

1959 PROGRESS REPORT

VARIETY TRIALS

Tomato Sweet Potato Pepper

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

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1959 TOMATO VARIETAL TRIALS

Many new and promising tomato varieties and strains are being developed by agricultural experiment stations of several states, by the U. S. Department of Agriculture, and by commercial seedmen. 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 Norfolk and 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, Norfolk, Warsaw, and Blacksburg tomato variety trials follow.

1959 Tomato Varietal Trial Eastern Shore - Virginia

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

Eleven varieties 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.
Soil:	Sassafras sandy loam.
Soil pH:	6.2
Plot size:	One row of twelve plants (36 x 5 feet). Yield records taken on center 10 plants.
Plot design:	Split plot.
Replications:	Four.
Spacing:	Plants 3 feet apart in row, 5 feet between rows.
Fertilization:	400 lb. per acre of 5-10-10 placed in the row and mixed with the soil 3 days before setting plants. 700 lb. per acre of 5-10-10 sidedressed 3 weeks after setting plants.
Field planting date:	April 27.
Cultivation:	Frequently enough to eliminate weeds.
Insecticides:	Endrin 8 days after field setting.
Growing conditions:	See Table No. 1.

Notes on Varieties Tested

The Eastern Shore tomato variety trials were conducted in 1958 as well as this season. Data on processing were not taken in 1958 but were obtained on eight varieties in 1959. In 1959 Delaware 14-2 and Homestead 24 replaced the 1958 Delaware 13-2 and Homestead 2. Also, after 1958,

Early Prolific, Big Early Hybrid, and Foremost E-21 were deleted. Rhode Island Early was added to the trials in 1959.

In the 1959 trials, the highest yielding group consisted of Delaware 14, Homestead 24, Texto 2, Kokomo, and Campbell 146. Among the three early varieties, Rhode Island Early produced the highest yield and Valiant the second highest in both the first and second harvest. Moreton Hybrid was third in yield at the second harvest.

Average yields of U.S. 1's for the 1958 and 1959 tests of the eight varieties grown in both seasons, show Campbell 146 to be highest with Chesapeake second and Kokomo third.

Delaware 14 and Campbell 146 produced the largest average fruit while Rhode Island Early produced the smallest with Century the next smallest. With the exception of Rhode Island Early (see variety notes) the general shape of the fruit of all varieties was oblate spheroid.

Kokomo - Fruit: Uniformity of color, shape and size satisfactory, somewhat smoother and with better shoulders than average. Canning qualities were somewhat above average in color, average flavor, somewhat below average for wholeness, and pH was high.
Plant: Large, erect, and dense.

Delaware 14-2 - Fruit: Uniformity of color, shape, and size satisfactory, with medium over-all smoothness and average shoulders but with less cracking than any variety in the trials. Canning qualities were average in color, average flavor, average for wholeness, and had the lowest soluble-solids-to-acid ratio of any variety in the trials.
Plant: Large, fairly erect, fairly dense.

Homestead No. 24 - Fruit: Uniformity of color, shape and size satisfactory, slightly rough in over-all shape, but with average shoulders. Cracking was next to the least of any variety in the trials. Canning qualities average in color, average flavor, average for wholeness, and low in soluble solids.
Plant: Medium size, fairly erect, fairly dense.

Campbell 146 - Fruit: Uniformity of color, shape and size satisfactory, slightly rough in over-all shape with shoulders of average smoothness and satisfactory color. Canning qualities were somewhat above average in color, average flavor, and average for wholeness. Based on one year's test, appears to be one of the better canning varieties.
Plant: Medium to large, rather erect with dense foliage.

Texto 2 - Fruit: Uniformity of color, shape, and size satisfactory, slightly rough in over-all shape, but shoulders and cracking were better than average. Canning qualities were average in color, average flavor, somewhat above average for wholeness, and high in soluble solids. Rated highest of varieties tested for canning on a weighted over-all score basis.
Plant: Medium size, fairly erect, fairly dense.

Chesapeake - Fruit: Uniformity in color, shape, and size satisfactory, slightly rough in over-all shape, but shoulders and cracking were better than average. Canning qualities were average color, average flavor, average for wholeness, and high in soluble solids with a high pH and low acidity. Plant: Very large, erect, and very dense.

Moreton Hybrid - The only variety in the trials said to be F₁. Fruit: Somewhat lacking in uniformity of color, shape, and size, slightly rough in over-all shape, with average shoulders, but the highest percentage of cracking in the trials. Produced a fairly high second early yield. This variety was not tested for canning qualities. Plant: Medium size, rather sprawling, open foliage. Fusarium wilt percentage next to highest in trials.

Valiant - Fruit: Somewhat lacking in uniformity of color, shape, and size, slightly rough in over-all shape with shoulders of fairly poor color but of average smoothness. Cracking percentage was high. Produced a fairly high first early yield. This variety was not tested for canning qualities. Plant: Medium size, rather sprawling, open foliage. Fusarium wilt percentage highest in trials.

Rutgers - Fruit: Uniformity of color, shape, and size satisfactory with medium over-all smoothness and shoulders somewhat above average. Cracking percent was high. Canning qualities were average color, average flavor, somewhat below average for wholeness, and high in soluble solids and ascorbic acid with a high pH. Plant: Fairly large, rather erect, dense.

Century - Fruit: Uniformity in shape satisfactory but somewhat lacking in color and size. Slightly rough in over-all shape with shoulders of fairly poor color but average smoothness. Cracking percentage was next to highest in trials. Produced a relatively small second early yield. Canning qualities were average color, average flavor, average for wholeness, and high in soluble solids. Plant: Large, fairly erect, fairly dense. Fusarium wilt was considerable.

Rhode Island Early - Fruit: Uniformity in color satisfactory but somewhat lacking in uniformity of size and shape, varying from oblate to plum-shape. Over-all shape exceptionally smooth with better than average shoulders. Fruit is rather small, being the smallest in the trials. Cracking percentage was high but this is an early variety and for the first two harvests the cracking percentage was relatively low. Produced a relatively high first early yield. This variety was not tested for canning qualities. Plant: Fairly small, sprawling, very open. Fusarium wilt present but not severe.

Note: The yield for the season of this variety was very low, but as it is quite early the later harvests are not considered important. The first and second harvests were highest in the trials. Also the small plants could be set closer together and possibly fertilized more heavily which might result in higher early yields. There is, however, a question of toughness of the skin which must be studied further before final evaluation.

Table No. 1 - Climatological and Irrigation Data in 1959 at Painter, Virginia

For week ending	Temperature			Precipitation & irrigation (inches)	For week ending	Temperature			Precipitation & irrigation (inches)
	Max.	Min.	Av.			Max.	Min.	Av.	
Apr. 25	75	40	56	1.45	June 20	85	49	68	.92
May 2	80	44	62	.02	June 27	93	61	79	1.00*
May 9	80	40	64	.08	July 4	97	56	81	.07
May 16	85	47	68	2.77*	July 11	88	56	76	1.75
May 23	87	53	71	.21	July 18	83	63	74	3.11
May 30	90	45	73	.01	July 25	91	73	83	.09
June 6	85	55	71	1.95*	Aug. 1	90	68	79	.76
June 13	91	60	77	1.03*	Aug. 8	86	78	81	0

* Including 1-inch irrigation.

