Georgia Coastal Plain Experiment Station

S. H. STARR, Director

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Sweet Potato Culture in the Coastal Plain of Georgia

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By

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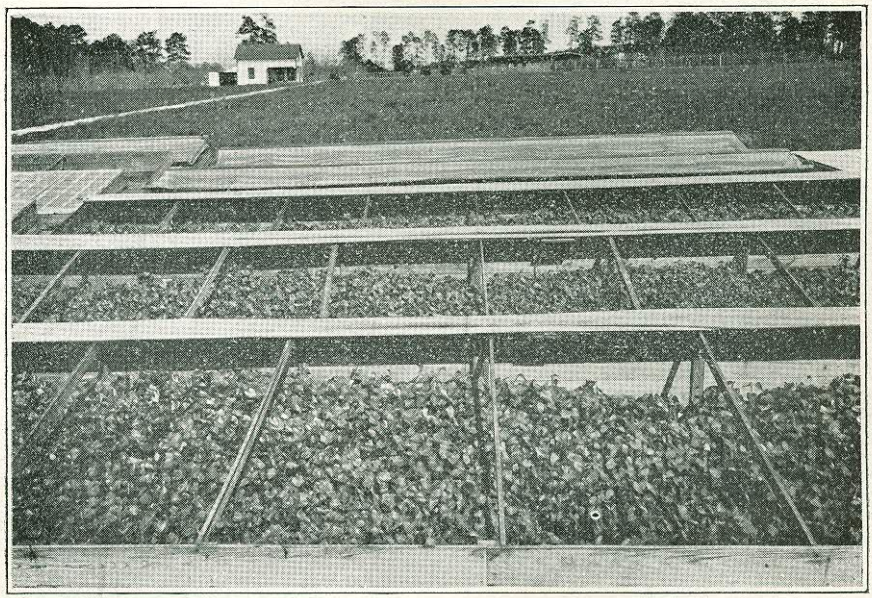

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IMPORTANCE OF THE CROP

For many years the sweet potato has been the most important truck crop in the South. Approximately 80 per cent of the entire crop is produced in what is commonly termed the cotton belt, although this section ships only about 30 per cent of the total carlot shipments and markets in carlots less than four per cent of its total production. This seems to indicate that the bulk of the southern crop is grown for local consumption rather than for shipment. However, it is not so much the fact that it is grown for home consumption as that there has not been created a demand for the southern sweet potato in the large consuming centers of the North.

Lack of conformity in many instances to established marketing principles has created a general reputation for poor grading, loose packing, unattractive packages and improper car loading. This condition is responsible to some extent for the slow progress that has been made in creating a general demand for one of our most widely adapted southern truck crops.

Approximately 115,000 acres of Georgia's farm lands are planted annually to sweet potatoes with a resulting crop valuation over a period of years of slightly less than eight million dollars.

A decidedly greater portion of the sweet potato crop of Georgia is produced in the coastal plain area, therefore the data embraced in this publication, which covers a ten-year period of study and observation, should be of particular interest to farmers of South Georgia.

ADAPTATION

The sweet potato thrives best in the warmer portions of the United States and is especially adapted to the coastal plain section of Georgia where the seasons are mild, the growing period long, the rainfall liberal and the soils of a light sandy nature.

TABLE I.—RAINFALL AT TIFTON, GEORGIA

This table shows the number of inches of rain received each month during the years 1923 to 1931 inclusive.

MONTH	1923	1924	1925	1926	1927	1928	1929	1930	1931	Avg. Mo. Rainfall
January	7.04	5.77	8.76	11.02	.38	1.36	5.11	5.41	2.54	**5.01**
February	1.97	4.43	2.37	4.66	2.93	7.39	4.45	2.56	2.75	**3.81**
March	5.24	4.82	.69	8.30	2.93	5.55	6.19	5.70	2.84	**4.64**
April	1.38	5.41	1.28	3.55	2.58	11.57	3.69	5.95	2.92	**3.86**
May	4.67	1.52	2.88	3.35	.66	3.41	2.34	1.20	3.24	**3.03**
June	8.87	6.50	6.00	2.88	8.40	4.27	7.04	7.22	2.48	**5.66**
July	4.51	5.43	3.34	7.56	6.70	7.93	4.87	5.62	7.11	**5.88**
August	4.14	3.21	1.94	4.20	9.66	18.36	3.29	3.82	4.77	**5.56**
September	1.05	12.01	2.91	2.86	.74	6.72	6.41	3.78	1.56	**3.95**
October	.58	1.01	6.63	1.13	.55	.40	3.31	.23	1.47	**1.91**
November	2.01	.26	2.93	4.02	.92	1.11	4.16	2.84	.00	**1.90**
December	2.17	6.63	4.65	2.39	7.70	2.48	4.36	3.72	2.73	**4.15**
Total for Year	**43.63**	**57.00**	**44.38**	**55.92**	**44.15**	**70.55**	**55.22**	**48.05**	**34.41**	

SOIL TYPES

The sandy loam soils underlaid with a firm subsoil, such as Tifton, Norfolk and closely related types, are ideal for sweet potato production; the further away from this type, the poorer the results will be. Clay soils and deep sands are poorly adapted.

CROP ROTATION

Crop rotation in growing sweet potatoes is important from the standpoint of maintenance of soil fertility, increased production and disease control.

A rotation in which sweet potatoes are grown on the land only once in four or five years, combined with seed selection and proper plant-bed sanitation, is effective in preventing loss from diseases.

By following a rotation in which green manures are turned under and by leaving the potato vines on the land, the heavy feeding habit of this crop may in a measure be counteracted and soil impoverishment avoided.

PREPARATION OF THE LAND

The type of soil on which sweet potatoes are usually grown is not difficult to prepare. It should be turned to a depth of six or seven inches when the soil is sufficiently dry to pulverize well, and then harrowed thoroughly. The number of harrowings required to put the land in good condition will depend on the nature of the soil and the amount of litter turned under. When the work of harrowing the land has been completed, the rows should be laid off three to three and one-half feet apart, the fertilizer applied, mixed with the soil, and listed on with a turn-plow or some implement that will throw the bed up to the desired height, and a light pole, long enough to extend over several rows, should then be dragged over the tops of the ridges. The

pole should be only heavy enough to level the beds slightly so that the plants will not roll off when dropped. This should be completed several days previous to the time of planting to permit the soil to settle or become firm in the bed.

SWEET POTATO VARIETIES

A study of sweet potato varieties has been in progress since 1922. This study embraces comparative yields of early and late harvestings of a large number of varieties.

Early Production of Sweet Potato Varieties: There are two very distinctive types of sweet potatoes. The one in general use in the South is the yam type, which is soft, juicy and carries a relatively high sugar content, while the potato preferred in the North is dry, mealy and low in sugar content. Varieties in this group are commonly referred to as the Jersey type.

The market on which the potato is to be sold will determine the type that should be grown. Southern markets do not accept the Jersey type and Northern markets accept the yam type only in a limited way. Therefore, in the light of data resulting from the test with early yields, as shown in Table I (a), it is recommended that Porto Ricos be used for southern markets and either Yellow Jersey or Big Stem Jersey for Northern markets. As will be seen in the accompanying table, Yellow Jersey has produced a higher yield than has the Big Stem, although in view of the fact that it has not been included in the test as many years and, further, that its acceptance on the market in competition with the Big Stem is not known, it is not given precedence over the Big Stem for Southern planting.

