	2.97	3.56	3.31	5.40 ^{bc}	0.36	7.72 ^b	4.47
Campbell 146	199.3 ^{ab}	164.5 ^{ab}	34.8 ^b	3.41	2.97	2.82	3.20	5.13 ^{bcd}	0.51	7.46 ^{bcd}	4.30
Homestead 24	197.3 ^{ab}	161.2 ^{ab}	36.1 ^b	3.77	3.51	2.90	3.60	4.73 ^{cd}	0.49	7.09 ^d	4.32
Kokomo	179.9 ^{ab}	150.3 ^{ab}	29.6 ^b	3.36	2.23	3.38	2.95	5.53 ^{ab}	0.43	7.55 ^{bc}	4.38
Stair	160.7 ^{bc}	135.6 ^{ab}	25.1 ^b	3.13	3.51	3.26	3.29	6.13 ^a	0.44	7.42 ^{bcd}	4.40
Texto 2	152.5 ^{bc}	116.6 ^{bc}	35.9 ^b	3.54	3.49	3.13	3.49	5.13 ^{bcd}	0.43	7.29 ^{cd}	4.32
Ace	145.2 ^{bc}	119.5 ^{bc}	25.7 ^b	3.51	3.21	3.28	3.38	5.13 ^{bcd}	0.43	7.09 ^d	4.37
Pocomoke	87.5 ^c	71.6 ^c	15.9 ^b	3.62	2.08	3.08	3.01	4.67 ^d	0.39	8.18 ^a	4.35

(1) The superscripts (a, b, c, d) indicate the statistical significance of each characteristic. For example, in each column data bearing an "a" superscript are significantly different from those not having an "a," those bearing "b" are significantly different from those not having a "b," etc.

(1A) Statistical significance at the 1% level.

(1B) No statistical significance.

(2) Organoleptic evaluation replicated.

(3) Chemical analysis from 2 cans for each of 3 harvests.

Notes: Seed sources were the same as those for fresh market varieties. Percent acid as citric = total acidity.

Table No. 4. Percent Yield at Each Harvest of Total Yield of Tomatoes in Replicated Fresh Tomato Trials for 1960 Season at Painter, Virginia.

Variety	Approximate percent of total yield at each harvest								
	6/27 68*	6/30 71*	7/8 79*	7/14 85*	7/19 90*	7/22 93*	7/26 97*	7/29 100*	8/2 104*
Mid-season									
Delaware 14-2	0	0	10	9	7	10	17	22	25
Campbell 146	0	0	11	6	9	7	17	38	12
Stair	0	0	13	5	43	12	8	10	9
Homestead 24	0	0	24	12	20	15	13	11	5
Kokomo	0	0	5	13	15	20	19	15	13
Texto 2	0	0	11	11	17	18	14	13	16
Pearson D. F.	0	0	9	12	21	9	17	22	10
Ace	0	0	17	15	4	15	13	21	15
Average	0	0	12	9	18	12	15	20	14
Earlier									
Pocomoke	1	2	21	36	24	11	4	1	0
Rhode Island Early	6	15	8	26	25	5	10	5	0
Moreton Hybrid	7	10	19	22	16	10	7	6	3
Average	4	8	16	29	22	9	7	4	1

* Days from field setting.

Table No. 5. Percent Yield at Each Harvest of Total Yield of Replicated Canning Tomato Trials for 1960 at Painter, Virginia.

Variety	Approximate percent of total yield at each harvest			
	7/12 83*	7/20 91*	7/27 98*	8/3 105*
Delaware 14-2	7	6	60	27
Campbell 146	10	7	53	30
Homestead 24	13	7	72	8
Kokomo	8	7	70	15
Stair	9	28	54	8
Texto 2	8	8	73	11
Ace	14	5	62	19
Pocomoke	20	12	68	-

* Days from field setting.

Table No. 6. Recoverable Percent of Raw Stock for Canning From 28 lb. (5/8 bu.) Fruit at Each Harvest and Average #303 Can Yield for all Harvests at Painter, Virginia.

Variety	Percent of 28 lb. remaining for canning after peeling, coring and trimming at each harvest.				Ave. #303 can yield per 28 lb. (5/8 bu.) for three harvests.
	7/12 ⁽¹⁾	7/20	7/27	8/3	
Delaware 14-2	-	69	56	67	24
Campbell 146	-	73	70	69	26
Homestead 24	-	72	70	65	26
Kokomo	-	74	70	68	26
Stair	-	73	58	72	25
Texto 2	-	50	62	62	22
Ace	-	69	68	69	26
Pocomoke	-	75	85	-(2)	30

(1) Data not taken.

(2) No marketable fruit produced.

Table No. 7. Climatological Data in 1960 at Painter, Virginia

For week ending	Temperature			Precipitation* (inches)	For week ending	Temperature			Precipitation* (inches)
	Max.	Min.	Av.			Max.	Min.	Av.	
Apr. 16	85	31	61	0	July 9	85	59	73	0.71
Apr. 23	90	30	62	0.11	July 16	89	56	74	1.21
Apr. 30	93	41	69	1.86	July 23	90	57	77	0
May 7	72	37	56	0.40	July 30	91	62	76	3.48
May 14	76	43	61	0.78	Aug. 6	93	68	81	1.74
May 21	88	44	68	0.50	Aug. 13	91	70	80	2.50
May 28	81	54	68	1.48	Aug. 20	90	60	76	0.03
June 4	86	59	70	2.50	Aug. 27	90	60	76	0.02
June 11	84	57	69	0.05	Sept. 3	90	61	78	0.06
June 18	90	62	76	0.23	Sept. 10	86	55	74	0.38
June 25	93	57	75	1.73	Sept. 17	84	53	69	4.91
July 2	85	53	73	0.89	Sept. 24	85	51	68	0

* Tomato and sweet potato areas were not irrigated.

1960 TOMATO VARIETY TRIALS FOR FRESH MARKET AND CANNING
Warsaw, Virginia

F. H. Scott, L. W. Johnson, H. M. Camper, Jr.

Ten varieties were grown for fresh market evaluation at the Eastern Virginia Research Station. Eight of these varieties were also grown for canning evaluation. The experimental procedure and growing conditions were as follows:

Location: Richmond County near Warsaw, Virginia.
 Elevation: 140 feet.
 Soil: Sassafras sandy loam.
 Soil pH: 6.0.
 Previous crop: Soybeans (unfertilized).
 Plot size: One row; records taken on 10 plants for fresh market and 20 plants for canning.
 Plot design: Split plot.
 Replications: Four.
 Spacing: Plants 3 feet apart in row, 5 feet between rows. Broadcast 10-10-10 at the rate of 800 lb. per acre 25 days before field setting. Sidedressed 5-10-10 at the rate of 500 lb. per acre 23 days after field setting.
 Field planting date: April 26.
 Cultivation: Frequently enough to control weeds.
 Pesticides: TDE-maneb dust.
 Growing conditions: See Table No. 15 and "Hail Damage" below.

