

Purity, Germination, and Yield of Some Vegetable Seeds Offered for Retail Sale in Ohio in 1941

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H. D. BROWN, C. N. McINTYRE, EDWARD DOLEZAL, AND RICHARD HEDGES¹

INTRODUCTION

For several years, Ohio vegetable growers had been recipients of seed, both packet and bulk, which did not conform to the standards established by the Ohio Agricultural Seed Law. To determine the value of this seed, the Ohio Division of Plant Industry, in cooperation with the Department of Horticulture of The Ohio State University and the Ohio Agricultural Experiment Station, started a seed-testing program in 1939. This program included a study of pureness to type, germination, and yield of several thousand lots of vegetable seed, both packet and bulk, from 1939 to 1941 inclusive.

The Ohio Division of Plant Industry has several inspectors who purchase samples of seeds from retailers and send them to the State Seed Laboratory. The degree of impurity of each sample is there evaluated by specialists. The impurities for which the seeds are checked are varietal mixture, mixtures of other crop seeds, common weeds, noxious weeds, and poisonous weeds. A hundred seeds of each variety are then placed on moistened blotter paper and put into a germinator in which the temperature and humidity are controlled. The percentage germination is recorded.

The vegetable seeds are then sent to the Department of Horticulture of The Ohio State University and Agricultural Experiment Station for germination in soil and trueness to variety and yield tests. One hundred seeds are germinated in steam-sterilized soil at the University greenhouses at Columbus, Ohio. By this method of germination, the environmental conditions for all varieties are as nearly the same as possible. After germination, the seedlings are carefully counted, and the germination is recorded in percentage. The vegetables so treated include tomatoes, peppers, and cabbage.

CABBAGE

Cabbage seedlings were transplanted to distances of 1½ by 1½ inches in sterilized soil on May 5 and set into the field on June 6, 1941. Each variety was replicated 4 times, and there were 10 plants in a replicate. At planting time, each lot was labeled with its varietal name and with the name of the seedsman appearing on the package. Commercial practices were followed as closely as possible. The plants were dusted at proper intervals in order to control insects and diseases. Water was added frequently from overhead irrigation lines in order to provide optimum moisture.

At harvest, each head was individually examined to determine whether it was true to variety. A record was made of all the offtype plants. United States Department of Agriculture Miscellaneous Publication No. 169 was used as the guide for types.

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TABLE 1.—Percentage germination, trueness to variety, and yield in tons per acre per four replicates of each variety of cabbage

Variety	Per cent field stand	Seedsman	Yield, pounds	Average weight per head, pounds	Tons per acre	Greenhouse germination, per cent	Per cent true to type	Remarks
Copenhagen Market.....	100	Botzum	85.0	2.1	10.3	94.0	92.5	.....
Copenhagen Market.....	100	A. J. Brown	72.5	2.3	8.9	43.0	84.4	32 plants planted.....
Copenhagen Market.....	100	Ferry-Morse	127.5	3.2	15.4	87.0	95.0	.....
Copenhagen Market.....	100	Good	102.3	2.6	12.3	71.0	92.5	3 offtype in foliage.....
Copenhagen Market.....	100	O & M	126.8	3.2	15.3	96.0	85.0	.....
Copenhagen Market.....	100	Page	105.3	2.6	12.7	76.0	85.0	.....
Copenhagen Market.....	100	J. B. Rice	130.3	3.3	15.7	82.0	95.0	.....
Copenhagen Market.....	100	Ben Franklin	70.0	1.8	8.5	90.0	57.5	.....
Copenhagen Market.....	100	Hygrade	82.3	2.1	10.3	85.0	97.5	.....
Copenhagen Market.....	100	Asgrow	135.3	3.4	16.4	95.0	95.0	.....
Copenhagen Market.....	100	Woodruff	86.5	2.2	10.5	82.0	90.0	.....
Golden Acre Yellows Resistant.....	100	Harris	116.5	2.9	14.1	85.0	100.0	.....
Golden Acre.....	100	Ferry-Morse	91.0	2.3	10.1	81.0	82.5	.....
Golden Acre.....	100	Holmes	102.3	2.6	12.3	94.0	100.0	.....
Golden Acre.....	100	Harris	105.0	2.6	12.7	98.0	87.5	2 Wakefield.....
Golden Acre.....	100	Asgrow	103.3	2.6	12.5	91.0	95.0	.....
Golden Acre.....	100	O & M	84.6	2.1	10.2	57.0	92.5	1 kale.....
Golden Acre.....	100	Livingston	86.3	2.2	10.4	78.0	95.0	1 purple foliage.....
Golden Acre.....	100	Woodruff	87.3	2.2	10.6	82.0	97.5	1 flat head.....
Golden Acre.....	100	Northern	67.3	1.7	10.4	74.0	100.0	.....
Detroit Resistant.....	100	Ferry-Morse	86.0	2.2	10.4	63.0	100.0	.....
Detroit Resistant.....	100	O & M	118.8	3.0	14.3	88.0	100.0	.....
Jersey Wakefield.....	100	Northern	64.3	1.6	7.7	82.0	100.0	.....
Jersey Wakefield.....	100	Botzum	72.3	1.8	8.7	87.0	92.5	.....
Jersey Wakefield.....	100	A. J. Brown	42.3	1.1	5.1	57.0	90.0	1 round head.....
Jersey Wakefield.....	100	Ferry-Morse	59.0	1.5	7.1	90.0	92.5	3 round heads.....
Jersey Wakefield.....	100	Good	43.3	1.1	5.2	69.0	45.0	12 kale, 10 round, 2 kohlrabi.....
Jersey Wakefield.....	100	J. C. McCullough	78.8	2.0	9.5	80.0	72.5	.....
Jersey Wakefield.....	100	Northrup, King	72.1	1.8	8.7	74.0	92.5	2 round heads, 1 purple foliage.....
Jersey Wakefield.....	100	Page	88.0	2.2	10.6	75.0	85.0	.....
Jersey Wakefield.....	100	J. B. Rice	81.8	2.0	9.9	86.0	95.0	.....

TABLE 1.—Percentage germination, trueness to variety, and yield in tons per acre per four replicates of each variety of cabbage—continued

Variety	Per cent field stand	Seedsman	Yield, pounds	Average weight per head, pounds	Tons per acre	Greenhouse germination, per cent	Per cent true to type	Remarks
Jersey Wakefield	100	Woodruff	77.0	1.9	9.3	85.0	97.5	.....
Jersey Wakefield	100	Madson	80.8	2.0	9.7	59.0	90.0	.....
Marion Market.....	100	Woodruff	160.0	4.0	19.4	94.0	95.0	2 Wakefield
Marion Market.....	100	Harris	152.3	3.8	18.4	95.0	97.5	.....
Marion Market.....	100	Disease Resistant	166.8	4.2	20.1	87.0	95.0	.....
Marion Market.....	100	O & M	131.0	3.3	15.8	87.0	100.0	.....
Marion Market.....	100	Michael-Leonard	144.8	3.6	17.5	81.0	97.5	.....
Marion Market.....	100	Northern	146.0	3.7	17.7	81.0	97.5	.....
Wisconsin No. 8.....	100	A. J. Brown	86.0	2.0	9.8	91.0	100.0	.....
Wisconsin No. 8.....	100	Michael-Leonard	60.0	1.5	7.3	71.0	90.0	.....
Early Flat Dutch.....	100	Woodruff	80.8	2.0	9.7	85.0	90.0	.....
Early Flat Dutch.....	100	J. C. McCullough	177.0	4.4	21.4	89.0	92.5	3 round heads
Early Flat Dutch.....	100	Fredonia	92.0	2.3	11.1	71.0	92.5	3 round heads
Early Flat Dutch.....	100	A. J. Brown	74.0	1.9	9.0	66.0	92.5	.....
Wisconsin Hollander.....	100	Northern	58.0	1.5	7.0	76.0	97.5	1 rutabaga
Wisconsin Hollander.....	100	Woodruff	65.0	1.6	7.8	86.0	95.0	.....
Wisconsin Hollander.....	100	O & M	86.0	2.2	10.4	83.0	97.5	1 rutabaga
Early Savoy.....	100	Fredonia	78.0	2.0	9.5	63.0	97.5	1 offtype foliage
Danish Ball Head.....	100	Botzum	79.5	2.0	9.6	50.0	100.0	.....
Danish Ball Head.....	100	A. J. Brown	78.0	2.0	9.5	60.0	100.0	.....
Danish Ball Head.....	100	Erie	81.0	2.0	9.8	61.0	97.5	.....
Danish Ball Head.....	100	Ferry-Morse	77.0	1.9	9.3	81.0	97.5	.....
Danish Ball Head.....	100	Good	112.0	2.8	13.6	65.0	82.5	.....
Danish Ball Head.....	100	Fredonia	104.0	2.6	12.6	53.0	87.5	.....
Danish Ball Head.....	100	Page	74.0	1.9	9.0	82.0	90.0	.....
Danish Ball Head.....	100	Northrup, King	130.3	3.3	15.7	66.0	92.5	.....
Danish Ball Head.....	100	Woodruff	114.0	2.9	13.8	84.0	92.5	.....
Danish Ball Head.....	100	Madson	70.0	1.8	8.5	64.0	97.5	1 Savoy type
Danish Ball Head.....	100	J. B. Rice	81.0	2.0	9.8	82.0	90.0	.....
Savoy Perfection Drumhead.....	100	J. B. Rice	83.0	2.1	10.0	84.0	100.0	.....
All Seasons.....	100	Northern	135.0	3.4	16.3	95.0	100.0	.....
All Seasons.....	100	A. J. Brown	122.0	3.1	14.8	73.0	100.0	.....