TABLE I (A)—EARLY PRODUCTION OF SWEET POTATO VARIETIES

Average Yields for Years 1924 to 1931 Inclusive

Fertilizer: 800 pounds per acre analyzing 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Planted: April 3rd. Average Date Harvested: August 7th.

Average Number of Growing Days 117.

VARIETY	Yield in Bushels per Acre				
	No. 1's	No. 2's	Strings	Jumbos	**Total**
1. Southern Queen	98.22	17.52	13.75	5.50	**134.99**
2. Porto Rico	97.28	20.09	17.94	5.20	**140.51**
3. Triumph**	84.04	16.79	15.62	3.11	**119.56**
4. Golden Beauty*	73.97	25.56	17.15	4.44	**121.12**
5. Bunch Porto Rico***	69.31	12.21	12.64	2.45	**96.61**
6. McMillan Cluster***	67.15	20.68	20.74	1.74	**110.31**
7. Nancy Hall***	66.04	19.91	13.47	.....	**99.42**
8. Schroer's Early†	63.22	15.49	19.80	3.57	**102.08**
9. Yellow Jersey†	61.45	28.72	49.83	.....	**140.00**
10. Yellow Yam†	56.25	20.86	21.57	.....	**98.68**
11. Big Stem Jersey§	46.26	19.37	35.75	.42	**101.80**
12. Jerusalem Yam***	55.33	26.74	17.04	.....	**99.11**
13. York Yam***	35.24	20.36	16.24	.....	**71.84**
14. Pumpkin Yam**	30.10	11.34	16.44	.....	**57.88**

†Three-year average. ***Four-year average. **Five-year average.
*Six-year average. §Seven-year average.

TABLE I (B)—EARLY PRODUCTION OF SWEET POTATO VARIETIES

Same as Table I (A) Showing Yields of No. 1's by Years as Indicated.

VARIETY	Yield in Bushels No. 1's per Acre								
	1924	1925	1926	1927	1928	1929	1930	1931	8 Year Average
1. Southern Queen	59	94	134	64	90	118	108	119	98
2. Porto Rico	76	59	114	195	58	101	74	101	97
3. Triumph**		68		125	64		67	98	84
4. Golden Beauty*	54	36	76	126	66	106			77
5. Bunch Porto Rico***			78	49	41	109			69
6. McMillan Cluster***	21	72	73	103					67
7. Nancy Hall***	48	84	76		56				66
8. Schroer's Early†	24	63		103					63
9. Yellow Jersey†						90	13	81	61
10. Yellow Yam†		21	65	83					56
11. Big Stem Jersey§		32	61	92	50	27	10	52	46
12. Jerusalem Yam***	24	80	34	84					55
13. York Yam***	9	18	52	62					35
14. Pumpkin Yam**		25	48		28		8	41	30

†Three-year average.

***Four-year average.

**Five-year average.

*Six-year average.

§Seven-year average.

Late Maturity of Sweet Potato Varieties: Inasmuch as the late potato crop of South Georgia is consumed almost entirely in the South, the yam type is of particular importance in this study.

The test was begun in 1922 and extended over a six-year period. This study shows Southern Queen to be the heaviest producing variety included in the test, with Golden Beauty (a strain of Porto Rico) coming second, as shown in Table II (a).

McMillan Cluster, Hardshell and Jerusalem Yam are high producing varieties but are not of commercial importance because of their high susceptibility to disease.

As a general purpose and commercial variety, the Porto Rico has no superior as a late potato.

Southern Queen should be used in a limited way as a late storage potato, as it keeps better than Porto Rico and is of good quality in late winter when taken from storage, although it is of poor quality when fresh and should be considered only as a storage product.

Pumpkin Yam is considered by many as possessing the finest quality of all varieties, however, because of its relatively low production, it should not be placed above Porto Rico as a potato for home use.

TABLE II (A)—LATE MATURITY OF SWEET POTATO VARIETIES

Average Yields for Years 1922 to 1927 Inclusive

Fertilizer: 500 pounds per acre analyzing 9% Phosphoric Acid, 2% Ammonia and 3% Potash.

Average Date Planted: April 25th. Average Date Harvested: Nov. 3rd.

Average Number Growing Days 193.

VARIETY	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Field Rot	**Total**
1. Southern Queen	152.59	31.45	20.48	16.72		**221.25**
2. Golden Beauty	149.69	34.54	18.45	11.80	2.80	**217.28**
3. Triumph	143.85	29.25	18.17	8.29	.94	**200.50**
4. McMillan Cluster	140.63	40.57	22.22	2.98	6.58	**212.98**
5. Jerusalem Yam	123.56	32.84	18.33	4.01	5.34	**184.08**
6. Porto Rico	121.99	24.18	19.34	18.20	1.65	**185.36**
7. York Yam	120.97	34.38	20.22	4.14	.32	**180.03**
8. Hardshell	118.33	40.32	20.95	.44	5.58	**185.62**
9. Nancy Hall*	110.82	38.36	22.61	3.15		**174.94**
10. Schroer's Early	100.03	25.15	17.45	4.86	.38	**147.87**
11. Pumpkin Yam	86.30	38.01	17.89	2.47	1.61	**146.28**
12. Dooly Yam	83.60	34.91	15.58	2.37	.14	**136.60**
13. Yellow Yam	70.87	31.89	18.54	.85		**122.15**
14. Purple Yam**	69.84	43.39	21.06	.31	2.43	**137.03**
15. Big Stem Jersey	61.96	33.81	53.87	1.14		**150.78**
16. Norton Yam*	59.99	27.53	16.09	3.71		**107.32**

*Five-year average.

**Four-year average.

THE INFLUENCE OF NORTHERN AND SOUTHERN GROWN SEED POTATOES ON SWEET POTATO YIELDS IN THE SOUTH.

This test was conducted in cooperation with the U. S. Department of Agriculture, the latter furnishing the northern grown stock and this station furnishing the southern grown. The purpose of this study was to determine whether or not the section from which the seed stock was procured would influence the yield. This was done in

TABLE II (B)—LATE MATURITY OF SWEET POTATO VARIETIES

Same as Table II (A) Showing Yields of No. 1's by Years as Indicated.

VARIETY	Yield in Bushels No. 1's per Acre						
	1922	1923	1924	1925	1926	1927	6 Year Average
1. Southern Queen	100	154	203	90	173	195	**152**
2. Golden Beauty	144	151	151	91	144	217	**150**
3. Triumph	142	80	183	107	183	169	**144**
4. McMillan Cluster	167	98	202	119	148	111	**141**
5. Jerusalem Yam	132	128	175	104	115	87	**123**
6. Porto Rico	130	112	99	85	186	119	**122**
7. York Yam	189	115	88	45	205	83	**121**
8. Hardshell	152	140	182	90	68	78	**118**
9. Nancy Hall**	74	80	169	88	143	------	**111**
10. Schroer's Early	41	119	130	56	121	132	**100**
11. Pumpkin Yam	89	86	126	76	82	59	**87**
12. Dooly Yam	122	83	95	69	68	64	**83**
13. Yellow Yam	55	77	94	36	71	93	**71**
14. Purple Yam*	131	51	83	15	------	------	**70**
15. Big Stem Jersey	66	45	64	29	120	49	**62**
16. Norton Yam**	71	70	77	38	44	------	**60**

*Four-year average.

**Five-year average.

response to a current opinion that seed potatoes which were grown in the North would produce heavier yields in the South than locally grown stock.

Eight varieties were used in the test. The resulting data show four varieties in each group leading. However, six varieties show practically the same production, while two others show rather decided increases in favor of southern grown stock. Therefore, the conclusion is reached that the section from which seed potatoes are procured has little if any influence on sweet potato yields in the coastal plain area of Georgia.