Hail Damage

Hail on May 21 seriously damaged the plants. Hail was blown by a high wind (velocity not measured) nearly parallel to the ground causing little damage to the leaves but seriously damaging bloom clusters and stems. Bloom clusters were severed from 81% of the plants and 89% of the plants were damaged in other ways, ranging from moderate to extensive. Therefore, YIELD DATA GIVEN IN THIS REPORT ON THE 1960 WARSAW TOMATO VARIETY TRIALS REVEAL LITTLE OR NOTHING ABOUT THE YIELD OR MATURITY PERIOD OF THE VARIETIES. Results of statistical analyses of the yield data are not reported. Yield data are given only because a limited correlation with certain observations may be of some rather vague value.

Yield data were adjusted for missing plants. The number of missing plants per variety is as follows:

Table No. 8. Missing Plants.

Variety	Missing plants		Variety	Missing plants	
	Fresh	Canning		Fresh	Canning
Ace	0	3	Pearson	1	-
Campbell 146	2	2	Pocomoke	0	0
Delaware 14-2	0	2	Rutgers	2	-
Homestead 24	0	2	Stair	5	3
Kokomo	3	3	Tecumseh	1	3

Processing Procedure

Weekly harvests were made of "canning ripe tomatoes." Thirty pounds of fruit graded into the same ratio of canning U. S. 1's and U. S. 2 as the total harvest were taken from each harvest and canned as peeled tomatoes. The #303 can yield of processed tomatoes derived from this weight of fruit was calculated. 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 Varieties Tested for Fresh Market

This season the varieties Ace, Pocomoke (Maryland 314), Pearson, Stair, and Tecumseh replaced in the trials Century, Chesapeake, Moreton Hybrid, Rhose Island Early, and Texto 2.

It will be noticed from the following table no. 9 that in 1959 and 1960 Campbell 146 and Delaware 14-2 produced relatively high yields but the results are not conclusive because of unusual and adverse conditions in both seasons. Of the 5 varieties grown in these 2 seasons, Rutgers produced the lowest yield. Campbell 146 was 99% higher than Rutgers and Delaware 14-2 82% higher. It will also be noticed in table no. 9 that in the averages for the 3 years 1956-58, which do not include Campbell 146 and Delaware 14-2, no variety yielded as much as 2% more than Rutgers.

Early blight was general in the field but not intense, ranging from moderately affected to very mildly affected. There was no Fusarium wilt or other diseases of importance in the field.

Table No. 9. Total Fresh Marketable Yield by Hundredweights Per Acre of Tomato Varieties at Warsaw, Virginia, 1956-1960.

Variety	Yearly					Averages	
	1956	1957	1958	1959*	1960*	1956-1957	1956-1958
Ace	-	-	-	-	86	-	-
Big Early Hybrid	218	144	287	-	-	181	216
Campbell 146	-	-	371	152	161	-	-
Century	230	148	324	77	-	189	234
Chesapeake	208	103	376	172	-	156	229
Delaware 13-2	-	-	326	-	-	-	-
Delaware 14-2	-	-	-	159	128	-	-
Early Prolific	250	155	326	-	-	203	244
Foremost E-21	179	153	320	-	-	166	217
Homestead 2	205	152	320	-	-	179	226
Homestead 24	-	-	-	86	125	-	-
Kokomo	206	144	373	102	107	175	241
Manalucie	167	96	-	-	-	132	-
Moreton Hybrid	225	167	275	50	-	196	222
Pearson	-	-	-	-	85	-	-
Pocomoke	-	-	-	-	60	-	-
Rhode Island Early	-	-	-	24	-	-	-
Rutgers	209	147	365	62	96	178	240
Stair	-	-	-	-	101	-	-
Tecumseh	-	-	-	-	102	-	-
Texto 2	208	152	326	85	-	180	229
Wiltmaster	139	122	-	-	-	131	-
Averages	204	140	332	97	105	172	230

* In 1959, very little rainfall first 54 days and weak plants probably reduced yields and may have affected relative performance. In 1960, hail damage to plants probably reduced yields and very likely affected relative performance.

Notes on Varieties Tested for Canning

Variety descriptions of plants and fruit characters will be found under comments on individual varieties.

Canned product evaluation resulted in Ace and Homestead 24 being placed superior to any other varieties in the trials. Yield-wise both of these varieties were in the below average grouping. The canned product evaluation of Delaware 14-2, Campbell 146, Tecumseh and Stair were judged average. Of this grouping Campbell 146 was the heaviest yielder of total marketable fruit in the canning trials, Delaware 14-2 was second heaviest and Stair was the fourth heaviest yielding variety. Tecumseh was next to the lowest yielding variety in the test. The remaining varieties, Kokomo and Pocomoke were judged below average in the canned product evaluations. Yield-wise Kokomo was the third highest yielding variety in the trials while Pocomoke was the lowest yielding variety.

In the chemical analyses performed on the canned product there was no significant difference in soluble solids between varieties, but levels did decrease significantly within varieties from weekly harvest to weekly harvest. The greatest changes occurred between the third (August 10) and fourth (August 17) harvests. Ascorbic acid levels were not exceptionally different in any varieties from those grown during previous years, however, Pocomoke and Delaware 14-2 did exhibit the highest levels during the 1960 season. The average pH of all varieties was below 4.5 this season. See tables no. 11 and 14 for additional data on the 1960 Warsaw canning tomato trials.

Comments on Individual Varieties

Campbell 146 - Fruit: Average in uniformity and color but slightly below average in over-all smoothness, and medium in weight. Shoulders average in smoothness, color, and cracking. Canning characters: Color of canned product about average. Wholeness and flavor somewhat above average. Fruit size very good for #303 can. Yield of total cannable tomatoes greatest on third week (August 10) of harvest, and was the highest yielding variety in the trials. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock at each harvest about average.

Vine: Slightly above medium size, fairly erect to somewhat recumbent, fairly dense foliage and somewhat above average in uniformity.

Comment: Interior was slow in coloring, taking from 3 to 5 days longer than Rutgers.

Delaware 14-2 - Fruit: Average in uniformity and somewhat above average in over-all smoothness and color and medium in weight. Shoulders average in smoothness but somewhat above average in color with next to the least amount of cracking in the trials. Canning characters: Color of canned product somewhat below average. Wholeness was outstanding; flavor was somewhat above average. Fruit size slightly large for #303 can. Yield of total cannable tomatoes greatest on fifth week (August 24) of harvest, and was the second highest yielding variety in the trials. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock at each harvest was one of the highest.

Vines: Large, fairly erect to somewhat recumbent, fairly dense foliage and somewhat above average in uniformity.

Homestead 24 - Fruit: Slightly below average in uniformity but average in over-all smoothness and color and of medium weight. Shoulders average in smoothness, color, and cracking. Canning characters: Color of canned product somewhat above average. Wholeness somewhat above average; flavor about average. Fruit size suitable for #303 can. Yield of total cannable fruit greatest on first week (July 27) of harvest, and a low yielder of fruit for canning. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock at each harvest was about average.

Vines: Medium size, fairly erect, rather dense foliage, and slightly above average in uniformity.

Kokomo - Fruit: Uniformity and color average, but somewhat below average smoothness and weight was medium. Shoulders average in smoothness and color but somewhat above average in cracking. Canning characters: Color of canned product somewhat below average. Wholeness somewhat below average. Flavor about average. Fruit size suitable for #303 can. Yield of total cannable tomatoes greatest on fourth week (August 17) of harvest, and the third highest yielding variety in the trials. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock at each harvest was the lowest of any variety in the trials.