TABLE 1.—Percentage germination, trueness to variety, and yield in tons per acre per four replicates of each variety of cabbage—concluded

Variety	Per cent field stand	Seedsman	Yield, pounds	Average weight per head, pounds	Tons per acre	Greenhouse germination, per cent	Per cent true to type	Remarks
Wisconsin All Seasons	100	Disease Resistant	153.0	3.8	18.5	83.0	97.5	.....
Wisconsin All Seasons	100	Ferry-Morse	155.0	3.9	18.7	90.0	92.5	.....
Wisconsin All Seasons	100	O & M	148.0	3.7	17.9	83.0	97.5	.....
Racine Market	100	O & M	125.3	3.1	15.1	88.0	100.0	.....
Premium Late Flat Dutch	100	Ferry-Morse	130.3	3.3	15.7	88.0	100.0	.....
Late Flat Dutch	100	Northern	94.0	2.4	11.4	81.0	100.0	.....
Late Flat Dutch	100	A. J. Brown	135.0	3.4	16.3	55.0	100.0	.....
Late Flat Dutch (bulk)	100	A. J. Brown	123.0	3.1	14.9	49.0	100.0	.....
Large Late Flat Dutch	100	A. J. Brown	103.0	2.6	12.4	57.0	100.0	.....
Late Flat Dutch	100	Good	157.0	3.9	19.0	86.0	97.5	.....
Late Flat Dutch	100	Northrup, King	110.0	2.8	13.3	73.0	95.0	1 round head
Late Flat Dutch	100	O & M	150.0	3.8	18.2	84.0	95.0	1 round head
Late Flat Dutch	100	Page	167.0	4.2	20.2	77.0	100.0	.....
Late Flat Dutch	100	J. B. Rice	175.0	4.4	21.2	77.0	95.0	.....
Early Winnigstadt	100	Woodruff	69.5	1.7	8.4	51.0	87.5	.....
Early Winnigstadt	100	A. J. Brown	61.5	1.5	7.4	51.0	92.5	.....
Glory Enkhuizen	100	Woodruff	164.0	4.1	19.8	80.0	97.5	.....
Surehead	100	Woodruff	134.0	3.4	16.2	76.0	100.0	.....
Resistant Premier	100	Henderson	115.0	2.9	13.9	78.0	97.5	.....
Globe	100	Livingston	122.0	3.1	14.8	83.0	95.0	.....
Globe	100	Disease Resistant	120.0	3.0	14.5	63.0	100.0	Only 8 plants in fourth replicate
Hollander No. 8	100	Livingston	105.0	2.6	12.7	83.0	100.0	.....
Savoy Chieftain	100	Northern	133.0	3.3	16.1	95.0	100.0	.....
Early Dwarf Dutch	100	Northrup, King	117.0	2.9	14.1	79.0	97.5	.....
Imperial Globe	100	Northern	95.5	2.4	11.6	72.0	90.0	.....
Green Acre	100	Henderson	133.5	3.3	16.1	97.0	100.0	.....
Savoy Chieftain	100	Ferry-Morse	92.0	2.3	11.1	99.0	100.0	.....
Late Flat Dutch (bulk)	100	Woodruff	143.0	3.6	17.3	63.0	97.5	.....
Late Flat Dutch	100	Erie	177.0	4.4	21.4	82.0	97.5	.....
Premium Late Flat Dutch	100	Madson	132.0	3.3	16.0	78.0	100.0	.....
Henderson's Premier	100	Henderson	127.8	3.2	15.4	91.0	97.5	.....

The average weight per head was calculated by taking the total weight from each four replicates and dividing that weight by the number of heads of cabbage in each group of replicates. The tons per acre were determined by calculating the number of plants per acre, multiplying this figure by the average weight per head, and dividing by 2,000.

TOMATOES

Field trials for tomatoes were conducted the same as those for cabbage, except that owing to the size of the plants and to limited ground space, eight plants were used for each replicate instead of ten, and methods of calculating yields were modified accordingly.

PEPPERS

Field trials for peppers were recorded in the same manner as those for cabbage and tomatoes, except that tons per acre were not calculated. Instead, the number of fruits harvested and pounds per plant were recorded.

BEETS

In the beet tests, 50 seeds were planted in each replicate. Each variety was replicated four times and properly labeled with the varietal name and the name of the seedsman. When the seedlings appeared above the ground, they were carefully counted, and the percentage germination was recorded.

At harvest, each beet was examined to determine its trueness to variety. The beets were then topped, and the weights of the roots and tops recorded separately. The total weight was obtained by adding the weight of the tops and weight of the roots. Then the beets were cut in half, and the degree of redness was determined. The dark red color was recorded as 1; the almost white was recorded as 5. The intermediate grades were given the rating of 2, 3, and 4, according to the intensity of red color. In table 4, a mean or average value for each variety is indicated.

CARROTS

Because carrot seed is extremely small, it was deemed advisable to use 1-gram samples per replicate, instead of the usual 50 seeds that were used for beets. The seeds were then planted in carefully prepared seedbeds. At time of maturity, the weight of roots and tops was recorded in a manner similar to that used in the beet trials. Each carrot was examined to determine its trueness to variety.

TURNIPS

The method used in the work with turnips did not vary from that employed with beets and carrots, except that degree of color was not determined.

BEANS

The bean seed, both green and lima, was planted June 24, 1941. Fifty seeds were planted in each replicate, and each variety was replicated four times. As soon as the seedlings appeared above the ground, the total number of seeds that germinated was recorded. During the growing season, all lots were both dusted and sprayed for the control of the Mexican bean beetle and leaf hoppers. At picking time, each plant was carefully examined to determine whether it was true to the variety as indicated on the seed packet. The yields per plant were calculated by taking the total weight of the four replicates and dividing that weight by the total number of plants.

TABLE 2.—Germination, pureness of variety, and yield of tomatoes

Variety	Seedsman	Field stand	Per cent germination	Yield, pounds—		Tons per acre	Per cent true to type	Remarks
				Per plot	Per plant			
Earliana	Page	32	76	350.5	10.9	9.9	100	
Earliana	Northrup, King	32	70	513.5	16.0	14.5	100	
Earliana	Condon	32	88	497.0	15.5	14.1	100	
Earliana	Ferry-Morse	31	88	624.8	20.1	17.7	100	
Earliana	A. J. Brown	31	87	511.5	16.5	14.5	93.5	Two plants offtype in foliage
Earliana	Crabbs, Reynolds, Taylor	31	66	469.5	15.1	13.3	100	
Earliana (bulk)	Woodruff	30	40	451.0	15.0	12.8	100	
Earliana	Isbell	32	54	558.3	17.4	15.8	100	
Earliana	Fredonia	32	60	403.5	12.6	11.4	0	All Bonny Best type
Earliana	Madson	29	58	384.0	13.2	10.9	100	
Earliana	J. C. McCullough	32	80	493.8	15.4	14.0	100	
Bonny Best	Page	32	91	520.8	16.3	14.8	96.9	1 Earliana plant
Bonny Best	Ferry-Morse	31	86	421.0	13.6	11.9	93.5	2 Earliana plants
Bonny Best	Northrup-King	29	76	476.8	16.4	13.5	100	
Bonny Best	Eric	32	95	485.3	15.2	13.8	100	
Bonny Best	Woodruff	32	80	461.8	14.4	13.1	100	
Bonny Best (bulk)	A. J. Brown	30	78	519.5	17.3	14.7	100	
Bonny Best	A. J. Brown	31	78	495.5	16.0	14.1	0	All offtype
Bonny Best	J. B. Rice	30	68	465.8	15.2	12.9	100	
Bonny Best	J. C. McCullough	30	93	437.3	14.6	12.4	100	
Break O'Day	Woodruff	32	94	572.8	17.9	16.2	100	
Break O'Day	A. J. Brown	31	57	549.8	17.7	15.6	100	
Break O'Day	J. C. McCullough	29	93	444.8	15.3	12.6	100	
Break O'Day	Harris	31	97	596.3	19.2	16.9	100	
Grothen's Red Globe	Livingston	32	89	387.5	12.1	11.0	100	
Pritchard Scarlet Topper	Harris	28	77	466.8	16.7	13.3	100	
Marglobe	J. B. Rice	32	96	490.0	15.3	13.9	100	
Marglobe	Hygrade	32	90	439.5	13.7	12.4	100	
Marglobe	Northrup, King	31	87	466.3	15.0	13.1	100	
Marglobe	Good	31	87	388.0	12.1	11.0	100	