Table No. 2 - Percent Yield at Each Harvest of Total Yield for 1959 Season at Painter, Virginia

Variety	Approximate percent of total yield at each harvest							
	6/27 61*	6/30 64*	7/7 71*	7/14 78*	7/21 85*	7/24 88*	7/28 92*	8/8 103*
Mid-season var.								
Kokomo	0	**	13	11	29	21	20	6
Delaware 14	0	**	8	15	23	9	30	15
Homestead 24	0	1	14	18	25	23	17	2
Campbell 146	0	1	11	14	24	14	24	12
Texto 2	0	**	16	19	32	14	15	4
Chesapeake	0	**	4	11	18	22	35	10
Rutgers	0	1	15	17	34	22	9	2
Average	0	**	12	15	26	18	22	7
Earlier var.								
Moreton Hybrid	0	4	32	25	25	7	7	**
Valiant	1	6	36	21	23	6	6	1
Century	**	6	20	20	36	8	9	1
Rhode Is. Ea.	3	16	42	22	13	2	1	1
Average	1	7	32	22	25	6	6	1

* Days from field setting.

** Less than 0.5%.

Table No. 3 - Eleven Tomato Varieties Tested in 1959 at Painter, Virginia. Total yield, early harvest yields, fruit weight, shoulder rating, cracking, and certain diseases

Varieties	AVERAGE YIELD PER ACRE (1) (Means of 4 replications)			EARLINESS (market- able yield per acre)		Average marketable fruit weight for season	SHOULDER rating (3)		CRACKING (3)				DISEASE (4)		Seed source (5)
	Total market- able	U.S. 1's	U.S. 2's U.S. 3's	Harvests (2)			Color	Smoothness	Total	Radial	Circular	Radial and circular	Fusarium wilt	Southern blight	
				1st	2nd										
				cwt.	cwt.										
Kokomo	170 ^a	98 ^{ab}	72 ^a	0	0.4	5.4	4	4	43	19	8	16	0	0	1
Delaware 14-2	167 ^a	122 ^a	45 ^c	0	0.5	6.1	3	3	27	15	8	4	0	0	5
Homestead 24	167 ^a	104 ^{ab}	63 ^{ab}	0	0.9	5.2	3	3	34	15	10	9	0	0	1
Campbell 146	153 ^{ab}	98 ^{ab}	55 ^{bc}	0	0.8	6.1	4	3	42	21	10	11	3	0	3
Texto 2	152 ^{ab}	99 ^{ab}	53 ^{bc}	0	0.1	5.1	4	4	38	13	13	12	0	0	6
Chesapeake	143 ^{abc}	87 ^{bc}	56 ^{bc}	0	0.4	5.6	4	4	39	25	8	6	0	0	6
Moreton Hybrid	129 ^{bcd}	78 ^{bcd}	51 ^{bc}	0	5.5	5.4	3	3	78	39	6	33	18	0	7
Valiant	122 ^{bcd}	77 ^{bcd}	45 ^c	1.4	7.3	5.4	2	3	69	27	9	33	20	5	2
Rutgers	117 ^{cd}	65 ^{cde}	52 ^{bc}	0	0.7	5.3	4	4	63	29	7	27	15	3	4
Century	106 ^{de}	58 ^{de}	48 ^{bc}	0	1.2	4.8	2	3	72	33	3	36	13	3	9
Rhode Is. Early	83 ^e	41 ^e	42 ^c	2.9	12.9	3.7	4	4	59	37	2	20	10	15	8

- (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) First harvest 61 days and second 64 days after field setting.
- (3) Shoulders: Color and smoothness rated 1, poor to 5, good. Cracking is percent cracked fruit of total fruit harvested. Shoulder observations and cracking counts made at 2nd, 3rd, 4th, and 5th harvests.
- (4) Percent of plants affected by Fusarium wilt and by Southern blight (also called sclerotium rot and Southern wilt) 109 days after field setting.
- (5) Seed sources: 1. Associated Seed Growers, 2. W. Atlee Burpee Co., 3. Campbell Soup Co., 4. Corneli Seed Co., 5. Delaware-Brasher, 6. Glecklers Seedmen, 7. Joseph Harris Co., 8. Rhode Island-Griffiths, 9. P.J. Ritter Co.

Table No. 4 - Eight Tomato Varieties Tested for Canning Characteristics in 1959 at Painter, Virginia.
Chemical and organoleptic evaluation of the canned product.

Varieties	ORGANOLEPTIC EVALUATION (1) (Co-Op Technical Panel)				CHEMICAL ANALYSIS (2, 3) (Mean of Duplicate)				
	Color	Whole- ness	Flavor	Weighted over-all score	% Soluble solids	Total acidity (4)	Soluble solids-acid ratio	Ascorbic acid mg./100 ml.	pH
Texto 2	3.71	4.42	3.50	3.95	6.00	1.18	5.16	9.94	4.38
Homestead 24	3.84	3.96	3.67	3.86	5.20	1.10	4.79	8.77	4.40
Campbell 146	4.13	3.42	3.79	3.83	6.15	1.20	5.13	11.74	4.33
Delaware 14-2	3.71	3.58	3.63	3.65	5.50	1.25	4.40	11.72	4.35
Chesapeake	3.54	3.84	3.42	3.64	6.15	.96	6.41	11.68	4.60
Century	3.58	3.46	3.88	3.56	6.15	1.25	4.92	11.70	4.45
Kokomo	4.00	2.75	3.54	3.50	5.50	1.11	5.01	11.57	4.65
Rutgers	3.21	2.84	3.34	3.08	6.18	1.06	5.04	11.98	4.63

- (1) Organoleptic evaluation replicated four times and rated by six judges for overall average as follows: color 30, wholeness 20, flavor 5. Scoring on basis of 1 (low) to 5 (high) using six judges.
- (2) Chemical analysis from 2 cans from each of 2 harvests.
- (3) There was no statistical significance in any of the chemical analysis at the 5% level.
- (4) Total acidity = percent acid as citric.

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

1959 TOMATO VARIETY TRIALS FOR FRESH MARKET AND CANNING
Warsaw, Virginia

Fresh Market Tomato Trials

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

Ten varieties were grown for evaluation at the Eastern Virginia Research Station. The experimental procedure and growing conditions were as follows:

Location:	Richmond County near Warsaw, Virginia.
Elevation:	140 feet.
Soil:	Sassafras sandy loam.
Soil pH:	6.1.
Previous crop:	Small grain.
Plot size:	One row; records taken on 9 plants.
Plot design:	Split plot.
Replications:	Four.
Spacing:	Plants 3 feet apart in row, 5 feet between rows.
Fertilization:	Broadcast 5-10-10 at the rate of 500 lb. per acre 22 days before field setting. Applied in rows 5-10-10 at the rate of 500 lb. per acre 17 days before field setting. Sidedressed 5-10-10 at the rate of 500 lb. per acre 34 days after field setting.
Field planting date:	May 7.
Cultivation:	Frequently enough to control weeds.
Pesticides:	Malathion dust and TDE-maneb dust.
Growing conditions:	See Table No. 5.
Note:	Very light rainfall (1.81 inches) for the first 54 days of the growing season and weak plants probably reduced yields and may have affected the relative performance of the varieties. This condition probably adversely affected especially the yields and earliness of the early varieties, Rhode Island Early and Moreton Hybrid and the early mid-season variety, Century.

Notes on Varieties Tested for Fresh Market

This year Delaware 14-2 and Homestead 24 replaced the 1958 Delaware 13-2 and Homestead 2. Others deleted after 1958 were Early Prolific, Foremost E-21, and Big Early Hybrid. Rhode Island Early was added to the 1959 trials.

Chesapeake and Delaware 14-2 produced the highest yields of U.S. 1's and these two plus Campbell 146 gave the highest total marketable yields. Moreton Hybrid appeared to be mid-season in maturity which was unexpected as in previous seasons it has been at least second-early in maturity. Probably adverse growing conditions in the early part of the season delayed the maturity of this variety.