Vine: Rather large, fairly erect, fairly dense foliage, and somewhat above average in uniformity.

Tecumseh - Fruit: Slightly below average in uniformity, average over-all smoothness but well below average in color and slightly below medium weight. Shoulders somewhat above average in smoothness but slightly below in color with average amount of cracking. Canning characters: Color of canned product somewhat above average. Wholeness somewhat below average, flavor about average. Fruit size suitable for #303 can. Yield of total cannable tomatoes greatest on first week (July 27) of harvest. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock at each harvest was somewhat below average.

Vine: Medium size, fairly erect, rather dense foliage, and somewhat above average in uniformity.

Stair - Fruit: Slightly below average in uniformity, but average in color and somewhat above average in over-all smoothness and slightly below medium weight. Shoulders somewhat above average in smoothness but slightly below in color and above average amount of cracking. Canning characters: Color of canned product somewhat below average. Wholeness somewhat below average; flavor somewhat above average. Fruit size suitable for #303 can. Yield of total cannable tomatoes greatest on fourth week (August 17) of harvest. Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock at each harvest was somewhat below average.

Vines: Rather large, fairly erect, fairly dense foliage and slightly above average in uniformity.

Rutgers - Fruit: Slightly above average in uniformity, but average in color and somewhat below average in over-all smoothness and of medium weight. Shoulders average in smoothness and color but slightly above average in cracking. Canning characters were not evaluated.

Vines: Rather large, fairly erect, rather dense foliage and somewhat above average uniformity.

Ace - Fruit: Somewhat above average in uniformity and average in over-all smoothness and color and medium in weight. Shoulders average in smoothness, somewhat above average in color and slightly above average in cracking. Canning characters: Color of canned product above average. Wholeness was outstanding, flavor was somewhat below average. Fruit size suitable for #303 can. Yield of total cannable tomatoes greatest on fourth week (August 17) of harvest. Yield of #303 cans

containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock at each harvest was about average.
Vines: Medium size, erect, dense foliage and above average uniformity.
Comment: This variety, said to be grown considerably in California, was included in this trial at the request of growers.

Pearson D. F. - Fruit: Well above average in uniformity, but rough and well below average in over-all color. Well above average in weight being the largest fruit in the trials. Shoulders well below average in smoothness and color with highest percentage cracking in the trials. Canning characters were not evaluated.
Vines: Slightly above medium size, erect and compact, with rather dense foliage but up-curling of leaflets reduced coverage and exposed under-surface of leaflets to injury by weather. Uniformity somewhat above average.
Comment: This variety, said to be grown considerably in California, was included in this trial at the request of growers.

Pocomoke (Maryland 314) - Fruit: Slightly below average in uniformity, but average in color and somewhat above average in over-all smoothness. Weight well below medium, being the lowest in the trials. Shoulders somewhat above average in smoothness and color and very low in cracking having much the lowest percentage of cracking in the trials. Canning characters: Color of canned product about average. Wholeness and flavor below average. Fruit size too small for economical processing of peeled tomatoes. Yield of total cannable tomatoes greatest on first harvest (July 27). Yield of #303 cans containing 12 ounces of peeled fruit from 12 pounds of canning ripe raw stock at each harvest was greatest for any variety in the trials.
Vine: Rather small, recumbent but fairly compact growth, dense foliage but type of growth exposed much of the fruit to the sun. Uniformity somewhat above average.

Table No. 10. Ten Tomato Varieties or Seedlings Tested in 1960 at Warsaw, Virginia. Yields, fruit weight, shoulder rating, cracking, and early blight.

Variety	Average Yield Per Acre (Means of 4 replications)			Average market- able fruit weight for season	Shoulder rating (1)		Cracking (2)				Disease rating Early blight (3)	Seed source (4)
	Total market- able	U.S. 1's	U.S. 2's U.S. 3's		Color	Smoothness	Total	Radial	Concentric	Radial & concentric		
	U.S. 1's U.S. 2's U.S. 3's											
	cwt.	cwt.	cwt.	oz.			%	%	%	%		
Campbell 146	161	90	71	5.5	6	6	28	15	5	8	7	2
Delaware 14-2	128	71	57	5.7	7	6	19	8	3	8	8	3
Homestead 24	125	57	68	5.6	6	6	35	16	4	15	6	1
Kokomo	107	48	59	4.9	6	6	42	19	4	19	7	1
Tecumseh	102	50	52	4.4	5	7	30	13	4	13	8	4
Stair	101	61	40	4.3	5	7	44	17	9	18	8	4
Rutgers	96	50	46	5.2	6	6	41	24	4	13	6	1
Ace	86	43	42	6.0	7	6	41	27	3	11	7	6
Pearson D. F.	85	40	45	7.3	3	4	48	10	17	21	7	6
Pocomoke	60	27	33	3.6	7	7	4	2	1	1	7	5

- (1) Shoulder ratings: Observations made at 1st through 4th harvest (78 to 100 days from field setting) and at 6th harvest (112 days). Ratings: 1, very poor to 9, very good.
- (2) Cracking: Counts made at all harvests. Figures are the percent of all fruit harvested.
- (3) Disease: Observations made 107 days after field setting. No symptoms of Fusarium wilt were observed. Early blight was the only disease of any importance, which was rated: 1, very intense and/or dead to 9, no symptoms.
- (4) Seed sources: 1, Asgrow Seed Co. 2, Campbell Soup Co. 3, Delaware-Brasher 4, Indiana-Johnson 5, Maryland-Stark 6, Peto Seed Co.

Table No. 11. Eight Tomato Varieties Tested for Canning Characteristics in 1960 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 (2) (Co-op technical panel)				Chemical Analysis (3) (Mean of duplicates)			
	Total market-able	U.S. 1's	U.S. 2's	Color	Wholeness	Flavor	Weighted overall score	% Soluble solids (1B)	% Acid as citric (1B)	Ascorbic acid mg/100 ml. (1A)	pH (1A)
	cwt.	cwt.	cwt.								
Campbell 146	223.5	88.2	135.3	3.44	3.91	3.78	3.64	5.56	0.34	8.48bcd	4.34b
Delaware 14-2	167.7	73.4	94.3	3.39	4.31	3.85	3.76	5.84	0.34	8.70ab	4.32b
Kokomo	164.7	44.0	120.7	3.41	3.56	3.67	3.50	5.52	0.36	8.36cd	4.43a
Stair	158.8	46.9	111.9	3.93	3.15	3.89	3.64	6.08	0.38	8.63abc	4.28b
Ace	147.3	60.0	87.3	3.85	4.50	3.54	4.06	5.88	0.33	8.64abc	4.33b
Homestead 24	145.9	34.6	111.3	4.09	4.06	3.76	4.05	5.36	0.34	8.29d	4.44a
Tecumseh	133.0	30.6	102.4	4.26	3.64	3.83	3.99	5.76	0.32	8.36cd	4.34b
Pocomoke	97.1	33.4	63.7	3.60	2.74	3.57	3.28	5.50	0.27	8.86a	4.32b

(1) The superscripts (a, b, c, d) indicate the statistical significance 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.