TABLE 2.—Germination, pureness of variety, and yield of tomatoes—continued

Variety	Seedsman	Field stand	Per cent germination	Yield, pounds—		Tons per acre	Per cent true to type	Remarks
				Per plot	Per plant			
Marglobe.....	Ferry-Morse	31	90	439.8	14.2	12.5	100	.....
Marglobe.....	J. C. McCullough	32	83	471.0	14.7	13.3	100	.....
Marglobe.....	Ben Franklin	31	79	428.5	13.8	12.1	100	.....
Marglobe.....	Woodruff	32	95	414.8	13.0	11.8	96.9	1 plant with yellow fruit
Marglobe.....	Crabbs, Reynolds, Taylor	32	75	453.8	14.1	12.8	100	.....
Marglobe.....	A. J. Brown	30	90	456.3	15.2	12.9	100	.....
Master Marglobe.....	F. C. Stokes	31	86	480.5	15.5	13.2	100	.....
New Marglobe.....	Manitowoc	31	67	377.3	12.2	10.7	100	.....
Rutgers.....	Card	32	96	420.3	13.1	11.9	100	.....
Greater Baltimore.....	Isbell	31	78	224.3	7.2	6.3	0	Dwarf Stone instead of Greater Baltimore
Greater Baltimore.....	Ferry-Morse	30	79	405.0	13.5	11.5	96.7	1 Ponderosa plant
Dwarf Stone.....	Isbell	31	77	384.0	12.4	10.9	100	.....
New Stone.....	Condon	31	82	447.0	14.4	12.7	83.8	5 Bonny Best variety
Stone.....	Northrup, King	31	94	334.3	10.8	9.5	100	.....
Stone.....	Ferry-Morse	31	83	465.8	15.0	13.2	100	.....
New Stone.....	Woodruff	31	86	436.3	14.1	12.4	96.7	1 Ponderosa
Stone.....	Woodruff	32	80	388.3	12.5	11.0	100	.....
New Stone.....	A. J. Brown	32	80	422.3	13.2	12.0	100	.....
New Stone.....	Page	32	86	460.8	14.4	13.1	50	16 plants of varietal mixture
Stone.....	Good	32	95	479.3	13.1	11.9	100	.....
Livingston's Beauty.....	Livingston	32	37	407.5	12.7	11.5	100	.....
Beefsteak.....	Page	32	80	298.3	9.3	8.4	28.1	Varieties mixed, 23 off-type
Beefsteak.....	Condon	32	76	429.0	13.4	12.2	100	.....
Ponderosa.....	J. C. McCullough	31	88	329.0	12.7	11.2	100	.....
Ponderosa.....	Condon	31	71	308.8	9.7	8.7	100	.....
Ponderosa.....	Fredonia	31	70	409.5	13.2	11.6	48.3	Varieties mixed, 16 off-type
Ponderosa.....	Madson	32	67	353.3	11.0	10.0	100	.....
Ponderosa (bulk).....	A. J. Brown	30	74	240.8	8.0	6.8	100	.....
Ponderosa (bulk).....	Woodruff	32	94	462.3	14.4	13.1	100	.....

TABLE 2.—Germination, pureness of variety, and yield of tomatoes—concluded

Variety	Seedsman	Field stand	Per cent germination	Yield, pounds—		Tons per acre	Per cent true to type	Remarks
				Per plot	Per plant			
Ponderosa.....	Woodruff	32	80	454.8	14.2	12.9	100	.....
Red Ponderosa.....	J. B. Rice	32	82	320.8	10.0	9.1	100	.....
Ponderosa.....	A. J. Brown	31	98	327.5	10.6	9.3	100	.....
Ponderosa.....	Ferry-Morse	32	82	262.3	8.2	7.4	100	.....
Ponderosa.....	Page	31	83	331.3	10.7	9.4	100	.....
Ponderosa*	Northrup-King	16	77	141.3	8.8	8.0	100	.....
Golden Ponderosa.....	Condon	32	88	331.8	10.4	9.4	100	.....
Ponderosa.....	Good	31	77	473.5	15.3	13.4	80.6	6 plants offtype
Beefsteak.....	Crabbs, Reynolds, Taylor	32	75	362.3	11.3	10.3	41.9	Variety mixed, 19 offtype
Ponderosa.....	Manitowoc	32	63	300.5	9.4	8.5	100	.....
Ponderosa*	Crabbs, Reynolds, Taylor	16	86	185.3	11.6	10.5	100	.....
Golden Queen.....	J. B. Rice	32	94	303.5	9.5	8.6	100	.....
Golden Queen.....	Page	31	91	359.0	11.6	10.2	100	.....
Chalk's Jewel.....	Woodruff	30	90	390.0	13.0	11.1	100	.....
Chalk's Jewel.....	Northrup, King	32	88	387.3	12.1	11.0	100	.....
Oxheart.....	Woodruff	32	81	457.8	14.3	13.0	100	.....
Oxheart.....	Fredonia	32	75	322.8	10.1	9.2	0	All offtype, pink but not Oxheart
Oxheart.....	Isbell	32	80	199.0	6.2	5.6	0	All offtype
Oxheart.....	Condon	28	82	182.3	6.5	5.2	100	.....
Oxheart.....	Ferry-Morse	31	75	339.3	10.9	9.6	100	.....
Stokesdale.....	Stokes	31	94	409.3	13.2	11.6	100	.....
Valiant.....	F. C. Stokes	32	97	338.0	10.6	9.6	100	.....
Fischer.....	Harris	31	90	335.0	10.8	9.5	100	.....
Victor.....	Harris	31	91	381.5	12.3	10.8	100	.....
Italian.....	Livingston	31	96	258.0	8.3	7.3	100	.....
John Baer.....	Woodruff	29	97	366.3	12.6	10.4	100	.....
Matchless.....	Ben Franklin	32	78	296.8	9.3	8.4	100	.....
Crimson Auskin.....	Woodruff	32	95	312.8	9.8	8.9	100	.....

*Only two replicates considered in this test.

TABLE 3.—Percentage germination, pureness of variety, and yield per four replicates of peppers

Variety	Seedsman	Per cent germination	Per cent stand	Yield		Per cent true to type	Remarks
				Number	Weight		
California Wonder.....	Ferry-Morse	74	100	190	36.3	100	.....
California Wonder.....	Botzum	91	100	251	45.8	100	.....
California Wonder.....	J. B. Rice	94	100	149	20.0	100	.....
California Wonder.....	Woodruff	95	100	176	25.5	100	.....
California Wonder.....	Livingston	78	100	230	49.8	100	.....
California Wonder.....	Northrup, King	81	100	266	44.8	100	.....
California Wonder.....	Hygrade	80	100	225	38.0	95	2 plants offtype
Ruby King.....	Condon	67	100	351	53.8	100	.....
Ruby King.....	Ferry-Morse	56	100	225	27.0	100	.....
Ruby King.....	Good	63	100	256	44.8	97.5	1 plant offtype
Ruby King.....	Fredonia	66	100	388	56.3	100	.....
Ruby King.....	Northrup, King	69	100	331	47.8	97.5	1 pimento
Ruby King.....	Woodruff	90	100	390	45.8	100	.....
Ruby King.....	Ferry Gardens	58	100	331	38.5	100	.....
Ruby King.....	Crosman	74	100	432	70.8	100	.....
World Beater.....	Ben Franklin	90	100	426	75.5	100	.....
World Beater.....	Ferry-Morse	77	100	284	37.0	100	.....
Green Sweet Mango.....	Good	71	100	270	37.5	100	.....
Pimento.....	Ferry-Morse	64	100	191	18.3	100	.....
Sweet Pimento.....	J. B. Rice	75	100	142	12.8	100	.....
Pimento.....	Botzum	83	100	122	11.5	100	.....
Pimento.....	A. J. Brown	50	100	226	21.3	100	.....
Pimento.....	Northrup, King	88	100	164	14.0	100	.....
Pimento.....	Woodruff	76	100	142	12.8	100	.....
Hungarian Yellow Wax.....	Zack Davis	33	100	632	46.8	100	.....
Hungarian Yellow Wax.....	Isbell	87	100	714	53.3	97.5	1 plant offtype
Hungarian Yellow Wax.....	Livingston	62	100	410	53.8	100	.....
Hungarian Wax.....	Holmes	89	100	339	43.0	97.5	1 plant offtype
Hungarian Wax.....	Woodruff	94	100	766	55.3	100	.....
Chinese Long.....	Condon	51	100	271	38.3	95	2 plants offtype
Oakview Wonder.....	Ferry-Morse	70	100	218	37.0	100	.....

