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South Dakota State University Agricultural  
Experiment Station

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## Vegetables in South Dakota

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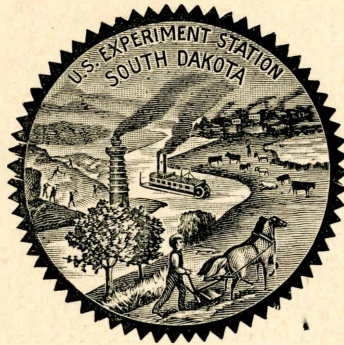
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November, 1900.

Bulletin 68.

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U. S.  
EXPERIMENT STATION  
SOUTH DAKOTA.



IN CONNECTION WITH THE  
SOUTH DAKOTA AGRICULTURAL COLLEGE.

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VEGETABLES IN SOUTH DAKOTA.

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DEPARTMENT OF HORTICULTURE.

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BROOKINGS, SOUTH DAKOTA.



SIOUX FALLS, S. D.  
WILL A. BEACH, PRINTER AND BINDER,  
1901.

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 Any farmer of the state can have the Bulletins of this Station free upon application to the Director.

# VEGETABLES IN SOUTH DAKOTA.

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## DEPARTMENT OF HORTICULTURE.

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N. E. HANSEN,  
Horticulturist.

W. S. THORNBUR,  
Assistant.

Over the larger part of the state farmers have been so busy with grain, stock and dairy farming that the culture of vegetables has been much neglected. This is evident from the immense quantities of vegetables shipped into the state, especially the northern portions. And yet the experience of many men scattered over the state shows that abundant crops of choice vegetables can be easily grown with proper care and management upon our fertile prairies. Many of the failures in raising vegetables in the northern part of the state come from the selection of late instead of early varieties. Inquiries are frequently received by this station for lists of desirable varieties. While this is to a considerable extent a local matter, it has been deemed advisable to make the following tests to give some indications as to the best list to recommend for trial. In all our prairie gardens we should remember that the directions given in eastern publications about the distances rows should be apart need modification in many cases. In the east, land is scarce and high priced and labor abundant and cheap; in the west these conditions are reversed. Hence the farm garden should not be laid out in the way common near large cities where land is worth hundreds of dollars per acre, but plenty of room should be given and the garden laid out in long rows to permit of horse cultivation. Our wheat farmers, who deem a quarter section a rather small place for one man to work, almost scorn to touch a hoe. Here American inventive genius has come to the rescue during the past few years, and the latest improved garden seed drills, wheel



hoes and weeders, make the labor of weeding comparatively light. A few dollars spent for these improved implements will be money wisely spent. To have abundance of garden vegetables during the entire season and enough to put into the cellar for use all winter and until the next crop comes in, means more than many dollars and cents saved. It means better health throughout the year, a table supplied constantly with the choicest of food, and increased enjoyment of rural life. Another point, the present age is one of extensive adulteration of foods and treatment of canned vegetables and fruit with chemical preservatives, injurious to health. Pure food laws may remedy this state of affairs in time, but until this time comes, the era of home canning will return more and more, and the increased use of home grown vegetables will largely conduce to the preservation of the public health.

The people with a small garden or a town lot should study this question also, but from the standpoint of economizing space. The possibilities of a small piece of land in the way of producing food products are wonderful. These possibilities have been demonstrated fully in the densely populated parts of Europe where farms, consisting of two to three acres, and supporting large families, are common.

In the following tests the land used was rather high dry upland, with no manure for several years and no irrigation. It was fairly typical of the ordinary farm garden in this vicinity.

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### SEEDSMEN.

The seeds used in the following experiments were purchased from the following seedsmen :

W. Atlee Burpee & Co .....	Philadelphia, Penn.
U. S. Department of Agriculture.....	Washington, D. C.
Colorado Seed House.....	Denver, Colo.
Henry A. Dreer.....	Philadelphia, Penn.
J. A. Everitt .....	Indianapolis, Ind.
R. & J. Farquhar & Co.....	Boston, Mass.

D. M. Ferry & Co.....	Detroit, Mich.
James J. H. Gregory & Son.....	Marblehead, Mass.
Haage & Schmidt.....	Erfurt, Germany
Peter Henderson & Co.....	New York, N. Y.
Iowa Seed Co.....	Des Moines, Iowa.
Johnson & Stokes.....	Philadelphia, Penn.
D. Landreth & Sons.....	Philadelphia, Penn.
Wm. Henry Maule.....	Philadelphia, Penn.
Northrup, King & Co.....	Minneapolis, Minn.
John A. Salzer Seed Co.....	La Crosse, Wis.
Sioux Falls Seed Co.....	Sioux Falls, S. D.
J. M. Thorburn & Co.....	New York, N. Y.
J. C. Vaughan & Co.....	Chicago, Ill.
James Vick's Sons.....	Rochester, N. Y.
F. S. White.....	Des Moines, Iowa.

#### EARLY TOMATOES-1899.

The experiments at this station in former years have shown that only early varieties are worth planting for profit. With a view to testing some of the recent introductions in comparison with older varieties and some imported from Europe, the following test was made: The seed was sown in the forcing house March 30, the seedlings transplanted into 2-inch pots May 1, and into 4-inch pots May 20, and set in the open field June 6. The plants were set in rows four feet apart and the plants four feet apart in the row. Twenty plants of each variety were set in all cases. From this basis the yield per acre is calculated in bushels of sixty pounds to facilitate comparison with yields in former years. The season was favorable. The plants were given good field cultivation, but were not manured, cut back or trained in any way.

# TOMATOES.

VARIETY.	SEEDSMAN.	DATE OF FIRST RIPENING	YIELD PER ACRE IN BUSHELS OF 60 POUNDS.					
			RIPE FRUIT.					GREEN FRUIT.  Sept. 18th, Killing Frost.
			Aug. 1-15	Aug 15-31	Total for August	Sept. 1-18	Total for Aug. and Sept.	
Acme .....	Vaughan .....	Aug. 8....	14	64	78	153	231	331
Atlantic Prize .....	Dreer .....	Aug. 8....	19	110	129	224	353	163
Bond's Early Minnesota .....	Gregory .....	Aug. 9....	16	72	88	273	361	193
Blount's Champion .....	Haage & S. ....	Aug. 1....	3	19	22	95	117	92
Bright and Early .....	Dreer .....	Aug. 9....	22	133	155	291	446	329
Burbank's Preserving .....	Livingston .....	Aug. 30....	*					
Burpee's Combination .....	Burpee .....	Aug. 9....	6	39	45	152	197	272
Courtet .....	Haage & S. ....	Aug. 15....	5	50	55	210	265	134
Dwarf Champion .....	S. F. S. Co. ....	Aug. 15....	2	29	31	115	146	300
Dwarf Golden Champion .....	Burpee .....	Aug. 19....		17	17	86	103	107
Earliest of All .....	Gregory .....	Aug. 1....	52	191	243	156	399	143
Early Leader .....	Vicks .....	Aug. 8....	49	211	260	270	530	229
Early Minnesota .....	N. K. & Co. ....	Aug. 9....	14	76	90	183	273	214
Early Richmond .....	Landreth .....	Aug. 4....	25	161	186	139	325	288
Early Ruby .....	Thorburn .....	Aug. 4....	29	116	145	281	426	153
Extra Early Advance .....	Burpee .....	Aug. 8....	20	92	112	179	291	239
Ficarazzi .....	Haage & S. ....	Aug. 2....	34	148	182	122	304	124
Fordhook Fancy .....	Burpee .....	Aug. 19....		24	24	81	105	80
Fordhook First .....	Burpee .....	Aug. 10....	5	42	47	188	235	286
Freedom .....	Henderson .....	Aug. 9....	10	53	63	103	166	261
Gooseberry Fruited .....	Haage & S. ....	Aug. 7....	*					
Henderson's Crimson Cushion .....	Henderson .....	Aug. 19....		15	15	50	65	211
Henderson's Ponderosa .....	Henderson .....	Aug. 15....		42	42	89	131	295
King Humbert .....	Haage & S. ....	Aug. 19....	*					
King Humbert White .....	Haage & S. ....	Aug. 15....	*					
King Humbert Yellow .....	Haage & S. ....	Aug. 10....	*					
Large Leaved Red .....	Haage & S. ....	Aug. 12....	2	27	29	150	179	160
Little Gem .....	Haage & S. ....	Aug. 8....	14	63	77	213	290	26
Livingston's Acme .....	Livingston .....	Aug. 12....	4	39	43	125	168	257
Livingston's Buckeye State .....	Livingston .....	Aug. 23....		2	2	37	39	345
Livingston's Dwarf Aristocrat .....	Livingston .....	Aug. 15....	6	25	31	120	151	118



# TOMATOES—CONTINUED.

VARIETY.	SEEDSMAN.	DATE OF FIRST RIPENING	YIELD PER ACRE IN BUSHELS OF 60 POUNDS.					
			RIPE FRUIT.					GREEN FRUIT.
					Total for			Sept. 18th.
			Aug. 1-15	Aug. 15-31	August	Sept. 1-18	Aug. and Sept.	Killing Frost.
Livingston's Honor Bright.....	Livingston.....	Aug. 19.....	.....	13	13	54	67	377
Livingston's Potato Leaf.....	Livingston.....	Aug. 11.....	5	35	40	158	198	237
Livingston's Yellow Prince.....	Livingston.....	Aug. 19.....	.....	30	30	119	149	146
Lorillard.....	Henderson.....	Aug. 9.....	2	18	20	148	168	236
Matchless.....	Burpee.....	Aug. 19.....	.....	32	32	75	107	323
New Imperial.....	S. F. S. Co.....	Aug. 12.....	5	27	32	185	217	293
Prelude.....	Haage & S.....	Aug. 8.....	4	58	62	276	338	94
Red Cherry.....	N. K. & Co.....	Aug. 8.....	4	44	48	236	284	64
Red Currant.....	N. K. & Co.....	July 28.....	*	.....	.....	.....	.....	.....
Salzer's Earliest of All.....	Salzer.....	Aug. 9.....	52	25	77	118	195	266
Striped of Japan.....	Haage & S.....	Aug. 16.....	.....	79	79	144	223	364
The Early Bird.....	J. & S.....	Aug. 8.....	26	128	154	315	469	312
The Enormous.....	Livingston.....	Aug. 23.....	.....	10	10	28	38	96
Tom Thumb.....	Haage & S.....	Aug. 12.....	*	.....	.....	.....	.....	.....
Trucker's Favorite.....	Burpee.....	Aug. 12.....	10	18	28	97	125	353
Vaughan's Earliest of All.....	Vaughan.....	July 28.....	52	155	207	202	409	102
Vilmorin's Dwarf.....	Haage & S.....	Aug. 15.....	.....	50	50	183	233	266
Violet of Lenville.....	Haage & S.....	Aug. 11.....	12	76	88	317	405	171

\* Small fruited or ornamental varieties.



## FIELD NOTES ON TOMATOES, 1899.

Acme. Purple, smooth, rots badly.

Atlantic Prize. Uneven in size and shape, fairly smooth, red.

Bond's Early Minnesota. Small, very smooth, purple, much like Early Minnesota.

Blount's Champion. Round, yellow, too small, mixed, ornamental only.

Bright and Early. Very smooth, average small, roundish, many small ones at frost time.

Burbank's Preserving. Fruit 3-celled, red,  $\frac{7}{8}$  inch in diameter, borne in racemes like currant tomatoes, plants very dwarf, leaves curiously twisted, much too late.

Burpee's Combination. Large, very smooth, purple, much rot.

Courtet. Very rough and uneven, too small and too late.

Dwarf Champion. Very smooth, plants of upright habit.

Dwarf Golden Champion. Fruit very smooth, attractive yellow color, plants upright but too much dwarfed.

Earliest of All. Same type and description as Vaughan's Earliest of All.

Early Leader. Red, flat, uneven in size, fairly smooth at first, rougher later in the season.

Early Minnesota. Small, purple, smooth, tendency to rot, much like Bond's Early Minnesota.

Early Richmond. Of Earliest of All type, red, flat and rough, late specimens too rough.

Early Ruby. The first specimens rather rough, main crop large and smooth, of good size, a good second early variety.

Extra Early Advance. Smooth, red, averages to small, tendency to rot.

Ficarazzi. Of Earliest of All type, flat, red and rough, later specimens too rough.

Fordhook Fancy. Very smooth.

Freedom. Very smooth, red, tendency to crack at stem end and to rot.

Gooseberry-fruited. Larger than Currant tomato but smaller than Red Cherry tomato, round, purplish red, smooth, uneven in size, very productive, for curiosity only.

Henderson's Crimson Cushion. Very large, red and fairly smooth, a very attractive fruit for fairs and display work but too late for profit.

Henderson's Ponderosa. Very large, purple, solid, fairly smooth, very attractive on account of large size and good quality, but rather late.

King Humbert. Red, pear-shaped, two-celled, of good quality,  $2\frac{1}{8} \times 2\frac{1}{4}$  inches, useful for fancy preserves and as an oddity only.

King Humbert White. A white variety of the King Humbert type and useful for the same purposes only, of attractive color.

King Humbert Yellow. A yellow variety of the King Humbert type, oval, of attractive color, for fancy preserves and as an oddity only.