(1A) Statistical significance at the 1% level.

(1B) No statistical difference.

(2) Organoleptic evaluation replicated 2 times for each of 5 harvest dates, and rated for overall average as follows: color 30, wholeness 20, flavor 5, scoring on basis 1 (low) to 5 (high) using seven judges.

(3) Chemical analyses from 2 cans for each of 5 harvests.

Notes: Seed sources were the same as those for fresh market. Percent acid as citric = total acidity.

Table No. 12. Percent Yield at Each Harvest of Total Yield of Tomatoes in Replicated Fresh Tomato Trials for 1960 at Warsaw, Virginia.

Variety	Approximate percent of total yield at each harvest							
	7/13 78*	7/20 85*	7/28 93*	8/4 100*	8/8 104*	8/16 112*	8/23 119*	8/30 126*
Campbell 146	1	5	18	20	17	11	21	7
Delaware 14-2	0	3	15	26	12	12	21	11
Homestead 24	**	10	48	18	5	4	13	2
Kokomo	0	**	27	32	11	5	16	9
Tecumseh	0	8	37	30	5	3	11	6
Stair	0	6	31	23	17	5	12	6
Rutgers	**	1	32	34	12	8	11	2
Ace	**	0	18	42	11	7	15	7
Pearson	0	1	28	43	10	2	8	8
Pocomoke	0	10	41	18	1	2	18	10
Average	**	4	29	29	10	6	15	7

* Days from field setting.

** Less than 0.5%.

Table No. 13. Percent Yield at Each Harvest of Total Yield of Replicated Canning Tomato Trials for 1960 at Warsaw, Virginia.

Variety	Approximate percent of total yield at each harvest					
	7/27 92*	8/3 99*	8/10 106*	8/17 113*	8/24 120*	8/31 127*
Campbell 146	16	21	25	17	15	6
Delaware 14-2	12	18	17	20	24	9
Kokomo	10	23	21	27	12	7
Stair	15	15	28	30	6	6
Ace	14	20	16	25	18	7
Homestead 24	26	24	15	23	9	3
Tecumseh	35	15	15	24	6	5
Pocomoke	44	25	16	8	4	3

* Days from field setting.

Table No. 14. Recoverable Percent of Raw Stock for Canning From 28 lb. (5/8 bu.) Fruit at Each Harvest and Average #303 Can Yield for all Harvests at Warsaw, Virginia.

Variety	Percent of 28 lb. remaining for canning after peeling, trimming and coring at each harvest.					Ave. #303 can yield per 28 lb. (5/8 bu.) for all harvests.
	7/27	8/3	8/10	8/17	8/24	
	%	%	%	%	%	#303 cans
Campbell 146	72	73	67	67	56	25
Delaware 14-2	72	73	73	62	62	26
Kokomo	69	72	59	54	58	23
Stair	70	69	52	56	69	24
Ace	74	68	62	59	74	25
Homestead 24	75	62	68	69	60	25
Tecumseh	69	68	58	56	68	24
Pocomoke	75	84	65	58	-	26

Table No. 15. Climatological Data in 1960 at Warsaw, Virginia

For week ending	Temperature			Precipitation* (inches)	For week ending	Temperature			Precipitation* (inches)
	Max.	Min.	Av.			Max.	Min.	Av.	
Apr. 30	95	37	68	0.15	July 2	93	52	74	0.86
May 7	80	35	58	0.24	July 9	92	58	76	0.11
May 14	72	44	58	2.60	July 16	90	55	75	0.42
May 21	89	43	69	0.80	July 23	98	57	79	0
May 28	82	53	68	3.01	July 30	89	60	76	4.82
June 4	88	55	71	0.36	Aug. 6	93	65	80	2.52
June 11	87	47	69	0	Aug. 13	93	67	78	2.01
June 18	92	58	77	0.40	Aug. 20	90	62	73	0.73
June 25	97	55	76	0.05	Aug. 27	91	56	76	0.05

* Area was not irrigated.

1960 SOUTHERN TOMATO EXCHANGE PROGRAM VARIETY TRIAL

Western Virginia

F. H. Scott

The 1960 Southern Tomato Exchange Program (STEP) trials were grown at forty-two locations in seventeen states, Puerto Rico and Mexico. The western Virginia replicated tests are conducted as a part of this program. This regional tomato program has facilitated rapid testing and accurate evaluation of many new tomato selections.

Ten breeding lines and named varieties 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:	6.3.
Previous crop:	Cover crop.
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:	5-10-10 at the rate of 400 lb. per acre was applied in rows 16 days before field setting. At field setting, applied 1/2 pint per plant of starter solution (3 lb. 10-52-17 in 50 gal. water). Twelve days after field setting, sidedressed with 10-10-10 at rate of 400 lb. per acre.
Field planting date:	May 19.
Cultivation:	Frequently enough to control weeds.
Fungicides:	Maneb.
Insecticides:	Chlordane (in starter solution), TDE and Malathion.
Growing conditions:	See Table No. 19.

Notes on Varieties Tested

The yields of marketable fruit in tomato variety trials in this area have been high as compared to other areas in Virginia. The average yield for the period 1958-1960 was more than 21 tons an acre.

The Step trial average yields for the period 1958-1959 showed no improvement over Rutgers as may be noticed in the following table no. 16. For the period 1959-1960, however, averages for Step 311 and Step 314 are rather high and for Step 305 somewhat low.

Table No. 16. Total marketable yield by hundredweights per acre of tomato varieties and seedlings in STEP trials at Blacksburg, Virginia 1958-60.

Variety or seedling	Yearly			Averages		
	1958	1959	1960	1958 1959	1959 1960	1958 1959 1960
Step 259	-	435	-	-	-	-
Step 260	355	378	-	367	-	-
Step 268	444	-	-	-	-	-
Step 274	423	-	-	-	-	-
Step 278	438	377	-	408	-	-
Step 281	417	399	482	408	441	433
Step 305	-	288	386	-	337	-
Step 311	-	415	562	-	489	-
Step 314	-	430	512	-	471	-
Step 329	-	-	458	-	-	-
Step 341	-	-	494	-	-	-
Step 346	-	-	504	-	-	-
Homestead 2	430	-	-	-	-	-
Homestead 24	455	370	452	413	411	426
Marion (Step 280)	450	385	482	418	434	439
Moreton Hybrid	407	-	-	-	-	-
Rutgers	469	369	392	419	381	410
Average	428	385	472	406	423	427

The Step trials in 1960 produced no significantly different yields at the 5% level of total marketable or U. S. 1's fruit. Step 329 appeared to be somewhat earlier than the others. The weight of the fruit ranged from 5.4 oz. to 6.7 oz. and averaged 6.2 oz. The general shape of all entries was oblate spheroid with an average ratio of 93% and ranging from 90% for Step 311 to 94% for Step 346.

Traces of early blight were the only indications of important diseases in the trials.

Comments on Individual Varieties

Step 311 - Fruit: Average uniformity and medium over-all smoothness, but well above medium in over-all color. Shoulders somewhat above medium in smoothness and coloring with cracking below average, being the lowest percent in the trials.

Vine: Large, fairly erect with dense foliage and quite uniform.

