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Evaluation of Vegetable Varieties

by

Homer D. Swingle

James F. Brown

David L. Coffey

Charles A. Mullins



The University of Tennessee
Agricultural Experiment Station
John A. Ewing, Dean
Knoxville

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COVER: Figure 1. Harvesting experimental plots of snap beans at the Plateau Experiment Station.

EVALUATION OF VEGETABLE VARIETIES

Cabbage, Snap Bean, Southern Pea, Squash, Sweet Potato and Tomato

Homer D. Swingle, James F. Brown, David L. Coffey
and Charles A. Mullins*

INTRODUCTION

The primary purpose of a variety evaluation program is to test new vegetable crop varieties available to growers along with a few of the older varieties as standards. Certain vegetable varieties are evaluated at three locations in the state each year. These locations are: the Main Station at Knoxville, the Plateau Station at Crossville, and the West Tennessee Station at Jackson.

This report deals with varieties tested since 1971 and for most crops summarizes data from the 1972, 1973, and 1974 tests. Older varieties are continually dropped from the test as their performance is determined. The failure of some of the older varieties to appear here does not imply that they are inferior varieties. Since it is impractical to test all newly-introduced vegetable varieties, many do not appear in this report.

A secondary purpose of the testing program has been to test unnamed, nonreleased lines. These are designated usually as numbered entries and are not generally available to the public. With sufficient testing and performance, they may appear as named varieties at a later date.

The least significant difference (L.S.D.) values at the 5% level are shown at the bottom of each table. The yields of any two varieties being compared must differ by at least this amount in order for the varieties to be considered different in yielding ability.

* Professor, Assistant Professor (Jackson), Associate Professor and Assistant Professor (Crossville), respectively, Department of Plant and Soil Science.

CABBAGE

Cumberland Plateau

Three years of cabbage variety trials (1972-74) have been conducted at the Plateau Experiment Station, Crossville. Varieties for both fresh market and processing were included in the trials.

Procedure

All trials were direct field-seeded in May. Hills were spaced one foot apart in 3-foot rows. Three to five seed were placed in each hill. Stand was later thinned to one plant per hill. Weed control was by cultivation. Recommended chemicals were used for insect control. All heads were cut in once-over hand harvest. All trials had four replications of each variety. Soils were a Hartsells loam testing medium to medium-high in P and K and were fertilized each year with 500 pounds of 10-10-10 per acre as a broadcast application. Thirty pounds of N was used as a sidedressing.

Records included yield per acre, firmness of heads, core size rating, head length, and head width. A Magness-Taylor firmness meter was used to record firmness of the cabbage heads in pounds resistance per square inch. Core size was rated from 1 to 5. Head length and width were measured to the nearest quarter of an inch.

Results

Most of the varieties were hybrids (Table 1). Mean yields were 21.6, 15.6, and 15.3 tons per acre for the 3 years, respectively. Varieties with high yields for the 3 years were King Cole, Green Boy, Superette, Gourmet, Dutchman, Harvester Queen, Code 24, Prime Pak, Headmaster, Rio Verde, Code 26, Tastie, Head Start, and 11C-X99. Lines tested for less than 3 years that had high yielding ability were Market Prize, Copenhagen Market, and Kleen Cut.

Varieties tested for 3 years that had the firmest heads as shown in Table 2 are Green Boy, Gourmet, Dutchman, Code 24, Prime Pak, Headmaster, Rio Verde, Code 26, 11C-X99, 11C-X28, 11C-X101, Wizard, Little Rock, and Red Head. Those tested for less than 3 years that had the firmest heads were Market Prize, NCX 907, Hyb. 84, NCX 903, NCX 902, and Stonehead.

Ratings of core size are also shown in Table 2. Varieties tested for 3 years with small cores are 11C-X99, 11C-X28, Green Delight, Banner, Pak Rite 42, Princess 39, 11C-X23, and Code 17. Varieties tested less than 3 years with small cores are Market Topper, Market Victor, Exp. 912, Hyb. 907, and Stonehead. Generally the high-yielding varieties had large cores. This suggests that yields may be associated with size of the stem.

Table 1. Yields of cabbage varieties tested at the Plateau Experiment Station, Crossville, 1972-74

Variety	1972	1973	1974	Mean
	Tons per acre			
King Cole	31.5	23.7	19.4	24.9
Green Boy	25.4	21.7	19.2	22.1
Superette	26.6	17.5	19.4	21.2
Gourmet	26.6	17.0	18.6	20.7
Dutchman	25.1	16.7	18.5	20.1
Harvester Queen	19.8	17.1	23.0	20.0
Code 24	26.0	16.9	16.5	19.8
Prime Pak	23.1	20.1	16.3	19.8
Headmaster	26.6	16.7	15.7	19.7
Rio Verde	22.7	19.9	16.0	19.5
Code 26	26.6	16.4	14.1	19.0
Tastie	21.1	18.3	14.7	18.0
Head Start	22.0	21.1	10.3	17.8
11C-X99	24.4	13.6	15.2	17.7
Jet Pak	18.9	17.7	15.5	17.4
11C-X28	17.9	17.8	15.2	17.0
Green Delight	19.3	15.5	16.0	16.9
11C-X101	19.0	14.4	15.0	16.1
Wizard	18.2	13.8	16.0	16.0
Banner	19.1	14.1	14.5	15.9
Little Rock	20.6	7.8	9.3	15.9
Red Head	23.4	8.5	12.2	14.7
Pak Rite 42	17.5	14.5	12.2	14.7
Roundup	21.6	8.8	13.3	14.6
Princess 39	17.6	10.4	15.2	14.4
11C-X23	13.1	12.2	13.0	12.8
Code 17	9.7	9.1	17.7	12.2
Code 5	20.5	—	12.5	—
Copenhagen Market	—	17.1	—	—
Market Prize	—	18.4	14.5	—
Market Topper	—	15.8	12.9	—
Market Victor	—	16.5	10.4	—
Jackpot	—	12.1	11.9	—
Exp. 912	—	10.4	20.3	—
Hyb. 907	—	13.2	15.6	—
Kleen Cut	—	21.9	15.6	—
NCX 907	—	—	16.0	—
Hyb. 84	—	—	15.5	—
NCX 903	—	—	15.2	—
NCX 902	—	—	13.4	—
Stonehead	—	—	11.3	—
LSD @ .05	5.3	6.3	4.6	—

Table 2. Firmness of head and core ratings of cabbage tested at the Plateau Experiment Station, Crossville, 1972-74