Large Leaved Red. Red, flat, too rough, too late.

Little Gem. Purple red, quite smooth but too small, irregular in shape and size, of no practical value.

Livingston's Acme. Purple, very smooth, considerable rot, all the various strains of Acme tested here show much tendency to rot.

Livingston's Buckeye State. Very smooth, but too late.

Livingston's Dwarf Aristocrat. Fruit not uniformly smooth, plant of upright habit.

Livingston's Honor Bright. Foliage light yellowish-green, fruit yellow, almost white when green and red when fully ripe, very smooth, fair size.

Livingston's Potato Leaf. Smooth, purple, not early enough.

Livingston's Yellow Prince. Very smooth, plant of upright habit.

Lorillard. Large, red, very smooth, first fruits crack at stem end, too late.

Matchless. Large, red, very smooth.

New Imperial. Smooth, purple, tendency to rot. Too late.  
 Prelude. Smooth, dark-red, too small.

Red Cherry. Fruit roundish-oval, very smooth but too small, except for use in fancy preserves, pickles and display work ; it is now exceeded in earliness by several larger varieties.

Red Currant. Very productive, but too small except for curiosity and for use in fancy preserves ; the early varieties of the Earliest of All type exceed it in earliness ; the fruit is produced in racemes like currants of 12 to 20 fruits each.

Salzer's Earliest of All. Large, red, very smooth.

Striped of Japan. Small, very rough, uneven in size, of no value.

The Early Bird. Purple-red, very attractive and smooth, larger than Bright and Early, valuable.

Enormous. Red, quite smooth, vines too long and unproductive, too late.

Tom Thumb. Red, flat, very uneven in size, both smooth and rough, of no value.

Trucker's Favorite. Large, very smooth, purple, too late.

Vaughan's Earliest of All. The earliest of all tested this year. Red, flat, very productive, but too rough to hold the market when later smooth sorts come in ; our best for first early.

Vilmorin's Dwarf. Of Earliest of All type, too small and too late.

Violet of Lenville. Of Earliest of All type, too small and too rough.

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## SUMMARY.

In the northern part of South Dakota earliness is the first requisite of a tomato. The earlier experiments at this station show that the large late smooth varieties are not profitable. Hence the extra early varieties have been most popular, although as a class they bear rougher and more irregular fruit. But improved shipping facilities make it harder each



year to sell these rough early varieties in competition with the large smooth varieties shipped in from the south. For market purposes then, we may say that smoothness is the first essential in a tomato. For home use earliness is more appreciated than smoothness except of course those intended for canning.

The following table gives the four most productive varieties for different periods and shows that a variety may be smooth as well as early. The figures give rate of yield per acre in bushels of 60 pounds:

FIRST HALF OF AUGUST—		Bushels.
Earliest of All.....		52
Salzer's Earliest of All .....		52
Vaughan's Earliest of All.....		52
Early Leader.....		49

SECOND HALF OF AUGUST—		
Early Leader.....		211
Earliest of All.....		191
Early Richmond.....		161
Vaughan's Earliest of All.....		155

TOTAL CROP FOR AUGUST—		
Early Leader.....		260
Earliest of All.....		243
Vaughan's Earliest of All.....		207
Early Richmond.....		186

SEPTEMBER 1-18 (FROST).—		
Violet of Leuville.....		317
The Early Bird.....		315
Bright and Early.....		291
Early Ruby.....		281

TOTAL FOR AUGUST AND SEPTEMBER—		
Early Leader.....		530
The Early Bird.....		469
Bright and Early.....		446
Early Ruby.....		426



## GROUND CHERRY.

Ground Cherry (N. K. & Co). Seed sown at the same time as the tomatoes in 1899, very productive. Fruit  $\frac{5}{8}$  of an inch in diameter; yellow, round and covered with an inflated husk; sweet and pleasant to eat out of the hand. Very popular for preserves, and if picked before injured by frost, can be kept in a dry room until the middle of January or even later. Many people grow this in the home garden where it will generally volunteer after the first year.

## SUBSOILING.

In November, 1895, a tract of land in the grounds of this department was subsoiled to the depth of 18 to 20 inches. The crops grown in 1896 compared with those upon ordinary fall plowing are given in Bul. 54 of this station. The experiment was continued in 1897 with the result given in the following table. Subsoiling is considered by many to be a remedy against drought; but both 1896 and 1897 were wet seasons, so that the results are somewhat conflicting. However, the indications for the two years favor subsoiling so far as increase of crop is concerned, but the expense of subsoiling largely offsets this advantage. For gardening purposes at least it may pay to subsoil a small tract.

CROP.	Surface Plowed.	Subsoiling.	Per Ct. Increase.
Potatoes, Salzer's Earliest.....	286 lbs.	287 lbs.	.....
Beans, Yellow-Eyed Field.....	62 "	77 "	24
Turnip, Bloomsdale Swede.....	480 "	785 "	63
Rutabaga, Large White .....	600 "	840 "	40
Carrots, Dreer's Half Long.....	339 "	342 "	.....
Beets, New Eclipse.....	684 "	846 "	24
Field Corn, Giant White .....	3450 " *	3855 " *	12
Tomatoes, nine varieties.....	1589 "	1916 "	21

\* Fodder.

The foregoing table shows that the results were more noticeable the second year than the first.

## EARLY TOMATOES, 1900.

Many of the varieties tested in 1899 were discarded and the remainder tested this year in comparison with a number

of new varieties. The seed was sown in flats in the forcing house March 29, the seedlings transplanted to other flats April 20 and to the field May 31. Ten plants of each variety were planted. The same cultivation was given as the previous year. Killing frost came September 17. The severe drought after planting caused such an uneven stand of plants that it is deemed best to give only approximate crop estimates in the following table. The crop was superior to that of the average crop of the state so far as that was ascertained. This may be due to the fact that the plants were all grown on the subsoiled land mentioned on the preceding page, but no check plants were grown, the subsoiling experiment having been discontinued. All the tomatoes in 1899 and 1900 were grown on the subsoiled land.

# EARLY TOMATOES, 1900.

VARIETY.	SEEDSMAN.	RIPE.	CROP.	FRUIT NOTES.
Atlantic Prize.....	Dreer.....	August 15.....	light.....	Large, smooth.
Atlantic Prize or Early Ruby.....	Vicks.....	" 11.....	fair.....	Medium, uneven.
Bright and Early.....	Dreer.....	" 15.....	good.....	Small, smooth; good sort.
Bond's Early Minnesota.....	Gregory.....	" 7.....	fair.....	Medium, smooth; good early variety.
Burpee's Combination.....	Burpee.....	" 18.....	fair.....	Medium, smooth.
Diadem.....	Gregory.....	" 15.....	fair.....	Small, smooth; red with yellow streaks.
Dwarf Golden Champion.....	Burpee.....	July 31.....	good.....	Large, smooth, yellow.
Dwarf Champion.....	S. F. S. Co.....	August 11.....	good.....	Uneven, smooth; a standard variety.
Early Bird.....	J. & S.....	July 31.....	good.....	Small, smooth; good early sort.
Early Leader.....	Vicks.....	August 15.....	good.....	Medium, smooth; apt to crack at stem end.
Early Michigan.....	Ferry.....	" 15.....	fair.....	Large, smooth; rather late.
Early Minnesota.....	N. K. & Co.....	" 11.....	fair.....	Uneven in size, smooth.
Early Richmond.....	Landreth.....	July 31.....	light.....	Uneven in size, rough.
Early Ruby.....	Thorburn.....	" 31.....	good.....	Large, smooth; a standard.
Enormous.....	Livingston.....	August 23.....	fair.....	Medium, smooth.
Enormous.....	Maule.....	" 15.....	fair.....	Large, smooth.
Everitt's Earliest of all.....	Everitt.....	July 31.....	light.....	Medium, rough.
Extra Early Advance.....	Burpee.....	August 7.....	good.....	Medium, smooth; a good sort.
Fordhook Fancy.....	Burpee.....	" 11.....	good.....	Large, smooth; a good sort.
Fordhook First.....	Burpee.....	" 11.....	fair.....	Large, smooth.
Freedom.....	Henderson.....	July 31.....	good.....	Medium smooth; a fine sort.
Golden Queen.....	White.....	August 18.....	good.....	Large, smooth; a fine yellow sort.
Henderson's Crimson Cushion.....	Henderson.....	" 15.....	light.....	Very large, smooth; late.
Henderson's Ponderosa.....	Henderson.....	" 29.....	good.....	Very large, smooth; late.
Improved Matchless.....	White.....	" 15.....	good.....	Large, uneven.
Kansas Standard.....	C. S. H.....	" 15.....	light.....	Small, smooth.
Livingston's Buckeye State.....	Livingston.....	" 18.....	good.....	Large, smooth.
Livingston's Dwarf Aristocrat.....	Livingston.....	" 15.....	good.....	Medium, smooth.
Livingston's Honor Bright.....	Livingston.....	" 23.....	good.....	Medium, smooth.
Livingston's Magnus.....	Livingston.....	" 7.....	fair.....	Medium, smooth.
Livingston's Yellow Prince.....	Livingston.....	July 31.....	good.....	Large, smooth, lemon yellow.
Matchless.....	Burpee.....	August 25.....	light.....	Medium, smooth.
Maule's Earliest.....	Maule.....	July 26.....	fair.....	Large, smooth.
May's Favorite.....	Farquhar.....	" 31.....	good.....	Large, smooth; a fine variety.
The Quick Sure.....	J. & S.....	August 7.....	light.....	Large, uneven.
Salzer's Earliest of All.....	Salzer.....	" 15.....	good.....	Uneven, smooth.
Spark's Earliana.....	J. & S.....	July 26.....	fair.....	Large, smooth.
Vaughan's Earliest of All.....	Vaughan.....	" 31.....	fair.....	Medium, rough; a good early sort.
White's Excelsior.....	White.....	August 15.....	fair.....	Uneven, smooth.
White New Giant.....	White.....	" 25.....	light.....	Large, smooth; rather late.



## SMALL VARIETIES OF TOMATOES, 1900.

The Yellow Peach and Purple Peach from Livingston and Peach and Yellow Peach from Burpee, were all tested. First fruit ripe about August 18. Fruit all small and varied in color according to the sort. Valuable only for fancy preserves or as ornamental sorts. The vines were all good and productive.

Burbank's Preserving. (Livingston). First fruit ripe August 30. Fruit small and bright red. The vines were small and not productive.

King Humbert. (Dreer). First fruit ripe August 15. Fruit irregular pear-shaped, medium sized and good quality. The vines were large and fairly productive.

The Red Pear-shaped and Yellow Pear-shaped from Burpee and Pear-shaped Yellow from White, were tested. First fruit ripe August 15; fruit pear-shaped, small; the vines were large and very productive. Useful only as ornamental fruits and for fancy preserves.

Cherry tomatoes were tested in variety. The fruit ripened about the middle of August and was very small. These varieties were always supposed to be earlier than larger sorts, but such is not the case, for several of our early large varieties were from one to two weeks earlier than the Cherry sorts. The fruit of the Cherry type is of course small, but useful for fancy preserves and display work.

Currant tomatoes ripened August 7. The fruit was very small and useful only in fancy pickles and display work.

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 RAISING TOMATOES WITHOUT A GREENHOUSE OR HOTBED.

Many busy farmers do not know or care to learn about the construction and management of hotbeds, neither are they near a greenhouse or market gardener.

Tomato seeds can easily be started in shallow boxes in a sunny window in the house and later transplanted to flower



pots, old berry boxes or tin cans, but some people dislike to do even this. Where a market gardener is near at hand, plants can be bought cheaply. Sometimes plants started indoors get too tender and slender, and are caught by late frosts when set out in the open garden, which should not be before the first week in June.

Some planters find it useful for the purpose of economy to melt the solder from tin cans and use them instead of flower pots. The cans are tied together with wire or stout string and filled with earth. Instead of ordinary tin cans it was found better to get cans of uniform size made at the tinner's from strips of scrap sheet iron and tin, with a flange at each end, so the ends will hook into each other, forming a can without a bottom, holding a little less than one quart each. These tins were placed in a board frame on the south side of a house, filled with rich garden soil, and the frame covered with a glass sash. The seed was sown April 22, 1899, and the seedlings thinned to one plant in each tin soon after germination. June 6 the plants were set in open field 4 by 4 feet without disturbing the ball of earth. The vines were killed by frost September 18.

The following results were obtained from three varieties: The rate yield is calculated in 60 pound bushels, counting the plants set 4 by 4 feet apart, or 2,722 plants per acre.

Earliest of All. (Vaughan.) August 7, first ripe fruit; eleven plants set in field 4 by 4 feet. The yield of perfect fruit the first half of August was at the rate of 54 bushels per acre; the yield the second half of August at the rate of 192 bushels per acre; September 1st to 18th, the yield was 205 bushels per acre. Green tomatoes culinary size, September 18, 102 bushels per acre. This variety is well adapted for this method of culture.