Comment: Based on 1959 and 1960 data and observations, Step 311 seems to be the best entry in the trials.

Step 314 - Fruit: Somewhat above average uniformity and medium in over-all smoothness and color. Shoulders medium in smoothness and coloring with average amount of cracking.

Vine: Rather large, fairly erect to somewhat recumbent with fairly dense foliage and slightly above average in uniformity.

Comment: Fruit tested by "feel," seemed somewhat firmer than other entries.

Step 346 - Fruit: Average uniformity and somewhat above medium in over-all smoothness and color. Shoulders medium in smoothness but somewhat below medium in coloring with cracking below average.

Vine: Medium size, fairly erect to somewhat recumbent with fairly dense foliage and about average uniformity.

Step 341 - Fruit: Average uniformity and medium over-all smoothness, but somewhat above medium in color. Shoulders medium in smoothness but somewhat below medium in coloring and average in percent of cracking.

Vine: Medium size, somewhat inclined to sprawl but fairly dense and slightly above average in uniformity.

Comment: Fruit tested by "feel," seemed slightly softer than average. The seed of Step 341 were slow in sprouting, producing rather weak seedlings which seemed to regain their vigor when set in the field.

Step 281 - Fruit: Average uniformity and medium in over-all color, but slightly rough. Shoulders medium in smoothness and coloring with cracking below average.

Vine: Large, fairly erect to somewhat recumbent with dense foliage and slightly above average in uniformity.

Marion (Step 280) - Fruit: Somewhat lacking in uniformity, well below medium in over-all color, and slightly rough. Shoulders medium in smoothness and coloring with average amount of cracking.

Vine: Large, fairly erect to somewhat recumbent with rather dense foliage and slightly above average in uniformity.

Step 329 - Fruit: Average uniformity and medium over-all smoothness, but slightly below medium color. Shoulders somewhat below medium in smoothness and color, but average in the amount of cracking.

Vine: Slightly above medium size, somewhat inclined to sprawl but with fairly dense foliage and somewhat above average in uniformity.

Comment: A little earlier than other entries.

Homestead 24 - Fruit: Slightly lacking in uniformity and medium in over-all smoothness and color. Shoulders medium in smoothness but slightly below medium in coloring and with average percent of cracking.

Vine: Medium size, erect with rather dense foliage and quite uniform.

Rutgers - Fruit: Average uniformity and medium over-all smoothness, but well below medium in color. Shoulders medium smooth and somewhat above medium in coloring and slightly above average in cracking.

Vine: Rather large, fairly erect with rather dense foliage and slightly above average in uniformity.

Step 305 - Fruit: Quite uniform, medium in over-all smoothness and slightly above medium in color. Shoulders somewhat above medium in smoothness and coloring, but highest percent of cracking in the trials.

Vine: Medium size although smallest in the trials, fairly erect with fairly dense foliage and somewhat above average in uniformity.

Table No. 17. Ten Tomato Varieties or Breeding Lines of the Southern Tomato Exchange Program Trials Tested in 1960 at Blacksburg, Virginia. Yields, fruit weight, shoulder rating and cracking.

Variety or seedling	Average Yield Per Acre (1) (Means of 4 replications)			Average marketable fruit weight	Shoulder rating (2)		Cracking (3)				Seed source (4)
	Total marketable	U.S. 1's	U.S. 2's U.S. 3's		Color	Smoothness	Total	Radial	Concentric	Radial & concentric	
	cwt.	cwt.	cwt.	oz.			%	%	%	%	
Step 311	562 a	501 a	61 ^e	6.5	7	6	14	9	4	1	1
Step 314	512 a	403 a	109 abc	6.3	5	6	30	2	27	1	3
Step 346	504 a	432 a	72 de	5.4	6	6	16	1	15	0	3
Step 341	494 a	375 a	119 ab	6.1	6	6	28	6	18	4	5
Step 281	482 a	394 a	88 bcde	6.5	7	7	16	6	9	1	2
Marion	482 a	366 a	116 ab	6.7	7	7	25	10	12	3	2
Step 329	458 a	369 a	89 bcde	5.4	6	6	22	0	22	0	4
Homestead 24	452 a	355 a	97 abcd	6.4	5	5	28	9	16	3	1
Rutgers	392 a	312 a	80 cde	6.2	5	6	31	4	24	3	1
Step 305	386 a	262 a	124 a	6.2	5	6	47	1	45	1	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 observations were made from the first (69 days) through the sixth harvest (103 days). Color and smoothness were rated 1, very poor to 9, very good.
- (3) Cracking counts were made at all harvests. Cracking is noted as the percent cracked fruit of the total fruit harvested.
- (4) Seed source: 1. Asgrow Seed Company, 2. Clemson Truck Experiment Station, 3. Gulf Coast Experiment Station, 4. Tomato Disease Laboratory, Jacksonville, Texas, 5. University of Hawaii.

Table No. 18. Percent Yield at Each Harvest of Total Yield for 1960 Season at Horticulture Farm, Blacksburg, Virginia.

Variety or breeding line	Approximate percent of total yield at each harvest								
	7/27 69*	8/2 75*	8/9 82*	8/16 89*	8/23 96*	8/30 103*	9/6 110*	9/13 117*	9/20 124*
Step 311	0	**	1	8	29	24	32	3	3
Step 314	0	**	4	7	18	21	33	13	4
Step 346	0	1	4	7	21	19	35	10	3
Step 341	**	2	4	15	27	27	20	3	2
Step 281	**	3	4	10	26	19	28	6	4
Marion	**	2	4	11	18	19	36	5	5
Step 329	1	3	5	16	24	18	27	4	2
Homestead 24	0	1	5	12	27	21	29	3	2
Rutgers	0	**	4	9	15	31	30	7	4
Step 305	**	2	6	10	16	26	27	9	4
Average	**	1	4	11	23	22	30	6	3

* Days from field setting.

** Less than 0.5% of total marketable harvest.

Table No. 19. Climatological and Irrigation Data in 1960 at Horticulture Farm, Blacksburg, Virginia.

For week ending	Temperature			Precipitation* (inches)	For week ending	Temperature			Precipitation* (inches)
	Max.	Min.	Av.			Max.	Min.	Av.	
May 14	68	30	47	0.61	July 23	90	50	72	1.40*
May 21	84	42	64	0.28	July 30	88	55	73	0.07
May 28	80	43	63	2.34*	Aug. 6	95	55	75	1.00*
June 4	82	42	65	0.50	Aug. 13	90	60	73	2.00
June 11	82	42	64	0.45	Aug. 20	86	50	70	0.33
June 18	84	46	69	1.65*	Aug. 27	86	52	69	1.01
June 25	88	48	68	1.16	Sept. 3	90	56	73	0.38
July 2	86	46	69	0.99	Sept. 10	90	56	71	0.06
July 9	88	51	70	0	Sept. 17	78	40	62	1.19
July 16	87	55	72	0.05	Sept. 24	82	43	63	1.38

* Including 1-inch irrigation.

SWEET POTATO VARIETY TRIALS - 1960
Eastern Shore, Virginia

F. H. Scott, L. W. Johnson, 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 1960 season was the second in this series of trials. More data were obtained in 1960 than in 1959 and we hope to broaden the scope of the trials even more in 1961.