TABLE III—COMPARATIVE YIELDS OF NORTHERN AND SOUTHERN GROWN SWEET POTATO SEED STOCKS.

Average Yields for Years 1923 to 1925 Inclusive.

Fertilizer: 500 pounds per acre analyzing 9% Phosphoric Acid, 2% Ammonia and 3% Potash.

Average Date Planted: May 16th. Average Date Harvested: Nov. 8th.

Average Number Growing Days 177.

VARIETY	Yield in Bushels per Acre	
	Northern Grown Stock	Southern Grown Stock
1. Southern Queen	151.13	175.35
2. Porto Rico	131.10	135.49
3. Nancy Hall	129.18	129.01
4. Big Stem Jersey	123.84	120.29
5. Dooly Yam	120.73	115.79
6. Triumph	118.08	113.66
7. Yellow Yam	105.09	106.94
8. Pumpkin Yam	70.35	124.03

SELECTION OF SWEET POTATOES FOR SEED

For general farm purposes mass selection of sweet potatoes for seed is the most practical method of procedure in keeping varieties true to type and potatoes free from disease. Several precautions should be observed in selecting sweet potatoes for seed purposes. Probably the most important of these is that of growing the seed stock from vine cuttings, and on newly cleared land or on land on which potatoes have not been grown for four or five years. Fields of potatoes to be used for seed should be gone over carefully before harvesting, and hills having dead vines, or those that are not true to type, dug up and removed. This is necessary in order that seed potatoes may be kept free from stem-rot and to keep the varieties pure; and then, just previous to bedding the potatoes the following spring, they should be sorted carefully and all roots discarded which show the slightest indication of rot. By careful selection the grower should be able to maintain pure varieties, increase productivity and reduce loss from disease.

SOURCES OF SWEET POTATO PLANTS

Sweet potatoes are grown either from draws, produced from the roots (potatoes), or from vine cuttings. In the light of data secured from tests that are being conducted at this station, it seems that the commercial grower must look to draws (except for seed purposes) for his source of plants as they can be produced earlier than vines. Plantings made from vine cuttings must of necessity be delayed until the earlier plantings from draws have produced enough vine growth to furnish cuttings. Yields secured from late plantings are too low to give the grower a substantial margin of profit over the cost of production.

As a precaution against disease it is very necessary that potatoes to be used for seed should be grown from vines. Such diseases as stem-rot and black-rot are often trans-

mitted from the plant bed to the succeeding crop on the draws, while even in a diseased plant it is not likely that the disease will have penetrated far enough at the time the vines are cut to infect them.

Comparative Yields of Vines, Draws and Whole Potatoes: Comparative yields from vines, draws and whole potatoes over a six-year period indicate that the highest production of No. 1 potatoes may be expected from draws. The yield from vines is only slightly less, while that of No. 1's resulting from whole potatoes is remarkably low. This is due to the fact that the whole potato continues to grow, setting very few new potatoes, with the result that the heaviest yield falls in the Jumbo grade. The Jumbo is in this instance, however, the mother potato which has continued to grow into a rough, irregular, deeply cracked and over-sized potato. This work was also supplemented by planting cut potatoes similar to the cubes into which Irish potatoes are cut for planting. The results were similar to those obtained from planting whole potatoes. It is concluded, therefore, that only draws or vines should be used for plantings under farm conditions.

TABLE IV—COMPARATIVE YIELDS OF VINES, DRAWS AND WHOLE POTATOES

Average Yields (Porto Rico), Years 1922 to 1927 Inclusive

Fertilizer: 500 pounds per acre analyzing 9% Phosphoric Acid, 2% Ammonia and 3% Potash.

Average Date Planted: May 16th. Average Date Harvested: Nov. 3rd.

Average Number Growing Days 172

Source of Plants	Yield in Bushels per Acre						
	No. 1's	No. 2's	Strings	Jumbos	Rot	Mother Potato	Total
Draws	83.33	30.16	20.65	.25			**134.39**
Vines	75.72	26.18	19.65	2.02	2.44		**126.01**
Whole Potatoes	26.51	10.41	8.32			114.78	**160.02**

Comparative Yields from Vine Parts: In order to determine whether or not the more fibrous, woody part of the vine near the base, or the tender, succulent part near the tip is better suited for vine cuttings, a test was begun in 1922 and was continued over a seven-year period. The data obtained in this test, as shown in Table No. V, indicate that the tips are slightly more desirable. They are also more desirable when taking vines for the purpose of growing seed potatoes, because there is less likelihood of carrying disease from the old plant in cuttings from the tip than from the base.

TABLE V—INFLUENCE OF VINE PARTS ON SWEET POTATO YIELDS

Average Yields (Porto Rico) for Years 1922, 1923, 1926, 1927, 1928, 1930 and 1931.

Fertilizer: 800 pounds per acre analyzing 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Planted: June 2nd. Average Date Harvested: Oct. 29th.

Average Number growing Days 150.

PART OF VINE	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
Tip (4th Part)	43.27	17.10	23.46	.04		**83.87**
Third Part	38.56	17.94	20.59	.05	.02	**77.16**
Second Part	39.97	16.20	19.60	.04		**75.81**
Base (1st Part)	28.79	16.29	17.12	.05		**62.25**

The Influence of Tip and Stem Ends of Sweet Potatoes on Color and Productivity: In the spring of 1924 Porto Rico seed potatoes were cut into halves, viz., the tip and stem ends. Each part of the potato was planted separately and each successive year the tip and stem ends, respectively, of the potatoes resulting from the two original parts have

been used as a source of plants for the succeeding crops. Data obtained thus far show no appreciable differences in color or yields resulting from the two parts.

TABLE VI—THE INFLUENCE OF TIP AND STEM ENDS OF SWEET POTATOES ON COLOR AND PRODUCTIVITY

Average Yields (Porto Rico), Years 1924 to 1928 Inclusive

Fertilizer: 500 pounds per acre analyzing 9% Phosphoric Acid, 2% Ammonia and 3% Potash.

Average Date Planted: May 10th. Average Date Harvested: Nov. 5th. Average Number Growing Days 180.

PART OF POTATO	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
Tip End	99.62	23.20	22.04	4.27	.88	**150.01**
Stem End	96.53	19.35	17.28	5.84	10.92	**149.92**

PRODUCTION OF SWEET POTATO PLANTS

The production of potato plants in hot beds is a highly specialized phase of sweet potato culture and is of particular importance in its relation to the early crop. However, hot-beds should be used in connection with the late crop also in order that draws and vines may be available early in the planting season, as early planting subsequently accompanied by a long growing period is perhaps the most important factor in securing heavy yields. This fact is borne out in results obtained from both planting and harvesting dates as shown in Tables Nos. XXII and XXV.

A detailed discussion of sweet potato plant production will be set out under the various headings which follow.

Quantity of Seed Potatoes Required: The quantity of seed potatoes required for bedding will depend on the purpose for which the plants are desired. Growers producing

potatoes for the early market will need about seven bushels of seed potatoes for each acre to be planted, as only about three pullings can be used. When potatoes are grown for the late market, the planting season may be extended over a longer period, thus reducing the seed requirement to four or five bushels per acre. Good seed should produce a maximum of between two and four thousand plants per bushel.

Size of Bed: The size of the hotbed may be approximated by allowing 20 square feet of space for each bushel of field run (ungraded) potatoes to be bedded, or, if graded potatoes are to be used, 15 square feet should be allowed for each bushel of No. 1's, 20 square feet for each bushel of No. 2's and 25 square feet for each bushel of strings.