Early Ruby. (Thorburn). Eighteen plants set in field August 8, first ripe fruit; yield of perfect fruit August 1-15 was at the rate of 26 bushels per acre; August 15-31, yield at the rate of 128 bushels per acre; yield September 1-18 at the rate of 313 bushels per acre. Green tomatoes Septem-

ber 18, 188 bushels per acre. This variety is well adapted to this method of culture.

Henderson's Ponderosa. (Henderson.) August 26, first ripe fruit, twelve plants set in field; rate of yield per acre in August only 4 bushels; September 1-18, 49 bushels; green fruit 415 bushels per acre. Too late for this method of culture.

# COMPARATIVE YIELDS PER ACRE IN BUSHEL OF 60 POUNDS.

VARIETIES.	RIPE TOMATOES.				GREEN.
	Aug. 1-15	Aug 15-31	Sept. 1-18	Total	Sept. 18
Earliest of All, from greenhouse.....	52	155	202	409	102
Earliest of All, from cold frame.....	54	192	205	451	105
Early Ruby, from greenhouse.....	29	116	281	426	153
Early Ruby, from cold frame.....	26	128	313	467	188
Ponderosa, from greenhouse.....		42	89	131	295
Ponderosa, from cold frame.....		4	49	53	415

It will be seen from the above table that the plants from cold frame compared favorably with those from the greenhouse. In using the cold frame care must be taken to lift the sash for ventilation when the sun is shining, and to take off the sash entirely on warm days, especially the latter part of May. On cold nights at first it may be necessary to cover the glass with a straw mat or boards. The advantage of the cold frame method is that the plants are not set back by transplanting and are not forced to grow spindling by excessive heat at any time, so that they are well hardened and suffer no backset when set in the open field. However, the method is only suitable for a few plants for the home garden, as on a large scale it is less trouble to transplant than it is to thin out the plants in the cans.



PEPPERS. Seed of Ruby King pepper was sown in this cold frame April 22 the same as the tomatoes, and the plants set in the field June 7. The plants attained good size but were not as productive as those started in the greenhouse. More peppers set on each plant than could reach full size.

□ EGG PLANTS. April 24 seed of Very Early Dwarf Purple, New York Purple, Improved New York Spineless and Round Purple egg plants was sown in 2-inch tins in this cold frame, thinned to one plant and set in open field June 7 without disturbing the ball of earth. The results were much less favorable than with tomatoes, although fruit of edible size was produced on all except New York Purple, at dates ranging from August 15 to September 1. The Very Early Dwarf Purple and Round Purple were the best; the former set more fruit than it could mature. Egg plants are too sensitive against cool nights for good results with this method except with the small very early varieties.

THE COLD FRAME FOR OTHER VEGETABLES. In the foregoing trials, the sash used was ordinary hot-bed sash which can be ordered unglazed from a seedsman or through a lumber dealer, and the glazing done at home to save the extra expense of shipping crated glass sash. But where it is inconvenient to get hot-bed sash, the storm windows from the dwelling house will answer the purpose, although not as strongly constructed for rough handling. The cold frame is convenient for starting other vegetables. Upon a succeeding page is given the results with cauliflower, one of the choicest of all vegetables and yet commonly neglected in this vicinity because thought to be much more difficult to grow than its less refined near relative, the cabbage.

With a view to testing the matter entirely from the home garden standpoint, the horticulturist of this station conducted trials in his private garden in 1899 and 1900 with a cold frame on the south side of the residence. The four storm sash were taken from the house the middle of April and used to cover the cold frame. A cover made of light boards was used on cold nights. Seed was sown in flat boxes of head

lettuce, cabbage, kohlrabi, brussels sprouts and cauliflower, and either thinned out in the boxes or transplanted further apart as soon as big enough to handle to other boxes and later set out with a ball of earth. Excellent cauliflower, cabbage and early kohlrabi were raised in this way. Brussels sprouts did not head well. Choice head lettuce (Landreth's Forcing and Black Seeded Tennis Ball), equal to that shipped into the local markets, was grown in this way, some being left to reach maturity under the glass and others set out in the open ground where they could be watered. People who are accustomed to the tough-leaved lettuce commonly grown from seed sown out doors in drills in this vicinity, should try this method for the home garden.

A good crop of Earliest of All, Bond's Early Minnesota and Early Ruby tomatoes was grown from seed planted in tins such as those already described and thinned out to one plant in each tin. Small, though acceptable, Very Early Dwarf Purple egg plants were grown in the same way.

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### CROSSING TOMATOES.

A very large number of varieties of tomatoes have been tested at this station and the results obtained published in bulletins. We are still looking for the ideal tomato, one of fair size, of perfect smoothness, and that will ripen its main crop in July and August instead of September. A rough very early tomato will not fill this want. In the hope of originating the variety desired, in 1898 the Red Cherry was crossed with pollen of Early Ruby, Bond's Early Minnesota and Ponderosa. The seed was saved and sown the following year at the same time as the variety test. Two of the crosses produced are shown in Plates I and II. The fruits were all of perfect smoothness, intermediate in size between that of the two parents and very early and productive, the first fruits ripening July 26. The Red Cherry was very prepotent in imparting its smooth, regular form of fruit, and the plants were so uniform a lot that it was very difficult to



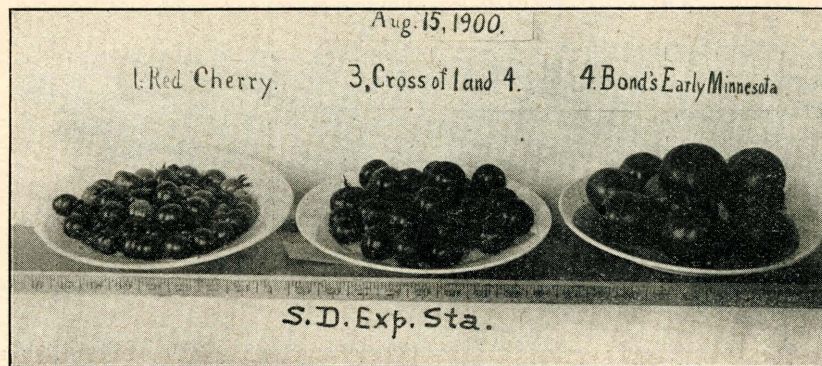


PLATE I—BREEDING TOMATOES.



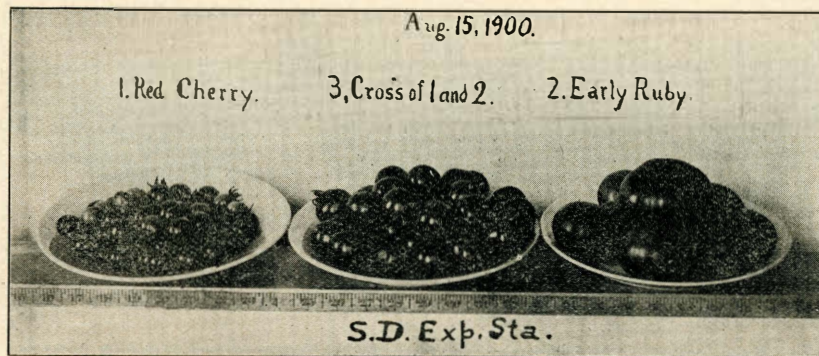


PLATE II—BREEDING TOMATOES.

confine the selection to a few plants. Seed has been saved and this experiment in plant-breeding will be continued.

### EGGPLANTS.

Eggplants are rarely seen in the gardens of the northern part of the state. While this choice vegetable is much more tender in plant than its near relative the tomato, it should not be left out of the home garden. A few plants can easily be grown from seed started in the house or in a hotbed. Some find difficulty in raising eggplants when the seed is sown early, owing to the difficulty in properly hardening off the plants before transplanting them to the garden, and owing to the severe check often given them by cold weather after sowing the seed. To test what could be done with late planting, seeds were sown in the greenhouse April 20, 1899, the seedlings transplanted into 2-inch pots May 22, and these small plants were set into the field 20 inches by 4 feet apart June 7. The following dates are those of first fruits of edible size; the figures give the average size and weight for the season and show that earlier planting is desirable:

Number	VARIETY.	Seedsman.	Date First Edible.	WEIGHT.		REMARKS.
				Pounds	Ounces	
6	Black Dwarf Nagasaki	Haage & S.	August 22.	.....	10	Too late.
5	Black Giant of Pekin...	Haage & S.	" 20.	.....	9	Too late.
2	Black Pekin.....	N. K. & Co.	" 25.	1	7	.....
7	Early Dwarf Violet.....	Haage & S.	July 28.	.....	9	Much like Very Early Dwf. Purple.
11	Early Purple.....	Salzer.....	August 22.	.....	10	Fruit too slender.
15	Improv'd N. Y. Spineless	Thorburn..	" 25.	1	5	.....
3	Improv'd N. Y. White..	N. K. & Co.	" 20.	1	.....	Too late.
13	Landreth Thornless	Landreth..	August 29.	.....	12	Too late.
17	Long Purple.....	Salzer.....	August 29.	.....	11	.....
1	New York Improved....	N. K. & Co.	" 29.	1	5	.....
14	New York Improved....	Landreth..	" 29.	1	4	.....
12	New York Purple.....	Salzer.....	" 29.	1	7	.....
18	Round Purple.....	Thorburn..	" 15.	.....	12	Very productive.
16	Scarlet Chinese.....	Thorburn..	" 25.	.....	.....	For ornament only.
9	Very Early Dwf. Purple	Gregory...	" 15.	.....	10	Small, very productive.
10	White.....	Salzer.....	" 22.	.....	9	Small, productive.

The numbers in the above table refer to Plate III. The Very Early Dwarf Purple is small, very productive and early, but sets more fruit than it can mature and should be restricted to two or three fruits per plant. The several large



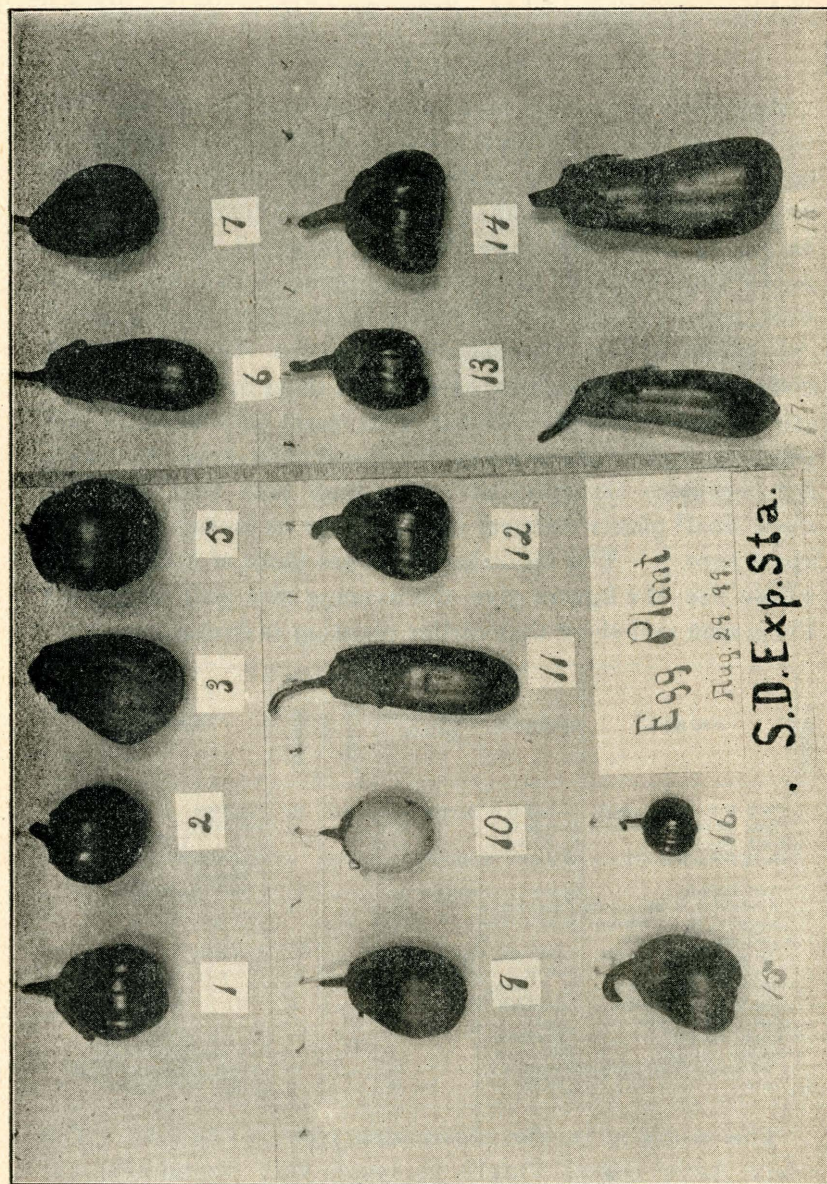


PLATE III—EGGPLANTS, AUG. 29, 1899.



varieties of the New York Improved type are the standard for market, but are late and should be restricted to one fruit per plant. The White was small and productive. The Scarlet Chinese is for ornamental purposes only.

In 1900 seed of some of the above varieties was sown in flats March 15. The drouth prevented transplanting to the field until June 7 and affected the crop. The weights are those of fair sample fruits. Killing frost came September 18. The numbers in the following table refer to the corresponding numbers in Plate IV, only the largest varieties being figured.