Six varieties have been in the trials for 4 years. For 3 years prior to 1959, Chesapeake's yield was somewhat below Rutgers, Century, Moreton Hybrid, Texto 2, and Kokomo, all of which were rather similar in yield. These 6 varieties plus Campbell 146 were in the 1958 and 1959 trials. For these two seasons Chesapeake produced the highest yield with Campbell 146 second and Kokomo third.

Variety descriptions of plants and fruit will be found under Eastern Shore notes on varieties, elsewhere in this report. The following notes are brief comments on varieties tested for fresh markets as observed at Warsaw, in cases where Eastern Shore descriptions may not be applicable.

Chesapeake - Lowest percent of cracking in the trials. Plants were large, erect, and dense.

Delaware 14-2 - Fruit shoulders above average in color and smoothness. Cracking below average. Plants medium size.

Campbell 146 - Fruit shoulders above average in color and smoothness. Cracking below average. Plants medium size, fairly erect, and fairly dense.

Kokomo - Fruit shoulders above average in color but only fairly smooth. Cracking below average.

Homestead 24 - Fruit shoulders above average in ripe color and smoothness. Cracking about average. All plants were moderately affected by early blight.

Texto 2 - Fruit shoulders above average in smoothness but only fairly well colored. Cracking about average.

Century - Fruit shoulders only fair color and smoothness. Cracking somewhat above average.

Rutgers - Fruit shoulders rather poor in color and fair in smoothness. Cracking somewhat above average.

Moreton Hybrid - Fruit shoulders only fair color and smoothness. Cracking above average.

Rhode Island Early - All plants rather intensely affected by early blight. Usually early blight is more advanced on early maturing varieties.

Table No. 5 - Climatological Data in 1959 at Warsaw, Virginia
(No irrigation available at this station)

For week ending	Temperature			Precipitation (inches)	For week ending	Temperature			Precipitation (inches)
	Max.	Min.	Av.			Max.	Min.	Av.	
May 2	84	40	64	.05	July 11	95	54	75	2.25
May 9	91	40	67	.00	July 18	88	67	75	6.59
May 16	92	37	65	.11	July 22	91	71	81	1.31
May 23	90	43	72	.35	Aug. 1	92	70	80	1.35
May 30	95	48	74	.24	Aug. 8	90	54	75	.19
June 6	89	54	72	.63	Aug. 15	95	66	78	.00
June 13	98	63	80	.16	Aug. 22	99	63	82	.00
June 20	88	48	67	.07	Aug. 29	97	66	81	1.34
June 27	98	60	80	.25	Sept. 5	90	68	80	.48
July 4	105	57	83	.71	Last harvest Sept. 8				

Table No. 6 - Ten Tomato Varieties Tested in 1959 at Warsaw, Virginia.
Total yield, early harvest yields, fruit weight,
shoulder rating, cracking, and certain diseases.

Varieties	AVERAGE YIELD PER ACRE (1) (Means of 4 replications)			EARLINESS (market- able yield per acre)			Average marketable fruit weight for season	SHOULDER rating (3)		CRACKING (3)				Early blight (4)	Seed source (5)
	Total market- able U.S. 1's U.S. 2's U.S. 3's	U.S. 1's	U.S. 2's U.S. 3's	Harvests (2)				Color	Smoothness	Total	Radial	Circular	Radial and circular		
				1st	2nd	3rd									
				cwt.	cwt.	cwt.									
Chesapeake	172 ^a	98 ^a	74 ^{ab}	0	0	0	5.7	4	4	30	26	2	2	69	5
Delaware 14-2	159 ^a	90 ^{ab}	69 ^{abcd}	0	0	4.4	6.3	4	4	34	27	4	3	44	4
Campbell 146	152 ^a	73 ^b	79 ^a	0	0	4.5	6.0	4	4	33	26	5	2	83	2
Kokomo	102 ^b	31 ^{cd}	71 ^{abcd}	0	0	0	5.1	4	3	34	28	2	4	50	1
Homestead 24	86 ^b	23 ^{cde}	63 ^{abcd}	0	0	6.8	5.3	4	4	48	25	17	6	100	1
Texto 2	85 ^b	32 ^c	53 ^{bcd}	0	0	1.4	5.4	3	4	48	32	7	9	31	5
Century	77 ^{bc}	14 ^{cde}	63 ^{abcd}	0	0	5.8	4.7	3	3	53	33	4	16	80	8
Rutgers	62 ^{bc}	13 ^{cde}	49 ^{cd}	0	0	0.2	4.6	2	3	52	42	5	5	58	3
Moreton Hybrid	50 ^{cd}	8 ^{de}	42 ^d	0	0	3.0	5.4	3	3	62	41	6	15	61	6
Rhode Is. Early	24 ^d	6 ^e	18 ^e	1.6	4.9	1.0	3.9	4	4	60	25	10	25	100	7

- (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) First harvest 53 days, second 67 days, and third 74 days after field setting.
- (3) Shoulders: Color and smoothness rated 1, poor to 5, good. Cracking is percent cracked fruit of total fruit harvested. Shoulder observations and cracking counts made at 3rd and 7th harvests.
- (4) Percent of plants affected by early blight 97 days after field setting. No Fusarium wilt was apparent in field. (Southern blight is not prevalent in this area.)
- (5) Seed sources: 1. Associated Seed Growers, 2. Campbell Soup Co., 3. Corneli Seed Co., 4. Delaware-Brasher, 5. Glecklers Seedmen, 6. Joseph Harris Co., 7. Rhode Island-Griffiths, 8. P. J. Ritter Co.

Canning Tomato Trials

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

Seven varieties were grown for evaluation at the Eastern Virginia Research Station. The growing conditions were the same as for the fresh market tomato trials except for plot size which was one row with records taken on twenty plants.

Weekly harvests were made of "canning ripe tomatoes." Thirty pounds of fruit graded into the same ratio of U.S. 1 and U.S. 2 as the total harvest was taken from each harvest and canned as peeled tomatoes. 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

Chesapeake produced the highest yields of U.S. 1's for canning while Delaware 14-2 and Campbell 146 along with Chesapeake gave the highest total marketable tomatoes for canning. The peak harvest date for Chesapeake and Delaware 14-2 came on the fourth harvest (September 2nd) while the big harvest for Campbell 146 came on the third harvest (August 24th).

Canned product evaluation resulted in Campbell 146 being placed superior to any variety in the trials with Kokomo second. Color of the canned product was best for Kokomo with Campbell 146 second. Chesapeake, Delaware 14-2 and Century produced poorly colored canned products. Wholeness of Campbell 146 was best with Chesapeake second. All varieties rated average for flavor, except Rutgers which was somewhat below average. In consideration of yield, along with quality of the canned product, Campbell 146 rated highest as an all around canning tomato in the 1959 tests.

The pH on all varieties changed significantly during the season, with a steady increase after the second harvest. Acidity changes were not so pronounced as pH changes, although small increases occurred from harvest to harvest. Sugar followed an inverse pattern to pH changes, with the greatest change occurring about mid-season (August 24th). As the season progressed, sugars became lower and ascorbic acid increased. See Table 4 for additional data on the 1959 Warsaw canning tomato trials.

Variety descriptions of plants and fresh market fruit will be found under fresh market notes on these varieties. The following notes are comments on individual varieties tested for canning as observed at Warsaw.

Chesapeake - Yield highest on fourth week of harvest for U.S. 1 and U.S. 2 and total cannable tomatoes. Size suitable for No. 303 can. Soluble solids and total acidity decreased as the season progressed. Color of the canned product somewhat below average, wholeness somewhat above average.