Variety	Firmness ¹				Core rating ²			
	1972	1973	1974	Mean	1972	1973	1974	Mean
King Cole	25.2	18.0	24.0	22.4	5.0	5.0	4.2	4.7
Green Boy	28.0	26.4	27.3	27.2	3.5	4.2	4.0	3.9
Superette	24.3	19.0	25.3	22.9	4.8	3.8	5.0	4.5
Gourmet	24.2	24.0	26.6	24.9	3.5	4.2	4.5	4.1
Dutchman	26.2	21.2	27.1	24.8	5.0	4.5	4.8	4.8
Harvester Queen	16.7	20.2	23.2	20.0	3.2	4.0	4.2	3.8
Code 24	25.8	24.0	27.8	25.5	4.2	4.8	3.8	4.3
Prime Pak	27.2	23.2	27.4	25.9	3.5	4.8	4.2	4.2
Headmaster	23.0	23.8	25.4	24.1	3.8	4.2	4.5	4.2
Rio Verde	28.1	29.8	27.9	28.6	3.8	4.5	4.5	4.3
Code 26	23.0	23.2	24.7	23.6	3.5	4.8	4.2	4.2
Tastie	22.8	16.5	20.9	20.1	4.0	4.0	4.0	4.0
Head Start	18.8	17.2	21.8	19.3	4.0	4.2	4.2	4.1
11C-X99	26.0	25.8	26.1	26.0	3.8	4.2	3.5	3.8
Jet Pak	22.0	15.2	26.8	21.3	4.0	4.5	3.8	4.1
11C-X28	27.0	29.0	29.7	28.6	4.2	3.0	3.5	3.6
Green Delight	19.7	15.5	24.3	19.8	3.2	3.5	3.5	3.4
11C-X101	27.1	26.8	27.7	27.2	3.0	3.8	4.5	3.8
Wizard	24.6	22.2	25.0	23.9	3.5	5.0	4.0	4.2
Banner	20.6	19.8	20.5	20.3	3.5	4.2	3.5	3.7
Little Rock	27.8	32.0	27.9	29.2	3.2	4.5	4.2	4.0
Red Head	26.9	26.0	26.7	26.5	4.8	3.0	5.0	4.3
Pak Rite 42	19.3	16.8	23.8	20.0	4.0	2.8	3.8	3.5
Roundup	24.7	22.0	23.2	23.3	5.0	4.8	5.0	3.9
Princess 39	20.0	14.5	21.1	18.5	4.0	3.5	3.5	3.7
11C-X23	21.6	19.0	20.0	20.2	3.0	2.5	3.2	2.9
Code 17	23.0	18.5	24.6	22.0	3.5	3.2	3.2	3.3
Code 5	19.3	14.0	20.1	17.8	3.2	—	3.8	—
Copenhagen Market	—	18.0	—	—	—	3.8	—	—
Market Prize	—	28.0	23.0	—	—	5.0	4.8	—
Market Topper	—	20.0	24.3	—	—	3.5	4.0	—
Market Victor	—	17.5	21.0	—	—	3.2	3.5	—
Jackpot	—	16.5	22.8	—	—	4.0	4.0	—
Exp. 912	—	15.5	22.2	—	—	2.8	3.5	—
Hyb. 907	—	17.2	20.9	—	—	2.8	3.8	—
Kleen Cut	—	20.8	23.6	—	—	3.2	5.0	—
NCX 907	—	—	27.4	—	—	—	4.5	—
Hyb. 84	—	—	25.2	—	—	—	4.5	—
NCX 903	—	—	28.3	—	—	—	5.0	—
NCX 902	—	—	27.0	—	—	—	5.0	—
Stonehead	—	—	23.6	—	—	—	3.0	—
LSD @ .05	3.0	3.9	3.0		0.6	1.3	0.8	

¹ Resistance in pounds per square inch.

² Rating based on a scale of 1 through 5 (1 being small and 5 large).



Figure 2. Head Start cabbage produces very uniform, early, medium-sized heads.

Head length and width (Table 3) seem closely associated with yields. Those with the greater head measurements usually produced the higher yields. One should remember that all varieties in these trials were at the same spacing. In production, it is likely that small head varieties could be spaced closer in the row than large head varieties, thereby increasing yields.

Summary

Forty-one cabbage varieties were tested over the 3-year period. Most performed well. Several varieties had excellent yields and should be useful for production in Tennessee. The long, cool growing season on the Plateau contributes to success with direct field-seeded cabbage. Other areas of the state may do better with transplants in order to mature the cabbage before hot weather.

Table 3. Length and width of cabbage heads tested at the Plateau Experiment Station, Crossville, 1972-74

Variety	Head length				Head width			
	1972	1973	1974	Mean	1972	1973	1974	Mean
	Inches				Inches			
King Cole	6.7	5.8	5.2	5.9	7.5	6.2	5.4	6.4
Green Boy	6.6	5.5	5.1	5.7	6.4	6.1	4.9	5.8
Superette	6.7	5.4	5.4	5.8	7.1	5.7	5.1	6.0
Gourmet	6.3	5.1	5.2	5.5	6.2	6.2	5.4	5.9
Dutchman	6.5	5.3	5.2	5.7	7.0	5.8	5.3	6.0
Harvester Queen	6.2	5.2	5.9	5.8	6.3	5.6	5.4	5.8
Code 24	6.5	5.1	5.1	5.6	7.0	5.8	5.3	6.0
Prime Pak	6.4	4.6	5.1	5.4	6.6	5.0	5.2	5.6
Headmaster	5.8	5.1	5.2	5.4	6.7	5.7	5.4	5.9
Rio Verde	5.6	5.0	4.9	5.2	6.0	5.9	5.1	5.7
Code 26	7.0	5.6	5.4	6.0	6.6	5.6	5.3	5.8
Tastie	5.8	6.2	6.0	6.0	5.4	5.6	5.2	5.4
Head Start	6.4	4.9	5.8	5.7	6.3	5.0	5.4	5.6
11C-X99	6.4	4.9	4.8	5.4	6.4	5.4	4.9	5.6
Jet Pak	6.0	5.8	5.4	5.7	5.9	5.0	4.9	5.3
11C-X28	5.8	5.2	4.6	5.2	6.0	5.7	4.6	5.4
Green Delight	6.0	4.9	5.4	5.4	6.2	5.4	5.3	5.6
11C-X101	5.4	4.9	4.9	5.1	5.6	5.7	5.1	5.5
Wizard	6.1	5.6	5.6	5.8	5.4	5.1	4.8	5.1
Banner	5.4	5.5	5.6	5.5	5.6	5.5	5.4	5.5
Little Rock	6.0	4.5	5.2	5.2	5.6	4.6	5.0	5.1
Red Head	6.3	5.0	4.8	5.4	6.3	4.6	4.6	5.2
Pak Rite 42	5.8	4.1	5.1	5.0	6.4	4.2	5.2	5.3
Roundup	5.9	4.5	5.4	5.3	6.4	4.9	5.4	5.6
Princess 39	6.0	5.2	5.6	5.6	6.1	4.8	5.4	5.4
11C-X23	5.2	3.6	4.8	4.5	5.4	3.5	4.7	4.5
Code 17	4.9	4.6	5.2	4.9	4.6	4.8	5.2	4.9
Code 5	6.1	—	6.2	—	6.1	—	6.0	—
Copenhagen Market	—	6.4	—	—	—	6.1	—	—
Market Prize	—	5.2	4.8	—	—	5.6	4.6	—
Market Topper	—	5.2	4.9	—	—	5.4	5.1	—
Market Victor	—	5.7	5.5	—	—	5.3	5.2	—
Jackpot	—	5.6	5.2	—	—	5.0	5.3	—
Exp. 912	—	4.2	5.4	—	—	4.4	4.9	—
Hyb. 907	—	6.0	5.9	—	—	4.9	5.4	—
Kleen Cut	—	5.9	6.0	—	—	5.5	6.0	—
NCX 907	—	—	4.9	—	—	—	5.2	—
Hyb. 84	—	—	5.1	—	—	—	5.1	—
NCX 903	—	—	4.5	—	—	—	5.0	—
NCX 902	—	—	4.6	—	—	—	5.0	—
Stonehead	—	—	5.1	—	—	—	5.0	—
LSD @ .05	0.5	1.0	0.5		0.7	1.2	0.6	