No.	VARIETY.	Seedsman.	WEIGHT.		REMARKS.
			Pounds	Ounces	
14	New York Improved..	Landreth.....	2	12	.....
15	N. Y. Impr. Spineless..	Thorburn .....	3	12	Choice, large.
12	New York Purple.....	Salzer.....	2	12	.....
1	New York Improved..	N. K. & Co.....	3	15	Choice, large.
3	Impr. New York White	N. K. & Co.....	2	6	A choice, white variety.
2	Black Pekin.....	N. K. & Co.....		12	Early.
10	White.....	Salzer.....		10	Choice, small, white.
11	Early Purple.....	Salzer.....		8	.....
18	Round Purple.....	Thorburn .....		8	.....

Seed for the variety test in 1900 was sown March 27, in the forcing house and transplanted into flats April 25. The transplanting into the field was delayed by the drouth until June 13, and the season continued dry for some time. In the following table the numbers refer to those given in Plate V; the date to that of the first fruits of edible size; the weights give those of the best fruits. The plants were set 2 by 4 feet and no manure or irrigation given. The fruits averaged larger, but only about a week later than those of the corresponding varieties started March 14. About fifteen plants were set of each variety. The small-fruited varieties ripened four to five fruits each, the larger one to two fruits each. It is worth the extra effort necessary to raise some of the large, but late varieties, as but a few plants are needed for the home garden. To be certain of fruit in seasons of early frost it will be best, at least for the northern part of the state, to raise some of the small but early varieties.



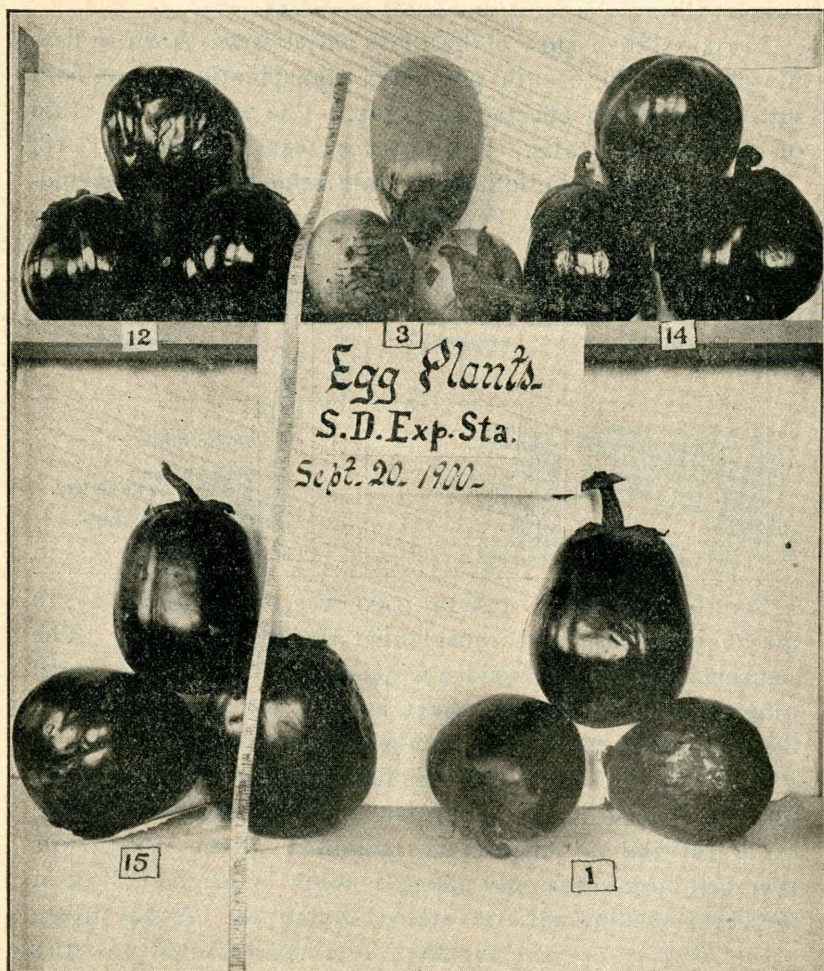


PLATE IV—EGGPLANTS, SEPT. 20 1899.





PLATE V—EGGPLANTS, SEPT. 20, 1900.



# EGGPLANTS.

NO.	VARIETY.	SEEDSMAN.	DATE FIRST EDIBLE.	WEIGHT		REMARKS.
				Pounds	Ounces	
1	Round French.....	Thorburn	Aug. 22.....	1	....	Productive.
2	Louisiana Purple.....	California Seed Store.	Sept. 3.....	2	4	Choice, but too late.
3	Black Pekin.....	Thorburn	" 3.....	10	....	
4	Very Early Dwarf Purple.....	Gregory	Aug. 10.....	5	....	Very early, small, productive.
5	Long Purple.....	Thorburn	" 22.....	15	....	
6	Early Long Purple.....	Burpee	" 22.....	9	....	
7	Early Purple.....	Salzer.	" 22.....	8	....	
8	Early Round Purple.....	Iowa Seed Co.	" 22.....	11	....	
9	Early Dwarf Round Purple.....	Burpee	" 10.....	6	....	Choice, early, small.
10	Landreth's Thornless Large Round Purple.....	Landreth	Sept. 3.....	2	5	Late, large, choice.
11	D. M. Ferry & Co's Improved Large Purple.....	Ferry	Aug. 22.....	3	8	Late, excellent, large.
12	Fordhook Improved Spineless.....	Burpee	Sept. 3.....	2	....	Choice, late.
13	White's Improved Long Purple Spineless.....	White	Aug. 22.....	2	....	Choice, late.
14	Livingston's Mammoth Purple.....	Livingston	" 22.....	2	4	Choice.
15	New Jersey Improved Large Purple.....	J. & S.	Sept. 3.....	2	8	Choice, but late.
16	Improved New York Purple.....	Thorburn	" 3.....	2	8	Choice, late, large.
17	New York Purple.....	Salzer	Aug. 22.....	13	....	
18	New York Improved.....	Salzer	" 22.....	2	5	Choice, late, large.
19	New York Improved.....	Landreth	Sept. 3.....	2	14	Choice, late, large.
20	New York Improved Spineless.....	Henderson	" 3.....	3	....	Choice, late, large.
21	Striped.....	Thorburn	" 3.....	11	....	Striped, purple and white.
22	Long White.....	Thorburn	Aug. 22.....	1	....	Productive, choice.
23	Round White.....	Thorburn	" 15.....	8	....	Choice, small, productive.
24	White Pearl.....	Thorburn	Sept. 3.....	1	6	Not productive.
25-27	White.....	Salzer	" 3.....	7	....	Productive, choice.
26	Improved New York White.....	N. K. & Co.	" 3.....	1	15	
28	Scarlet Chinese.....	Thorburn	Aug. 22.....	5	....	For ornament only, productive.
29	U.S. Department 2004.....	Agr. Department.....	" 14.....	14	....	Choice, the most productive.

## PEPPERS, 1899.

Peppers are but little grown in home gardens, especially in the northern part of the state, although they are in good demand. For the home garden the seed may be started in hot beds or in boxes in a sunny window and transplanted to the field when all danger from frost is past.

Maximilian De Loup in his "American Salad Book" describes pepper salads and states that the use of green or uncooked peppers is becoming more general each year as their good qualities are better known, and new ways of serving them are discovered; that their healthfulness is acknowledged by all, and when once their use becomes familiar, a dinner is considered incomplete without them in some form; that peppers vary greatly in flavor, some being as mild as lettuce and others very fiery; that most of the strong and fiery qualities of a pepper are in the seeds and veins, so that by removing these parts almost any pepper can be made edible; that peppers are always peeled by those who know best how to use them, as peeling improves the flavor wonderfully and that peeling is easily done with a small sharp pointed knife.

In the following test the seed was sown in flats in the forcing house March 31, 1899, the seedlings potted into 2-inch pots May 18 and set in the field June 17.

The numbers in the following notes refer to the numbers in Plate VI. Nos. 78 and 80 were from Landreth; No. 82 from Thorburn; all the others from Northrup, King & Co.



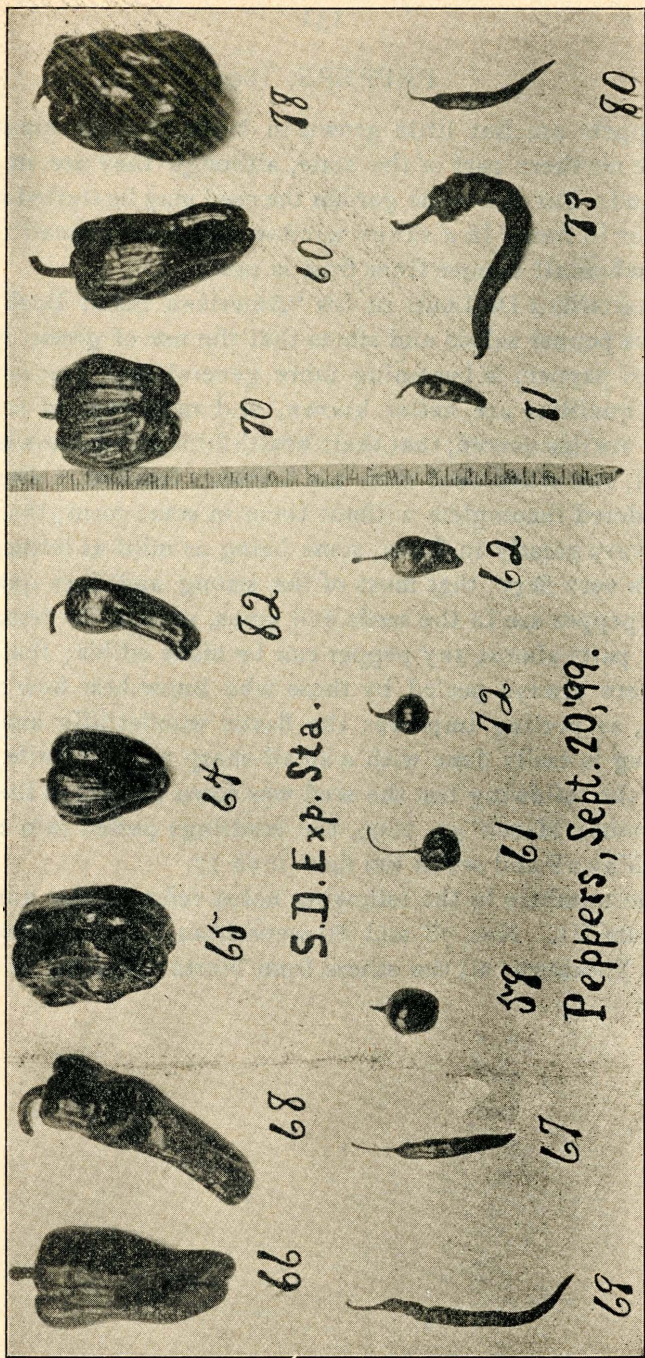


PLATE VI—PEPPERS, SEPT. 20, 1899.



# PEPPERS.

No.	VARIETY.	FIRST RIPP.	FRUIT NOTES.
73	Cardinal .....	September 10.....	Too late.
80	Cayenne .....	August 23.....	Medium size, very fine, productive; the second best of the smaller sorts.
62	Celestial .....	September 7.....	Very small, very productive, but too late to ripen well.
64	Golden Dawn .....	September 7.....	Very productive, good for green peppers, but too late to ripen well.
61	Kaleidoscope.....	September 7.....	Very small, extremely productive; but too late.
60	Large Bell or Bull Nose .....	September 1.....	Of good size, but much dry rot; moderately productive, large, but too late.
63	Large Golden Upright.....	September 7.....	Very large and a heavy yielder; good for green peppers; too late to ripen well.
78	Large Sweet Spanish.....	September 1.....	Very productive, but much dry rot, fine for green peppers; too late to ripen well.
59	Oxheart .....	September 1.....	Small, not productive.
72	Red Cherry .....	August 23.....	Productive, medium size; bright cherry red; upright habit, but stems break in wind.
69	Red Cayenne .....	September 10.....	Very productive, but too late to ripen well.
67	Red Chili.....	September 1.....	Very small, of strong growth, very productive; the third best small sort.
65	Ruby King.....	September 1.....	Very productive, good for green peppers; does not ripen well.
70	Sweet Mountain.....	September 1.....	Large, very productive; sets too many fruits.
82	Sweet Spanish.....	September 7.....	Productive, but too late.
68	Sweet Spanish.....	September 7.....	Very productive, much dry rot, too late to ripen well.
71	Yellow Chili .....	August 1.....	Small, early, very productive; the best small sort this year.