TABLE 3.—Percentage germination, pureness of variety, and yield per four replicates of peppers—continued

Variety	Seedsman	Per cent germination	Per cent stand	Yield		Per cent true to type	Remarks
				Number	Weight		
Sweet Harris Earliest.....	J. B. Rice	78	100	472	72.3	100	.....
Sweet Mountain.....	Page	82	100	323	45.8	100	.....
King of North.....	Woodruff	87	100	608	86.3	100	.....
King of North.....	Harris	76	100	381	55.5	100	.....
Sunnybrook.....	Burpee	55	100	305	40.3	100	.....
Sunnybrook.....	Asgrow	87	100	441	53.3	100	.....
Oshkosh.....	Zack Davis	82	100	517	81.0	100	.....
Large Bell or Bull Nose.....	Card	91	100	528	101.5	97.5	1 plant bore orange, smooth, heart-shaped fruits
Large Bell or Bull Nose.....	Northrup, King	68	100	433	68.0	100	.....
Sweet Bull Nose.....	Page	65	100	452	75.3	100	.....
Bull Nose.....	A. J. Brown	83	100	401	65.5	100	.....
Bull Nose.....	Ferry Gardens	60	100	611	56.8	82.5	7 plants of mixed variety
Bull Nose.....	Woodruff	95	100	325	34.3	100	.....
Bull Nose.....	Madson	64	100	305	54.5	0	All peppers slightly tapering
No. 51.....	.....	.....	100	356	58.3	100	.....
Sweet Bull Nose (bulk).....	Crabbs, Reynolds, Taylor	46	100	385	61.5	100	.....
Chinese Giant.....	Condon	51	100	257	48.3	100	.....
Chinese Giant.....	Fredonia	41	100	462	89.8	100	.....
Hot Long Red Cayenne.....	Woodruff	84	100	936	44.8	97.5	1 plant of type
Long Thick Cayenne.....	Ferry Gardens	90	100	1,311	15.5	100	.....
Hot Long Red Cayenne.....	Page	70	100	243	6.0	100	.....
Hot Long Red Cayenne.....	J. B. Rice	87	100	900	41.5	100	.....
Long Red Cayenne.....	A. J. Brown	39	100	190	4.3	100	.....
Long Red Cayenne.....	Fredonia	54	100	317	7.0	100	.....
California Wonder Crimson.....	Woodruff	87	100	284	47.0	100	.....
Holmes Prolific Sweet.....	Holmes	82	100	526	79.5	100	.....
Early Wonder.....	Henderson	91	100	298	46.3	92.5	3 plants of mixed varieties
Sweet Banana.....	Holmes	88	100	937	73.8	100	.....
Fordhook.....	Burpee	88	100	557	92.3	100	.....
Rumanian Wax.....	Henderson	79	100	520	97.5	100	.....

TABLE 4.—Percentage germination, trueness to variety, and yield in pounds per four replicates of beets

Variety	Seedsman	Field stand, 200 seeds	Yield in pounds			Average index of color	Per cent true to type	Remarks
			Weight of roots	Weight of tops	Total			
Extra Early Flat Egyptian	Sterling	36	21.8	13.5	35.3	2.9	89.0	4 elongated
Extra Early Flat Egyptian	Northrup, King	70	40.5	18.0	58.5	3.2	88.6	8 globe
Extra Early Flat Egyptian	Nebraska	36	23.8	10.8	34.5	3.2	91.7	3 globe
Crosbys Egyptian	Condon	119	51.0	31.3	82.3	2.5	93.3	7 globe, 1 elongated
Crosbys Egyptian	Woodruff	38	28.0	13.3	41.3	3.3	81.6	3 globe, 4 elongated
Crosbys Egyptian	Card	76	49.5	37.0	86.5	3.4	100.0	.....
Crosbys Egyptian	J. B. Rice	58	41.5	27.0	68.5	2.9	98.3	1 elongated
Crosbys Egyptian	J. C. McCullough	84	51.5	33.5	85.0	2.9	97.6	2 elongated
Crosbys Egyptian (bulk)	Woodruff	138	60.0	34.5	94.5	3.7	94.9	5 globe, 2 elongated
Crosbys Egyptian	Crosman	91	49.0	25.8	74.8	2.6	89.0	3 globe, 7 elongated
Crosbys Egyptian	Page	56	47.5	23.0	70.5	3.6	98.2	1 globe
Crosbys Egyptian	Burpee	83	45.5	24.0	69.5	3.0	89.2	9 elongated
Crosbys Egyptian	Forney	92	54.5	32.0	86.5	3.2	94.6	1 globe, 4 elongated
Crosbys Egyptian	Asgrow	106	51.5	47.5	99.0	2.8	92.5	1 globe, 7 elongated
Early Wonder	Henderson	122	56.5	34.0	90.5	3.4	95.9	4 globe, 1 elongated
Early Wonder	Forney	68	42.5	20.0	62.5	3.1	91.2	6 elongated
Early Wonder	W. T. Phillips	75	45.3	25.2	70.5	3.4	96.0	3 flat
Early Wonder	Saunders	86	36.3	26.2	62.5	3.3	95.3	4 elongated
Detroit Dark Red	Card	98	36.0	16.5	52.5	2.2	98.0	2 elongated
Detroit Dark Red	Erie	75	47.0	25.8	72.8	2.6	93.3	5 elongated
Detroit Dark Red (bulk)	Saunders	58	27.5	17.3	44.8	1.7	91.4	5 elongated
Detroit Dark Red (bulk)	Michael-Leonard	117	39.0	34.0	73.0	1.7	82.1	21 elongated
Detroit Dark Red	Livingston	84	37.0	19.3	56.3	2.5	92.9	6 elongated
Detroit Dark Red	Woodruff	67	29.8	18.7	48.5	2.4	95.5	3 elongated
Detroit Dark Red	Good	97	47.3	27.5	74.8	2.8	86.6	13 elongated
Detroit Dark Red (bulk)	Crabbs, Reynolds, Taylor	124	36.5	37.5	74.0	2.0	93.5	8 elongated
Detroit Dark Red	Northrup, King	77	33.3	20.5	53.8	2.9	90.9	7 elongated
Detroit Dark Red	Empire	102	36.8	16.7	53.5	2.1	93.1	7 elongated
Detroit Dark Red	A. J. Brown	67	35.5	19.8	55.3	3.2	77.6	15 elongated

TABLE 4.—Percentage germination, trueness to variety, and yield in pounds per four replicates of beets—continued

Variety	Seedsman	Field stand, 200 seeds	Yield in pounds			Average index of color	Per cent true to type	Remarks
			Weight of roots	Weight of tops	Total			
Detroit Dark Red.....	Manitowoc	99	47.5	26.0	73.5	2.6	82.8	16 elongated, 1 sugar beet
Detroit Dark Red.....	Asgrow	88	48.5	28.5	77.0	2.4	86.4	12 elongated
Detroit Dark Red.....	Market Gardeners'	48	27.0	13.5	40.5	1.9	83.3	8 elongated; 3 replicates
Detroit Dark Red.....	Isbell	70	36.5	19.5	56.0	2.2	87.1	9 elongated
Detroit Dark Red.....	Crosman	55	29.5	15.3	44.8	2.7	85.5	8 elongated
Detroit Dark Red.....	J. C. McCullough	58	29.5	14.5	44.0	2.1	86.2	7 elongated, 1 flat
Detroit Dark Red.....	Fredonia	49	27.8	15.7	43.5	2.7	79.6	10 elongated
Detroit Dark Red.....	Sterling	78	38.5	23.3	61.8	2.6	82.1	12 elongated, 2 flat
Detroit Dark Red.....	J. B. Rice	60	39.5	34.5	74.0	2.2	88.3	6 elongated, 1 flat
Detroit Dark Red.....	Chautauqua	113	48.0	27.5	75.5	2.5	85.8	14 elongated, 2 flat
Detroit Dark Red.....	Chautauqua	111	52.0	34.0	86.0	2.6	97.3	3 flat
Early Blood Turnip.....	Fredonia	84	48.5	33.0	81.5	2.7	86.9	8 elongated, 3 flat
Early Blood Turnip.....	J. C. McCullough	74	26.0	10.3	36.3	2.2	97.3	2 elongated
Early Blood Turnip.....	Good	49	35.5	21.5	57.0	2.9	98.0	1 flat; 3 replicates planted
Early Blood Turnip.....	Northrup, King	73	43.5	29.0	72.5	3.0	89.0	4 elongated, 4 flat
Early Blood Turnip.....	Nebraska	94	40.5	31.0	71.5	2.1	100.0	.....
Early Blood Turnip.....	Manitowoc	85	44.5	25.0	69.5	3.0	89.4	8 elongated, 1 flat
Early Blood Turnip.....	Michael-Leonard	91	42.5	32.8	75.3	3.0	96.7	2 elongated, 1 flat
Early Blood Turnip.....	Zack Davis	42	29.0	12.8	41.8	3.0	81.0	8 elongated
Early Blood Turnip.....	A. J. Brown	65	45.5	17.5	63.0	2.8	89.2	5 elongated, 2 flat
Early Blood Turnip.....	Woodruff	105	54.5	34.0	88.5	3.3	89.5	6 elongated, 5 flat
Early Blood Turnip.....	Saunders	104	44.0	37.8	78.8	2.5	93.3	3 elongated, 4 flat
Early Blood Turnip.....	Sterling	87	49.5	30.0	79.5	3.1	96.6	1 sugar beet, 2 flat
Eclipse.....	Fredonia	95	59.3	35.5	94.8	3.5	87.4	12 elongated
Eclipse.....	Manitowoc	73	54.5	32.3	86.8	3.4	82.2	8 elongated, 5 flat
Early Blood.....	Page	86	43.0	24.5	67.5	2.2	89.5	5 elongated, 4 flat
Ohio Canner.....	Market Gardeners'	58	28.5	15.0	43.5	2.3	94.8	3 elongated
Detroit Blood Turnip.....	W. T. Phillips	71	32.0	15.3	47.3	2.1	97.2	2 flat
Crosby.....	Michael-Leonard	40	32.5	16.3	48.8	3.8	92.5	3 flat

TABLE 5.—Percentage germination, pureness of variety, and yield per four replicates of carrots