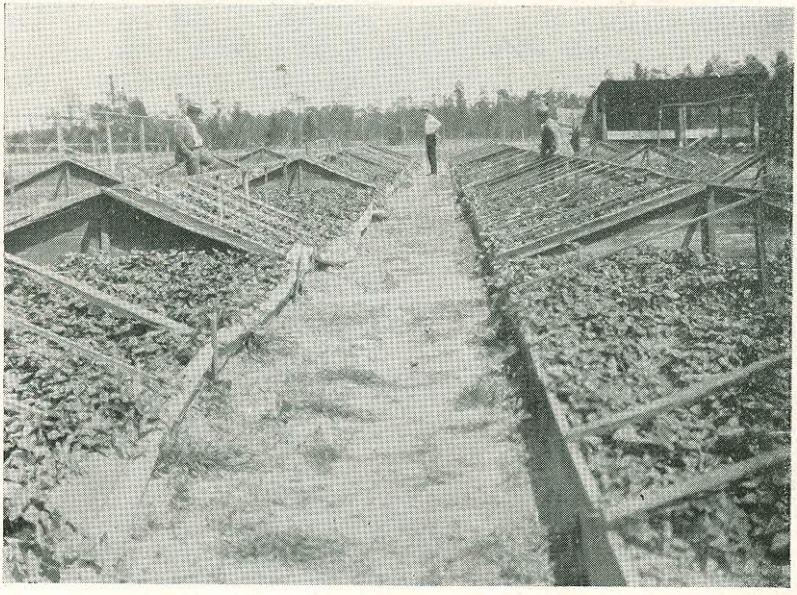
Location of Bed: A location should be selected that is free from sweet potato disease organisms. Such a location may best be secured by avoiding old plant beds, fields on which potatoes have recently been grown, and drifted soils. The location should also be well drained and should be one that affords protection from the cold north winds. The south side of a building or a southern slope bordered on the north by a heavy growth of timber offers excellent protection.

Source of Heat for Plant Bed: In order to produce slips for early planting, artificial heat must be used in the bed. Inasmuch as manure-heated beds are less expensive and quite adequate for the needs of the growers of South Georgia, only that type of bed will be discussed. Manure-heated beds must be covered with some water-proof material to protect the manure from the heavy rains of late winter and early spring, as manure ceases to heat when it becomes saturated with water.

Plant Bed Construction: There are two types of hotbeds which are well adapted to sweet potato plant production.

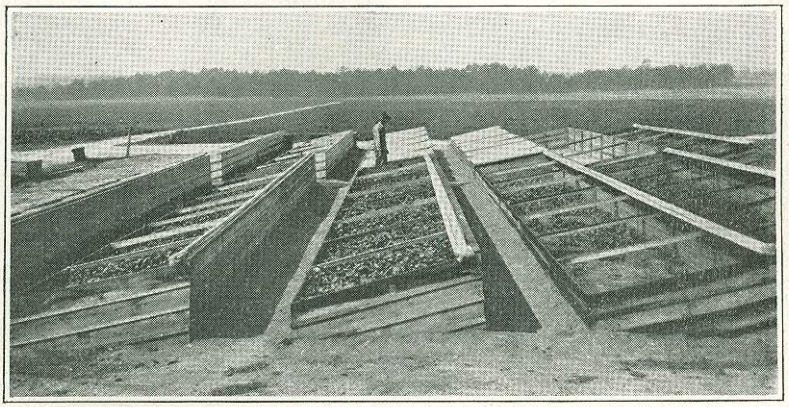
The type in most general use among the growers of

early potatoes in South Georgia is a bed with a gable roof. The bed extends north and south with the rafters sloping to the east and west. The walls of this bed should be 12 inches high. They should be constructed of six-inch shiplap or tongue and grooved boards, supported by substantial stakes or posts. When the walls are in place throw out four inches of soil to be used in covering potatoes. The remaining soil should be banked against the sides of the bed to protect from cold and turn the surface water away. Then place a two by four inch ridge pole 18 inches above the side walls, supported at 10 foot intervals with two by four inch stakes. One by two inch strips spaced three feet apart and extending from ridge pole to the side walls will serve as supports for the cover. The ends should be gabled with the same material that is used in the side walls. Ten by thirty feet is probably the most convenient size for a bed of this type.



The "Gable Roof" type of hotbed.

The second is a "shed" type of bed which extends east and west and slopes to the south. Six by thirty feet is a convenient size. The south wall should be 12 inches and the north wall 24 inches high, and each, together with the ends, should be constructed of tongue and grooved material. Other details of construction are similar to those designated for the gable type.



The "Shed Roof" type of hotbed.

Covering for Plant Bed: The plant bed cover originally used by potato growers consisted of unbleached sheeting treated with linseed oil. A more durable and less expensive cover, however, may be obtained by treating unbleached sheeting with a solution of light floor oil and paraffin wax mixed in the proportion of one gallon of light floor oil to five pounds of paraffin. The paraffin should be placed in the oil and heated until it has melted.

The sheeting may be purchased in three foot widths. As many widths should be sewed together as will be required for the width of the bed. The sheeting may be treated with the hot oil solution either by painting it on with a wide paint brush or by dipping it into the solution. If the cover is immersed in the solution all excess oil should

be wrung out before it is placed on the bed.

When the bed has been completed and the potatoes placed and covered, the treated sheeting should then be stretched tightly over the bed and nailed down securely by the use of strips placed along the margin.

Approximately one gallon of the oil solution will be required to treat 12 square yards of sheeting. The cost, at the present writing, of the oil solution mixed in the proportions suggested above is less than 50¢ per gallon as compared with a cost of $1.00 per gallon for linseed oil, and it has an additional advantage of causing slower deterioration of the sheeting.

Manure for Plant Bed: Only fresh stable manure should be used. It should be dug from the stall one or two days before it is to be placed in the bed and turned several times to insure uniform heating. Before placing the manure in the bed it is good practice to cover the bottom with straw or litter of some kind to prevent contact with the soil. If the manure is dry it should be sprinkled as it is placed in the bed, as moisture is essential to the bacterial action by which heat is produced. Manure should be placed in the bed to a depth of six or eight inches and should be well tamped or packed. The manure should be covered to a depth of about one inch with soil to prevent contact with the potatoes.

Soil for Plant Bed: Since the young plants draw on the mother potatoes for food in the early stage of their growth, rich soil is not necessary. Where a light sandy soil is used for covering the bed the sprouts come through earlier, root development is more extensive and fewer roots are broken off in pulling the plants.

Seed Potato Treatment: To prevent disease organisms from being carried into the plant bed on the surface of

sweet potatoes they should be immersed for ten minutes in a one to 1000 strength solution of corrosive sublimate. The material may be purchased from drug stores or wholesale drug houses. To get this to a working basis dissolve one ounce of corrosive sublimate powder in one gallon of hot water and dilute to eight gallons. The solution should not be placed in metal containers. It should be used only two or three times as it loses its effectiveness after repeated use. After the potatoes have been treated they may be placed immediately in the bed.

Corrosive sublimate is a deadly poison when taken internally and should be handled with care.

Bedding Seed Potatoes: The seed potatoes should be bedded about six weeks to two months before the plants are desired for field planting. The potatoes should be placed by hand over the surface of the bed as close together as possible without having them touch one another. If the potatoes are too close, disease will spread more readily, and also the sprouts will be so crowded that long, spindling plants will be produced. After the potatoes have been placed in the bed they should be covered to a depth of about two inches with soil.