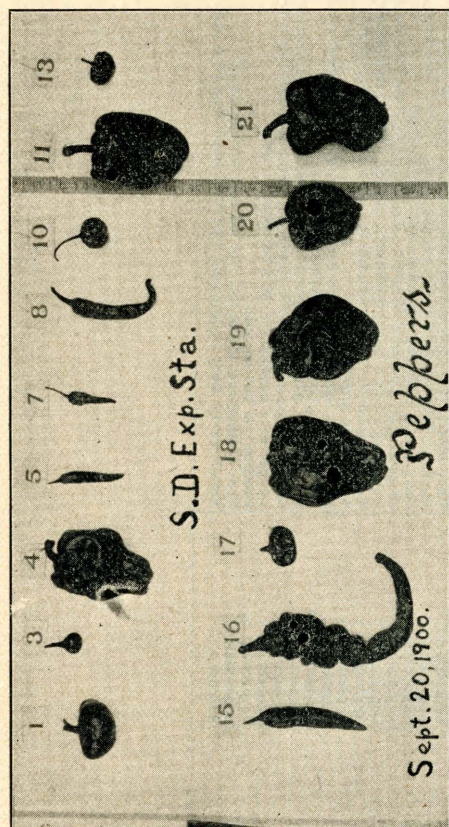


PLATE VII—PEPPERS, SEPT. 20, 1900.

# PEPPERS, 1900.

Seed sown in greenhouse March 29, 1900; transplanted to flats April 25, set in field June 13; season very dry at first. The numbers refer to Plate VII.

No.	VARIETIES.	SEEDSMAN.	FRUIT NOTES.
1	Metcalf Squash.....	Farquhar .....	Medium, tomato shaped, thick fleshed; very productive.
3	Red Cherry.....	N. K. & Co.....	Small, round, bright red, fairly productive.
4	Sweet Mountain.....	N. K. & Co.....	Large, fine, productive.
5	Red Chili.....	N. K. & Co.....	Small, long, productive; our best small red variety.
7	Yellow Chili.....	N. K. & Co.....	Small, long, productive; our best small yellow sort.
8	Long Cayenne.....	Thorburn .....	Small, long, not early, productive.
10	Kaleidoscope.....	N. K. & Co.....	Small, spherical; very heavy yielder.
11	Long Golden Upright.....	N. K. & Co.....	Large, heavy yielder, but rather late.
13	Burpee's Mikado.....	Burpee.....	Small, flat, wrinkled; productive.
15	Black Nubian.....	Burpee.....	Small, long slender black, productive.
16	Elephant's Trunk.....	Burpee.....	Medium, long, much wrinkled; late but very productive.
17	Oxheart.....	N. K. & Co.....	Small, flat; productive but late.
18	Maule's Improved Ruby King.....	Maule.....	Large, very productive; good sort.
19	Ruby King.....	Thorburn .....	Large, our best large red; plant early.
20	Golden Dawn.....	Burpee.....	Large, our best large yellow; plant early.
21	Golden Queen.....	J. & S. ....	Large, but late.



## CAULIFLOWER.

The seed was sown April 24, 1899, under glass in a cold frame. The plants were set in field June 5 and given good field cultivation the same as for cabbages. Care must be taken when the heads begin to form to tie up the leaves over it, otherwise the sun burns and browns the white heads, making them rank in flavor and unfit for market. Cauliflower is one of the choicest of vegetables and should be more commonly grown in Dakota gardens.

VARIETY.	Seedsman.	First Fit for Use.	NOTES.
Autumn Giant .....	Salzer .....	Sept. 8...	Headslarge, somewhat broken, quite late.
Salzer's Earliest Surehead	Salzer .....	Aug. 15 ..	A very reliable header, heads small, but a good early variety.
Early Paris .....	Salzer .....	.....	Plants good, but failed to head.
Salzer's Midsummer .....	Salzer .....	Aug. 22 ..	Heads of good size, but somewhat loose and leafy.
Early La Crosse Favorite.	Salzer .....	July 20...	Heads variable, some leafy; a good header.
Ex. Early Danish Snowball	Salzer .....	Aug. 10 ..	A good early variety.
N. K. & Co's. Model .....	N. K. & Co.	Aug. 10 ..	A reliable header; heads extra choice.
Early Dwarf Erfurt .....	Salzer .....	July 29...	A reliable header; heads small but choice.
Early Snowball .....	Salzer .....	Aug. 20 ..	A reliable header; heads small but choice.
Burpee's Best Early .....	Burpee .....	Aug. 10 ..	Heads variable, of good size.

## KOHL-RABI.

This is one of the vegetables that is much neglected in Dakota gardens and yet it is easily grown. It is a near relative to the cabbage, but the part eaten is the turnip-like swelling formed just above the surface of the ground. These heads should be used when young, before they get woody. Seed of three varieties was started April 24 in a cold frame, and the plants set in field June 5.

Salzer's Purple Vienna; Salzer. Edible July 5. Heads dark purple, 1 to 2 pounds. Valuable for early use.

Short Leaved White Vienna; Henderson. Edible July 15. Heads white, 1 to 2 pounds. Good early variety.

Early White Vienna; Salzer. Edible July 15. Heads white, 1 to 2 pounds. Good second early variety.

The same varieties were sown in drills in the field May 6, and were ready for use from July 15 to August 1.

## KALE.

Kale is a near relative of the cabbage which does not head, but forms an abundance of leaves which are cut and used as greens. The leaves endure severe frost in the fall. The plants may be handled the same as cabbage, but good results were obtained in the present case by sowing out doors in drills May 6, 1899, and thinning. Extra Curled Dwarf German and Dwarf Curled Scotch from Landreth and Brown German from Henderson were considered the most desirable of the ten varieties tested.

## SWEET CORN.

Twenty-two varieties of sweet corn were planted May 31, 1899, in rows four feet apart, and the stalks thinned to nine inches apart in the row. Of the following list, Early LaCrosse Sweet, Mexican Sweet, Lackey's Early Sweet and Telephone Sweet were our choice in order of preference:

VARIETY.	SEEDSMAN.	Ready for use	Length of ears in inches	Number of Rows	Weight of ear in ounces.	YIELD.
Early Crosby Sugar.....	Landreth .....	Aug. 26	7½	12	6	.....
Early LaCrosse Sweet .....	Salzer .....	" 10	6½	8	6	Very productive.
Cory.....	Gregory .....	" 16	7	8	8	Very productive.
Country Gentleman.....	Thorburn .....	" 29	6	20	5	Kernels small.
Crosby Early.....	Thorburn .....	" 26	5¾	14	5	Kernels small.
Early Fordhook.....	Burpee .....	" 12	5½	8	5	Very productive.
Early Landreth Market.....	Landreth .....	" 17	5½	8	5	Moderate.
Extra Early Adams.....	Salzer .....	" 15	5½	12	8	Productive.
Extra Early Minnesota Sugar..	Landreth .....	" 12	7	8	5	Very productive.
Extra Early Naragansett Sugar	Landreth.....	" 15	6¾	8	5	Moderate.
First Crop Sugar.....	Gregory .....	" 15	6¾	8	5	Productive.
Hickox Improved.....	Thorburn .....	" 26	6¾	14	6½	Late.
Lackey's Early Sweet.....	Gregory .....	" 10	6¾	8	7	Very productive.
Late Mammoth .....	Thorburn .....	" 29	7½	16	8	Very good, late.
Mammoth White Cory.....	Gregory .....	" 10	6	12	6	Productive.
Mexican Sweet.....	Gregory.....	" 26	6¾	8	5	Very productive.
New Champion.....	Salzer.....	" 16	7½	14	7	Not productive.
New Early Champion.....	Gregory.....	" 17	6½	12	9	Very productive.
N. X. & Co. XXXX.....	N. K. & Co.....	" 15	6¾	16	7	Productive.
Salzer's Northern Pedigree....	Salzer.....	" 16	5½	14	6	Not productive.
Stowell's Evergreen.....	Salzer.....	" 29	7½	14	7	Productive.
Telephone Sweet.....	Salzer.....	" 15	9	10	7	Very productive.



## CUCUMBERS.

Planted May 29, 1899.

VARIETY.	Seedsmen.	Pickling Size.	Slicing Size.	NOTES.
Burpee's White Wonder.....	Burpee.....	Aug. 1..	Aug. 10..	White, smooth, even, fine.
Bismarck.....	Salzer.....	July 27..	" 1..	"
New Extra Early Haskimoso...	Salzer.....	Aug. 1..	" 5..	A good, early sort.
Early Custer.....	Landreth.....	July 29..	" 4..	"
Early Frame.....	Landreth.....	" 28..	" 5..	"
Early Frame.....	J. & S.....	" 24..	July 29..	Productive.
Everbearing.....	Salzer.....	" 25..	Aug. 1..	"
Early Market.....	Salzer.....	" 25..	" 7..	A fine variety.
Fordhood Improv'd White Spine	Burpee.....	" 29..	" 1..	"
Giant Pera.....	Salzer.....	" 25..	" 1..	Very productive.
Green's Prolific.....	Salzer.....	" 25..	" 10..	"
Giant of Pera.....	J. & S.....	Aug. 1..	" 10..	"
Improved Long Green.....	Salzer.....	July 24..	" 1..	A fine sort.
Improved Long Green.....	J. & S.....	" 24..	" 1..	Very productive.
Jersey Pickle.....	Landreth.....	" 25..	" 3..	Very productive.
Jersey Ex. Early Prolific Pickle	J. & S.....	" 29..	" 3..	Very good.
Japanese Climbing.....	Salzer.....	" 25..	" 1..	"
Landreth's First Early.....	Landreth.....	" 27..	" 5..	"
Landreth's Choice.....	Landreth.....	" 27..	" 1..	"
Long Green Turkey.....	Landreth.....	Aug. 1..	" 5..	"
Long Green Southgate.....	Salzer.....	" 1..	" 5..	"
New White Pearl.....	J. & S.....	" 1..	" 6..	"
New Evergreen White Spine...	J. & S.....	" 1..	" 5..	"
New Arlington White Spine...	J. & S.....	" 1..	" 7..	"
New Japanese Climbing.....	J. & S.....	" 3..	" 10..	"
J. & S.'s Perfected Jersey Pickle	J. & S.....	" 5..	" 10..	"
Green Prolific, or Boston Pickling	J. & S.....	July 20..	" 1..	"
Salzer's Boston Pickling.....	Salzer.....	" 27..	July 29..	"
Salzer's Perfection.....	Salzer.....	" 29..	Aug. 1..	Very good.
Salzer's None Such.....	Salzer.....	Aug. 1..	" 5..	"
Salzer's Prolific Pickle.....	Salzer.....	July 25..	" 1..	"
Salzer's Morning Star.....	Salzer.....	Aug. 1..	" 7..	"
Salzer's Earliest.....	Salzer.....	" 1..	" 7..	"
Salzer's Market Garden.....	Salzer.....	" 3..	" 7..	"
Salzer's Long Giant.....	Salzer.....	" 1..	" 8..	"
Salzer's Giant Tailby's Hybrid	Salzer.....	July 28..	" 1..	"
Thorburn's New Everbearing.....	J. & S.....	" 28..	" 1..	Good sort.
Westerfield's Chicago.....	J. & S.....	" 20..	July 25..	"
Peerless or Imp. White Spine...	J. & S.....	Aug. 1..	Aug. 7..	"
White German.....	Salzer.....	" 2..	" 7..	"
White Erfurt Spine.....	Salzer.....	" 3..	" 10..	"
West India Gherkin.....	Salzer.....	" 1..	" 1..	"
Early White Spine Improved.....	Landreth.....	" 3..	Aug. 10..	"
Early Russian.....	N. K. & Co.	July 25..	" 3..	Very early and productive.
N. K. & Co.'s Siberian.....	N. K. & Co.	" 27..	" 3..	Productive.
U. S. Dept. of Agr. 1192.....	U. S. Dept.	Aug. 1..	" 10..	"
Serpent or Snake.....	J. & S.....	Spec'm's	4 in. long	A curiosity.

Improved Long Green. J. & S. One of the earliest and the most productive sort. The fruits were large green and smooth.

Early Russian. N. K. & Co. One day later than Improved Long Green, but a very fine smooth fruit. Very productive.

Green Prolific. Salzer. Fruit rather short, but thick; very good. Ripens early and is very productive.

N. K. & Co's Siberian. N. K. & Co. A very good early sort for both pickling and table use. The vines were rank and productive.

Burpee's White Wonder. Burpee. This is a very attractive variety, being even in size, smooth and pure white. Probably the best general purpose variety.

The following varieties were especially desirable for pickling purposes: N. K. & Co's., Siberian, West India Gherkin, Jersey Extra Early Prolific and the following for table use: Burpee's White Wonder, Green Prolific, Fordhook Improved White Spine, Salzer's Perfection.

### BEETS.

Thirty varieties of garden beets were tested (1899) of which the following early round varieties were considered of especial value: New Meteor from Johnson & Stokes, New Columbia from Vaughan, Faust's Early Crimson and Arlington Favorite from Gregory, Early Bassano, Best of All, Early Blood Turnip, Bastian's Extra Early and Early York from Salzer. Of the long tapering beets, N. K. & Co's Market Garden from Northrup, King & Co., and Salzer's Red Beauty from Salzer.

### SWISS CHARD.

One variety of Swiss Chard or Silver Leaf Beet from Salzer was grown among the beets. It made a strong growth and produced an abundance of leaves. The part eaten is not the root, but the midrib of the leaf which is prepared much the same as asparagus. The flavor is distinct from that of the ordinary beet root. Swiss Chard is a choice vegetable that is very easily grown and should be found in every home garden.