Delaware 14-2 - Yield highest on fourth week of harvest for total cannable tomatoes with a larger percentage of U.S. 2 fruit than U.S. 1. Size suitable for No. 303 can. Soluble solids decreased as the season progressed while total acidity was low for first harvest, peaked during the middle harvest, then decreased during later harvests. Color of the canned product somewhat below average, wholeness average.

Campbell 146 - Yield highest on third week of harvest for U.S. 1, U.S. 2 and total cannable tomatoes. Size suitable for No. 303 can. Soluble solids decreased as the season progressed with little change in total acidity. Color of the canned product average, wholeness somewhat above average.

Homestead 24 - Yield highest on fourth week of harvest for total cannable tomatoes with a larger percentage of U.S. 2 fruit than U.S. 1. Size suitable for No. 303 can but somewhat small. Soluble solids and total acidity changed very little throughout the harvest season. Color of the canned product average, wholeness average.

Kokomo - Yield highest on fourth week of harvest for total cannable tomatoes with U.S. 1 and U.S. 2 fruit being about equal. Size excellent for No. 303 can. Soluble solids and total acidity remained constant throughout the harvest season. Color of the canned product average, wholeness average.

Century - Yield highest on fourth week of harvest for total cannable tomatoes with U.S. 1 and U.S. 2 fruit being equal. Size satisfactory for No. 303 can. Soluble solids decreased while acidity increased over the period of the harvest season. Color of the canned product somewhat below average, wholeness average.

Rutgers - Yield constant over harvest period with approximately 45 percent more U.S. 1 fruit than U.S. 2, however, this variety gave the lowest yields of total cannable tomatoes. Size satisfactory for No. 303 can. Soluble solids decreased as the season progressed with total acidity reflecting slight change. Color average, and wholeness somewhat below average.

Table No. 7 - Seven Tomato Varieties Tested for Canning Characteristics in 1959 at Warsaw, Virginia.
Total yield for canning and chemical and organoleptic evaluation of the canned product

Varieties	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 (1A)	U.S. 2's (1A)	Color	Whole-ness	Flavor	Weighted over-all score	% Soluble solids (1C)	Total acidity (1B) (4)	Soluble solids-acid ratio (1C)	Ascorbic acid mg./100 ml. (1C)	pH (1B)
Chesapeake	cwt. 168	cwt. 120 ^a	cwt. 48 ^d	2.90	4.17	3.41	3.41	5.08	1.20 ^{ab}	4.22	12.35	4.32 ^{bc}
Delaware 14-2	166	96 ^b	70 ^b	2.87	3.38	3.63	3.12	5.18	1.19 ^{ab}	4.38	12.67	4.30 ^c
Campbell 146	153	92 ^b	61 ^{bc}	3.64	4.33	3.41	3.87	5.00	1.11 ^{abc}	4.50	13.58	4.40 ^{ab}
Homestead 24	133	70 ^c	63 ^{bc}	3.52	3.61	3.24	3.53	5.14	1.11 ^{abc}	4.66	13.10	4.41 ^a
Kokomo	125	66 ^c	59 ^{bc}	3.75	3.14	3.44	3.77	5.26	1.07 ^{bc}	5.01	12.99	4.40 ^{ab}
Century	125	49 ^d	76 ^a	2.81	3.31	3.46	3.05	5.16	1.06 ^{bc}	4.96	12.95	4.36 ^{abc}
Rutgers	98	56 ^{cd}	42 ^d	3.21	2.46	2.85	2.90	5.02	1.02 ^c	4.94	12.75	4.37 ^{abc}

(1) The superscriptions (a, b, c, d) indicate the statistical significance of each characteristic. In each column, data bearing a particular superscript letter are significantly different from those not having this letter.

(1A) Statistical significance at the 5% level.

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

(1C) No statistical significance at the 1% level.

(2) Organoleptic evaluation replicated 2 times for each of 4 harvest dates and rated for over-all average as follows: color 30, wholeness 20, flavor 5, scoring on basis of 1 (low) to 5 (high) using six judges.

(3) Chemical analyses from 2 cans from 5 harvests.

(4) Total acidity = percent acid as citric.

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

1959 TOMATO VARIETY TRIAL
Norfolk, Virginia

F. H. Scott and A. V. Watts

Ten varieties were grown for evaluation at the Virginia Truck Experiment Station. The experimental procedure and growing conditions were as follows:

Location:	Princess Anne County near Norfolk, Virginia.
Elevation:	26 feet.
Soil:	Woodstown.
Soil pH:	6.2.
Previous crop:	Rye cover.
Plot size:	One row of twelve plants (36 x 5 feet). Yield records taken on center 10 plants.
Plot design:	Split plot.
Replications:	Four.
Spacing:	Plants 3 feet apart in row, 5 feet between rows.
Fertilization:	600 lb. per acre of 5-10-10 on rye cover in December. 800 lb. per acre of 5-10-10 broadcast just prior to setting plants. At field setting 1/2 pint starter solution per plant (3 lb. of 8-8-8 to 50 gal. water). Sidedressed 2 weeks after field setting with 650 lb. per acre of 5-10-10.
Field planting date:	April 20.
Cultivation:	Frequently enough to eliminate weeds.
Insecticides:	Dieldrin to control flea beetles. DDT to control fruitworms.
Growing conditions:	See Table No. 8.

Notes on Varieties Tested

The Norfolk tomato variety trials have been conducted for several years. In 1959 Delaware 14-2 and Homestead 24 replaced the 1958 Delaware 13-2 and Homestead 2. Also, after 1958, Early Prolific, Big Early Hybrid, Foremost E21, and Chesapeake were deleted. Rhode Island Early was added to the trials in 1959.

In the 1959 trials only four varieties produced yields significantly lower than the highest yield group. Moreton Hybrid, Century, and Valiant were somewhat below average and Rhode Island Early was quite low. However, three of these varieties are early maturing and the total yield for the entire season is frequently not considered important. Of the early varieties at the first harvest, Moreton Hybrid produced the highest yield with Rhode Island Early second and Valiant third.

Five varieties, in addition to Rutgers, have been in the trials for three years. The yields of these varieties did not vary greatly, but it may

be of interest to note that Texto 2, Moreton Hybrid, and Kokomo were in the highest yielding group with Century somewhat below average and Valiant considerably below. Campbell 146 has been in the trials for only two years and has the highest average yield for those two years of any varieties in the trials.

Variety descriptions of fresh market fruit and plants will be found under Eastern Shore notes on varieties, elsewhere in this report. (Processing qualities described in the Eastern Shore notes may not be applicable to this test, as no processing study was made of the Norfolk trials.) The following notes are very brief comments on varieties as observed at Norfolk, in cases where the Eastern Shore descriptions may not be applicable.

Delaware 14-2 - In the highest yielding group of U.S. 1's. One of the two varieties in the trials that had the least cracking.

Kokomo - In the highest yielding group of U.S. 1's. Somewhat smoother than average but shoulder coloring slightly below average. Average in cracking.

Homestead 24 - In the highest yielding group of U.S. 1's. Rather smooth in over-all shape with average shoulders. About average in cracking.

Campbell 146 - In the highest yielding group of U.S. 1's. Shoulders and over-all shape average. Third from lowest in cracking.

Texto 2 - In the highest yielding group of U.S. 1's. Rather smooth in over-all shape with average shoulders. About average in cracking.

Rutgers - In the highest yielding group of U.S. 1's. Rather smooth in over-all shape, but shoulders somewhat below average in color and shape. About average in cracking.

Moreton Hybrid - Slightly below average in yield of U.S. 1's. Highest yield of marketable fruit at the first harvest. Somewhat rough in over-all shape with average shoulders. Highest percentage of cracking in the group.

Century - Below average in yield of U.S. 1's. Over-all shape average but shoulders somewhat below average in color and shape. Cracking was third from highest in trials.