CABBAGE

West Tennessee

Cabbage variety trials were conducted at the West Tennessee Experiment Station, Jackson, in 1971, 1972, and 1973. Each trial was established by transplanting potted plants to the field in late March. Seedlings were transplanted from greenhouse flats into 2½ inch peat pots about February 20, grown in the greenhouse for approximately 2 weeks, and finally hardened for another 2 weeks in the coldframe before field setting. The earliest transplanting date was March 18 in 1971 and the latest date was March 29, 1972.

The soil used for these tests was classified as Memphis silt loam. Four hundred pounds per acre of 12-24-24 fertilizer was applied broadcast to each test plot before transplanting. Each plot also received one sidedressing at the rate of 100 pounds per acre (33 pounds of nitrogen per acre) of ammonium nitrate 3 weeks after transplanting. The 1973 crop received an additional 100 pounds per acre of ammonium nitrate 3 weeks after the first sidedressing.

All varieties were grown in one row plots, 25 feet in length, replicated four times. Plants were spaced 1 foot apart in 3½ foot rows. Plots were cultivated two or three times to control weeds and insecticides were applied according to University of Tennessee recommendations.

Market Prize was grown in each of the three trials and considered as a check. Market Topper, also considered as a check, was grown in the 1973 trial.

The number of days from transplanting to main harvest varied with time of transplanting, but varieties matured in about the same sequence each year. Marketable yield for each variety by years, average head weight, and the average number of days from transplanting to main harvest are shown in Table 4.

Average marketable yields of Banner, Headstart, NK 906, and Superette were significantly higher than Market Prize. All other varieties yielded as well as Market Prize. Other characteristics, however, are equally as important as yield. Some of these characteristics and a seed source for each variety are shown in Table 5.

Table 4. Performance of cabbage varieties grown at West Tennessee Experiment Station, Jackson, 1971-1973

Variety	Avg. no. days from field setting to main harvest	Marketable yield				Avg. wt. of marketable heads
		1971	1972	1973	Avg.	
		Tons per acre				
Banner	71	19.6	18.6	15.3	17.8	3.1
NK Exp 72	72	18.2	17.1	17.1	17.5	3.0
Headstart	73	22.4	18.6	16.5	19.2	3.2
Jet Pak	73	19.8	16.5	16.8	17.7	3.1
Copenhagen Market	73	—	17.4	14.6	16.0	2.8
Market Victor	73	—	—	16.3	—	3.1
Harvester Queen	75	18.3	17.9	16.2	17.5	3.0
NK 906	75	18.5	19.2	16.3	18.0	3.0
Market Prize	77	14.9	16.8	14.3	15.3	2.7
Market Topper	78	—	—	16.5	—	3.3
Tastie	77	—	17.9	14.1	16.0	2.8
Superette	77	18.4	19.7	17.5	18.5	3.2
Kleen Cut	79	16.9	16.0	14.9	15.9	2.8
Rio Verde	83	12.0	20.4	20.6	17.7	3.3
L.S.D. @ .05	—	2.4	2.9	2.2	2.5	—

Table 5. Horticultural characteristics of cabbage varieties evaluated at West Tennessee Experiment Station, Jackson, 1971-1973

Variety	Seed source ¹	Color ²	Uniformity ³	Remarks
Banner	A	LG	G	Early, uniform heads, firm.
NK Exp 72	N-K	LG	G	Early, heads firm, attractive.
Head Start	A	LG	E	Early, very attractive, slightly loose.
Jet Pak	N-K	BG	G	Early, firm, attractive heads.
Copenhagen Market	F-M	LG	F	Lacks uniformity, slightly loose.
Market Victor	H	BG	G	Early, very attractive.
Harvester Queen	N-K	G	G	Firm, holds well, attractive.
NK 906	N-K	BG	G	Attractive heads, firm.
Market Prize	H	BG	E	Firm, holds well.
Market Topper	H	BG	E	Firm, holds well.
Tastie	N-K	BG	G	Small, does not hold well.
Superette	F-M	BG	P	Large, ruffled outer leaves, lacks uniformity.
Kleen Cut	N-K	G	F	Very firm, holds well.
Rio Verde	N-K	BG	P	Large, late, lacks uniformity.

¹ Seed Source Code: A = Asgrow; H = Harris; F-M = Ferry-Morse; N-K = Northrup-King.

² Color Code: LG = Light Green; G = Green; BG = Blue Green.

³ Uniformity Code: P = Poor; F = Fair; G = Good; E = Excellent.

Summary

Data and observations from these performance tests indicate that several cabbage varieties tested have potential for commercial production in West Tennessee.

Headstart, Banner, and Jet Pak reach maturity earlier than Market Prize or Market Topper. These varieties performed well consistently and should be considered where earliness is an important factor. Heads of Headstart were less firm than those from Market Prize.

Market Victor also looked promising in the one test in which it was grown. Harvester Queen and NK 906, maturing at about the same time as Market Prize, produced firm, attractive heads slightly larger than Market Prize. Yields of these varieties were slightly higher due to larger size of individual heads. Performance of these varieties does not warrant that they be used to replace Market Prize or Market Topper in commercial plantings, but does indicate that they are worthy for trial plantings.

SNAP BEAN

Evaluation of processing type snap bean varieties has continued at the Plateau Experiment Station for many years. The most recent report dealt with the 1970 and 1971 crops and appeared in Tennessee Farm and Home Science Progress Report Number 81. Selected varieties tested from 1972 through 1974 are discussed in this report.

Procedure

Seventy-three varieties were included in the 3 years of testing. This report includes the more promising varieties that were in test at least 2 of the 3 years with two plantings each year. They are grouped into those tested all 3 years and those tested for 2 years (Table 6). Established popular varieties included as checks were Early Gallatin, Bush Blue Lake (BBL) 274, and Slenderwhite. Astro was added as a check starting in 1973.

The crop was fertilized using 500 pounds per acre of 8-12-6 banded. Plots were 50 feet long with two rows 38 inches apart. A randomized complete block with four replications was used. Seeders were calibrated to produce a stand of 6 to 8 plants per foot of row. Production practices used were those recommended by the University of Tennessee and common to the area. Harvesting was with a two-row mechanical picker.