### OKRA.

Okra or "Gumbo" is but little grown in Dakota gardens. In the south it is much relished for soups and is also





PLATE VIII—OKRA, JULY 29, 1899.

canned for winter use. The pods are gathered when about half grown before they become woody and are very mucilaginous when sliced and cooked. The ripe seeds are sometimes parched and used instead of coffee. The seed of ten varieties was sown in drills two inches deep in rows three feet apart, May 6, 1899. This was earlier than is usually advisable, as the plants are tender against frosts. The numbers in the following table refer to Plate VIII. Numbers 1, 4, 6 and 8, were from Johnson & Stokes, the remainder from Landreth:

No.	VARIETY.	FIT FOR USE.	COLOR OF POD	CROP.	NOTES.
2	Dwarf.....	July 25	Dark green.....	Large ...	Choice.
4	Improved Dark Prolific.....	July 25	Dark green.....	Fair.....	Late.
9	Landreth's Long Green Pod.....	July 25	Dark green.....	Fair.....	Pods solid.
7	Long White Pod.....	Aug. 10	Green white.....	Light....	Late.
1	New Lady Finger.....	July 25	Light green.....	Very l'ge	Choice.
3	New South.....	July 31	Dark green.....	Fair.....	.....
8	Perkins' Mammoth Long Podded	July 25	Very dark green	Very l'ge	Pods solid.
10	Prolific.....	July 25	Dark green.....	Very l'ge	Pod solid, ch'ce
6	White Velvet.....	July 28	L'g't gr. to white	Very l'ge	.....
5	White Velvet.....	July 31	Dark green.....	Large....	Choice.



# SUMMER SQUASH.

Seed Planted in Hills May 26th, 1899.

No.	VARIETY.	SEEDSMAN.	FIT FOR USE.	REMARKS.
54	Cream-Colored Crookneck.....	Henderson.....	August 15.....	Very productive.
53	Early Bush.....	Gregory.....	" 8.....	White, size medium.
40	Early Custard.....	N. K. & Co.....	" 7.....	Large, very productive.
51	Early Golden Bush.....	J. & S.....	" 14.....	Light yellow, size medium.
118	English Vegetable Marrow.....	Thorburn.....	" 19.....	Productive, choice.
52	Extra Early Bush.....	Landreth.....	" 19.....	Light yellow, very productive.
56	Golden Bush.....	Gregory.....	" 12.....	Very large, fine, productive.
42	Golden Custard.....	J. & S.....	" 10.....	Medium size, good.
41	Golden Custard.....	Landreth.....	" 15.....	Large, fairly productive.
54	Golden Custard.....	N. K. & Co.....	" 12.....	Large, fairly productive.
64	Golden Summer Crookneck.....	Landreth.....	" 15.....	Choice, productive, not large.
27	Improved Cocozelle Bush.....	Burpee.....	" 19.....	Moderate bearer.
26	Italian Vegetable Marrow.....	Thorburn.....	" 10.....	Productive. See note.
63	Long Golden Straightneck.....	Landreth.....	" 12.....	Good size, choice.
55	Long Island White Bush.....	Henderson.....	" 12.....	Very productive.
67	Mammoth Bush Summer Crookneck.....	Henderson.....	" 10.....	Choice, the largest Crookneck this year.
49	Mammoth White Bush Scallop.....	Gregory.....	" 15.....	Medium size, white, very productive.
62	New Giant or Mammoth Summer Crookneck.....	J. & S.....	" 10.....	Very large, productive.
57	New Mammoth White Bush.....	J. & S.....	" 12.....	Large, white, choice.
45	New Mammoth White Bush Scalloped.....	Burpee.....	" 15.....	Large, white, choice.
50	Silver Custard.....	Henderson.....	" 15.....	Flat, white, medium size.
68	Straightneck Summer.....	N. K. & Co.....	" 10.....	Size, medium, straightneck.
48	Strickler's Summer.....	Gregory.....	" 15.....	Large, light yellow.
47	Strickler's Summer.....	Burpee.....	" 14.....	Good size, dark-yellow.
65	Summer Crookneck.....	Gregory.....	" 15.....	Medium size.
24	Vegetable Marrow.....	Henderson.....	" 10.....	Very large, productive.
58	White Bush Scalloped.....	Henderson.....	" 15.....	Medium size, white, productive.
36	White Pineapple.....	J. & S.....	" 20.....	Very productive and choice.
60	White Pineapple.....	N. K. & Co.....	" 20.....	Very productive and choice.
59	Yellow Bush Scalloped.....	Henderson.....	" 15.....	Rather small.
43	Yellow Pattypan.....	Burpee.....	" 15.....	Small, but very productive.

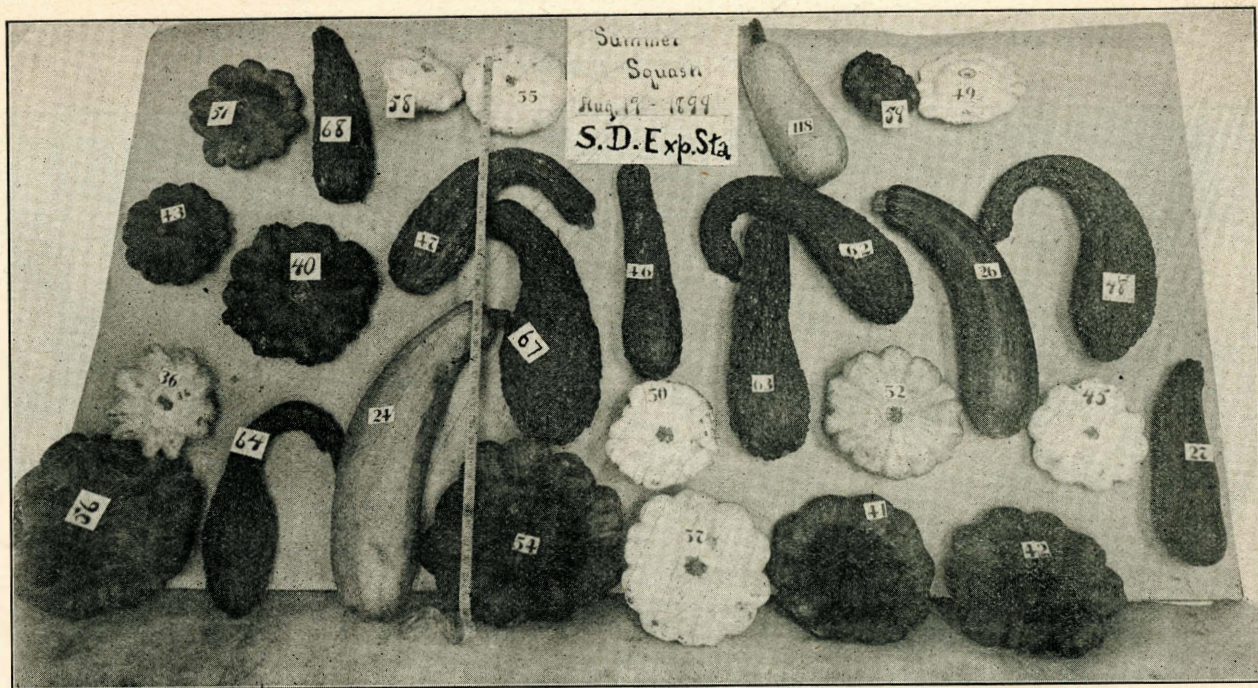


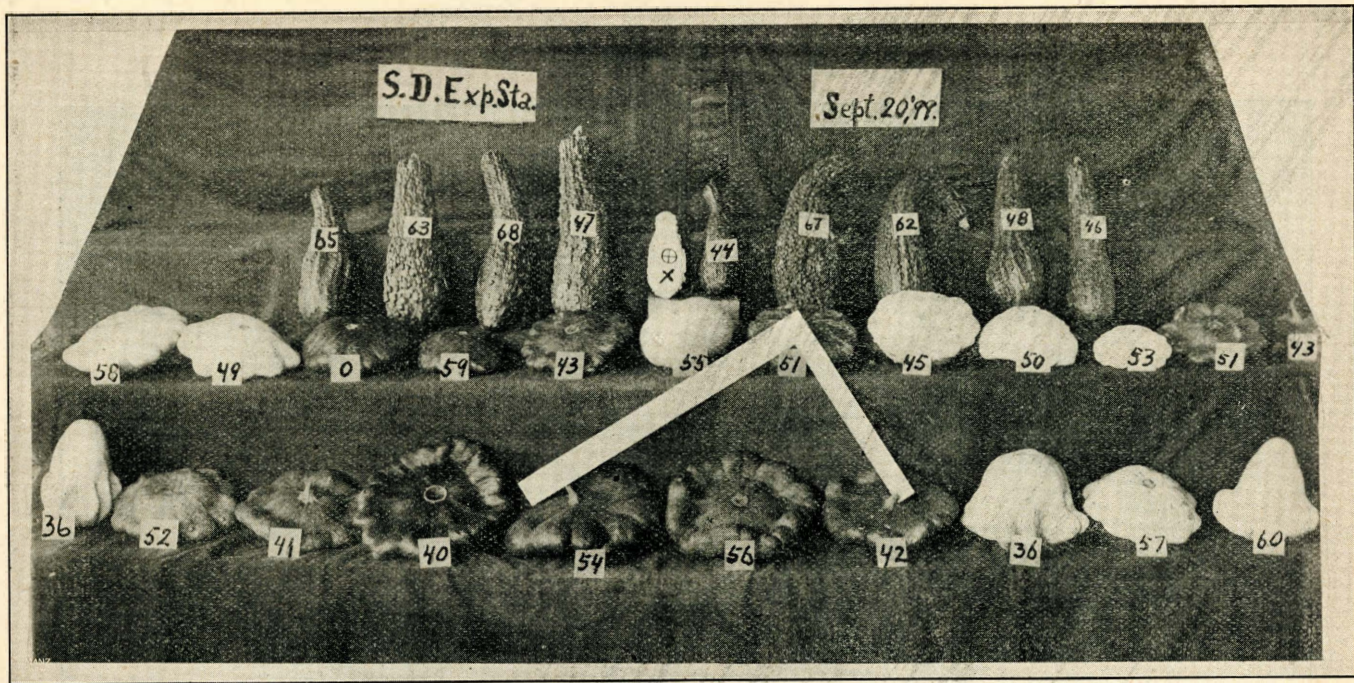
PLATE IX—SUMMER SQUASH, AUG 19, 1899.

Upper Row: Nos. 51, 68, 58, 55, 118, 59, 49.

Middle Row: Nos. 43, 40, 47, 67, 46, 63, 62, 26, 48.

Lower Rows: Nos. 56, 36, end view; 64, 24, 54, 50, 57, 41, 52, 42, 45, 27.





**PLATE X—SUMMER SQUASH, SEPT. 20, 1899.**

Upper Row: Nos. 65, 63, 68, 47, XX, 44 (a Crookneck from seed replanted June 26), 67, 62, 48, 46.

Middle Row: Nos. 58, 49, 0 (a green sport of the bush type), 59, 43, 55, 51, 45, 50, 53, 51, 43.

Lower Row: Nos. 36, 52, 41, 40, 54, 56, 42, 36, 57, 60.

## SUMMER SQUASH.

The Summer Squash in the foregoing table may be roughly divided into three classes, the Crooknecks, Bush Scallops and Vegetable Marrows. All are used before the shell hardens and are easily grown. The Vegetable Marrows especially should be used when less than half grown, as when ripe they are rather dry. In Italy the Italian Vegetable Marrow is used when quite young, hardly the size of small cucumbers.

In planting squash plenty of seed should be used to allow for the ravages of the striped beetle. It is a difficult insect to combat, but dusting the plants with air-slacked lime and tobacco dust is a help. Some good gardeners practice covering the hills at first with mosquito netting. The netting is fastened on an open frame or put on sticks or barrel staves cut in halves, forming a sort of tent. Sprinkling the plants with Paris green water is a help also.





PLATE XI—SQUASH AND PUMPKINS SEPT. 20 1899.

Upper Row: Nos. 83, 14, 3, 34, 14, 69, 5, 33, 84, 28, 108, 85, 82, 79, 103, 110.

Middle Rows: Nos. 25, 88, 2, 4, 16, 10, 106, 61, 15, 28 (two specimens), 37, 21, 35, 31, 39, 18, 6, 76, 17, 11.

Lower Row: Nos. 14, 1, 8, 24, 29, 13, 7, 26, 77, 118, 9, 20.

## VARIETIES OF SQUASH.

The numbers refer to Plate XI.