Plant Bed Management: The frame work of the bed should be complete and all of the materials required in the preparation of the cover should be at hand before the manure is placed. This is necessary in order that the manure may be protected from rain. After the potatoes have been placed and covered to the desired depth with soil, the bed should be watered and the cover nailed down securely. It should then be observed at frequent intervals and later waterings given as often as the soil becomes dry. Weeds and grass spring up readily where artificial heat is used and should be pulled off before the plants appear in order to prevent competition. After there is a good stand of

plants on the bed and the days have become warmer, the ends of the beds should be opened to permit ventilation. About a week before the plants are to be set in the field one side of the cover should be loosened and rolled up a little way, at first during the early mornings and late afternoons of bright warm days. It may gradually be left off longer each day until the plants are hardened to out-door conditions; although it should be placed on the bed each night until the danger from frost has passed.

Care should be exercised in "drawing" the plants from the bed to prevent pulling the potatoes out of the soil. Potatoes that appear loose may be held in place with one hand while the plants are pulled with the other. Beds should be watered and the covers placed on again immediately after the plants have been pulled. This should be repeated after each pulling as long as the weather remains cool.

FERTILIZER REQUIREMENTS

In 1922 when work was begun with sweet potato plant food requirements, the fertilizer in most general use among farmers of this section contained 9 per cent phosphoric acid, 2 per cent ammonia and 3 per cent potash. Therefore this formula (9-2-3) was adopted as a standard fertilizer for early tests with this crop. After five or six years of study it was observed that an 8-4-4 formula was better adapted for sweet potato production; consequently, this formula (8-4-4) was used as the basic fertilizer in projects which were begun after that time.

Data obtained from a ten-year study of plant food requirements of the sweet potato crop show that substantial increases in yield may be produced from the use of commercial fertilizer.

Triangle Fertilizer Test: A series of tests known as the Triangle Fertilizer method was begun in 1922 and extended

over a six-year period. The object of this study was to determine a formula that could be used as a dependable basis for a more specific study of sweet potato fertilizer requirements. This preliminary test indicated that a formula carrying 8 per cent phosphoric acid, 4 per cent ammonia and 4 per cent potash most nearly approximated the plant food requirements of the sweet potato crop.

Fertilizer Formula Test: Using this formula (8-4-4) as a basis, a new series of formulas was begun in 1928 in which only one variable occurred. As will be observed in Table No. VII, these formulas are divided into four groups, viz., phosphoric acid, ammonia and potash series, with one group of incomplete formulas.

In the phosphoric acid series the highest yield was produced by the formula carrying 8 per cent phosphoric acid. This requirement corresponds with that indicated in the Triangle test.

In the ammonia and potash series the highest yields resulted from the formulas carrying 8 per cent of ammonia and 8 per cent of potash, respectively, as compared with 4 per cent each in the Triangle test.

By selecting the highest yielding variables from each of the three series, a formula is constructed which contains 8 per cent phosphoric acid, 8 per cent ammonia and 8 per cent potash. However, the increase from 8 per cent of ammonia over that obtained from 4 per cent and the increase from 8 per cent of potash over that resulting from 6 per cent are so slight that it is believed the use of an 8-4-6 formula under sweet potatoes will prove a more conservative farm practice.

TABLE VII—FERTILIZER FORMULA TEST

Average Yields (Porto Rico), Years 1928 to 1931 Inclusive.

Fertilizer: 800 pounds per acre.

Average Date Planted: April 19th. Average Date Harvested: Nov. 1st.

Average Number Growing Days 197.

(Arranged according to plot and series numbers).

FERTILIZER FORMULA*	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	Total
Phosphoric Acid Series:						
2-4-4	102.29	26.63	18.68	1.99	.51	**150.10**
4-4-4	110.37	23.80	20.23	1.90	.62	**156.92**
6-4-4	104.03	20.49	19.23	1.98	.48	**146.21**
8-4-4	115.11	18.19	19.28	2.93	1.09	**156.60**
10-4-4	104.65	22.50	18.74	2.27	.91	**149.07**
12-4-4	108.76	21.00	20.14	3.27	1.15	**154.32**
Check (No fertilizer)	29.90	9.08	16.46	.10	.27	**55.81**
Ammonia Series:						
8-2-4	83.50	19.84	20.55	2.38	1.29	**127.56**
8-4-4	107.69	20.87	20.85	2.54	1.24	**153.19**
8-6-4	110.57	22.53	19.70	2.68	1.21	**156.69**
8-8-4	120.81	18.41	20.22	7.84	.89	**168.17**
Potash Series:						
8-4-2	88.24	24.11	22.88	.80	.23	**136.26**
8-4-4	127.39	21.04	20.62	3.01	1.71	**173.77**
8-4-6	149.61	22.19	19.60	3.40	.78	**195.58**
8-4-8	151.13	21.05	21.33	6.52	1.24	**201.27**
8-4-10	150.97	23.41	20.37	9.94	2.00	**206.69**
Incomplete Formulas:						
0-4-4	103.43	21.21	20.10	1.15	1.34	**147.23**
8-0-4	76.84	18.20	20.50	1.18	.10	**116.82**
8-4-0	69.70	25.91	20.16	.46	.22	**116.45**
Check (No fertilizer)	48.57	15.55	18.14	.25	.04	**82.55**

*Phosphoric Acid, Ammonia and Potash, in the order named.

HIGH ANALYSES FERTILIZERS

A comparative test with high and low analyses fertilizers has been conducted for four years. The resulting data show lower yields from fertilizers of extremely high con-

centration (Table No. IX). However, the 16-8-8 formula, which is of medium concentration, compares favorably with the standard mixture (8-4-4) and should result in considerable saving to the farmer in reduced transportation cost and handling charges. Also it has been observed that high analyses fertilizers, unless thoroughly mixed with the soil, often injure the young plants, thus causing poor stands and consequent reduction in yields.

TABLE VIII—FERTILIZER FORMULA TEST

Average Yields (Porto Rico), Years 1928 to 1931 Inclusive.

Fertilizer: 800 pounds per acre.

Average Date Planted: April 19th. Average Date Harvested: Nov. 1st.

Average Number Growing Days 197.

(Same as Table No. VII, but arranged in order of yield).

FERTILIZER FORMULA*	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
8-4-8	151.13	21.05	21.33	6.52	1.24	**201.27**
8-4-10	150.97	23.41	20.37	9.94	2.00	**206.69**
8-4-6	149.61	22.19	19.60	3.40	.78	**195.58**
8-8-4	120.81	18.41	20.22	7.84	.89	**168.17**
8-4-4 (Avg.)	116.70	20.03	20.25	2.82	1.34	**161.14**
8-6-4	110.57	22.53	19.70	2.68	1.21	**156.69**
4-4-4	110.37	23.80	20.23	1.90	.62	**156.92**
12-4-4	108.76	21.00	20.14	3.27	1.15	**154.32**
10-4-4	104.65	22.50	18.74	2.27	.91	**149.07**
6-4-4	104.03	20.49	19.23	1.98	.48	**146.21**
0-4-4	103.43	21.21	20.10	1.15	1.34	**147.23**
2-4-4	102.29	26.63	18.68	1.99	.51	**150.10**
8-4-2	88.24	24.11	22.88	.80	.23	**136.26**
8-2-4	83.50	19.84	20.55	2.38	1.29	**127.56**
8-0-4	76.84	18.20	20.50	1.18	.10	**116.82**
8-4-0	69.70	25.91	20.16	.46	.22	**116.45**
Check (avg.) no fertilizer	39.23	12.32	17.30	.18	.15	**69.18**

*Phosphoric Acid, Ammonia and Potash, in the order named.