Results

Bush Blue Lake 274 has been desired by some processors due to outstanding pod quality, but poses a problem for the producers due to excessive vine growth and lodging. New lines of this type in the 3-year test show yields equal to the standard BBL 274 (Table 6). BBL GV2 and BBL 68-115 had practically no lodging of plants (Table 7). Pod measurements taken were equal or superior to BBL 274.

Slenderwhite has been widely grown in Tennessee for a small sieve type for processing whole or as fancy cut beans, especially for canning. Its light- to medium-green pod color has been objec-

Table 6. Yield of snap bean varieties, Plateau Experiment Station, Crossville, 1972-74

Variety	Yields						Mean
	1972		1973		1974		
	Early	Late	Early	Late	Early	Late	
Bushels per acre							
In trials 3 years							
BBL Type							
BL-GV2	200	255	109	178	158	203	184
BBL 68-115	248	212	100	145	215	173	182
BBL 274	265	228	77	119	194	176	176
BBL Supreme	186	249	90	108	191	193	170
Small Sieve							
Slenderwhite	213	245	106	117	188	203	179
Pirol	184	283	80	107	165	191	168
Slenderette	236	180	99	90	165	212	164
Large Sieve							
Early Gallatin	217	299	117	194	128	203	193
Exp. 140-2347	250	227	103	212	119	195	184
GP 65-71A	196	207	62	142	206	198	168
E 2203	198	234	81	118	128	140	150
In trials 2 years							
Unclassified							
White Seeded Provider	—	—	155	136	199	213	176
72AI-4	—	—	78	138	158	225	150
Astro	—	—	135	121	165	148	142
Exp. 116-137	—	—	158	135	102	156	138
XI 68-2990	—	—	41	128	134	232	134
Galaslim	—	—	81	214	84	134	128
XP B46	—	—	91	94	124	198	127
GP66937A	—	—	120	102	131	156	127
XP B47	—	—	96	96	134	154	120
Ozark	—	—	88	108	62	171	107
LSD @ .05			17	16	55	65	—

Table 7. Horticultural characteristics of snap bean varieties, Plateau Experiment Station, Crossville, 1972-74

Variety	Pod Description						
	Green-ness	Curva-ture	Rough-ness	Length inches	Touche-s soil	Concen-tration	Plant lodging
In Trials 3 years							
BBL Type							
BBL GV2	dark	slight	slight	5.8	occas.	sat.	slight
BBL 68-115	dark	slight	slight	5.5	occas.	sat.	none
BBL 274	dark	pronounced	pronounced	5.7	often	sat.	severe
BBL Supreme	dark	slight	slight	5.5	occas.	sat.	severe
Small Sieve							
Slenderwhite	medium	slight	slight	5.0	occas.	conc.	slight
Pirol	dark	slight	slight	4.4	occas.	conc.	slight
Slenderette	dark	slight	slight	4.8	occas.	conc.	slight
Large Sieve							
Early Gallatin	dark	slight	slight	5.1	occas.	sat.	slight
Exp. 140-2347	medium	slight	slight	5.3	often	conc.	slight
GP 65-71A	dark	slight	slight	5.3	occas.	sat.	slight
E2203	dark	slight	slight	5.6	occas.	sat.	slight
In trials 2 years							
Unclassified							
White Seeded							
Provider	dark	slight	slight	5.4	occas.	sat.	slight
72Al-4	dark	pronounced	pronounced	6.0	often	sat.	severe
Astro	dark	slight	none	5.5	often	sat.	slight
Exp. 116-137	medium	slight	slight	5.4	often	sat.	slight
XI 68-2990	dark	slight	slight	4.9	occas.	sat.	slight
Galaslim	dark	slight	slight	5.0	occas.	sat.	slight
XP B46	dark	slight	slight	5.4	occas.	sat.	slight
GP66937A	dark	slight	slight	5.2	often	sat.	slight
XP B47	dark	slight	slight	5.4	occas.	sat.	slight
Ozark	dark	pronounced	slight	5.5	occas.	sat.	slight

tional for a freezer bean. Pirol and Slenderette, in the same class as Slenderwhite, produced pods with dark green color and comparable yields to Slenderwhite (Tables 6 and 7). Pods of Pirol were short but with mechanical handling may not be objectional for processing. Slenderette bore heart-shaped pods on very vigorous plants.

In the large sieve or diameter pod class, none of the newer lines consistently outyielded Early Gallatin—the major variety of this class grown in Tennessee (Table 6). Not any of the varieties excelled Early Gallatin in pod or plant characteristics (Table 7).

White Seeded Provider produced the largest average yield of varieties tested only 2 years, but was not the top-yielding variety in every test (Table 6). It compared favorably to standard varieties in pod and plant measurements (Table 7). Like the colored seeded

Provider that has been used commercially, it was one of the earliest lines in the trials and showed considerable promise. Pods from 72 AI-4 and Ozark were more curved than those from other lines. Exp. 116-137 pods were not as dark green as some varieties which may limit its usefulness as a freezer bean. The excessive lodging for 72 AI-4 would make machine harvest difficult. Pods of GP66937A, Exp. 116-137, Astro, and 72 AI-4 were borne lower on the plant which allowed more contact with the soil and more soil rot.

Summary

Based on recorded data and observations of field performance of 73 varieties tested from 1972 to 1974, the more promising new lines recommended for trial are BBL 68-115, Slenderette, and White Seeded Provider.

SOUTHERN PEA

Southern Cooperative southern pea variety trials are conducted each year at the West Tennessee Experiment Station. These trials consist of observational and advanced testing of both named varieties and breeder's lines. In this report data will be presented on varieties grown in the advanced test for at least 2 years during the 1972-74 period.

In the advanced test, varieties are planted in one-row plots 30 feet in length replicated four times. During the period 1972-74, tests were conducted on Grenada and Dexter loam soils. Soil tests indicated high levels of phosphorus and potassium in these soils; therefore no fertilizer was applied. Trifluralin was applied at 0.5 pound per acre preplant incorporated for weed control and cultivations were made as needed. Two to three applications of carbaryl were made during the bloom period for cowpea curculio control.

Pinkeye Purple Hull and Mississippi Silver were grown in each test as check varieties. Multiple hand harvests of mature green peas were made at 3-4 day intervals during the harvest season. Descriptive characteristics of varieties and horticultural evaluations made during the tests are shown in Tables 8 and 9, respectively.

Descriptive information about the varieties evaluated is shown in Table 8. Data in Table 9 show that Pinkeye Purple Hull consistently out-yielded the other purple hull varieties and had a slightly more concentrated harvest period. Bush Purple Hull, a dwarf variety, was recently released by the Arkansas Agricultural Experiment Station. Plants of this variety were considerably less viney than those of Pinkeye Purple Hull and well adapted to machine harvesting, but consistently produced low yields in these



Figure 3. The low bushy plant of Pinkeye Purple Hull Southern pea allows for successful mechanical harvesting.