No. 1, American Turban, Gregory. No. 2, Butman, Gregory. No. 3, Boston Marrow, Gregory. No. 4, Pike's Peak, Gregory. No. 5, Brazil Sugar, Burpee. No. 6, Chicago Warty Hubbard, J. & S. No. 7, Fordhook, Burpee. No. 8, Low's Bay State, Gregory. No. 9, Large Winter Crookneck, Gregory. No. 10, Orange Marrow, N. K. & Co. No. 11, Large Fruited Boston Marrow, Landreth. No. 13, Mammoth Whale, Burpee. No. 14, The Faxon Squash, Gregory. No. 15, The Warren Squash, Gregory. No. 16, Salzer's Improved Hubbard, Salzer. No. 17, Squash No. 7, Gregory. No. 18, Warty Hubbard, Gregory. No. 20, The Marblehead. No. 21, Essex Hybrid, Gregory. No. 22, Hubbard N. K. & Co's Selected Stock, N. K. & Co. No. 24, Vegetable Marrow, Henderson. No. 25, White Chestnut, Gregory. No. 26, Italian Vegetable Marrow, Thorburn. No. 28, The Der Wing, Burpee. No. 29, Canada Crookneck, Gregory. No. 31, Henderson's Delicata, Henderson. No. 33, Dunlap's Early Marrow, Gregory. No. 34, Early Orange Marrow, Burpee. No. 35, Early Prolific Marrow, Henderson. No. 37, Cocoanut, Gregory. No. 39, The Victor, Gregory. No. 61, Perfect Gem, Burpee. No. 118, English Vegetable Marrow, Thorburn.

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PUMPKINS.

No. 69, Big Tom Field, J. & S. No. 76, Cheese Pumpkin, Gregory. No. 77, Calhoun, Thorburn. No. 79, Early Sugar, Thorburn. No. 82, Golden Marrow, Burpee. No. 83, Genuine Mammoth, Burpee. No. 84, Gibson, Gregory. No. 85, Golden Oblong, J. & S. No. 88, Japanese Pumpkin, Gregory. No. 103, Negro or Nantucket, Gregory. No. 106, Quaker Pie, J. & S. No. 108, Sugar Pumpkin, Gregory. No. 110, Small Sugar, J. & S.



## FALL AND WINTER SQUASH.

Of the large fall varieties, the most productive were the Orange Marrow and Boston Marrow. Of winter sorts, Hubbard and Marblehead were the most productive. The various strains of Hubbard tested were all good, the Warted Hubbard being especially desirable.

Of the small varieties, the following were the most productive in the order named. Cocoanut, Henderson's Delicata, Perfect Gem, Canada Crookneck, Der Wing. The Cocoanut was very prolific and a good keeper. Henderson's Delicata and Perfect Gem were good for both early and late use; Canada Crookneck and Der Wing were good keepers. These small varieties should not be neglected, as they will generally give a crop in unfavorable seasons when the larger sorts fail.

Of the pumpkins, Nos. 69, 73, 74, 78, 80, 82 and 95 appeared to be nearly or quite the same, and were all large, yellow and productive. Nos. 83 and 88 are from seed replanted June 26 and are not a fair test as to size. No. 103 was productive, black. The smaller varieties are grown chiefly for table use and were all productive.

## BUSH BEANS.

62 Varieties Planted May 24, 1899.

VARIETIES.	Seedsman.	Edible.	Remarks.
Best of All Bush.....	Landreth..	July 18..	Fair.
Best of All Dwarf.....	Burpee....	July 18..	Fair.
Black Marrow.....	Salzer.....	Sept. 1...	Very large.
Black Valentine.....	Henderson..	July 18..	Very large.
Blue Podded Butter.....	Burpee....	July 18..	Very large.
Boston Market.....	Salzer.....	July 18..	Fair.
Burpee's New Stringless Green Pod Bush.....	Burpee....	July 18..	Fair.
Burpee's Saddle Back Wax.....	Burpee....	July 14..	Fair.
China Red Eye.....	Burpee....	July 18..	Fair.
China Red Eye.....	Landreth..	July 18..	Fair.
Cream Valentine.....	Henderson..	July 18..	Fair.
Crystal Wax.....	Landreth..	July 25..	Fair.
Crystal White Wax.....	Salzer.....	Sept. 2...	Late.
Davis White Wax.....	Burpee....	July 14..	Large.
Detroit Wax.....	Landreth..	July 14..	Fair.
Dwarf German Black Wax.....	Burpee....	July 14..	Moderate.
Dwarf German Wax.....	Landreth..	July 14..	Fair.
Dwarf Horticultural.....	Thorburn..	July 18..	Very large.
Dwarf Kidney Wax.....	Landreth..	July 18..	Fair.
Early Yellow Six Weeks.....	Burpee....	July 18..	Fair.
Early Brown Six Weeks (Bush or Mohawk).....	Landreth..	July 18..	Very large.
Emperor William Bush.....	Burpee....	July 18..	Fair.
Kverbearing or Inexhaustible.....	Burpee....	July 25..	Fair.
Extra Early Red Valentine (best improved round pod.).....	Burpee....	July 18..	Fair.
Goddard, or Boston Favorite.....	Burpee....	July 19..	Very large.
Golden Eye Wax Bush.....	Burpee....	July 18..	Fair.
Henderson's Bountiful.....	Henderson..	July 18..	Very large.
Henderson's Earliest Red Valentine.....	Henderson..	July 18..	Fair.
Improved Extra Early Red Valentine.....	Landreth..	July 18..	Fair.
Improved Golden Wax Bush.....	Landreth..	July 14..	Fair.
Improved Rust Proof Golden Wax.....	Burpee....	July 14..	Very large.
Ivory Podded Wax.....	Salzer.....	July 14..	Very large.
Keeney's Rustless Golden Wax Bush.....	Burpee....	July 20..	Fair.
Kidney Wax Bush.....	Burpee....	July 14..	Fair.
Landreth's Scarlet.....	Landreth..	July 18..	Moderate.
Long Early Six Weeks.....	Landreth..	July 18..	Fair.
Longfellow Bush.....	Henderson..	July 18..	Fair.
Mammoth Yosemite Wax.....	Salzer.....	Aug. 1...	Large.
Ne Plus Ultra.....	Salzer.....	July 18..	Very large.
New Black Eye.....	Burpee....	July 14..	Small.
New Giant Stringless Green Pod Valentine.....	J. & S.....	July 18..	Fair.
New Prolific German Wax.....	Burpee....	July 18..	Fair.
New Valentine Wax.....	Burpee....	July 14..	Fair.
Perfection Wax.....	Burpee....	July 16..	Very large.
Prolific Black Wax.....	Salzer.....	July 18..	Fair.
Refugee or Brown Valentine.....	Landreth..	Aug. 1...	Small.
Rogers' Lima Wax.....	Burpee....	July 20..	Small.
Rogers' Lima Wax.....	Thorburn..	July 20..	Small.
Round Yellow Six Weeks.....	Burpee....	July 19..	Fair.
Salzer's Earliest Wax.....	Salzer.....	July 14..	Fair.
Salzer's Golden Wax.....	Salzer.....	July 19..	Fair.
Salzer's Round Podded Wax.....	Salzer.....	July 14..	Small.
Salzer's Six Weeks.....	Salzer.....	July 18..	Fair.
Stringless Green Pod.....	Landreth..	July 18..	Fair.
Stringless Green Podded.....	Gregory....	July 18..	Small.
Thorburn's Refugee Wax.....	Thorburn..	July 20..	Fair.
Thorburn's Valentine Wax.....	Thorburn..	July 14..	Fair.
Triumph of the Frames.....	Thorburn..	July 18..	Large.
Wardwell's Kidney Wax.....	Salzer.....	July 16..	Large.
White Wax.....	Salzer.....	July 18..	Fair.
White Wax Bush.....	Landreth..	July 20..	Small.
Yosemite Mammoth Wax.....	Burpee....	July 18..	Very large.



## SUMMARY.

Among the wax or yellow podded bush beans the following were especially desirable this season owing to attractiveness and freedom from stringiness of the pod and productiveness of the plants: Perfection Wax, Ivory Podded Wax, Kidney Wax, Detroit Wax, Yosemite Mammoth.

Among the green podded sorts, Henderson's Bountiful, Early Six Weeks, New Giant Stringless Green Pod Valentine, Dwarf Horticultural, Black Valentine; of blue or purple podded, the Blue Podded Butter.

Goddard or Boston Favorite and Dwarf Horticultural are good green shell beans.

# POLE BEANS.

Planted May 29, 1899.

No.	VARIETY.	Seedsman.	Edible.	Snap or Shell.	Length of Pods.	Color of Pods.	Beans in Pod.	REMARKS.
35	Andalusia Market.....	Salzer.....	Aug. 20.	Snap.....	5 to 6 in.	Yellow...	5	Productive, but late.
21	Broad Speckled Sickle.....	Landreth..	" 1.	Shell.....	6 in.	Green.....	6	Very productive.
13	Burpee Sunshine Wax.....	Burpee.....	" 10.	Snap.....	5 in.	Gr. Yel...	4 to 5	Productive and profitable.
14	Burpee's White Zulu.....	Burpee.....	" 1.	Snap.....	6 in.	Green.....	5 to 6	Moderately productive.
18	Creaseback or Fat Horse.....	Landreth..	" 1.	Both.....	6 in.	Green.....	7 to 8	Productive.
32	Cut Short or Corn Hill.....	Salzer.....	" 20.	Shell.....	4 to 5 in.	Green.....	3 to 4	Productive and profitable.
31	Golden Butter Wax.....	Salzer.....	" 10.	Snap.....	4 to 5 in.	Yellow...	5 to 6	Very productive.
27	Golden Cluster Wax.....	Burpee.....	" 20.	Snap.....	3 to 4 in.	Yellow...	3 to 4	Profitable variety.
30	Horticultural.....	Landreth..	" 10.	Both.....	4 to 5 in.	Green.....	6 to 7	Productive, but rather late.
36	Horticultural, Cranberry or Wren's Egg.	Burpee.....	" 10.	Both.....	6 to 7 in.	Green.....	6 to 7	Very productive.
38	Kentucky Wonder.....	Burpee.....	" 10.	Snap.....	7 to 8 in.	Green.....	8 to 9	Very productive.
23	Landreth's Southern Prolific.....	Landreth..	" 10.	Snap.....	4 to 5 in.	Green.....	4 to 5	Very productive.
26	Lazy Wife's.....	Burpee.....	" 20.	Both.....	4 to 5 in.	Green.....	4 to 5	Productive, but rather late.
19	Monstrous Poddied Southern Prolific.....	Landreth..	" 10.	Snap.....	6 to 9 in.	Green.....	8 to 9	Very productive.
29	New Golden Wax Flaglot.....	Burpee.....	" 1.	Snap.....	5 to 6 in.	Yellow...	7 to 8	Very productive.
37	Old Homestead (Improved Kentucky Wonder)	Burpee.....	" 15.	Snap.....	6 to 7 in.	Green.....	6 to 7	Very productive.
17	Red-Speckled, oval-seeded, Cut Short Cornfield	Landreth..	" 20.	Both.....	3 to 4 in.	Green.....	2 to 4	Productive.
34	Salzer's Case Knife.....	Salzer.....	" 10.	Both.....	5 to 6 in.	Green.....	5 to 6	Productive.
33	Salzer's Giant Black Wax.....	Salzer.....	" 10.	Snap.....	5 to 6 in.	Yellow...	4 to 5	Very productive.
24	Scarlet Kanner.....	Burpee.....	" 15.	Shell.....	5 to 6 in.	Green.....	2 to 4	Not productive.
39	Southern Prolific Pole (Kentucky Wonder)	Burpee.....	" 18.	Both.....	6 in.	Green.....	8	Very productive.
12	Southern Prolific.....	Salzer.....	" 10.	Snap.....	5 in.	Green.....	7 to 8	Very productive.
20	Tall German Wax.....	Landreth..	" 15.	Snap.....	4 to 5 in.	Yellow...	4 to 5	Very productive.
28	White Creaseback or Best of All.....	Burpee.....	" 1.	Both.....	5 to 6 in.	Green.....	8	Profitable.
25	White Dutch or Case Knife.....	Landreth..	" 15.	Both&dry	5 to 6 in.	Green.....	8	Not productive.
22	Willing's Pride.....	Salzer.....	" 1.	Snap.....	7 in.	Green.....	8	Productive.
15	Yard Long.....	Salzer.....	" 10.	Shell.....	6 in to 2 ft	Green...	12 to 15	Not productive.
16	Yard Long or Cuban Asparagus.....	Burpee.....	" 18.	Shell.....	8 to 10 in.	Green...	7 to 8	Not productive.