Ten varieties or numbered seedlings of sweet potatoes were grown for evaluation at the Eastern Shore sub-station of the Virginia Truck Experiment Station. The experimental procedure and growing conditions were as follows:

Location:	Accomack County near Painter, Virginia.
Elevation:	30 feet.
Soil:	Sassafras fine sandy loam.
Soil pH:	5.6.
Plot size:	Five rows 32.5 feet long each. Yield records taken on center row.
Plot design:	Randomized block.
Replications:	Four.
Spacing:	Plants 13 inches apart in rows 36 inches apart.
Fertilization:	3-9-12 at the rate of 1000 lb. per acre side-dressed 2 weeks after field planting.
Field planting date:	May 11.
Harvest date:	September 28.
Cultivation:	Frequently enough to control weeds.
Growing conditions:	See Table No. 7, page 13.

Notes on Varieties Tested

Nugget (formerly seedling N. C. 171) produced the highest yield in sizes suitable for the fresh market. Centennial (formerly seedling L3-77) and Copperskin Goldrush were second with Nemagold and Porto Rico 109 third. Carogold and Allgold produced the lowest yields in the fresh market group.

Carogold was highest in yield of canning sizes. Nemagold and Jersey Orange were second. Oklamar was lowest (see comments on Oklamar).

In total marketable yield, including oversize (20 to 36 ounces), Nugget was again highest with Centennial second and Nemagold third. Allgold was lowest.

Very little cracking occurred this season. Allgold had about 1.5% cracked roots of the total roots harvested. The other varieties ranged from 0 to 0.6%.

Jumbos (36 ounces or more) were relatively low this season. Porto Rico 109 produced 3% jumbos of total roots and Centennial 2%. All other varieties ranged from 0 to 1%. Jumbos and oversize (20 to 36 ounces) however, were considerable. Percent of total roots was as follows: Oklamar 13%, Centennial 10%, Porto Rico 109 9%, Nugget and Allgold 6%, Nemagold and L1-80 4%, Copperskin Goldrush 3%, Carogold and Jersey Orange 0. The 140-day growing period was probably 30 days too long for an early variety such as Oklamar and perhaps 10 to 15 days too long for Centennial and Porto Rico 109.

Culls in addition to jumbos and cracked roots ranged from 6% of the total roots for Copperskin Goldrush and Carogold to 23% for Oklamar. The main causes of culls were irregular shape and small size.

Processing Qualities

In the processing evaluation L1-80, Centennial, Nugget, Oklamar, and Copperskin Goldrush rated in the highest group in this order as general all-round processing roots. The color uniformity of L1-80 was particularly outstanding. Oklamar rated in the highest group in the vacuum packs, but was scored low in the syrup packs because of poor texture and lack of firmness. However, it was judged superior on the wholeness characteristic in both syrup and vacuum packs.

Porto Rico 109 and Jersey Orange were scored in the least desirable group. Porto Rico was most lacking in uniformity of flesh color. It scored slightly above average on the wholeness characteristic, but was quite low in the firmness characteristic in syrup packs. Jersey Orange was rated very poor on both the wholeness and firmness characteristics.

Nemagold, Carogold, and Allgold were rated in the average group. Allgold was rated as the least desirable of the three varieties in this group, primarily because of its washed out yellow color and lack of uniformity of color. Carogold and Nemagold were rated almost equal with each of the two varieties leaving something to be desired in the firmness characteristic.

Individual processing characters for each of the replicated varieties may be found in table no. 21.

Comments on Individual Varieties

Nugget - Mostly spindle-shaped with light copper color rather smooth skin although some roots were slightly russeted. Flesh uniformly salmon. Culls mostly irregular shape and small size with a few jumbos. General appearance very good. Estimated sprout count was between Carogold (lowest in trials) and the average for the other 8 varieties in the trials. Canning characters: Uniformity of flesh color well above average. Wholeness of the processed roots in vacuum packs was superior. Weighted over-all score of both syrup and vacuum packs was third highest in the replicated trials.

Centennial - Shape mostly a thick-spindle and skin light copper in color. Flesh a very uniform orange throughout. Culls mostly irregular shape and small size with 2% of total harvest being jumbos. General appearance a little rough but good. Canning characters: Uniformity of flesh color well above average with the second highest rating in the trials. Wholeness of the processed roots in vacuum packs was average and this leaves something to be desired. Weighted over-all score of both syrup and vacuum packs was second highest in the replicated trials.

Nemagold - Mostly spindle-shaped with cream colored skin that scuffed rather easily. Flesh a fairly uniform salmon. Culls mostly small size and irregular shape and no jumbos. General appearance, although a little scuffed, was good. Canning characters: Uniformity of flesh color slightly below average. Wholeness of the processed roots in vacuum packs was above average. Weighted over-all score for both syrup and vacuum packs was slightly below average for the trials.

Copperskin Goldrush - Shape mostly thin-spindle to fairly thick-spindle. Skin copper color and scuffed rather easily. Flesh fairly uniform light orange. Culls mostly small size with relatively few of irregular shape and no jumbos. General appearance very good. Canning characters: Uniformity of flesh color slightly above average. Wholeness of the processed roots in vacuum packs was below average. Weighted over-all score of both syrup and vacuum packs was slightly above average.

Porto Rico 109 - (A selection from Unit I Porto Rico by the Virginia Truck Experiment Station.) Mostly spindle-shaped but rough with skin ranging in color from cream to tannish-rose. Flesh variegated salmon and cream with lighter ends. Culls mostly small size and irregular shape but with 3% of total harvest being jumbos. General appearance fair, which may have been improved if harvested 15 days earlier. Canning characters: Uniformity of flesh color poorest of any variety in trials. Wholeness of the processed roots in vacuum packs above average. Weighted over-all score of both syrup and vacuum packs was lowest of any variety in trials and was below commercial acceptability.

Carogold - Shape quite symmetrical and mostly thin-spindle although a moderate number were average spindle-shape. Skin light copper with a rose tint and satiny sheen. Flesh uniformly salmon. Culls mostly small size with a few of irregular shape and no oversize on jumbos. General appearance best in the trials. Yield may have been increased by harvesting 10 to 15 days later. Estimated sprout count was lowest in the trials. Canning characters: Uniformity of flesh color below average. Wholeness of the processed roots in vacuum packs slightly below average. Weighted over-all score of both syrup and vacuum packs below average.

Oklamar - Mostly turnip-shaped and some were globular. Skin rose color but color fading especially toward ends. Flesh a fairly uniform salmon.

Culls were 24% of total harvest, being the highest proportion in the trials. Culls were caused mostly by irregular shape although there was a little veining and 1% jumbos. General appearance poor. If harvested 30 days earlier it is very likely marketable yield would have increased, culls decreased, and appearance improved. Canning characters: Uniformity of flesh color above average. Wholeness of the processed roots in vacuum packs superior. Weighted over-all score of both syrup and vacuum packs was above average.

Jersey Orange - Mostly spindle-shaped although there were some turnip-shaped. Skin was cream color slightly russeted. Flesh somewhat blotchy light salmon in color. The 16% culls were caused by small size, veining and irregular shape. General appearance fairly good. Canning characters: Uniformity of flesh color below average. Wholeness of the processed roots in vacuum packs below average. Weighted over-all score of both syrup and vacuum packs was below average, and commercial acceptability.