TABLE IX—HIGH ANALYSES FERTILIZER TEST

Average Yields (Porto Rico), Years 1928 to 1931 Inclusive.

Fertilizer: 800 pounds of an 8-4-4 per acre, basic rate of application.

Average Date Planted: April 19th. Average Date Harvested: Nov. 1st.

Average Number Growing Days 197.

FERTILIZER FORMULA*	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	Total
16-8-8 (400 pounds)_____	127.50	22.56	21.25	1.99	3.10	176.40
8-4-4 (800 pounds)_____	125.92	19.49	20.70	3.04	.77	169.92
30-15-15 (200 pounds)____	108.43	17.52	16.12	2.28	2.93	147.28

*Phosphoric Acid, Ammonia and Potash in the order named.

THE EFFECT OF VARYING AMOUNTS OF FERTILIZER ON EARLY PRODUCTION OF SWEET POTATOES

This test is being conducted to determine the amount of fertilizer that can be most economically applied to sweet potatoes that are being grown for the early market. In this study comparative yields from both Big Stem Jersey and Porto Rico varieties are available. The effect of varying amounts of fertilizer as it influences the yield of each variety may be observed in Table No. X.

It is of interest to note that Porto Rico, without exception, produces more potatoes with an equal amount of fertilizer than does the Big Stem. It is also interesting to note, however, that the maximum yield of No. 1 potatoes from Porto Rico results from 700 pounds of fertilizer per acre, while 900 pounds give the highest yield of No. 1's in Big Stem Jersey. The heavier applications under Porto Rico tend to produce Jumbos which suggests that the potatoes in this variety reach market size a few days earlier than does the Big Stem.

TABLE X—THE EFFECT OF VARYING AMOUNTS OF FERTILIZER ON EARLY PRODUCTION

Average Yields for Years 1927 to 1931 Inclusive.

Fertilizer: 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Planted: March 26th. Average Date Harvested: July 30th.

Average Number Growing Days 128.

AMOUNT OF FERTILIZER PER ACRE	Yield in Bushels per Acre				
	No. 1's	No. 2's	Strings	Jumbos	Total
Big Stem Jersey:					
300 Pounds	43.06	16.68	29.25	-------	88.99
500 Pounds	54.07	17.04	30.44	-------	101.55
700 Pounds	70.07	15.88	29.65	-------	115.60
900 Pounds	84.22	17.64	26.71	-------	128.57
Porto Rico:					
300 Pounds	71.46	11.96	17.26	2.34	103.02
500 Pounds	83.43	15.64	15.30	3.97	118.34
700 Pounds	98.31	15.98	16.95	7.69	138.93
900 Pounds	93.30	17.17	17.26	15.66	143.39

THE EFFECT OF RATES OF APPLYING FERTILIZER ON LATE MATURITY OF SWEET POTATOES

A study was begun in 1922 for the purpose of determining the maximum amount of fertilizer that could be profitably applied to sweet potatoes. The applications were made in variations of 200 pounds, the rates ranging from 200 to 1200 pounds per acre. At the beginning of this test the entire amount of fertilizer, regardless of the rate per acre, was applied previous to planting, although it was soon observed that fertilizer when applied in excess of 800 pounds in the drill caused injury to the young plants, thus resulting in a poor stand. To overcome the detrimental effect of excessive applications the practice of broadcasting was resorted to. However, it was again observed that a given amount of fertilizer uniformly distributed through the entire surface area of the soil was not accessible to the concentrated feeding area of the roots at the time it was most

essential in the plant's development and, therefore, was less effective than the same amount of fertilizer applied in the drill. A third method of applying excessive amounts of fertilizer, and one which gave better results, was that of placing one-third the amount in the row and the remaining two-thirds in the two adjacent furrows. This method proved more successful, although it was concluded that where heavy fertilization was practiced the amount should be divided, part being applied previous to planting and the remaining part used as a side dressing. Therefore, to study the effect of this method of applying fertilizer a test was begun in 1928 in which the variation in rates of application is 400 pounds and the maximum amount 2000 pounds per acre. All fertilizer in excess of 800 pounds is applied as side dressings at the first and second cultivations.

As will be noted in Table No. XI, 800 pounds seems to be the most profitable rate of application where all fertilizer is applied previous to planting, whereas if the applications are divided, part being applied previous to planting and part as a side dressing, as shown in Table No. XII, profitable increases in yield result from applications ranging as high as 1600 pounds per acre. However, it is doubtful if such heavy applications would prove a safe procedure under actual farm practice and prevailing market conditions.

Applications of fertilizer ranging from 400 to 800 pounds per acre should prove profitable for this crop on the principal soil types of South Georgia.

It is further concluded that all fertilizers of standard mixture, not exceeding 800 pounds per acre, should be applied in the drill and thoroughly mixed with the soil by the use of a small plow. It should then be ridged on and the soil allowed to settle before the plants are set.

All fertilizer (of standard mixture) in excess of 800 pounds per acre should be applied as a side dressing at the first cultivation.

TABLE XI—VARYING AMOUNTS OF FERTILIZER

Average Yields (Porto Rico), Years 1922 to 1927 Inclusive.

Fertilizer: 9% Phosphoric Acid, 2% Ammonia and 3% Potash.
Average Date Planted: April 11th. Average Date Harvested: Nov. 2nd
Average Number Growing Days 206.

Amount of Fertilizer Per Acre*	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
Check (No fertilizer)	69.35	26.13	23.63	4.10	------	**123.21**
200 Pounds	79.93	35.34	22.64	8.28	------	**146.19**
400 Pounds	97.79	36.22	26.19	10.16	------	**170.36**
600 Pounds	114.19	44.26	25.91	10.63	.16	**195.15**
800 Pounds	125.28	42.35	26.07	18.64	------	**212.34**
1000 Pounds	130.38	41.38	21.69	25.16	.20	**218.81**
1200 Pounds	154.66	42.89	19.99	43.43	1.03	**262.00**

*All fertilizer applied previous to planting.

TABLE XII—THE EFFECT OF RATES OF APPLYING FERTILIZER ON LATE MATURITY

Average Yields (Porto Rico), Years 1928 to 1931 Inclusive.

Fertilizer: 8% Phosphoric Acid, 4% Ammonia and 4% Potash.
Average Date Planted: April 26th. Average Date Harvested: Oct. 31st.
Average Number Growing Days 189.

Amount of Fertilizer Per Acre*	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
Check (No fertilizer)	35.82	11.25	11.19	------	.30	**58.56**
400 Pounds	72.94	15.96	17.79	3.53	1.58	**111.80**
800 Pounds	93.22	17.39	21.01	5.13	3.11	**139.86**
1200 Pounds	123.85	20.83	20.28	7.85	2.54	**175.35**
1600 Pounds	161.71	20.07	16.08	17.77	4.41	**220.04**
2000 Pounds(3-year avg.)	143.19	22.86	17.96	36.47	.39	**220.87**

*The 400 and 800 pound rates were applied before planting. In the 1200 pound rate, 800 pounds was applied at planting and 400 pounds at the first cultivation. In the 1600 pound rate, 800 pounds was applied before planting and 800 pounds at the first cultivation. In the 2000 pound rate, 800 pounds was applied before planting, 800 pounds at the first cultivation and 400 pounds at the second cultivation.