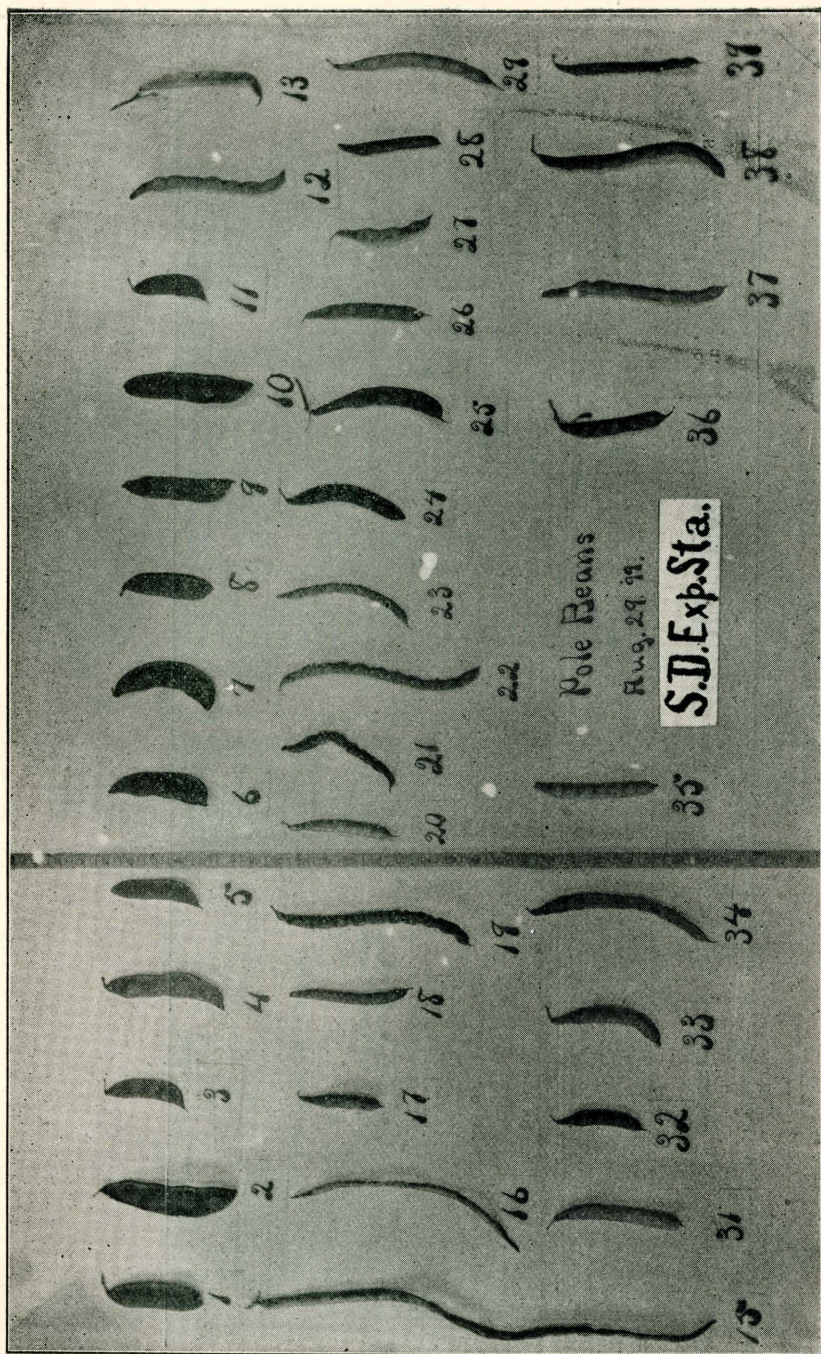


PLATE XII—POLE BEANS, AUG. 29, 1899.

## POLE BEANS.

The numbers in the preceeding table refer to plate XII.

New Golden Wax Flageolet, Burpee was without doubt the best wax or yellow podded pole bean tested. Large, light yellow, smooth pods were produced in great abundance, both early and late, a valuable and very profitable sort.

Golden Butter Wax, Salzer. A rank grower, and very productive sort. Pods medium sized, yellow, choice. A splendid sort.

Burpee's White Zulu, Burpee. The choicest early green podded sort in the test. Pods long, broad, flat, and light green. Only moderately productive.

Salzer's Giant Black Wax, Salzer. A very productive variety of the green podded sorts. Pods medium sized, beans dark to black. An excellent market sort.

Of the shell beans the following were productive, and considered especially desirable: Broad Speckled Sickle, Landreth, Horticultural Cranberry or Wren's Egg, Burpee and Lazy Wife's Burpee.

## POLE LIMA BEANS.

Eleven varieties were planted May 29, 1899. The poles were set 4 by 6 feet. Killing frost came Sept. 18. Lima beans are of finer quality than common pole beans, but harder to raise in this latitude. The Early Black Lima from Burpee and Improved Early Lima from Salzer were the best of those tested, but hardly profitable. The others were all too late for profitable culture here. The numbers refer to Plate XII.

No.	VARIETY.	SEEDSMAN.	FIT FOR USE.
11	Caroline or Sewer .....	Landreth .....	Aug. 24....
1	Challenger Lima .....	Landreth .....	Aug. 24....
5	Early Black Lima .....	Burpee .....	Aug. 20....
4	Extra Early Jersey .....	Landreth .....	Aug. 28....
2	Ford's Mammoth Podded .....	Burpee .....	Aug. 24....
8	Improved Early Lima .....	Salzer .....	Aug. 24....
7	King of the Garden .....	Burpee .....	Aug. 24....
10	King of the Garden .....	Salzer .....	Aug. 24....
6	Large Lima Pole .....	Landreth .....	Aug. 24....
9	Large White Lima .....	Landreth .....	Aug. 28....
3	Willow Leaf Lima .....	Burpee .....	Aug. 28....



## DWARF LIMA BEANS.

Seed was planted May 24, 1899. Killing frost came September 18.

VARIETY.	SEEDSMAN.	FIT FOR USE.	BEANS.
Burpee's Bush.....	Burpee.....	Aug. 24....	Large white.
Henderson's Bush.....	Henderson....	Aug. 24....	Small white.
Dwarf Carolina.....	Landreth.....	Aug. 24....	Small white.
Jackson's Wonder.....	Burpee.....	Aug. 24....	Small brown black mottled.
New Wonder Bush.....	J. & S.....	Aug. 20....	Large white.
Thorburn's Dwarf.....	Thorburn.....	Aug. 24....	Large white.

It is sometimes recommended to plant lima beans with the eye down; some of Burpee's and Henderson's were tested this way, but no difference was observable from those planted in the ordinary way. Frost came late this year so that there was a large crop of green-shelled beans. But in seasons of early frost it is evident that bush limas are too late for profit. The fine flavor of limas makes them worthy of trial for the home garden, and the bush limas do better here than the pole limas.

## ENGLISH BROAD BEANS.

English broad or dwarf beans are largely cultivated in Europe. They can be sowed quite early and are not so sensitive to frost as the common bush beans. The beans are eaten as shelled either green or when dry. Seed of the following varieties was planted May 24, 1899. The plants made a strong growth but were attacked so much by blister beetles that it was found necessary to spray with a Paris green solution June 29. The general northwestern experience that broad beans lack too much in productiveness to be worthy of cultivation, is confirmed by the following test:

Broad Windsor, Landreth. Edible Aug. 10. The pods were from 3 to 3½ inches long, dark green, containing from 3 to 4 beans. The plants grew to be about 3 feet high, very rank but not productive.

Early Mazagan Long Pod, Landreth. Edible July 20. The pods were 1 to 1½ inches long, green, and each con-

tained from 2 to 3 beans. The plants grew to be about 3 feet high, were rank, but not productive.

Green Windsor, Thorburn. Edible July 18. The pods were from 2 to 2½ inches long, green, and each contained 3 beans. The plants grew to be about 3 feet tall, were rank but not productive.

Sword Long Pod, Thorburn. Edible August 1. The plants grew to be about 3 feet tall, were very rank, but not productive.

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#### MISCELLANEOUS VEGETABLES.

The following vegetables were planted in the spring of 1899. Some others were grown, especially some from Turkestan, Russia and China, but as no seeds are commercially obtainable, report is deferred until seeds can be grown from the roots saved.

**Artichoke.**—The Globe or French artichokes are perennial plants and are very popular in Europe and some parts of the far south. The part eaten is the large flower bud which forms the year after planting. Seed of three varieties were planted May 6, 1899, but the plants all froze out the first winter in spite of careful mulching.

**Chives.**—This is a species of onion (*Allium Schoenoprasum* L.) which forms a low, thick clump of slender grass-like hollow leaves which are used for flavoring. The flowers are violet-red. The plant lives over from year to year and furnishes leaves for cutting very early in the spring. Several clumps from Salzer were planted in the spring of 1899, made a good growth and proved hardy the following winter without protection or mulch of any kind. The clumps should be taken up, divided and replanted every two or three years, to keep up a vigorous growth. This is the "Schnittlauch" of the Germans.

**Dandelion.**—Dandelion is one of the old-fashioned plants for greens in early spring, but the improved sorts are worthy of cultivation. Improved Thick-leaved, French Garden and Endive-leaved from Thorburn, Arlington from



Gregory, and Cabbaging and French Garden from Landreth made a good growth during the season, and came through the following winter in good condition. In the spring the leaves were blanched, either by inverting flower pots over the plants, or by two boards inverted trough-fashion over the row. Blanched dandelion leaves are more tender and less bitter than those not blanched.

**Endive.**—Endive makes a good salad for late use. Broad-leaved from Landreth, and Green Curled and Moss Curled from Landreth and Salzer were grown. The plants endured summer drouth remarkably well. When the leaves reach full size they are blanched. Three methods were tried, covering with inverted flower pots or two boards inverted trough fashion and tying up the leaves. The latter method was preferred. The curled-leaved varieties can also be used as a garnish for table vegetables.

**Herbs.**—A number of herbs of spicy, aromatic taste and odor are much used for flavoring and seasoning in culinary operations and they should be more commonly grown in Dakota gardens. The following were sowed this year and made a good growth: Borage, Sweet Fennel, Curled Chervil from Thorburn, and Coriander, Summer Savory, Sage, Sweet Marjoram, Sweet Basil, Thyme, Fennel, Anise, Dill, Borage, all from Landreth. Several other kinds were planted, but did not germinate. Some herbs are used for flavoring only and others have medicinal value also. Those who have eaten chopped meat seasoned with sage or thyme, cucumber pickles flavored with dill, German "lebkuchen" or honey cakes flavored with cardamon seeds, cookies flavored with anise seed, lettuce mixed with a few finely cut borage leaves, or rye bread, cottage cheese or pickled beets seasoned with caraway seeds, will usually agree that some herbs at least are useful plants for the kitchen garden aside from their medicinal value.

**Ice Plant.**—The Ice Plant (*Mesembryanthemum cristalinum*) gets its name from the crystalline ice-like covering of the leaves. In hot countries the leaves are used as a salad

or boiled the same as spinach. Seed was sown out doors May 6; the plants formed a thick spreading mass of small, thick, fleshy leaves one foot high and three feet across. Drouth did not affect their growth in the least. Salads are so much a matter of individual taste that it may be hazardous to venture an opinion, but Ice Plant either raw or boiled was not to our taste. But the plant is worth growing in hanging baskets and in the flower garden for the odd foliage.

**Martynia.**—Three varieties of Martynia or Proboscis flower, from Thorburn, were planted in the garden May 6. *M. craniolaria*, *proboscidea*, and *lutea*, blossomed early in July and produced an abundant crop of long, curved, pointed pods. These pods are used for pickles when young and tender.

**Mustard.**—White London, Chinese Broad-leaved, Black Giant Southern Curled, from Thorburn, and Bloomsdale Large-leaved, from Landreth, were sowed and furnished an abundance of leaves. The plants ran to seed early. A few leaves added to lettuce gives flavor to the salad. The young leaves of Chinese Broad-leaved and Bloomsdale Large-leaved are used as a salad, and the older and larger leaves boiled like Spinach.

**Nasturtium.**—The dwarf and tall nasturtium are popular flowers, and the green seed-pods are good for use in pickles. Dwarf yellow and tall yellow from Landreth sowed June 8, produced pods fit for pickling by the middle of August.

**New Zealand Spinach.**—New Zealand Spinach, from Thorburn and Burpee, made a strong, spreading growth and produced an abundance of crisp, tender leaves after common spinach had run to seed and up to the time of frost. Dry weather did not affect the growth. This plant merits attention.

**Parsley.**—The new Fern-Leaved, Extra Curled Dwarf, and Fine Double Curled and Plain or Single, all from Burpee, made a good growth. Some combine the useful with the ornamental by planting the fine leaved parsley as edging to flower beds. The Turnip-rooted or Hamburg Parsley from Burpee was also tested. This is a variety in



which the root is the part eaten and may be stored for use during winter.

**Roquette.**—The leaves of Roquette or Rocket Salad are used for salad. Seed from Thorburn was planted and made a good growth, but the flavor of the leaves either raw or boiled was not at all to our taste.

**Salsify or Oyster Plant** has been grown often at this station, and are considered one of the sure crops. The roots are best dug in the fall and stored in cellar for winter use; they may be left in the ground until spring, but fall digging is better. Sandwich Island and Long French, from Landreth; Wisconsin Golden, from Gregory, and Mammoth Sandwich Island from Vaughan, were tested, and all made a good crop.

**Scolymus.**—Scolymus is a vegetable with spiny, thistle-like leaves, from Spain, with roots much like a small parsnip and keeping equally well in winter. Seed from Thorburn, planted May 6, made a good growth, but the spiny leaves made it an unpleasant crop to handle.

**Skirret.**—This is called "Zuckerwurzel" (Sugar root) in Germany. The plump, fleshy roots are sweet and used boiled during winter, the same as Salsify. Seed from Thorburn were a thin stand; the roots made good growth.

**Sorrel.**—Two varieties were tested. Mammoth Lyons and Large French from Thorburn. Seed sowed May 6 formed dense clumps of leaves about one foot in height; the leaves endured severe frosts in the fall, many being good October 20. The acid leaves are used boiled, the same as Spinach, and is often mixed with Spinach to give it flavor.