Variety	Total stand per 4 grams of seed	Total weight of tops, pounds	Total weight of roots, pounds	Total weight, pounds	Seedsman	Per cent true to type	Remarks
Danvers Half Long	223	17.5	46.8	64.3	Saunders	94.6	12 offtype
Danvers Half Long	298	20.8	51.5	72.3	Fredonia	96.6	10 offtype
Danvers Half Long	273	23.5	47.5	71.0	Sterling	97.1	8 offtype
Danvers Half Long	266	17.0	41.8	58.8	O & M	96.6	9 offtype
Danvers Half Long	99*	9.3	22.5	31.8	Nebraska	96.9	3 offtype
Danvers Half Long	332	22.3	52.7	75.0	Card	98.7	4 offtype
Danvers Half Long	284	21.0	46.3	67.3	Botzum	98.5	4 offtype
Danvers Half Long	367	26.0	66.5	92.5	Michael-Leonard	99.1	3 offtype
Danvers Half Long	289	23.0	56.0	79.0	Zack Davis	98.9	3 offtype
Danvers Half Long	298	17.8	61.2	79.0	J. B. Rice	98.6	4 offtype
Danvers Half Long	289	22.3	45.7	68.0	Crosman	96.8	9 offtype
Danvers Half Long	261	25.8	57.0	82.8	Woodruff	95.4	12 offtype
Danvers Half Long	294	22.3	58.0	80.3	Good	97.6	7 offtype
Danvers Half Long	353	26.5	60.0	86.5	J. C. McCullough	97.7	8 offtype
Danvers Half Long	203	17.3	43.0	60.3	Condon	98.5	3 offtype
Danvers Half Long	295	22.3	53.5	76.3	Crabbs, Reynolds, Taylor	95.9	12 offtype
Chantenay	282	26.5	58.0	84.5	Fredonia	98.5	4 offtype
Chantenay Half Long	252	16.3	45.2	61.5	Crosman	98.8	3 offtype
Chantenay	263	22.8	52.5	75.3	Zack Davis	99.2	2 offtype
Chantenay	263	21.3	54.7	76.0	Forney	93.1	18 offtype
Chantenay Coreless	251	22.0	44.5	66.5	A. J. Brown	98.0	5 offtype
Chantenay	287	24.0	54.0	78.0	Nebraska	94.4	16 offtype
Chantenay	336	21.3	63.0	84.3	Condon	100.0	.....

TABLE 5.—Percentage germination, pureness of variety, and yield per four replicates of carrots—continued

Variety	Total stand per 4 grams of seed	Total weight of tops, pounds	Total weight of roots, pounds	Total weight, pounds	Seedsmen	Per cent true to type	Remarks
Chantenay.....	311	25.0	61.5	86.5	Sterling	95.4	14 offtype
Oxheart.....	245	23.3	51.5	74.8	Condon	97.1	7 offtype
Oxheart.....	201	16.8	46.5	63.3	Forney	98.5	3 offtype
Oxheart.....	271	24.5	53.8	78.3	J. B. Rice	95.5	12 offtype
Oxheart.....	222	20.8	48.5	69.3	Fredonia	96.3	8 offtype
Oxheart.....	262†	28.5	54.0	82.5	Nebraska	96.5	9 offtype
Long Orange.....	203	16.5	29.5	46.0	Good	94.5	9 offtype
Improved Long Orange.....	161	14.3	28.5	42.8	Crosman	90.9	15 offtype
Improved Long Orange.....	325	25.5	41.0	66.5	Zack Davis	97.8	8 offtype
Improved Long Orange.....	247	21.3	37.0	58.3	J. B. Rice	97.5	6 offtype
Improved Long Orange.....	246	25.5	41.3	66.8	Forney	100.0	.....
Danvers.....	361	23.8	53.7	77.5	Michael-Leonard	97.7	8 offtype
Chantenay Long Type.....	294	14.8	46.5	61.3	Henderson	97.6	7 offtype
Chantenay Long.....	380	21.3	48.5	69.8	Michael-Leonard	100.0	.....
Chantenay.....	277	17.0	46.3	63.3	Woodruff	97.8	6 offtype
Red Coreless Chantenay.....	388	20.0	61.0	81.0	Erie	99.4	2 offtype
Nantes.....	447	12.3	57.0	69.3	Woodruff	99.1	3 offtype, 1 parsnip
Scarlet Nantes.....	258	10.3	44.0	54.3	Fredonia	98.0	5 offtype
New Coreless Nantes.....	364	6.5	40.8	47.3	A. J. Brown	99.4	2 offtype
Condon's Coreless Nantes.....	226	6.0	38.3	44.3	Condon	97.7	5 offtype
Rice's Coreless Nantes.....	311	5.8	42.0	47.8	J. B. Rice	100.0	.....
Imperator.....	252	16.0	38.5	54.5	Asgrow	96.0	10 offtype
Canner's Half Long.....	331	20.5	51.0	71.5	Condon	99.6	1 offtype
Streamliner.....	266	12.0	28.0	40.0	Condon	100.0	.....

*Only three replicates planted.

†One replicate, planted on a grade, probably drowned out.

TABLE 6.—Percentage germination, trueness to variety, and yield per four replicates of turnips

Variety	Seedsman	Stand from 200 seeds	Weight of tops, pounds	Weight of roots, pounds	Total weight, pounds	Per cent true to type	Remarks
Purple Top White Globe	Ferry-Morse	107	15.5	12.3	27.8	100.0	
Purple Top White Globe	Card	89	13.8	8.0	21.8	98.8	1 Purple Top Strap Leaved
Purple Top White Globe	Michael-Leonard	119	22.5	15.0	37.5	100.0	
Purple Top White Globe	Crosman	92	21.3	15.0	36.3	98.9	1 all white
Purple Top White Globe	Manitowoc	96	22.3	18.3	40.6	100.0	
Purple Top White Globe	Saunders	127	28.3	20.0	48.3	99.2	1 all white
Purple Top White Globe	Vaughan	116	22.3	11.0	33.3	100.0	
Purple Top White Globe	Chautauqua	122	24.0	15.5	39.5	99.0	1 offtype
Purple Top White Globe	Northrup, King	107	24.5	17.8	42.3	99.0	1 flat
Purple Top White Globe	Market Gardeners'	164	32.8	17.0	49.8	100.0	
Purple Top White Globe	J. C. McCullough	119	24.5	16.0	40.5	98.3	2 Purple Top Strap Leaved
Purple Top White Globe	Burpee	137	19.5	12.8	32.3	100.0	
Purple Top White Globe	Condon	137	22.0	14.5	36.5	100	
Purple Top White Globe	Page	120	24.0	14.5	38.5	100.0	
Purple Top Strap Leaved.....	Sterling	90	16.0	9.0	15.0	95.5	4 Purple Top White Globe
Purple Top Strap Leaved.....	Ferry-Morse	72	9.5	3.0	12.5	97.2	2 Purple Top White Globe
Purple Top Strap Leaved.....	Condon	85	9.3	4.5	13.8	100.0	
Purple Top Strap Leaved.....	Michael-Leonard	84	9.7	6.3	16.0	95.2	4 Purple Top White Globe
Purple Top Strap Leaved.....	Fredonia	55	6.8	6.8	13.5	100.0	
Purple Top Strap Leaved.....	Erie	62	7.0	5.0	12.0	96.7	2 Purple Top White Globe
Purple Top Strap Leaved.....	O & M	55	8.8	4.0	12.8	100.0	
Purple Top Strap Leaved.....	Forney	40	7.0	5.3	12.8	20.1	31 Purple Top White Globe
Extra Early Purple Top Milan	J. B. Rice	39	9.0	6.8	15.8	97.4	1 all white
Seven Top.....	Forney	94	13.8	7.7	21.5	100	

TABLE 7.—Percentage germination, trueness to variety, and yield in pounds per four replicates of green beans