TABLE XIII—SOURCES OF AMMONIA

Average Yields (Porto Rico), Years 1928 to 1931 Inclusive

Fertilizer: 800 pounds per acre analyzing 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Planted: April 19th. Average Date Harvested: Oct. 31st. Average Number Growing Days 196.

SOURCES	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
Cotton Seed Meal	106.64	22.22	20.60	8.07	1.22	**158.75**
½ Nitrate of Soda and ½ Cotton Seed Meal	106.07	22.81	20.83	9.31	1.37	**160.39**
Dried Blood	95.54	22.57	20.40	7.45	.59	**146.55**
Nitrate of Soda	90.56	20.34	19.27	17.00	3.00	**150.17**
Sulphate of Ammonia	81.64	18.35	7.42	16.91	1.97	**126.29**
Cyanamid	77.56	20.19	19.48	1.76	.40	**119.39**
Calcium Nitrate	71.68	19.25	17.64	5.51	.76	**114.84**
Urea	71.47	23.71	17.54	3.10	2.28	**118.10**
Leunasaltpeter	70.75	19.03	14.56	4.19	1.46	**109.99**
Calurea	66.64	17.78	15.88	2.33	1.49	**104.12**

SOURCES OF AMMONIA

In order to determine the source or sources from which the ammonia in sweet potato fertilizers may be most economically derived, a study is in progress which includes nine different carriers and one combination in which half the ammonia is derived from an organic and half from a mineral source. The ammonia from each source is being applied in a complete fertilizer previous to planting.

It will be observed in Table No. XIII that the formula receiving half the ammonia from cotton seed meal and half from nitrate of soda and the formula receiving all ammonia from cotton seed meal show practically the same yield of No. 1 potatoes. However, in view of the fact that nitrate of soda is a cheaper source of ammonia than cotton seed meal, it is recommended that a fertilizer be used in which

half of the ammonia is derived from nitrate of soda and half from cotton seed meal. It will be observed further that among the mineral sources, nitrate of soda is showing to best advantage, coming fourth in order of yield.

TABLE XIV—SOURCES OF POTASH

Average Yields (Porto Rico), Years 1928 to 1931 Inclusive

Fertilizer: 800 pounds per acre analyzing 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Planted: April 20th. Average Date Harvested: Oct. 30th.

Average Number Growing Days 194.

SOURCES	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
Kainit	157.19	23.95	20.51	19.00	1.17	**221.82**
Sulphate of Potash	137.39	24.39	17.55	11.55	.91	**191.79**
Sulphate of Potash Magnesia	131.15	20.93	17.93	10.84	.96	**181.81**
Muriate of Potash	117.40	22.70	17.72	16.48	2.77	**177.07**

SOURCES OF POTASH

A test is being conducted to determine the source from which the potash in sweet potato fertilizer should be derived. This study embraces the principal potash carriers which are commercially available. The potash from each source is being applied in a complete fertilizer previous to planting. The data obtained from this test, as shown in Table No. XIV, indicate that the highest yield may be expected from fertilizers in which the potash is derived from kainit. The data further indicate that sulphate of potash is second in importance as a source of potash for sweet potato fertilizer.

MISCELLANEOUS PLANT NUTRIENTS

A study is being conducted to ascertain whether or not sweet potato yields on the ridge lands of South Georgia can be increased by supplementing commercial fertilizers with such materials as are shown in Table No. XV. The data obtained indicate that with the exception of stable manure, these materials tend to depress rather than increase sweet potato yields.

TABLE XV—MISCELLANEOUS PLANT NUTRIENTS

Average Yields (Porto Rico), Years 1928 to 1931 Inclusive

Fertilizer: 800 pounds per acre analyzing 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Planted: April 26th. Average Date Harvested: Oct. 29th.

Average Number Growing Days 187.

TREATMENT	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
5 Tons Stable Manure per Acre (No commercial fertilizer)	138.50	22.65	19.66	15.09	4.07	**199.97**
8-4-4	116.73	20.03	20.25	2.83	1.35	**161.19**
8-4-4 and 100 lbs. Sulphur	89.26	22.67	19.15	3.36	4.37	**138.81**
8-4-4 and 50 lbs. Bluestone	84.28	21.68	21.00	5.30	3.43	**135.69**
8-4-4 and 1000 lbs. Lime	70.34	21.30	19.78	2.49	.69	**114.60**
Check (No fertilizer)	44.67	13.10	17.70	.....	.25	**75.72**

SPACING TEST (DRILL)

In a spacing test in which the rate of application of fertilizer per acre remained constant for the various spacings, the yield of No. 1 potatoes varied very little, although the total yields from the closer spacings were considerably higher. The increase in total yield from the close spacings may be attributed to the fact that a high percentage of

these potatoes were under-size and fell in the No. 2 and string grades, as will be observed from Table No. XVI. This condition led to the suggestion that the small potatoes might be increased to marketable size by the use of additional plant food. Therefore, to meet this requirement a revised test was begun in 1928 in which the rate of application of fertilizer was based on the number of hills per acre. For example, a planting that is spaced 16 inches in the drill receives 800 pounds of fertilizer per acre, whereas a planting spaced eight inches in the drill carries double the number of plants and, therefore, receives 1600 pounds of fertilizer per acre, or an equal amount to each plant.

Assuming that the cost of cultivation remains constant for the various spacings, the data resulting from this test, as shown in Tables Nos. XVII and XVIII indicate that the most conservative planting distance, taking into consideration the cost of plants and fertilizer, as compared with the returns from No. 1 potatoes, is 12 inches in the drill.

TABLE XVI—SPACING TEST (DRILL)

Average Yields (Porto Rico), Years 1922 to 1927 Inclusive

Fertilizer: 500 pounds per acre analyzing 9% Phoshoric Acid, 2% Ammonia and 3% Potash.

Average Date Planted: May 2nd. **Average Date Harvested: Nov. 4th.**

Row Width: 3½ Feet. **Average Number Growing Days 187.**

DISTANCE IN DRILL	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	Total
4 Inches	126.53	68.23	54.86	6.63	.24	256.49
8 Inches	124.66	49.10	40.10	7.38	.25	221.49
12 Inches	122.98	42.97	35.35	9.23	.18	210.71
16 Inches	121.43	36.52	29.18	8.33	.29	195.75
20 Inches	118.93	36.94	21.91	9.46	.21	187.45
24 Inches	106.56	36.08	21.32	11.86	.89	176.71
28 Inches	98.57	40.54	22.11	17.46	1.48	180.16

TABLE XVII—SPACING TEST (DRILL)

Average Yields (Porto Rico), Years 1928 to 1931 Inclusive

Fertilizer: 800 pounds of an 8-4-4* per acre, basic rate of application for plants spaced 16 inches in drill and 3½ feet in the row. Each plant in the various spacings received an equal amount of fertilizer.

Average Date Planted: May 5th. Average Date Harvested: Oct. 30th.

Average Number Growing Days 179.

DISTANCE IN DRILL	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
4 Inches	153.35	33.03	25.78	4.95	3.25	**220.36**
8 Inches	124.43	31.88	23.28	2.91	.64	**183.14**
12 Inches	93.35	22.48	27.89	1.20	.61	**145.53**
16 Inches	64.03	16.83	26.13	2.12		**109.11**
20 Inches	63.22	16.90	23.15	1.75	.36	**105.38**
24 Inches	54.56	17.06	20.89	1.26	1.23	**95.00**
28 Inches	41.41	11.15	16.80	.57	.51	**70.44**

*Phosphoric Acid, Ammonia and Potash in the order named.