Table 8. Descriptive characteristics of selected southern pea varieties

Variety	Horticultural group ¹	Plant type ²	Seed characteristics			Class ⁶
			Color ³	Pattern ⁴	Size ⁵	
Pinkeye Purple Hull	PHRdE	LB	Cr	SE	L	NC
Bush Purple Hull	PHBrE	E	Cr	SE	M	NC
G70-90 B	PHRdE	LB	Cr	SE	M	NC
Mississippi Silver	Cr	HB	DB	S	L	C
Colossus	Cr	LB	DB	S	VL	C

¹ Horticultural Group Code: PHRdE = Purple Hull Red Eye;
PHBrE = Purple Hull Brown Eye;
Cr = Cream

² Plant Type Code: LB = Low Bushy; E = Erect; HB = High Bushy

³ Seed Color Code: Cr = Cream; DB = Dark Brown

⁴ Seed Pattern Code: SE = Small Eye; S = Solid

⁵ Seed Size Code: M = Medium; L = Large; VL = Very Large

⁶ Seed Class Code: NC = Non crowder; C = Crowder

trials. The G70-90 B is a breeder's line from the Georgia Agricultural Experiment Station. Plant and seed characteristics are similar to those of Pinkeye Purple Hull, but it, too, has failed to yield as well as Pinkeye Purple Hull under West Tennessee conditions.

The remaining two varieties evaluated in these tests were large-

Table 9. Performance of southern pea varieties at West Tennessee Experiment Station, Jackson, 1972-74

Variety	Days to maturity ¹	Harvest period days ¹	Percent shellout ¹	Yield of green shell pods			
				1972	1973	1974	Avg.
				Pounds per acre			
Pinkeye Purple Hull	68	10	61	9300	5100	7900	7400
Bush Purple Hull	69	13	64	6300	2400	—	4400
G70-90 B	69	11	63	5500	4000	7100	5500
Mississippi Silver	70	11	60	6500	5100	6700	6100
Colossus	70	9	64	8000	4900	6200	6400
L.S.D. @ .05	—	—	—	1000	1300	1300	—

¹ Data are averages for 3 years except Bush Purple Hull which was included in the trials only 2 years.

seeded brown crowder peas. Mississippi Silver has been an important commercial processing variety in Tennessee for several years. It has consistently produced high yields of large, well-filled pods and is fairly well adapted to machine harvesting. Colossus was released in 1972 by the South Carolina Agricultural Experiment Station. Table 8 shows that in these trials both average yield and percent shellout of Colossus were slightly higher than for Mississippi Silver. Plants were more compact and less viney than plants of Mississippi Silver. Another outstanding attribute of Colossus is the ease of opening and shelling of the pods. Data from these tests suggest that Colossus has potential for production in home gardens, fresh market operations, and for commercial processing in Tennessee.

Summary

The commonly-grown southern pea variety, Pinkeye Purple Hull, was the highest-yielding variety in trials that were multiple hand-harvested. Colossus showed promise in the brown crowder class.

SUMMER SQUASH

The growing of summer squash for the frozen food industry has been a recent development on the Cumberland Plateau. This market outlet combined with fresh market sales has stimulated an interest in an evaluation of the many new varieties of yellow type and Zucchini type squash. This report summarizes the 1973-74 trials at the Plateau Experiment Station, Crossville. Varieties tested are shown in Tables 10 and 11.

Procedure

Seeds of yellow summer and Zucchini squash were planted in early May each of the 2 years. In 1973, 400 pounds per acre of 15-10-10 fertilizer was broadcast with 30 pounds of N as ammonium nitrate sidedressed at first bloom. The following year 400 pounds per acre of 10-10-10 was used at planting with 30 pounds of N from calcium nitrate used as a sidedressing.

Plots were 21 feet long with rows spaced 4 feet apart and two plants per hill every 3 feet. Each variety was replicated four times in a randomized complete block design. Maneb and Sevin were used on a 10- to 14-day schedule for disease and insect control. Harvests were made three times per week for 5 weeks each year. Attempts were made to harvest when squash were between 1.5 and 2.5 inches in diameter. In addition to yield data, curvature and appearance ratings were made.

Table 10. Yields, fruit curvature, and appearance of Zucchini type summer squash, Plateau Experiment Station, Crossville, 1973-74

Variety	Yield			Curvature			Appearance		
	1973	1974	Mean	1973	1974	Mean	1973	1974	Mean
	—Tons per acre—			—Rating*—			—Rating**—		
Senator	6.4	22.9	14.6	9.2	10.0	9.6	9.5	10.0	9.8
Zucchini Hybrid	5.4	20.9	13.2	9.0	10.0	9.5	9.8	10.0	9.9
Ambassador	6.9	16.2	11.6	9.2	10.0	9.6	8.5	8.5	8.5
Diplomat	5.3	14.6	10.0	9.2	10.0	9.6	7.8	8.0	7.9
Golden Zucchini	4.2	9.4	6.8	9.2	9.0	9.6	7.0	9.0	8.0
Apollo	—	20.5	—	—	10.0	—	—	10.0	—
Zucchini Elite	—	19.7	—	—	10.0	—	—	10.0	—
President	—	15.5	—	—	10.0	—	—	9.5	—
Blackjack	—	13.3	—	—	10.0	—	—	6.5	—
Aristocrat	—	12.2	—	—	10.0	—	—	9.0	—
Blackini	—	12.0	—	—	10.0	—	—	6.5	—
Chefini	—	11.8	—	—	10.0	—	—	8.0	—
LSD @ .05	NS	4.4	—	0.8	0.4	—	0.8	0.5	—

* Curvature rating: 1 = severely curved; 10 = straight.

** Appearance rating: 1 = misshapen, rough; 10 = smooth and attractive.



Figure 4. Zucchini squash is vigorous and prolific.

Results

Rainfall in 1973 was much greater than in 1974 during the squash production season. Temperatures were somewhat lower. Honeybee activity among the blossoms was noted to be less in the more humid, cool season. Yields, especially for the Zucchini types, were noticeably less in 1973 than in 1974 (Tables 10 and 11). Senator, Zucchini Hybrid, Apollo, and Elite were judged the most promising when yield and appearance were considered (Table 10). Golden Zucchini was attractive in color but was low in yield and less desirable in appearance. It was the only nonhybrid of the Zucchini types in the trials. Blackjack and Blackini were rated low in appearance due to the dark, dull color.