Valiant - Next to lowest in yield of U.S. 1's. Third from highest yield of marketable fruit at the first harvest. Over-all shape and shoulders somewhat below average. Cracking was next to highest in trials.

Rhode Island Early - Lowest in yield of U.S. 1's in trials. Second from highest yield of marketable fruit at the first harvest. Somewhat smoother than average in over-all shape (form varied from oblate to plum-shape) with well-colored exceptionally smooth shoulders. One of the two varieties in the trials that had the least cracking.

Table No. 8 - Climatological and Irrigation Data in 1959 at Norfolk, Virginia

For week ending	Temperature			Precipitation & irrigation (inches)	For week ending	Temperature			Precipitation & irrigation (inches)
	Max.	Min.	Av.			Max.	Min.	Av.	
Apr. 18	81	39	56	2.72	June 13	93	64	79	.47
Apr. 25	79	45	58	.81	June 20	87	55	68	.43
May 2	82	50	65	.23	June 27	95	64	80	1.00*
May 9	90	50	65	.28	July 4	98	63	72	1.50
May 16	90	46	69	1.02	July 11	87	68	77	1.62
May 23	89	55	73	.55	July 18	86	70	76	3.67
May 30	93	52	73	1.00*	July 25	92	73	82	.37
June 6	88	59	73	1.72	Last harvest July 27				

* Including 1-inch irrigation.

Table No. 9 - Percent Yield at Each Harvest of Total Yield for 1959 Season at Norfolk, Virginia

Varieties	Approximate percent of total yield at each harvest									
	6/19 60*	6/25 66*	6/29 70*	7/2 73*	7/6 77*	7/9 80*	7/13 84*	7/16 87*	7/20 91*	7/27 98*
Mid-season										
Delaware 14-2	0	1	4	7	20	12	27	16	7	6
Kokomo	0	**	6	7	19	14	28	13	9	4
Homestead 24	0	2	7	11	20	14	23	13	7	3
Campbell 146	0	4	6	8	20	12	27	12	7	4
Texto 2	0	1	5	7	27	16	23	14	6	1
Rutgers	0	2	12	8	17	18	23	8	9	3
Average	0	2	7	8	20	14	25	13	7	4
Earlier										
Moreton Hybrid	4	2	12	12	21	22	15	6	4	2
Century	0	5	14	15	24	18	15	5	3	1
Valiant	2	4	12	19	28	22	9	2	1	**
Rhode Is. Ea.	3	9	30	16	24	8	3	5	2	0
Average	2	5	17	15	24	18	11	5	2	1

* Days from field setting.

** Less than 0.5%.

Table No. 10 - Ten Tomato Varieties Tested in 1959 at Norfolk, Virginia
Total yield, early harvest yields, fruit weight, shoulder
rating, cracking, and certain diseases.

Varieties	AVERAGE YIELD PER ACRE (1) (Means of 4 replications)			EARLINESS (market- able yield per acre)		Average marketable fruit weight for season	SHOULDER rating (3)		CRACKING (3)				DISEASE (4)		Seed source (5)
	Total market- able U.S. 1's U.S. 2's U.S. 3's	U.S. 1's	U.S. 2's U.S. 3's	Harvests (2)			Color	Smoothness	Total	Radial	Circular	Radial and Circular	Fusarium wilt	Southern blight	
				1st	2nd										
				cwt.	cwt.										
Delaware 14-2	210 ^a	191 ^a	19 ^c	0	3.0	6.1	3	3	15	8	3	4	0	3	5
Kokomo	208 ^{ab}	179 ^{ab}	29 ^{abc}	0	1.1	5.1	2	3	25	0	7	8	0	13	1
Homestead 24	198 ^{abc}	165 ^{abc}	33 ^{abc}	0	4.4	5.1	3	3	28	9	10	9	0	13	1
Campbell 146	191 ^{abc}	168 ^{abc}	23 ^{bc}	0	7.1	5.9	3	3	17	7	5	5	0	10	3
Texto 2	184 ^{abcd}	146 ^{abcd}	38 ^{ab}	0	2.5	5.2	3	3	28	10	6	12	0	3	6
Rutgers	182 ^{abcd}	147 ^{abcd}	35 ^{ab}	0	4.3	4.3	2	2	28	19	3	6	0	3	4
Moreton Hybrid	175 ^{abcd}	138 ^{bcde}	37 ^{ab}	6.8	4.0	5.6	3	3	36	26	4	6	15	3	7
Century	161 ^{bcd}	125 ^{cde}	36 ^{ab}	0	7.6	4.7	2	2	30	16	6	8	8	15	9
Valiant	155 ^{cd}	117 ^{de}	38 ^{ab}	3.8	6.6	4.7	2	2	31	17	6	8	3	8	2
Rhode Is. Early	136 ^d	94 ^e	42 ^a	4.4	12.2	3.9	4	5	15	9	3	3	23	10	8

- (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) First harvest 60 days and second 66 days after field setting.
- (3) Shoulders: Color and smoothness rated 1, poor to 5, good. Cracking is percent cracked fruit of total fruit harvested. Shoulder observations and cracking counts made at 3rd, 5th, 6th and 7th harvests.
- (4) Percent of plants affected by Fusarium wilt and by Southern blight (also called sclerotium rot and Southern wilt) 73 days after field setting.
- (5) Seed sources: 1. Associated Seed Growers, 2. W. Atlee Burpee Co., 3. Campbell Soup Co., 4. Corneli Seed Co., 5. Delaware-Brasher, 6. Glecklers Seedmen, 7. Joseph Harris Co., 8. Rhode Island-Griffiths, 9. P.J. Ritter Co.

1959 SOUTHERN TOMATO EXCHANGE PROGRAM VARIETY TRIAL

Western Virginia

F. H. Scott

The 1959 STEP (Southern Tomato Exchange Program) trials were grown at forty locations in sixteen states, Hawaii, 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:	6.0.
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:	5-10-5 at the rate of 400 lb. per acre was drilled into soil 15 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). Fourteen days after field setting, sidedressed with 5-10-5 at rate of 400 lb. per acre.
Field planting date:	May 20
Cultivation:	Frequently enough to control weeds.
Fungicides:	Maneb.
Insecticides:	Chlordane (in starter solution), TDE and Malathion.
Growing conditions:	See Table No. 11.

Notes on Varieties Tested

The 1959 variety trials produced an average yield of 385 cwt. per acre of marketable fruit with only Step 305 being significantly lower in yield at the 5% level. U.S. 1's average 339 cwt. per acre with Homestead 24 and Rutgers fairly low in yield and Step 305 quite low.

No wilts or other diseases were apparent in the field, except for traces of early blight.

The following notes are on varieties tested in 1959.

Step 259 - Fruit: Uniformity and over-all color and smoothness similar to Rutgers but slightly more globular in shape. Shoulders rather smooth and cracking slightly below average.

Plant: Fairly large, somewhat more sprawling but dense as Rutgers, and quite uniform.

Step 259 and Step 311 produced the highest first-harvest yields in the trials.

Step 314 - Fruit: Somewhat irregular in uniformity of color but shape and size fairly uniform. Over-all color and smoothness about same as Rutgers. Color of shoulders somewhat below average and cracking above average.

Plant: Fairly large, similar to Rutgers in growth habit and foliage density and fairly uniform.

Step 311 - Fruit: Very uniform in color, shape, and size and similar to Rutgers in over-all color and smoothness. Best shoulders in the trials, being rather smooth and well colored. Cracking considerably less than average.

Plant: Rather large, similar to Rutgers in growth habit and foliage density, and quite uniform.

Step 311 and Step 259 produced the highest first-harvest yields in the trials.

Based on over-all characteristics, Step 311 seemed to be the best in the trials.