Variety	Seedsman	Per cent field germination	Total yield, pounds	Per cent true to type	Calculated yield in pounds for perfect stand	Remarks
Burpee Stringless Green Pod.....	Fredonia	66.5	28.3	100	42.5	.....
Burpee Stringless Green Pod.....	Condon	54.5	26.5	100	48.6	.....
Early Stringless Green Pod.....	Northrup, King	58.5	28.3	100	48.3	.....
Burpee Stringless Green Pod.....	A. J. Brown	67.5	27.0	100	40.0	.....
Burpee Stringless Green Pod.....	Holmes Seed Co.	61.5	23.3	100	37.8	.....
Burpee Stringless Green Pod.....	Isbell	65.5	25.0	100	38.2	.....
Burpee Stringless Green Pod.....	Chautauqua	54.0	26.3	100	48.6	.....
Burpee Stringless Green Pod.....	Burpee	44.0	23.8	100	54.1	.....
Burpee Stringless Green Pod.....	Michael-Leonard	46.0	22.3	100	48.4	.....
Burpee Stringless Green Pod.....	Crabbs, Reynolds, Taylor	44.5	20.8	100	46.6	.....
Burpee Stringless Green Pod.....	Ferry-Morse	48.0	24.0	100	50.0	.....
Burpee Stringless Green Pod.....	J. C. McCullough	39.5	17.8	100	45.5	.....
Giant Stringless Green Pod.....	J. C. McCullough	44.0	19.5	100	44.3	.....
Burpee Stringless Green Pod.....	Woodruff	45.5	18.8	100	41.2	.....
Burpee Stringless Green Pod.....	Saunders	40.5	24.3	100	59.9	.....
Tendergreen.....	Asgrow	51.5	22.3	100	43.2	.....
Tendergreen.....	Harris	57.5	19.5	100	33.9	.....
Tendergreen.....	Condon	52.5	17.8	100	33.8	.....
Tendergreen.....	Woodruff	50.0	16.8	100	33.5	.....
Tendergreen.....	Saunders	64.0	27.8	99.2	43.4	1 plant offtype
Stringless Red Valentine.....	Fredonia	61.0	28.8	100	47.1	.....
Stringless Red Valentine.....	Asgrow	61.5	29.8	99.2	48.4	1 yellow wax variety
Stringless Red Valentine.....	Crabbs, Reynolds, Taylor	66.0	38.8	100	58.7	.....
Stringless Red Valentine.....	Woodruff	61.5	24.8	99.2	40.2	1 yellow wax variety
Stringless Red Valentine.....	Condon	52.0	25.3	100	48.6	.....
Extra Early Red Valentine.....	Northrup, King	45.0	26.3	100	58.3	.....
Extra Early Red Valentine.....	J. C. McCullough	59.5	26.8	100	44.9	.....
Black Valentine.....	Holmes	57.5	32.5	100	56.5	.....
Bountiful.....	Woodruff	57.5	32.5	100	56.5	.....
Bountiful.....	Harris	32.0	18.0	100	56.3	.....
Bountiful.....	Condon	34.0	19.3	100	56.6	.....
Dwarf Green Pod Bountiful.....	Asgrow	46.5	20.8	100	44.6	.....
Bountiful.....	Crabbs, Reynolds, Taylor	45.0	22.3	100	49.4	.....
Pencil Pod Black Wax.....	Condon	48.0	21.5	100	44.8	.....
Dwarf Pencil Pod Black Wax.....	J. C. McCullough	57.5	21.0	100	36.5	.....
Pencil Pod Black Wax.....	Michael-Leonard	46.5	16.3	100	34.9	.....
Pencil Pod Black Wax.....	Woodruff	51.5	24.3	100	47.1	.....
Improved Pencil Pod Black Wax.....	Asgrow	49.0	20.8	100	42.3	.....

TABLE 7.—Percentage germination, trueness to variety, and yield in pounds per four replicates of green beans—continued

Variety	Seedsman	Per cent field germination	Total yield, pounds	Per cent true to type	Calculated yield in pounds for perfect stand	Remarks
Pencil Pod Black Wax.....	Market Gardeners'	59.5	26.0	100	43.7	.....
Pencil Pod Black Wax.....	J. B. Rice	66.0	24.3	99.2	36.7	1 green snap bean variety
Pencil Pod Black Wax.....	Crabbs, Reynolds, Taylor	64.0	23.3	100	48.7	.....
Pencil Pod Black Wax.....	Ferry-Morse	50.5	23.8	100	47.0	.....
Round Pod Kidney Wax.....	Woodruff	34.0	18.8	98.5	55.1	1 green-podded variety
Improved Golden Wax.....	Michael-Leonard	47.0	25.0	100	53.2	.....
Rust-Proof Golden Wax.....	Condon	38.0	17.0	100	44.7	.....
Golden Wax.....	Ferry-Morse	45.5	16.0	100	35.2	.....
Improved Golden Wax.....	Erie	23.0	14.3	100	61.9	.....
Improved Golden Wax.....	Northrup, King	25.0	10.8	100	43.0	.....
Improved Golden Wax.....	Saunders	32.0	15.8	100	49.2	.....
Improved Golden Wax.....	Crosman	29.0	13.0	100	44.8	.....
Improved Golden Wax.....	Fredonia	31.5	18.5	100	58.7	.....
Improved Golden Wax.....	Asgrow	29.5	8.3	100	28.0	.....
Improved Golden Wax.....	Kimmel	6.5	3.8	100	50.0	.....
Improved Golden Wax.....	Isbell	32.5	12.3	100	37.7	.....
Improved Golden Wax.....	J. C. McCullough	34.0	17.3	100	33.9	.....
Sure Crop Wax.....	Woodruff	44.5	23.3	100	52.2	.....
Dark Red Kidney.....	Isbell	55.0	36.0	100	65.5	.....
Burpee's Bush.....	Woodruff	54.0	27.8	100	51.4	.....
Asgrow Stringless.....	Asgrow	60.0	30.0	100	50.0	.....
Wardwell's Kidney Wax.....	Forney	45.0	31.0	100	68.9	.....
Cut Short or Cornhill.....	Woodruff	70.5	11.0	100	15.6	.....
Cut Short or Cornhill.....	Forney	56.5	11.3	100	19.9	.....
White Crease Back.....	Woodruff	57.5	36.3	100	63.0	.....
Round Pod Kidney (red).....	Condon	54.5	36.3	100	66.5	.....
Streamliner.....	Henderson	59.5	35.0	100	58.8	.....
Streamliner.....	Harris	46.5	27.0	100	58.1	.....
Streamliner.....	Vaughan	36.5	21.3	100	58.2	.....
Early Dwarf Stringless Black Wax.....	Isbell	33.0	18.3	100	55.3	.....
Black Wax.....	Woodruff	50.5	25.3	100	51.0	.....
Plentiful.....	Ferry-Morse	48.0	24.3	100	50.5	.....
Mammoth Podder.....	Condon	51.5	8.3	100	16.0	.....
Lazy Wife.....	Woodruff	37.5	3.3	100	8.7	.....
White Kidney.....	Asgrow	33.0	20.0	100	60.6	.....
Marrowfat.....	Forney	26.5	12.5	100	47.2	.....
Tender Pod.....	Burpee	48.0	49.3	100	102.6	.....
Dwarf Horticultural*.....	Asgrow	43.5	10.0	100	23.0	.....

*Only three replicates of this variety.

TABLE 8.—Percentage germination, trueness to variety, and yield in pounds per four replicates of lima beans

Variety	Seedsman	Per cent field germination	Total yield, pounds	Per cent true to type	Calculated yield in pounds for perfect stand
Henderson Bush Lima	Isbell	55.5	20.0	100	36.0
Henderson Dwarf Bush Lima	J. C. McCullough	37.0	20.5	100	55.4
Fordhook	Crabbs, Reynolds, Taylor	55.5	42.5	100	76.6
Fordhook	Saunders	56.0	43.0	100	76.8
Fordhook	Asgrow	62.0	48.0	100	77.4
Fordhook	J. C. McCullough	54.4	39.8	100	72.9
Fordhook	Michael-Leonard	59.0	50.8	100	98.5
Fordhook	Asgrow	54.5	41.0	100	75.2
Fordhook	Ben Fish & Son	58.0	44.5	100	76.7
Fordhook	Northrup, King	63.5	35.3	100	55.5
U. S. D. A. No. 236	U. S. D. A.	39.0	33.8	100	86.5
Burpee Improved Bush Lima	Condon	41.0	22.0	100	53.7
Burpee Improved Bush Lima	Asgrow	32.5	27.8	100	85.4
Burpee Improved Bush Lima	Market Gardeners'	48.5	31.3	100	64.4
Burpee Improved Bush Lima	Saunders	44.0	33.0	100	75.0
Burpee Improved Bush Lima	J. C. McCullough	54.5	33.5	100	61.5
Baby Bush Lima	Northrup, King	56.0	22.0	100	39.3
Large White Butter	Asgrow	17.5	2.0	100	11.4
King of the Garden	Asgrow	25.0	35.0	100	140.0
King of the Garden	Condon	50.0	33.8	100	67.5
King of the Garden	Saunders	40.5	40.0	100	98.8
Maryland Thick Seed	Northrup, King	52.0	23.0	100	44.2
Henderson Baby Bush Lima	Northrup, King	66.0	24.8	100	37.5
Baby Potato	Asgrow	64.0	46.0	100	71.9
Early Baby Potato	Asgrow	53.5	38.5	100	72.0
Late Baby Potato No. 49-514-40	University of Illinois	66.5	51.5	100	77.4
Early Baby Potato No. 11A-508-40	University of Illinois	69.0	44.8	100	64.9

TABLE 9.—Percentage germination and pureness of variety per four replicates of peas

Variety	Seedsman	Per cent field stand	Per cent true to type	Remarks
Little Marvel.....	Market Gardeners'	83	100	
Little Marvel.....	W. T. Phillips	82.5	94	
Little Marvel.....	Asgrow	75	97	
Little Marvel.....	Saunders	65	100	
Little Marvel.....	Ferry-Morse	80.5	97.5	
Little Marvel.....	Woodruff	75.5	98.5	
Little Marvel.....	J. C. McCullough	88	98	
Laxton's Progress.....	Condon	83	99	1 Telephone type
Laxton's Progress.....	J. C. McCullough	61	98	
Laxton's Progress.....	W. T. Phillips	45	98	Replications 1 and 2 drowned out
Laxton's Progress.....	W. T. Phillips	64	92	
Thomas Laxton.....	Condon	59.5	100	
Alaska.....	Market Gardeners'	77	100	
Alaska.....	Market Gardeners'	78.5	98	1 Telephone type
Alaska (bulk).....	W. T. Phillips	69	100	
Alaska.....	Asgrow	78	97	
Alaska.....	A. J. Brown	85	97	
Alaska.....	J. C. McCullough	87.5	92	
Alaska.....	Woodruff	66	94	Replications 1 and 3 drowned out
American Wonder.....	A. J. Brown	70	98.5	
American Wonder.....	Condon Bros.	75	96	3 Telephone type
Telephone.....	J. C. McCullough	56	100	