All varieties of yellow squash tested were hybrids except Early Prolific Straightneck and Yellow Summer Crookneck. These two have been the most popular of the yellow squash before the introduction of hybrids a few years ago. Varieties, with the exception of Butterbar, were fairly consistent in their yield rank for the 2 years in test (Table 11). Yields of Early Prolific Straightneck were not significantly (.05 level) lower than those of any of the hybrids for either year. Curvature and appearance ratings for Straightneck compared favorably with standard varieties. Summer Crookneck

Table 11. Yields, fruit curvature, and appearance of yellow type summer squash, Plateau Experiment Station, Crossville, 1973-74

Variety	Yield			Curvature			Appearance		
	1973	1974	Mean	1973	1974	Mean	1973	1974	Mean
	—Tons per acre—			—Rating*—			—Rating**—		
Butterpak	7.0	8.5	7.8	7.8	7.5	7.6	8.8	10.0	9.4
Gold Strike	5.9	9.3	7.6	8.0	10.0	9.0	8.0	7.0	7.5
Hyrific	6.3	8.6	7.4	8.0	6.5	7.2	9.5	10.0	9.8
Butterbar	3.9	10.6	7.2	9.0	9.0	9.0	9.8	10.0	9.9
Early Prolific Straightneck	5.8	8.3	7.0	9.0	8.5	8.8	9.2	10.0	9.6
Slendergold	4.2	8.0	6.1	7.8	4.0	5.9	9.5	9.0	9.2
Goldneck	4.1	7.6	5.8	5.8	5.0	5.4	7.8	10.0	8.9
Dixie	3.1	8.0	5.6	7.5	7.0	7.2	8.8	10.0	9.4
Seneca Prolific	4.4	6.9	5.6	9.0	9.0	9.0	8.5	9.0	8.8
Goldhorn	4.4	6.4	5.4	8.0	6.5	7.2	7.8	9.5	8.6
Golden Rebel	3.0	6.9	5.0	6.8	6.0	6.4	8.5	10.0	9.2
Goldbar	3.6	6.4	5.0	9.8	9.0	9.4	9.5	10.0	9.8
Yellow Summer Crookneck	2.4	5.5	4.0	7.8	5.0	6.4	7.5	7.8	7.6
Golden Girl	—	7.1	—	—	8.5	—	—	8.0	—
LSD @ .05	3.0	4.4	—	0.8	0.4	—	0.8	0.5	—

* Curvature rating: 1 = severely curved; 10 = straight.

** Appearance rating: 1 = misshapen, rough; 10 = smooth and attractive.

produced lower yields and had greater curvature and less desirable appearance of the fruit than several of the hybrid varieties.

Summary

Several varieties appear to have high yielding ability along with the capacity to produce smooth attractive fruit. Curvature should be considered in light of the particular market. Processors need a straight fruit, while this may not be of much importance on many fresh markets. Several of the varieties rated high in appearance. Size and intensity of color preferences may be options of processors and may dictate, along with yield, the variety acceptable for their use.

SWEET POTATO

During the depression year of 1932, sweet potato acreage in Tennessee reached its maximum of 75,000 acres. Since then, a steady and continuous decline in acreage has resulted in less than 2,500 acres now being produced annually. The start of the decline was due to the low per-acre yield of 80-90 bushels and the decrease in consumer demand. This was partially associated with the use of non-wilt resistant varieties such as Nancy Hall and Porto Rico. With this low yield and low price received growers failed to maintain their storage facilities. The mechanization of cotton and loss of farm labor further discouraged the sweet potato enterprise since cotton was the chief competitor.

Significant advancements were made in breeding for disease resistance, uniformity of color, and higher yields during the 1950's and 1960's. The University of Tennessee has cooperated in a variety evaluation program with the USDA and other state experiment stations continuously since 1950. Wilt-resistant varieties introduced into the state, as the result of these early tests, were Goldrush in 1951 and Centennial in 1960. Average per acre yield for the state has increased from 80 bushels in 1932 to about 180 bushels annually after 1964. Centennial is presently the most widely-grown variety in Tennessee. Other varieties tested and tried by growers as a result of these trials are: Allgold, Gem, and Nugget. This report summarizes the results of sweet potato testing at two locations during the 1971-74 period.

In comparison with other vegetables, relatively few new varieties are available for testing. Very few private companies are involved in sweet potato breeding. Screening of new lines available through the Cooperative Program has been conducted at the West Tennessee Experiment Station, Jackson. Promising lines are selected from these screening trials and go into the advanced testing program at Jackson and the Main Experiment Station, Knoxville. Those that have shown the most promise since 1971 are included in this report.

Plots at Jackson were on either a Dexter loam or a Memphis silt loam while those at Knoxville were on a Sequatchie loam. Plots were fertilized according to recommendations resulting from soil test. This varied from 200 to 450 pounds per acre of 12-24-24 at Jackson and from 400 to 500 pounds of 12-24-24 at Knoxville. Herbicides were generally used for weed control. Each treatment consisted of three-row plots 30 feet in length which were replicated four times. Rows were 42 to 48 inches apart and plants were spaced 12 inches in the row. Plants were field-set the second week of May at Knoxville except in 1973 when they were set May 29. Plantings were

made at Jackson the third week of May except it was delayed a week in 1972.

Roots were harvested near the middle of September except in 1972 when wet weather at Knoxville delayed harvest until October 11. Roots were graded according to U.S. Standards and weighed within 2 days following harvest. U.S. Number 1 roots were 2.0 to 3.5 inches in diameter and 2 to 7 inches long. Jumbo grade was made up of roots that exceeded the diameter or length requirements of the above grade. The U.S. Marketable grade was comprised of the Number 1, the Cannery, and the Jumbo grades.

Yields at both locations were considerably higher than State averages (Table 12). No variety in the trials all 4 years excelled Centennial in yield of marketable potatoes at either location.

The most promising entry during the last 2 years was Jasper which excelled Centennial in total yield each of the years at Jackson

Figure 5. Jasper sweet potato produces a high percentage of marketable size roots.



Table 12. Yields of marketable sweet potatoes, Jackson and Knoxville locations, 1971-74

Variety	Jackson					Knoxville					2-location mean
	1971	1972	1973	1974	Mean	1971	1972	1973	1974	Mean	
Bushels (55-pound) per acre											
In trial 4 years											
Centennial	611	500	244	438	448	263	485	317	336	350	399
La. 7-177	503	441	159	397	375	298	402	333	415	362	369
Jewel	589	440	337	406	443	316	481	364	393	389	416
Rose Centennial	—	—	—	—	—	290	510	346	394	385	—
In trial 3 years											
La. 7-182	—	436	274	415	375	—	510	327	464	434	405
In trial 2 years											
Jasper	—	—	312	530	410	—	—	325	394	360	385
LSD @ .05	90	56	57	71		NS	NS	NS	NS	—	—

and Knoxville. Yields at Knoxville were not significantly different (.05 level) for the two varieties. Jewel was equal in performance to Centennial, showing a consistent high yield, especially at Knoxville. Rose Centennial, a mutation with a darker skin color, produced slightly higher yields than Centennial each year at Knoxville, but these were not significantly higher (.05 level).

The percentage of marketable potatoes grading Number 1 varied somewhat between varieties and between years (Table 13). All were superior to Centennial when both locations were considered. Of the named varieties, Jewel and Jasper excelled. The importance of the percentage of Number 1 grade roots will vary with market demand as to size and with the price of Canning and Jumbo grades. The low percentage of grade 1 at Knoxville in 1971 was due to the large percentage of canning size roots making up the marketable yield (Table 14). The small-size roots likely were a result of the influence of excessive wet and cool weather.