Step 281 - Fruit: Uniformity somewhat irregular in color, shape, and size. Over-all color similar to Rutgers, but shape slightly rougher. Shoulders rather smooth and of average color. Cracking considerably less than average. Plant: Fairly large, similar to Rutgers in growth habit and foliage density, and fairly uniform.

Step 280 - Fruit: Somewhat irregular in uniformity of shape, but color and size fairly uniform. Over-all color similar to Rutgers, with shape slightly rougher and somewhat more globular. Shoulders rather smooth and of average color. Cracking about average.

Plant: Fairly large, somewhat more sprawling and open growth than Rutgers, and quite uniform.

Step 260 - Fruit: Somewhat irregular in uniformity of shape, but color and size fairly uniform. Over-all color somewhat deeper red than Rutgers, but shape slightly rougher and flatter. Shoulders fairly smooth and similar to Rutgers in color. Cracking considerably less than average.

Plant: Rather small, similar to Rutgers in growth habit and foliage density, and quite uniform.

Step 278 - Fruit: Somewhat irregular in uniformity of shape, but color and size fairly uniform. Over-all color similar to Rutgers, but shape slightly

rougher. Shoulders fairly smooth and similar to Rutgers in color. Cracking average.

Plant: Fairly large, growth habit similar to Rutgers but foliage somewhat more open, and fairly uniform.

Homestead 24 - Fruit: Uniformity and over-all color and smoothness similar to Rutgers. Shoulders rather smooth and of average color. Highest percentage of cracking in the trials.

Plant: Medium size, growth habit similar to Rutgers but foliage somewhat more open. All plants quite uniform except one which was much larger and more erect than the others.

Rutgers - Fruit: Fairly uniform in color, shape and size. Over-all color average red and shape fairly smooth. Shoulders rather smooth and of average color. Cracking about average.

Plant: Fairly large, fairly erect, dense, and fairly uniform.

Step 305 - Fruit: Somewhat irregular in uniformity of color and size, but shape fairly uniform. Over-all color and smoothness and shoulders similar to Rutgers. Lowest percentage of cracking in the trials.

Plant: Rather small, similar to Rutgers in growth habit and foliage density, and quite uniform.

Table No. 11 - Climatological and Irrigation Data in 1959 at Horticulture Farm, Blacksburg, Virginia

For week ending	Temperature			Precipitation & irrigation (inches)	For week ending	Temperature			Precipitation & irrigation (inches)
	Max.	Min.	Av.			Max.	Min.	Av.	
May 16	81	30	57	1.22	July 25	88	58	73	1.51
May 23	82	34	64	.46	Aug. 1	86	60	74	1.13
May 30	84	52	67	.58	Aug. 8	86	54	72	2.38
June 6	78	42	64	.73	Aug. 15	88	50	70	0
June 13	86	46	67	.60	Aug. 22	89	60	74	1.07
June 20	80	34	57	1.00*	Aug. 29	91	62	75	.91
June 27	88	46	71	.88	Sept. 5	84	56	71	3.17
July 4	94	44	72	0	Sept. 12	84	42	67	.61
July 11	80	40	68	1.00*	Sept. 19	77	37	57	0
July 18	84	58	71	.50	Sept. 26	84	36	61	0

* Including 1-inch irrigation.

Table No. 12 - Percent Yield at Each Harvest of Total Yield for 1959 Season at Horticulture Farm, Blacksburg, Virginia

Varieties	Approximate percent of total yield at each harvest										
	7/29 70*	8/5 77*	8/10 82*	8/14 86*	8/18 90*	8/21 93*	8/26 98*	9/2 105*	9/8 111*	9/14 117*	9/21 124*
Step 259	4	2	5	6	14	10	12	11	16	13	7
Step 314	**	2	3	3	7	14	23	13	19	11	5
Step 311	4	1	2	3	19	29	25	4	5	4	4
Step 281	2	4	4	6	13	15	15	4	17	14	6
Step 280	1	2	4	5	13	19	22	9	9	11	5
Step 260	**	2	5	6	15	17	26	8	9	9	3
Step 278	**	3	5	6	15	23	29	5	6	6	2
Homestead 24	**	2	6	6	22	21	30	3	4	4	2
Rutgers	**	2	6	2	5	10	28	13	14	14	6
Step 305	2	6	7	5	18	16	20	9	7	6	4
Average	1	2	5	5	14	17	23	8	11	9	5

* Days from field setting.

** Less than 0.5%.

Table No. 13 - Ten Tomato Varieties or Breeding Lines of STEP Trials Tested in 1959
 at Blacksburg, Virginia
 Total yields, 1st and last harvest yields, fruit weight, shoulder
 rating, and cracking

Variety or breeding line	AVERAGE YIELD PER ACRE (1) (Means of 4 replications)			Marketable yields 1st and last harvests		Average marketable fruit weight		SHOULDER rating (3)		CRACKING (3)				Seed source (4)
	Total market- able U.S. 1's U.S. 2's U.S. 3's	U.S. 1's	U.S. 2's U.S. 3's	Harvests (2)		1st harvest	All harvests	Color	Smoothness	Total	Radial	Circular	Radial and circular	
				1st	Last									
				cwt.	cwt.									
Step 259	435 ^a	386 ^a	49 ^{abc}	16.0	25.8	6.2	4.7	3	4	13	9	3	1	2
Step 314	430 ^a	387 ^a	43 ^{bcd}	2.0	20.5	7.5	5.4	2	3	21	5	16	0	3
Step 311	415 ^a	384 ^a	31 ^e	15.2	17.4	6.3	5.7	4	4	10	7	3	0	1
Step 281	399 ^a	357 ^a	42 ^{bcde}	8.4	25.6	6.9	5.8	3	4	10	7	3	0	2
Step 280	385 ^a	351 ^a	34 ^{de}	4.4	19.4	6.1	5.8	3	4	17	10	7	0	2
Step 260	378 ^a	325 ^a	53 ^{ab}	0.9	12.7	5.2	5.1	3	3	10	5	5	0	2
Step 278	377 ^a	324 ^a	53 ^{ab}	0.8	14.2	4.4	5.7	3	3	16	12	4	0	1
Homestead 24	370 ^a	314 ^{ab}	56 ^a	1.4	5.8	6.1	6.0	3	4	37	23	11	3	1
Rutgers	369 ^a	312 ^{ab}	57 ^a	0.2	20.3	4.8	5.4	3	4	19	3	13	3	1
Step 305	288 ^b	249 ^b	39 ^{cde}	6.8	10.6	5.8	4.8	3	4	8	1	7	0	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) First harvest 70 days and last 124 days after field setting.
- (3) Shoulders: Color and smoothness rated 1, poor to 5, good. Cracking is percent cracked fruit of total fruit harvest. Shoulder observations and cracking counts made at 1st (70 days) and 2nd (77 days) harvests.
- (4) Seed source: 1. Associated Seed Growers, 2. Clemson Truck Experiment Station, 3. Gulf Coast Experiment Station.

1959 SWEET POTATO VARIETY TRIALS
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 1959 season was the first in this series of trials. Therefore only named varieties are in the trials but within the next several years we hope to delete most of the named varieties and place newer selections in the trials. Also sufficient data were not obtained to warrant a comprehensive evaluation of the varieties for the season. We hope to broaden the scope of the trials in 1960.

Eleven varieties 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.
Soil:	Sassafras sandy loam.
Soil pH:	6.8.
Plot size:	Three rows 30 feet long each. Yield records taken on center row.
Plot design:	Randomized block.
Replications:	Four.
Spacing:	Plants 1 foot apart in rows 3 feet apart.
Fertilization:	3-9-12 at the rate of 1000 lb. per acre sidedressed 2 weeks after field planting.
Field planting date:	May 12
Harvest date:	September 22.
Cultivation:	Frequently enough to control weeds.
Growing conditions:	See Table No. 1.