L1-80 - Mostly spindle-shaped with copper color skin slightly russeted. Flesh fairly uniform orange. Culls mostly small size and irregular shape. General appearance good. Canning characters: Uniformity of flesh color the most outstanding of any replicated variety. Wholeness of the processed roots in vacuum packs about average. Weighted over-all score of both syrup and vacuum packs was the highest on any variety in the replicated trials.

Allgold - Mostly spindle-shaped but rough. Skin cream color. Flesh salmon but somewhat variegated. Culls were 19% of total harvest being next to highest proportion in the trials. Cause of culls was mostly irregular shape but with some small size. General appearance fairly good. Canning characters: Uniformity of flesh color was next to poorest in the trials. Wholeness of the processed roots in vacuum packs above average. Weighted over-all score of both syrup and vacuum packs below average and bordering on commercially unacceptable.

Table No. 20. Ten Sweet Potato Varieties or Numbered Seedlings Tested in 1960 at Eastern Shore (Accomack County), Virginia. Yields, culls, stand counts, and root weights.

	Plant count	*Average Yields Per Acre of Marketable Roots (Means of 4 replications)				Culls			Weight per marketable root
		Total**	Fresh market	Canning	Oversize	Jumbo	Cracked	Other	
		(1)	(2)	(3)	(4)	(5)	(6)	(6)	
	plt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	oz.
Nugget (7)	117	402a	291a	97bc	22bc	6	1	45	8.7
Centennial	112	380ab	245ab	94bc	35ab	9	0	37	7.5
Nemagold	117	365abc	227bc	131b	15bc	0	1	32	6.4
Copperskin Goldrush	119	350bcd	248ab	103bc	13d	0	0	23	6.8
Porto Rico 109	106	346bcde	225bc	78cd	21bc	12	0	33	7.7
Carogold	115	329bcde	166d	169a	0d	0	2	22	5.2
Oklamar	113	319cdef	212bcd	56d	48a	6	0	94	8.9
Jersey Orange	115	307def	186cd	123b	0d	0	0	59	5.5
L1-80	116	298ef	178cd	113bc	11d	3	2	37	6.1
Allgold	114	273f	160d	94bc	19bc	0	5	66	6.3

* The superscriptions (a, b, c, d, e, f) 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.

** The data in the column under the subhead "total" are calculated from adjusted means from a covariance analysis. In the other three yield columns, missing plants did not change the significance so the means were not adjusted. This results in the total yield being somewhat different from the total of the remaining three columns.

- (1) Total yield: Length 2 to 10 inches, diameter 1 to 3.75 inches. Not over 36 oz.
- (2) Fresh market: Length 3 to 10 inches, diameter 1.75 to 3.75 inches. Not over 20 oz.
- (3) Canning: Length 2 to 7 inches, diameter 1.0 to 2.25 inches.
- (4) Oversize: Length more than 10 inches, and/or diameter more than 3.75 inches and/or weight more than 20 oz. but less than 36 oz.
- (5) Jumbo: Weight 36 oz. or more.
- (6) Other culls: Predominantly misshapen, rough or small. Veining was considerable in Jersey Orange and to a lesser degree in Oklamar.
- (7) Nugget: Formerly seedling N. C. 171. Released in the spring of 1960 by the N. C. Agricultural Experiment Station as the Nugget variety.

Table No. 21. Mean Evaluation Scores of Canned Sweet Potatoes from 1960 Replicated Plantings on Eastern Shore of Virginia, Processed at Harvest Time.

A - Syrup Pack

Variety	Color		Whole-ness	Firm-ness	Tex-ture	Flavor	Weighted Over-all Score
	Hue	Uniform-ity					
Centennial	9.1	8.6	9.5	6.5	7.3	7.4	8.3
L1-80	8.9	9.0	7.2	5.1	8.7	7.8	7.7
Nugget	8.6	8.2	9.0	7.3	6.7	7.6	7.6
Copperskin Goldrush	9.2	7.7	8.6	2.7	8.8	8.4	7.3
Nemagold	7.7	6.7	8.6	5.7	7.5	7.9	6.8
Oklamar	9.0	7.8	9.2	5.9	6.6	7.7	6.6
Carogold	7.1	6.9	8.5	5.2	7.8	7.5	6.6
Allgold	6.8	5.9	9.4	5.1	8.2	8.2	6.5
Jersey Orange	7.0	6.9	5.2	4.6	7.8	7.5	5.9
Porto Rico 109	5.8	3.5	8.1	5.1	7.4	8.2	5.2

B - Vacuum Pack

Variety	Color		Whole-ness	Firm-ness	Tex-ture	Flavor	Weighted Over-all Score
	Hue	Uniform-ity					
L1-80	8.9	9.0	6.8	6.9	9.2	8.7	8.0
Oklamar	9.0	7.8	8.8	6.6	8.4	8.1	7.8
Centennial	9.1	8.6	6.7	6.2	7.3	6.3	7.2
Nugget	8.6	8.2	7.0	7.0	6.3	5.0	7.0
Copperskin Goldrush	9.2	7.7	6.1	3.6	8.6	7.6	6.7
Nemagold	7.7	6.7	7.6	6.2	7.1	6.7	6.5
Carogold	7.1	6.9	6.8	6.4	7.0	6.7	6.4
Allgold	6.8	5.9	7.6	6.0	8.1	6.3	6.2
Jersey Orange	7.0	6.9	5.6	5.3	7.5	6.5	6.0
Porto Rico 109	5.8	3.5	7.6	7.1	6.3	6.8	5.4

Notes: See next page.

NOTES:

Scoring on basis of 1 (low) to 10 (high) using 5 judges with weighted over-all scores of 6 or below indicating below "fair" commercial acceptability.

Processing procedure: Sweet potatoes were processed September 30. Pack scored by technical panel of 5 judges during four replications, begun November 14. Roots graded for size according to U. S. Standards for Sweet Potatoes for Canning, peeled in boiling 10 percent lye, packed immediately in #404 x 307 cans, filled with hot 25 percent syrup and closed, or closed under a mechanical vacuum of at least 26 inches. Processed for 30 minutes at 240° F. for syrup packs, 45 minutes at 240° F. for vacuum packs.

Firmness was measured with an ASCO Model 3C firmness meter using 200 grams prestress weight, 200 grams test weight and a time interval of 10 seconds. Six roots of each variety rated by the judges for the other factors were tested for firmness during each replication.

Factors weighted for over-all average as follows: Uniformity 30, hue 20, wholeness 20, firmness 15, texture 10 and flavor 5. Hue = exterior color (range from bright orange to light yellow); wholeness = lack of cracking and/or sloughing; firmness = resistance to compression; and texture = moistness or mouth feel and lack of stringiness.