Jumbo grade potatoes have a limited demand. They are acceptable for canning and a few can be sold through local stores, but it is uneconomical to package and ship them. Some growers are able to move them to restaurants and other eating establishments at a profit. They take less labor to prepare and a smaller percentage is wasted in peeling than with smaller roots.

The early-maturing varieties like Centennial and Jasper may produce a greater yield of Jumbo or oversized potatoes according to widespread trials over the south. This did not appear to be the case in these trials (Table 14).

In areas where a cannery market exists, the smaller-size roots are important. They command the highest price because they are used in the whole pack which is the top Cannery grade. Centennial appeared to equal or exceed in production of Canning-size roots at Jackson (Table 15). At Knoxville, La 7-182 produced more cannery grade in 1972 and 1974.

The skin color of all the varieties listed is a bronze to copper color except Rose Centennial. Flesh color of all is of an orange shade. Jewel is slightly lighter than Centennial in both skin and flesh color. Roots are smooth and usually a desirable fusiform and tapered shape. La 7-177 has a dark copper skin with a dark orange flesh. La 7-182 and Jasper are basically copperskinned but contain a shade of rose. Both have medium to dark orange flesh. Jasper is well-shaped and smooth and is resistant to soil rot, tolerant to root-knot nematode, and has a shorter storage life than other varieties. All of the varieties are tolerant or resistant to stem rot

Table 13. Percent of the marketable sweet potatoes grading U.S. Number 1, Jackson and Knoxville locations, 1971-74

Variety	Jackson					Knoxville					2-location mean
	1971	1972	1973	1974	Mean	1971	1972	1973	1974	Mean	
	Percent					Percent					
In trial 4 years											
Centennial	54	52	41	48	49	30	77	64	51	56	53
La. 7-177	64	42	52	56	54	30	79	71	55	59	57
Jewel	62	41	58	56	54	37	82	78	59	64	59
Rose Centennial	—	—	—	—	—	30	68	67	50	54	—
In trial 3 years											
La. 7-182	—	45	59	57	54	—	64	68	54	62	58
In trial 2 years											
Jasper	—	—	50	62	56	—	—	69	54	62	59

Table 14. Yield of jumbo grade sweet potatoes, Jackson and Knoxville locations, 1971-74

Variety	Jackson					Knoxville					2-location mean
	1971	1972	1973	1974	Mean	1971	1972	1973	1974	Mean	
Bushels (55-pound) per acre											
In trial 4 years											
Centennial	105	132	21	64	81	26	67	32	105	58	70
La. 7-177	47	151	14	60	68	18	28	14	130	48	58
Jewel	89	171	58	69	97	36	46	19	113	29	63
Rose Centennial	—	—	—	—	—	26	122	39	134	80	—
In trial 3 years											
La. 7-182	—	153	28	84	88	—	123	45	111	93	90
In Trial 2 years											
Jasper	—	—	33	61	47	—	—	17	83	50	49
LSD @ .05	NS	NS	20	NS	—	NS	57	19	NS	—	—

Table 15. Yield of canning grade sweet potatoes, Jackson and Knoxville locations, 1971-74

Variety	Knoxville					Jackson					2-location mean
	1971	1972	1973	1974	Mean	1971	1972	1973	1974	Mean	
Bushels (55-pound) per acre											
In trial 4 years											
Centennial	177	110	124	163	144	158	46	82	59	86	115
La. 7-177	133	103	63	116	104	189	55	82	56	96	100
Jewel	132	87	85	108	103	162	42	61	49	79	91
Rose Centennial	—	—	—	—	—	175	42	75	62	89	—
In trial 3 years											
La. 7-182	—	87	84	96	89	—	61	54	101	72	81
In trial 2 years											
Jasper	—	—	123	142	132	—	—	83	99	91	111
LSD @ .05	35	16	21	30	—	NS	12	27	28	—	—

or wilt. Rose Centennial is a mutation of Centennial and except for skin color appears similar.

Summary

All varieties in the sweet potato trials since 1971 yielded well and would be acceptable on markets accustomed to handling Centennial. The presently-grown varieties of Centennial and Jewel performed as well generally as the newer lines. Jasper, for the 2 years' testing at Jackson, appeared the most promising of the new lines.

TOMATO

Tomatoes are an important fresh market as well as home garden crop. A variety testing program has been an important phase of the research with this crop. One phase of the program has been to cooperate with other southern research workers in evaluating unnamed lines developed by breeders at the various experiment stations. Superior lines are named and released.

The evaluation of commercial seed company varieties available to the growers is another phase of these trials. Some of these varieties are a result of the seed company's breeding program and some are a product of the experiment stations. This report concerns the evaluation of named tomato varieties that were included in the trials at the Main Experiment Station, Knoxville, during the 1972-1974 period.

Each year seeds were sown in flats between March 10-15. Seedlings were pricked to 3-inch peat pots in late March or early April. These were grown in the greenhouse until the last week of April. Field planting dates in 1972, 1973, and 1974 were April 20, April 30, and April 30, respectively.

Trials were on Huntington soils testing medium to high in P and K and initial fertilizers were broadcast and varied from 48-60 pounds of N per acre, 72-208 pounds of P_2O_5 per acre, and 72-168 pounds of K_2O per acre. Two side dressings of 30 pounds of N per acre each were given in 1972 and 1974. One application of 30 pounds of N per acre was used in 1973.

Plots were one row 20 feet in length, replicated four times. Plants were spaced 2 feet apart in 4-foot rows. Weeds were controlled with diphenamid plus a single cultivation. University of Tennessee recommendations were followed for insect and disease control. Weekly applications of pest control materials were made throughout the growing period and control was rated good to excellent.



Figure 6. Walter tomato variety bears a large number of medium-sized fruit on each cluster.

Determinate (self-topping) varieties were unpruned and supported on stakes by the Florida weave system. Indeterminate varieties were pruned to two stems and each plant tied to a stake.

Fruits were harvested in the pink stage usually two or three times per week. Grading was on the basis of U.S. Standards. The minimum size fruit graded marketable was 1-7/8 inches in diameter. Fruit rated marketable but not meeting Number 1 standards were those having defects such as growth cracks or catfacing. The marketable grade would usually meet local, near-by market standards, but the packing houses would only pack a more strictly-graded product such as those referred to as Number 1 grade. The main reasons for fruit failing to meet either the Number 1 or the marketable grade were small size (below 1-7/8 inches), excessive catface or locular scar (larger than 1/2-inch in diameter), or having cracks in the aggregate of more than 1 inch.