Notes on Varieties Tested

Goldrush produced the highest yield of U.S. 1's or better and in the second yield group was Allgold, Carogold, Early Port, Oklamar and Porto Rico 109. In the third group were Porto Rico Unit I, Nemagold, and Sunnyside and in the lowest yield group was Vates Golden and Jersey Orange.

In the totals of marketable yields again Goldrush was first and in the second group were Allgold, Carogold and Early Port.

Carogold was by far the highest in average yield of Canning U.S. 1's taken from the total harvest. Carogold appears to be somewhat later in maturing than the other varieties which may account for the relatively large number of small canning-size roots.

Only four varieties produced a significant amount of cracked roots and of these only Jersey Orange with 18 percent cracked of the total harvest and Porto Rico Unit 1 with 12 percent could be considered serious. Vates Golden produced 8 percent cracked roots and Nemagold 6 percent.

Only a very few jumbos were produced in the whole field. The lack of jumbos was probably the result, at least in part, of a relatively short growing season (133 days).

Carogold produced the smoothest roots in the trials of excellent spindle shape and skin color. However, Carogold along with Sunnyside produced the lowest number of sprouts. No careful sprout count was made but it is estimated that Carogold produced about half as many sprouts as Porto Rico.

The main cause of culls was small size. A description of the major causes of culls, in addition to small size or cracked roots, follows. Irregular shape: Early Port, Oklamar, Porto Rico 109, Porto Rico Unit 1, Sunnyside. Rough: Early Port, Sunnyside, Vates Golden. Veining: Early Port, Jersey Orange, Oklamar. Scuffing: Goldrush, Nemagold. Indentions called "early" cracking: Carogold, Nemagold. Soil rot: Allgold, Jersey Orange. Secondary roots: Early Port. Sprouts: Nemagold. Rough skin: Porto Rico 109.

Processing Qualities

In the processing evaluation Oklamar rated highest as a general all-round processing root of the named varieties in the replicated trials. Carogold produced a very smooth root that was easily peeled but lacked firmness which resulted in compression of the roots when canned in both vacuum and syrup packs.

Unit I Porto Rico, Early Port, Goldrush, and Porto Rico 109 rated in the least desirable group. Each of these varieties severely lacked uniformity of flesh color.

Goldrush was rated down for lack of wholeness and because of moderate amounts of syrup appearing in vacuum packs. The wholeness factor was quite satisfactory for Unit I Porto Rico and Porto Rico 109, however, both of these varieties were also rated down because of moderate amounts of syrup in vacuum packs.

Nemagold rated quite well for the wholeness factor but gave excessive amounts of syrup in vacuum packs. It rated second best of the named varieties. Darkening of vacuum packed roots was evident in Unit I Porto Rico, Nemagold, and Porto Rico 109.

L3-77, which was grown in observational plots only, rated highest as a general all-round processing sweet potato. For this variety no yield data was taken.

Table No. 14 - Eleven Sweet Potato Varieties Tested in 1959 on Eastern Shore (Painter), Virginia. Yields, root weight, cracked, and culls

Varieties	*AVERAGE YIELDS OF MARKETABLE ROOTS (Means of 4 replications)					*CULLS		*Total of all roots (including culls)	Average weight per marketable fruit	*Average yields of canning U.S. 1's from total harvest
	Grades			Totals		Cracked	Total (including cracked)			
	U.S. 1's or better	U.S. 2's	Canning U.S. 1's	U.S. 1's U.S. 2's	U.S. 1's U.S. 2's Canning					
Goldrush	cwt. 158a	cwt. 65ab	cwt. 23b	cwt. 223a	cwt. 246a	cwt. 2.0b	cwt. 20c	cwt. 266a	oz. 6.6	cwt. 49bcd
Allgold	124ab	84a	21b	208ab	229ab	1.2b	36abc	265a	6.8	39bcde
Carogold	119ab	30c	61a	149bcd	210abc	0.6b	25c	235ab	3.1	105a
Early Port	98abc	59abc	19b	157abc	176abcd	0b	29c	205bcd	7.1	38bcde
Oklamar	91abc	56abc	19b	147bcd	166bcd	0.5b	50abc	216abc	7.0	27de
Porto Rico 109	88abc	54abc	15b	142bcd	157bcd	5.1b	28c	185bcd	7.7	29de
Porto Rico Unit I	84bc	37bc	20b	121cd	141cd	22.2ab	50abc	191bcd	7.2	30de
Nemagold	83bc	28c	30b	111cd	141cd	11.1ab	48abc	189bcd	5.5	55b
Sunnyside	56bc	36bc	23b	92cd	115d	1.4b	31bc	146d	4.5	32cde
Vates Golden	46c	47bc	17b	93cd	110d	14.2ab	66ab	176bcd	6.5	24e
Jersey Orange	43c	34bc	25b	77d	102d	31.7a	71a	173cd	4.2	55bc

* 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.

Table No. 15 - Mean Evaluation Scores of Canned Sweet Potatoes Tested in 1959 on Eastern Shore (Painter), Virginia Processed at Harvest Time

Sweet potatoes were processed September 23. Pack scored by technical panel during four replications, begun November 9.

Scoring on basis of 1 (low) to 10 (high) using seven judges with scores below 6 indicating below "fair" commercial acceptability.

Syrup Pack

Variety	Color		Whole-ness	Firmness (gms.)	Texture	Flavor	Weighted over-all score
	Hue	Uniformity					
L3-77*	9.24	8.69	8.99	7.88	8.05	5.66	8.52
Oklamar	8.42	7.99	8.99	5.95	8.11	7.95	7.98
Nemagold	7.34	7.88	8.71	7.27	7.31	7.71	7.78
Carogold	6.87	9.02	7.92	5.26	8.30	8.38	7.69
Sunnyside	8.30	7.74	8.91	4.68	8.68	7.71	7.72
Allgold	8.09	7.64	8.16	4.28	8.72	8.31	7.47
Vates Golden	7.68	6.75	8.80	7.11	7.54	7.79	7.35
Jersey Orange	6.96	6.64	8.94	6.89	7.48	8.41	7.37
Porto Rico Unit I	7.10	5.50	7.79	4.93	8.17	8.24	6.60
Early Port	7.10	5.54	9.07	8.69	6.95	7.27	7.26
Goldrush	7.04	5.37	8.91	5.24	7.39	8.18	6.74
Porto Rico 109	7.44	7.52	7.20	6.14	7.44	7.71	7.23

* Not in replicated plots, grown in observational plots.

Vacuum Pack

Variety	Color		Whole-ness	Firmness (gms.)	Texture	Flavor	Weighted over-all score
	Hue	Uniformity					
L3-77*	9.69	8.90	7.12	7.40	7.39	7.00	8.23
Oklamar	9.14	8.44	6.79	7.14	7.19	6.69	7.84
Nemagold	7.83	8.00	8.14	6.45	7.90	8.63	7.78
Carogold	8.16	7.77	7.56	5.98	8.19	8.07	7.59
Sunnyside	7.77	6.22	7.44	7.05	8.06	7.00	7.12
Allgold	6.90	6.34	6.90	8.16	7.29	6.94	7.21
Vates Golden	7.46	6.42	7.54	5.18	7.96	7.17	7.12
Jersey Orange	6.70	6.32	7.27	7.93	7.84	6.67	7.00
Porto Rico Unit I	8.57	6.84	7.94	7.83	6.94	6.84	7.56
Early Port	6.92	5.26	7.17	8.74	7.44	7.09	6.81
Goldrush	7.93	6.52	6.20	5.71	8.43	8.07	6.89
Porto Rico 109	6.26	5.43	6.63	6.48	6.94	6.60	6.20

* Not in replicated plots, grown in observational plots.