Table No. 22. Summary Evaluation of Sweet Potato Varieties in 1960 Trials on Eastern Shore

Variety	Fresh				Canned	
	Total Yield Fresh market and Canning	Chemical Analysis			Yield of Canning U.S. 1's per acre	Average of Syrup and Vacuum Packs Weighted Over-all Score
		Mg. Carotene per 100 g. (Dry Basis)	Percent Moisture	Percent Dry Matter		
L8-64*	cwt. 279				cwt. 160	8.6
L1-80	291	48.17	72.60	27.40	113	7.9
L3-64*	219				104	7.9
Centennial	339	43.16	73.68	26.32	94	7.7
B-6716*	217				197	7.5
Nugget	388	44.56	73.79	26.21	97	7.3
B-6521*	186				110	7.3
Oklamar	268	39.11	76.91	23.09	56	7.2
Copperskin Goldrush	351	39.11	75.38	24.62	103	7.0
Nemagold	358	27.25	73.54	26.46	131	6.7
L4-89*	296				120	6.6
Carogold	335	20.49	71.55	28.45	169	6.5
Kandee	216				101	6.4
Allgold	254	36.78	74.25	25.75	94	6.3
Jersey Orange	309	18.86	74.66	25.34	123	6.0
Porto Rico 109	303	10.68	69.57	30.43	78	5.3

* Not in replicated plots, observational plantings only.

Sweet Potato Observational Plantings - 1960

These observational plantings, because of the small number of plants in single rows, produce very little information, which is especially true of the yield data. The descriptions of the roots may be of some value to those who have never seen them. Yield data are given in table no. 23 more as a description of the sizing of the roots than as an indication of yield. Information on observational plantings is included in this report because of the interest indicated by certain sweet potato growers.

L3-64, L4-89, and L8-64 were developed by Louisiana Agricultural Experiment Station and B6521 and B6716 by the U.S.D.A. Kandee was released several years ago by the Kansas State College and was included in the observational plantings at the request of a grower.

The observational plantings were grown under the same conditions as the sweet potato replicated trials, except sprouts were field set May 24 and harvested September 27 (127 days). Also L8-64 was produced from sprouts shipped from Louisiana Agricultural Experiment Station. All other sprouts were from seed stock bedded near the field.

There were no jumbos (36 oz. or more) or cracked roots.

Processing Qualities

Of the varieties grown in observational plots, L8-64 rated very high with a weighted over-all score surpassing any variety in either the replicated or observational plantings. It possessed an outstandingly attractive deep orange color in the processed form, remained uniformly whole after processing, possessed a pleasing texture, being soft and smooth to the palate as is characteristic of the yam types.

The remaining observational varieties had one or more characteristics which left something to be desired with respect to processing. In this respect L4-89 and Kandee did not show up well at all as being suitable for processing as whole roots.

Individual processing characters for each of these varieties may be found in tables 24-A and 24-B.

Comments on Individual Varieties

L4-89 - Skin tan and flesh variegated orange. The relatively high 7% oversize was the result of over-length. The main cause of culls was small size. Canning characters: Uniformity of flesh color quite variable and definitely unacceptable. Wholeness of the processed roots in vacuum packs below average. Weighted over-all score of both syrup and vacuum packs below average.

L8-64 - Skin rose color. Flesh exceptionally uniform dark orange; excellent coloring. No oversize and culls were small size and irregular

shape. May be a later-sizing seedling. Canning characters: Uniformity of flesh color superior to any variety tested in either the observational or replicated trials. Wholeness of the processed roots in vacuum packs well above average. Weighted over-all score of both syrup and vacuum packs highest for any variety in either the observational or replicated trials.

L3-64 - Skin rose color and flesh uniformly light salmon. Culls small size and irregular shape. Canning characters: Uniformity of flesh color above average. Wholeness of the processed roots in vacuum packs above average. Weighted over-all score of both syrup and vacuum packs second highest of any variety in either the observational or replicated trials, receiving an equal value with L1-80.

Kandee - Skin cream color and flesh a mottled salmon color. Shape was thick spindle approaching turnip-shaped. Oversize caused by large diameter. Culls were small size. Canning characters: Uniformity of flesh color next to poorest of any variety tested. Wholeness of processed roots in vacuum packs below average. Weighted over-all score of both syrup and vacuum packs below average and in the range of being commercially unacceptable.

B6716 - Skin purple and flesh a uniform orange. Only about 9% of total roots were large enough for "fresh market" classification. Culls were small size. May be a later-sizing seedling. Canning characters: Uniformity of flesh color above average. Wholeness of the processed roots in vacuum packs was below average and bordering on below commercial acceptability. Weighted over-all score of both syrup and vacuum packs was above average.

B6521 - Skin copper color and flesh a uniform light orange color. The relative high 28% culls were small size and irregular shape. Canning characters: Uniformity of flesh color about average. Wholeness of the processed roots in vacuum packs was below average. Weighted over-all score of both syrup and vacuum packs was about average.

Table No. 23. Sweet Potato Observational Plantings of Five Numbered Seedlings and One Variety in 1960 on Eastern Shore (Accomack County), Virginia. Yields, culls, stand counts, and root weights.

Seedling number or variety	Plant count	Average Yields Per Acre of Marketable Roots*				Culls	Weight per marketable root
		Total	Fresh market	Canning	Oversize		
		(1)	(2)	(3)	(4)		
	plt.	cwt.	cwt.	cwt.	cwt.	cwt.	oz.
L4-89	46	319	176	120	23	24	6.4
L8-64	23	279	119	160	0	57	4.6
L3-64	33	228	115	104	9	36	4.6
Kandee	41	226	115	101	10	9	5.4
B6716	21	217	20	197	0	17	3.8
B6521	19	202	76	110	16	80	6.3

* Yields adjusted to plant count.

(1), (2), (3), (4) - See numbered notes under table no. 20.

Table No. 24. Mean Evaluation Scores of Canned Sweet Potatoes from 1960 Observational Plantings on Eastern Shore of Virginia, Processed at Harvest Time.

A - Syrup Pack

Variety	Color		Wholeness	Firmness	Texture	Flavor	Weighted Over-all Score
	Hue	Uniformity					
L8-64	9.7	9.2	9.6	5.5	8.9	7.8	8.7
L3-64	8.2	7.6	9.8	7.8	8.4	8.1	8.3
B-6716	7.7	8.0	9.0	7.4	7.9	8.4	8.1
B-6521	8.3	7.4	7.8	6.0	8.2	8.4	7.6
L4-89	6.8	5.3	8.2	7.3	8.0	8.0	6.9
Kandee	6.3	5.0	8.9	7.7	6.7	7.4	6.7

B - Vacuum Pack

Variety	Color		Wholeness	Firmness	Texture	Flavor	Weighted Over-all Score
	Hue	Uniformity					
L8-64	9.7	9.2	8.3	5.6	8.7	7.3	8.4
L3-64	8.2	7.6	7.8	6.8	6.9	5.6	7.4
B-6716	7.7	8.0	5.8	6.1	7.5	5.7	7.0
B-6521	8.3	7.4	6.5	5.2	6.8	6.9	7.0
L4-89	6.7	5.3	6.7	7.1	7.4	6.2	6.4
Kandee	6.3	5.0	6.3	7.3	6.2	5.4	6.0

Note: Scoring on basis of 1(low) to 10 (high) using 5 judges with weighted over-all scores of 6 or below indicating below "fair" commercial acceptability.

Processing procedure, firmness explanation, and weights for scoring each characteristic cited after table no. 21, page 34.