Results

Tables 16 and 17 list varieties tested and they are grouped by the number of years they have been in the trials during the 1972-1974 period. Generally, varieties were fairly consistent in yield from year to year. The 1972 yield was often less than in either of the other years, especially in yield of early fruits (Table 17). This

Table 16. Yield and size of marketable tomatoes at Main Experiment Station, Knoxville, 1972-74

Variety	1972	1973	1974	Avg.	Grading No. 1	Avg. size No. 1 fruit
	Tons per acre				Pct.	Oz.
In trial 3 years						
Setmore	27.22	26.09	25.46	26.26	70	6.8
Big Seven	21.16	27.25	27.84	25.42	74	8.0
Supersonic B	23.61	26.23	24.88	24.91	62	8.1
Ramapo	22.55	28.02	23.20	24.59	71	8.6
Creole	21.72	25.07	24.97	23.92	79	7.1
Big Boy	21.19	27.59	22.63	23.80	72	8.1
Sunlight	18.11	24.79	27.76	23.55	69	7.3
Monte Carlo	22.65	24.02	23.19	23.29	75	7.9
Better Boy	20.80	25.09	22.58	22.82	67	8.5
Walter	15.77	20.95	30.03	22.25	70	6.2
Floradel	19.38	23.39	23.49	22.09	78	7.4
Campbell 1327	18.67	17.65	19.40	18.57	73	7.1
Homestead 24	13.58	19.47	22.56	18.54	66	6.6
Manapal	17.89	18.76	18.31	18.32	72	7.3
In trial 2 years						
Traveler	20.78	25.19	—	22.99*	83	6.7
Early Girl	—	23.44	18.03	20.74*	63	5.4
Dessert No. 7	16.00	19.30	—	17.65*	57	10.3
Big Early	14.22	18.42	—	16.32*	51	7.4
Machine Harvest-1	14.88	15.82	—	15.35*	61	5.6
In trial 1 year						
Harris OCHF	—	—	26.10	—	91	7.2
Super M	20.85	—	—	—	52	7.6
Midsummer	18.43	—	—	—	44	7.5
Bradley	18.12	—	—	—	47	6.7
Terrific	17.57	—	—	—	36	7.7
Moreton	17.51	—	—	—	50	7.1
Jet Star	16.87	—	—	—	60	7.5
Late Summer	16.72	—	—	—	33	8.7
Climax	—	—	15.86	—	77	6.1
Cal Ace	15.86	—	—	—	30	9.2
ArKing	15.86	—	—	—	50	6.0
Stakeless	8.67	—	—	—	46	6.7
LSD @ .05	3.85	4.74	4.19	—	—	—

* Two-year average.

was due to an excess of blossom-end rot likely resulting from a low pH soil along with great moisture fluctuation, especially in the early fruiting period. Locular scars and catfacing were also more severe in 1972. In comparing yields of varieties grown early in

1972 with those of other years, one should keep this in mind. It is interesting to note in Table 16, that of the varieties tested all 3 years, Creole is the only non-hybrid in the nine top yielding varieties. Also, the last five in marketable yield are all non-hybrids.

Percentage of the marketable yield that graded Number 1 varied with varieties. Fewer defects were found in Creole, Floradel, Monte Carlo, and Big Seven. Traveler, a pink-skinned variety and Harris OCHF in the trials 2 and 1 year, respectively, graded very high in Number 1 fruits (Table 16).

The average size of Number 1 fruit is shown for each variety (Table 16). Different sizes are desired by different markets. Most varieties were of sufficient size except Early Girl and Machine Harvest-1.

Earliness of fruiting is important to many growers. Yields of marketable fruit the first 2 weeks are shown in Table 17. Big Seven, Campbell 1327, Early Girl, and Harris OCHF were earliest of the varieties tested.

Varieties in test 3 years

Determinate or self-topping varieties are Setmore, Sunlight, Walter, Campbell 1327, and Homestead 24. Advantages of these are most of the fruit are borne in a relatively short period and plants occupy the ground a shorter time. Usually the first fruits to ripen are from determinate plants, but as shown in Table 17, yields of early fruits are not always greater. Stakes or means for supporting plants need not be as tall for determinate varieties.

Walter has been the outstanding variety in this group for shipping markets. It has very firm fruit that is usually medium-size, free of cracks, and rather smooth. It is not as early as others of this group. Setmore has produced high early and normal yields. Fruits are rather flat and are less firm than Walter. For local markets that will accept a small- to medium-size fruit, Setmore appears promising. Campbell 1327 and Sunlight had less total yield but higher early yields and fruits of larger size than Setmore. One could increase the average fruit size with any of these determinate varieties by pruning to a two-stem system.

All varieties tested 3 years are resistant to fusarium wilt except Big Boy. Big Seven, Monte Carlo, and Better Boy are both wilt and nematode resistant. Big Seven was unusual in vigor—bearing large, early, as well as a great number of fruit throughout the season. Better Boy and Monte Carlo were very similar in growth habits and fruit characteristics. Both were impressive in vigor and gen-

Table 17. Yield of early marketable tomatoes at Main Experiment Station, Knoxville, 1972-74 (first 2 weeks)

Variety	1972	1973	1974	Avg.
Tons per acre				
In trial 3 years				
1. Big Seven	5.78	10.32	8.56	8.22
2. Campbell 1327	2.80	9.54	10.09	7.48
3. Sunlight	7.03	6.82	4.89	6.25
4. Supersonic B	3.81	7.94	6.51	6.09
5. Monte Carlo	3.66	6.89	6.79	5.78
6. Setmore	3.78	6.47	5.20	5.15
7. Better Boy	3.39	7.32	4.31	5.01
8. Creole	3.81	4.52	4.63	4.32
9. Big Boy	3.64	5.22	4.05	4.30
10. Walter	2.21	5.61	4.21	4.01
11. Homestead 24	4.48	5.17	1.97	3.87
12. Ramapo	2.22	5.21	3.58	3.67
13. Floradel	3.78	2.64	4.17	3.53
14. Manapal	3.57	3.54	2.34	3.15
In trial 2 years				
15. Early Girl	—	11.88	13.78	12.84*
16. Dessert No. 7	4.67	8.88	—	6.77*
17. Big Early	3.36	6.36	—	4.86*
18. Machine Harvest-1	3.45	6.15	—	4.80*
19. Traveler	1.14	3.37	—	2.26*
In trial 1 year				
20. Harris OCHF	—	—	9.28	
21. Climax	—	—	8.16	
22. Moreton	6.35	—	—	
23. Super M	4.95	—	—	
24. Jet Star	4.78	—	—	
25. Midsummer	4.40	—	—	
26. Late Summer	3.11	—	—	
27. Bradley	2.71	—	—	
28. Terrific	2.69	—	—	
29. ArKing	2.45	—	—	
30. Stakeless	.83	—	—	
31. Cal Ace	.03	—	—	
LSD @ .05	1.23	1.49	1.67	

* Two-year average.

eral performance. The fruit lack firmness for distant shipping. Ramapo was another very vigorous-growing variety and produced a high yield of very large fruit. However, its lateness would be a disadvantage for many markets. It may well be used in home gardens and for those who desire large fruit.

Other observations

Early Girl produced high yields of early tomatoes of small to medium size. Since it is wilt susceptible, it has limited use. Traveler is the most impressive pink-skinned variety tried in several years. It had very smooth fruits, reflected in the high percentage of Number 1 fruits (Table 16). It is not early maturing.

Summary

Excellent tomato varieties are available for meeting many needs. In choosing a variety one should consider plant characters, market demands, presence of nematodes or wilt, yield, earliness, and system of culture to be used.

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