TABLE 9.—Percentage germination and pureness of variety per four replicates of peas—continued

Variety	Seedsman	Per cent field stand	Per cent true to type	Remarks
Telephone.....	Good	49	100	.....
Telephone.....	Woodruff	66	100	.....
Nott's Excelsior.....	A. J. Brown	63.5	97	.....
Nott's Excelsior.....	Livingston	72.5	97	.....
Nott's Excelsior.....	Asgrow	85	94	.....
Little Marvel (bulk).....	Market Gardeners'	80	92	.....
Little Marvel.....	J. C. McCullough	62.5	100	Replications 1 and 2 drowned out
Little Marvel.....	Crabbs, Reynolds, Taylor	74	100	.....
Little Gem.....	Saunders	67	94	.....
Dwarf Premium Gem.....	J. B. Rice	76	100	.....
Gradus.....	W. T. Phillips	64	100	Replications 2 and 4 drowned out, No. 4 completely
Sutton's Excelsior.....	Woodruff	56	98	Poor growth
Nott's Excelsior.....	W. T. Phillips	71	95.5	.....
Nott's Excelsior.....	Forney	56	96.5	1 Telephone type
Edible Pod.....	Woodruff	58	100	.....
Laxtonian.....	Woodruff	68.5	100	.....
Laxtonian.....	Asgrow	84	100	.....
Laxtonian.....	W. T. Phillips	57.5	88	.....
Hundred Fold.....	Livingston	75	100	.....
Hundred Fold.....	W. T. Phillips	71.5	100	.....
Top Notch.....	Burpee	50	98	.....

TABLE 10.—Percentage germination and pureness of variety of radishes per four replicates

Variety	Seedsman	Per cent field stand	Per cent true to type	Remarks
Early Scarlet Globe	Condon	65.5	87.8	12 ovate, 1 long, 1 purple
Early Scarlet Globe	Asgrow	56.6	92.9	7 ovate, 1 purple
Early Scarlet Globe	Fredonia	72.5	96.6	1 white, 3 long, 1 French Breakfast
Vick's Scarlet Globe.....	Botzum	63.0	98.4	2 long
Scarlet Globe.....	Woodruff	61.0	97.5	2 white, 1 long
Scarlet Globe.....	Erie	59.5	98.3	1 ovate, 1 elongated
Early Scarlet Globe	Crosman	63.5	96.9	4 ovate
Early Scarlet Globe	Crabbs, Reynolds, Taylor	62.5	96.0	5 elongated
Early Scarlet White Tip	J. C. McCullough	72.5	98.6	1 ovate, 1 rose
Early Scarlet White Tip	Fredonia	59.0	99.2	1 elongated
Early Scarlet White Tip	Good	59.5	96.5	2 white globe, 1 red, 1 dark red long
Early Scarlet White Tip	Hygrade	73.5	98.0	1 white, 1 rose, 1 rose winter
Early Scarlet White Tip	Page	70.0	97.9	2 white, 1 pink
Early Scarlet Turnip.....	Manitowoc	48.0	91.7	8 ovate
Early Scarlet Turnip.....	Card	60.0	99.2	1 white tip
Cincinnati Market	Woodruff	56.0	98.2	2 ovate
Cincinnati Market	Market Gardeners'	51.5	100.0	.....
Cincinnati Market	Woodruff	59.0	98.3	2 white
Long Scarlet Short Top.....	Fredonia	70.5	92.2	3 rutabaga foliage, 9 oval, 2 rose, 1 pink root
Long Black Spanish Winter.....	Page	56.0	82.1	9 white root, 11 white
Sparkler.....	Saunders	15.5	96.8	1 white
Scarlet Turnip White Tip.....	Excel	59.0	92.4	2 purple, 1 white, 4 oval, 2 elongated
Scarlet Turnip White Tip.....	Condon	67.5	99.3	1 elongated

TABLE 10.—Percentage germination and pureness of variety of radishes per four replicates—continued

Variety	Seedsman	Per cent field stand	Per cent true to type	Remarks
Scarlet Turnip White Tip	Good	72.0	97.2	1 elongated, 1 white, 2 no white tip
Long Scarlet Globe	Woodruff	60.0	90.0	1 cabbage, 3 white
Long Scarlet Globe	Ferry-Morse	72.5	98.6	2 pink
French Breakfast	Woodruff	60.0	80.0	5 long white, 1 ovate, 5 white tip, 1 globe
French Breakfast	Botzum	75.0	94.7	8 elongated
French Breakfast	Page	61.0	95.1	1 round, 5 elongated
French Breakfast (bulk)	Card	70.5	95.7	2 long, 2 purple, 1 white, 1 offtype
French Breakfast (bulk)	Woodruff	66.0	92.4	8 long, 1 purple, 1 round
French Breakfast	A. J. Brown	71.0	100.0	
Icicle	Crabbs, Reynolds, Taylor	72.0	100.0	
Icicle	Card	69.0	100.0	
Icicle	Fredonia	44.5	98.9	1 purple globe
Icicle	Manitowoc	46.5	100.0	
White Icicle (bulk)	Woodruff	70.0	100.0	
White Icicle	J. C. McCullough	64.0	99.2	1 long red
White Icicle	Erie	53.0	75.5	1 purple top
Long White Icicle	Fredonia	56.0	98.2	1 red, 1 purple
Long White Icicle	Page	70.5	100.0	
Crimson Giant	Sterling	75.5	99.3	1 mustard foliage
Crimson Giant	A. J. Brown	52.0	98.1	1 white, 1 elongated
Scarlet China	Page	59.5	95.0	6 white
Chinese Red Winter	Forney	46.5	88.1	3 globe, 2 rose, 3 long black Spanish, 1 white
Scarlet Globe White Top	Erie	61.0	96.7	2 white, 1 red, 1 elongated

PEAS, RADISHES, AND SPINACH

Trials for peas, radishes, and spinach were conducted in the same manner as the bean trials, except that yield records were not calculated because of unfavorable growing conditions.

TABLE 11.—Percentage germination and pureness of variety of spinach

Variety	Seedsman	Total stand, 200 seeds	Per cent stand	Per cent true to type	Number of type
King of Denmark	Page	56	28.0	100.0	.....
King of Denmark	Condon	102	51.0	96.1	4
Virginia Savoy	W. T. Phillips	119	59.5	97.5	3
Virginia Savoy	Asgrow	117	58.5	99.1	.....
Long Standing Bloomsdale	Fredonia	58	29.0	100.0	.....
Long Standing Bloomsdale	Condon	112	56.0	99.1	1
Long Standing Bloomsdale	Manitowoc	74	37.0	97.3	2
Long standing Bloomsdale	Zack Davis	94	47.0	98.9	Poor yellowish growth and foliage, 1 offtype
Long Standing Bloomsdale	Ben Franklin	82	41.0	100.0	.....
Long Standing Bloomsdale	Madson	72	36.0	98.6	.....
Savoy Bloomsdale	Ferry-Morse	67	33.5	100.0	.....
Savoy Bloomsdale	J. C. McCullough	87	43.5	95.4	.....
Savoy Bloomsdale	Sterling	68	34.0	97.1	2
Savoy Bloomsdale	Livingston	109	54.5	100.0	.....
Savoy Bloomsdale	Crabbs, Reynolds, Taylor	106	53.0	100.0	.....
Savoy Bloomsdale	J. C. McCullough	82*	54.0	100.0	.....
Savoy Bloomsdale	Erie	47	23.5	97.9	.....
Bloomsdale	A. J. Brown	109	54.5	100.0	Foliage yellow
Round Thick Leaved	Forney	3	1.5	0	3 cabbage plants
Round Thick Leaved	A. J. Brown	31	15.5	96.8	2
Circled Bloomsdale	Zack Davis	56*	37.5	98.2	1

*Only three replicates planted. Adjustments were made for these replicates.

DISCUSSION OF RESULTS

Throughout the growing season, it was evident that many of the varieties did not conform to the standards established by the Ohio Agricultural Seed Law. Many of the lots were mixtures of varieties, and some of the lots were totally mislabeled. The more evident mixtures were observed in the cabbage tests (fig. 1). In one instance, a seed company had a mixture of rutabagas, kale, and a round-headed type of cabbage in a lot that was labeled as a Jersey Wakefield variety of cabbage. These mixtures were more evident in crops for which the seed supply had been imported from Europe previous to the war.

The muskmelon tests on the whole gave fair results although there were some varietal mixtures. One cucumber vine was grown from seed labeled Honey Rock. Two companies offered seed which was completely mislabeled. A sample of seed from another company produced three different varieties, none of which was representative of the variety indicated on the container.

In the spinach trials, most of the varieties were true to type, except one which was mislabeled; this packet was marked as Round Thick Leaved spinach, but upon germination, it was found that the packet contained cabbage seed instead of spinach seed.