Notes: See next page.

NOTES:

Processing procedure: Roots graded for size according to U.S. Standards for Sweet Potatoes for Canning, preheated 30 minutes at 130° F., peeled in boiling 10% lye, packed immediately in #3 squat cans, filled with hot 25% syrup and closed, or closed under a mechanical vacuum of at least 26 inches then processed for 32 minutes at 240° F.

Firmness measured by puncturing 6 roots from each can for each replication using Chatillon pressure tester with a 7/16 inch plunger point, 555 grams equals a score of 10.

Factors rated 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 pressure (table value multiplied by 55 grams will give actual reading in grams); and texture = moistness or mouth feel and lack of stringiness.

Table No. 16 - Summary Evaluation of Sweet Potato Varieties in 1959 Trials on Eastern Shore

Variety	Fresh				Canned	
	Total yield per acre U.S. 1, U.S. 2 Canning U.S. 1	Chemical Analysis			Total canning U.S. 1's from entire harvest	Average syrup and vacuum packs weighted score
		Mg. caro- tene/100 g. (dry basis)	% Moisture	% Dry matter		
	cwt.				cwt.	
Goldrush	246	55.37	73.66	27.24	49	6.82
Allgold	229	54.47	74.17	25.83	39	7.38
Carogold	210	50.18	73.74	26.66	105	7.64
Early Port	176	43.69	72.76	27.24	38	7.04
Oklamar	166	64.83	77.35	22.65	27	7.91
Porto Rico 109	157	27.91	69.47	30.53	29	6.72
Porto Rico Unit I	141	38.27	73.46	26.54	30	7.08
Nemagold	141	47.84	72.19	27.81	35	7.78
Sunnyside	115	36.81	75.03	24.97	32	7.42
Vates Golden	110	49.87	74.68	25.32	24	7.24
Jersey Orange	102	38.08	73.43	26.57	55	7.19
L3-77*	---	59.64	73.54	26.46	--	8.38

* Not in replicated plots, grown in observational plot.

NOTES: U.S. 1's or better: Diameter - minimum 1 3/4", maximum 3 3/4"; Length - minimum 3", maximum 10";
Not over 20 ounces in weight.

U.S. 2's: Diameter - minimum 1 1/2"; Not over 36 ounces in weight.

Canning U.S. 1's: Diameter - minimum 1", maximum 2 1/4"; Length - minimum 2", maximum 7".

1959 PEPPER VARIETAL TRIAL

Western Virginia

F. H. Scott

Eight pepper varieties were grown for evaluation at the Virginia Agricultural Experiment Station. The experimental procedure was as follows:

Location: Montgomery County near Blacksburg, Virginia.
 Elevation: 2040 feet.
 Soil: Groseclose silt loam.
 Soil pH: 5.6.
 Previous crop: Cover crop.
 Plot size: One row of 12 plants (18 x 3 feet). Yield records taken on center 10 plants.
 Plot design: Split plot.
 Replications: Four.
 Spacing: Plants 18 inches apart in row, 3 feet between rows.
 Fertilization: 400 lb. per acre of 5-10-5 mixed in rows 15 days before field setting. At field setting 1/2 pint per plant starter solution (3 lb. of 10-52-17 to 50 gal. water). Sidedressed 6 days after field setting with 400 lb. per acre 5-10-5 and 30 days with 300 lb. per acre 16-0-0.
 Field planting date: May 20
 Cultivation: Frequently enough to control weeds.
 Insecticides: Chlordane (in starter solution), TDE and Malathion.
 Growing conditions: See Table No. 11.

Notes on Varieties Tested 1959

The yield of peppers in 1959, although higher than 1958, was relatively low as compared to 1956 and 1957.

There were no mosaic diseases apparent in the field of eight varieties. This may have resulted in an advantage in yield to mosaic-susceptible varieties.

Description of the fruit will be found in the 1958 summary report. Description of plants in the 1959 tests, comments on varieties in the 1956-1959 tests, and 1959 table of yields and weights follow.

Plant Description - 1959

Variety	Height (inches)	Growth habit	Leaf cover	Fruit position
Lib. Bell	13	Interm.	Interm.	Interm.
Yolo B	13	Interm.	Interm.	Interm.
Yolo A	13	Interm.	Dense	Interm.
Wondergreen	14	Erect	Dense	Erect
Keystone	13	Interm.	Dense	Pendant
Ill. No. 6	9	Very spreading	Interm.	Pendant
Ill. No. 2	10	Spreading	Light	Pendant

Keystone Resistant Giant produced above average yields of the largest fruit in the tests. While not producing the highest yields in the trials, the smooth, blocky, handsome fruit with no bronzing in these tests, places Keystone as perhaps the best all-round variety in the trials.

Wondergreen, which was in the trials only in 1958 and 1959, produced a higher than average yield of very dark green exceptionally glossy fruit. More than half of the fruit was 4-lobed, fairly smooth and with no bronzing, but the walls were rather thin. Based on only two seasons of testing, for those who do not object to thin walls, this variety is highly recommended.

Yolo Wonder, Yolo Wonder A and Yolo Wonder B (identified in the 1958 trials as Yolo Wonder (Brown)) did not show any great variations in these trials. All were quite similar in yield which was above average and in fruit size which was average. Yolo Wonder B was somewhat smoother with a higher percent of 4-lobed fruit than A in 1958 and 1959. Yolo Wonder was deleted from the trials after 1957. All strains seem to be worthy of recommendation.

Notes on Varieties Tested 1956-1959

Pennwonder and Liberty Bell have produced high yields. Pennwonder fruit is not quite blocky, being somewhat elongated. In 1957 nearly half of the plants were affected by tobacco mosaic. Liberty Bell fruit was somewhat irregular and crumpled in shape with a little bronzing.

Calwonder was deleted from the tests after 1958 because of fairly low yield of only fairly blocky fruit with a tendency to bronze.

Wisconsin Lakes was deleted from the trials after 1957 because of difficulty in picking.

Vinedale was deleted because of low yield and small size. This variety was early, but earliness is not an important factor in this area.

Illinois No. 2 and Illinois No. 6 are not recommended because of low yields and roughness.

Pimiento types, Perfection and V-1 (Virginia-Oberle) were tested in 1956 and 1957 and Early Pimiento in 1956. Based on yields and other qualities, Perfection seemed to be the best of the three pimiento types.

Variety Recommendations Based on Trials

Keystone Resistant Giant
Wondergreen (thin walled)
Yolo Wonder B
Yolo Wonder A

Table No. 17 - Eight Pepper Varieties Tested in 1959 at Blacksburg, Virginia. Yield of marketable fruit, weight and shape of fruit and seed source.

Varieties	*Yield per acre (means of 4 replications)	Average fruit weight for season	Fruit shape	Seed source
	cwt.	oz.		
Liberty Bell	143	4.0	Tapering	Ferry-Morse Seed Co.
Yolo Wonder B	132	4.5	Blocky	Joseph Harris Co.
California Wonder	120	3.6	Blocky	Corneli Seed Co.
Yolo Wonder A	118	4.1	Blocky	Assoc. Seed Growers
Wondergreen	111	4.5	Blocky	Ferry-Morse Seed Co.
Keystone Resistant Giant	109	4.7	Blocky	Corneli Seed Co.
Illinois No. 6	103	4.2	Little taper	Illinois-Thompson
Illinois No. 2	99	3.9	Blocky	Illinois-Thompson

* There is no statistical significance in the yield figures at the 5% level.