TABLE 12.—Number of plants, pureness of variety, and yield of varieties of muskmelons, four replicates

Variety	Seedsman	Number of plants	Yield, pounds	Number of melons	Average weight per melon, pounds	Number of melons per vine	Per cent true to type	Remarks
Rocky Ford.....	Zack Davis	94	190.3	125	1.5	1.3	100	.....
Rocky Ford.....	Fredonia	81	274.8	150	1.8	1.9	100	.....
Rocky Ford.....	Erie	80	223.2	136	1.6	1.7	100	.....
Rocky Ford.....	Crabbs, Reynolds,							.....
	Taylor	84	185.8	112	1.7	1.1	97.6	2 vines with Hackensack-shaped fruit
Rocky Ford.....	Robinson	66	122.8	96	1.3	1.5	100	.....
Rocky Ford.....	Michael-Leonard	63	211.8	121	1.8	1.9	100	.....
Green Flesh Rocky Ford.....	Crabbs, Reynolds,							.....
	Taylor	87	186.5	115	1.6	1.3	97.7	2 vines of Hackensack variety
Rocky Ford.....	Page	52	197.5	106	1.9	2.0	100	.....
Rocky Ford.....	A. J. Brown	79	256.0	149	1.7	1.9	100	.....
Honey Rock.....	Robinson	139	288.3	142	2.0	1.0	100	.....
Honey Rock.....	Market Gardeners'	81	229.8	125	1.8	1.6	100	.....
Honey Rock.....	J. C. McCullough	93	201.3	105	1.9	1.1	100	.....
Honey Rock.....	Saunders	74	223.8	141	1.6	1.9	100	.....
Honey Rock.....	Zack Davis	99	522.8	98	5.3	1.0	0	All Tip Top type
Honey Rock.....	Michael-Leonard	69	185.3	93	2.0	1.4	98.6	1 cucumber vine
Honey Rock.....	Crosman	51	301.8	160	1.9	3.1	100	.....
Honey Rock.....	Isbell	58	267.8	124	2.2	2.1	82.8	10 vines bore deeply ribbed melons
Honey Rock.....	A. J. Brown	88	328.8	153	2.2	1.7	100	.....
Honey Rock.....	Burpee	70	251.8	128	2.0	1.8	100	.....
Tip Top.....	Zack Davis	70	425.0	118	3.8	1.7	100	.....
Tip Top.....	Market Gardeners'	103	432.0	211	2.1	2.1	0	All Honey Rock type
Tip Top.....	J. C. McCullough	94	394.8	105	3.8	1.1	93.6	5 vines Banana type, 1 offtype
Tip Top.....	J. B. Rice	103	552.0	143	3.9	1.4	100	.....
Tip Top.....	Woodruff	115	514.8	138	1.2	3.7	100	.....
Tip Top.....	Saunders	104	435.3	132	3.3	1.3	100	.....
Tip Top.....	Robinson	96	552.0	132	4.2	1.4	100	.....
Tip Top.....	Michael-Leonard	109	425.0	150	2.8	1.4	100	.....
Tip Top.....	Livingston	86	504.5	124	4.1	1.4	100	.....
Tip Top.....	Northrup, King	70	386.3	92	4.2	1.3	100	.....
Tip Top.....	Condon	76	514.8	120	4.3	1.6	100	.....
Tip Top.....	Crabbs, Reynolds,							.....
	Taylor	71	438.8	104	4.2	1.5	91.6	6 Hackensack vines
Tip Top.....	Forney	94	535.0	129	4.2	1.4	100	.....

TABLE 12.—Number of plants, pureness of variety, and yield of varieties of muskmelons, four replicates—continued

Variety	Seedsman	Number of plants	Yield, pounds	Number of melons	Average weight per melon, pounds	Number of melons per vine	Per cent true to type	Remarks
Hales Best.....	J. B. Rice	57	176.8	127	1.4	2.2	100	
Hales Best.....	J. C. McCullough	63	242.5	132	1.9	2.1	100	
Hales Best.....	Ferry-Morse	63	237.3	116	2.1	1.8	100	
Hearts of Gold.....	Crabbs, Reynolds, Taylor	67	179.3	123	1.5	1.8	100	
Hearts of Gold.....	Burpee	76	247.8	124	1.9	1.6	100	
Hearts of Gold.....	Zack Davis	107	267.3	161	1.7	1.5	100	
Hearts of Gold.....	Sterling	51	145.3	85	1.7	1.7	100	
Hearts of Gold.....	J. C. McCullough	68	294.0	142	2.1	2.1	100	
Hearts of Gold.....	Michael-Leonard	91	298.5	166	1.8	1.8	100	
Hearts of Gold.....	Northrup, King	64	222.5	107	2.1	1.7	100	
Hearts of Gold.....	Forney	98	251.8	128	1.9	1.3	100	
Hearts of Gold.....	Condon	88	239.5	114	2.1	1.3	100	
Hearts of Gold.....	Woodruff	114	322.5	168	1.9	1.5	100	
Hearts of Gold.....	Holmes	105	300.0	181	1.4	1.7	99.1	1 Hackensack vine
Sugar Rock.....	Crosman	70	253.8	122	2.1	1.7	100	
Queen of Colorado.....	Robinson	84	277.8	91	3.1	1.1	100	
Benders Surprise.....	Woodruff	96	656.0	144	4.6	1.5	100	
Benders Surprise.....	Condon	102	590.0	126	4.7	1.3	100	
Hackensack.....	Woodruff	123	503.3	127	4.0	1.0	100	
Hackensack.....	Forney	77	431.0	128	3.4	1.7	97.6	3 round melons
Hackensack.....	Page	73	412.3	133	3.1	1.8	100	
Pride of Wisconsin.....	Henderson	76	313.0	84	3.8	1.1	100	
Pride of Wisconsin.....	Livingston	81	271.0	69	3.9	.9	100	
Pride of Wisconsin.....	Holmes	97	302.8	86	3.5	.9	100	
Pride of Wisconsin.....	Robinson	105	393.5	121	3.3	1.2	100	
Fordhook.....	Forney	82	239.3	148	1.6	1.8	100	
Delicious.....	Woodruff	59	394.5	131	3.0	2.2	100	
Delicious.....	Harris	70	378.8	130	2.9	1.8	100	
Delicious.....	Henderson	97	408.5	152	2.7	1.6	100	
Milwaukee Market.....	Crabbs, Reynolds, Taylor	77	422.3	130	3.3	1.7	100	
Condon's Perfomance.....	Condon	83	419.8	135	3.1	1.6	100	
Emerald Gem.....	J. B. Rice	60	335.5	160	2.1	2.7	0	Mixture of Tip Top, Honey Rock, Fordhook types
Ohio Sugar.....	Livingston	71	461.8	137	3.4	1.9	100	
Ohio Sugar.....	Saunders	70	488.3	138	3.5	2.0	100	
Market King.....	Harris	42	253.8	69	3.7	1.6	100	



Fig. 1.—Mixtures of varieties as found in cabbage tests (variety Jersey Wakefield). Kale can be observed in center of photograph.

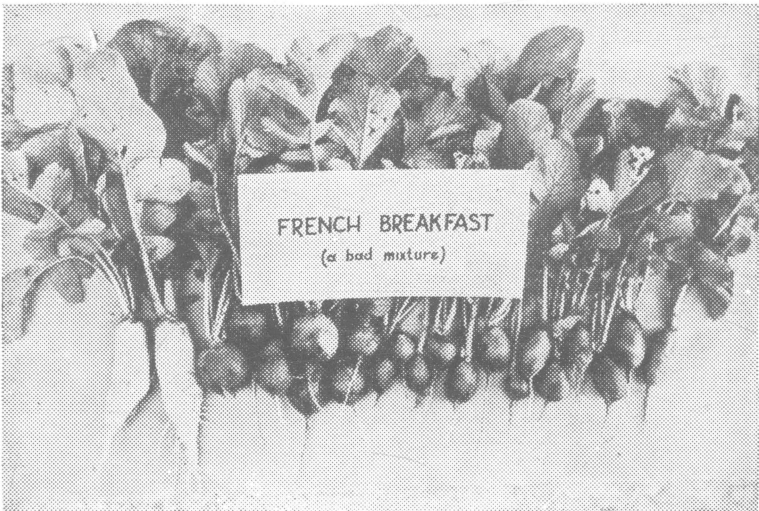


Fig. 2.—These radishes were grown from a packet of seed labeled French Breakfast. Only 4 of the 21 radishes are typical of this variety.

Other crops which showed a rather large mixture of varieties were radishes and tomatoes. The most common mixture (fig. 2) was found in the French Breakfast radish, which, incidentally, is another variety imported from Europe. In tomatoes, one or two plants in some lots were found to be of a different variety from that labeled on the container, although in 4 cases there were from 16 to 23 plants which were offtype out of a possible 32. The seed from five companies was totally mislabeled.

The least offtype plants were found among the beans, both lima and green. Most of the lots performed satisfactorily in the field. All the lima beans were true to type.

There were a few bad mixtures among the carrots and beets. Many of the beets showed a wide variation in the intensity of the red color.

SUMMARY

The more evident mixtures in the cabbage variety were in the lots labeled Jersey Wakefield.

The mean of color for beets varied from 1.7 to 3.8.

Lima beans were all 100 per cent true to variety.

All plots of peas were 90 to 100 per cent true to variety.

Yield records for spinach and radishes were not determined, owing to unfavorable growing conditions. One company offered spinach seed for sale which upon germination produced cabbage plants. The radish plots showed a number of mixtures, even though the majority of the lots were 90 per cent true to variety.

The trueness to variety of muskmelons, in the majority of cases, was 90 per cent or higher, although there were some lots totally mislabeled.