COST ESTIMATES AND NET RETURNS FROM SWEET POTATO SPACINGS

Table No. XVIII shows the number of plants per acre required for each spacing and the corresponding amount of fertilizer that should be used in order to give an equal rate of application to each plant. This table further shows the cost of plants and fertilizer per acre, together with the total cost for each planting, while in the last column will be seen the net returns per acre. These figures were obtained from an estimated cost of $1.00 per thousand for plants, $25.00 per ton for fertilizer, and a market price of 75¢ per bushel for the resulting yield of No. 1 potatoes. These figures do not take into consideration the cost of planting, cultivation and harvesting of the crop, although this expenditure should be amply covered by the returns from the remaining grades which may be used for feed purposes or as seed potatoes.

TABLE XVIII—COST ESTIMATES AND NET RETURNS FROM SWEET POTATO SPACINGS (DRILL)

Fertilizer: 800 pounds of an 8-4-4* per acre, basic rate of application for plants spaced 16 inches in the drill and 3½ feet in the row.

Amount of Fertilizer per Plant: .085 Pound.

Estimated Cost of Plants: $1.00 per Thousand (Porto Rico).

Estimated Cost of Fertilizer: $25.00 per Ton.

Estimated Market Price of No. 1 Potatoes: $.75 per Bushel.

Distance in Drill	Number Plants perAcre	Pounds Fertilizer per Acre	Cost per Acre			Value of No. 1's per Acre	Net Return per Acre Based on No.1's
			Plants	Fert	Plants & Fert.		
4 Inches	37,428	3,200	$37.42	$40.00	$77.42	$115.01	$37.59
8 Inches	18,714	1,600	18.71	20.00	38.71	93.32	54.61
12 Inches	12,478	1,066	12.47	13.32	25.79	70.01	44.22
16 Inches	9,357	800	9.35	10.00	19.35	48.02	28.67
20 Inches	7,485	640	7.48	8.00	15.48	47.41	31.93
24 Inches	6,238	533	6.23	6.66	12.89	40.92	28.03
28 Inches	5,347	457	5.34	5.71	11.05	31.06	20.01

*Phosphoric Acid, Ammonia and Potash in the order named.

SPACING TEST (ROWS)

A study was begun in 1925 with spacings in row widths to supplement the work with spacings in the drill. In this test all plants are spaced 16 inches in the drill, while the rows vary from two to five feet. Data resulting from this study, as shown in tables Nos. XIX and XX, indicate that the most profitable returns may be expected from potatoes planted in three-foot rows.

TABLE XIX—SPACING TEST (ROW WIDTHS)

Average Yields (Porto Rico), Years 1925 to 1931 Inclusive

Fertilizer: 800 pounds of an 8-4-4* per acre, basic rate of application for plantings spaced 16 inches in the drill and 3½ feet in the row.

Amount of Fertilizer per Plant: .085 Pound.

Average Date Planted: May 7th. **Average Date Harvested: Oct. 29th.**

Average Number Growing Days 176. **Plants spaced 16 inches in drill.**

ROW WIDTH	Yield in Bushels Per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
2 Feet	124.08	26.01	26.11	1.47		**177.67**
3 Feet	109.66	24.30	23.72	1.14	1.26	**160.08**
4 Feet	87.76	28.60	17.81	4.04		**138.21**
5 Feet	73.02	16.78	12.88	3.97		**106.65**

*Phosphoric Acid, Ammonia and Potash in the order named.

TABLE XX—COST ESTIMATES AND NET RETURNS FROM SWEET POTATO SPACINGS (ROW WIDTHS)

Fertilizer: 800 pounds of an 8-4-4* per acre, basic rate of application for plantings spaced 16 inches in the drill and 3½ feet in the row.

Amount of Fertilizer per Plant: .085 Pound.

Estimated Cost of Plants: $1.00 per Thousand (Porto Rico).

Estimated Cost of Fertilizer: $25.00 per Ton.

Estimated Market Price of No. 1 Potatoes: $0.75 per Bushel.

Row Widths	Number Plants per Acre	Pounds Fert. per Acre	Cost per Acre			Value of No. 1's per Acre	Net Return per Acre Based on No. 1's
			Plants	Fert.	Plants & Fert.		
2 Feet	16,339	1,389	$16.34	$17.41	$33.75	$93.06	$59.31
3 Feet	10,890	926	10.89	11.57	22.46	82.24	59.78
4 Feet	8,169	694	8.17	8.67	16.84	65.82	48.98
5 Feet	6,540	556	6.54	6.95	13.49	54.76	41.27

*Phosphoric Acid, Ammonia and Potash in the order named.

SETTING PLANTS IN THE FIELD

The setting of sweet potato plants is facilitated considerably where all preparation has been completed several days in advance of the time the plants are to be set in the field. By so doing the soil will have become firmed in the bed. This will enable the roots of the plants to make quicker contact with the soil and thus become established with less difficulty. Another point in favor of preparing the land in advance is that the plants may be set immediately after a rain and thus eliminate the necessity of watering by hand. The potatoes will be more uniform in size and there will be a higher per cent of marketable roots where they are spaced uniformly in the drill.

The most generally used method of setting plants in the field is by hand. Probably the most convenient device that can be used in this method of transplanting is a thin stick about three to three and one-half feet long, having in the lower end a slight notch. The droppers lay the plants on the top of the ridge at the proper distances and the planters place the notch on the root of the plant, forcing it into the soil. The earth is then packed about it by a second thrust of the stick or by the foot of the operator.

Where a large acreage is grown, the work of setting the plants in the field may be facilitated by the use of transplanting machines.

THE EFFECT OF PLANTING DATES ON EARLY PRODUCTION

The Porto Rico and Big Stem Jersey varieties were planted at fifteen-day intervals beginning March 15th and continuing through April 15th. The average date of harvesting for all plantings was July 29th. The most important point to be considered in the resulting data is the effect of the number of growing days on yield. Apparently the

sweet potato must have 115 to 120 growing days in order that profitable returns may be realized from the early crop.

TABLE XXI—THE EFFECTS OF PLANTING DATES ON EARLY PRODUCTION

Average Yields for Years 1927 to 1931 Inclusive

Fertilizer: 800 pounds per acre analyzing 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Harvested: July 29th.

DATE PLANTED	Yield in Bushels per Acre					No. Growing Days
	No. 1's	No. 2's	Strings	Jumbos	**Total**	
Porto Rico:						
March 15th	114.03	15.83	14.62	6.29	**150.77**	137
April 1st	89.70	13.41	14.79	9.03	**126.93**	120
April 15th	35.39	8.54	17.31	.30	**61.54**	105
Big Stem Jersey:						
March 15th	83.87	18.73	21.08	.43	**124.11**	137
April 1st	50.34	17.95	27.87	-------	**96.16**	120
April 15th	16.75	9.19	23.31	-------	**49.25**	105

THE EFFECT OF PLANTING DATES ON LATE MATURITY

A series of plantings was begun April 1st and continued at fifteen-day intervals through August 1st. The results from this study, as shown in Table No. XXII, indicate that the sweet potato crop requires a long growing period for the production of maximum yields. The potato seems to continue to grow as long as the vines remain green and healthy.

The highest yield of No. 1 potatoes in this test was obtained from the planting made April 1st. The length of the growing period for this planting was 218 days, however, after 185 to 200 days there is a tendency for the

growth to go more into Jumbos than into No. 1 potatoes. This is especially noticeable in results from "Harvesting Dates," as shown in Table No. XXV.

TABLE XXII—THE EFFECT OF PLANTING DATES ON LATE MATURITY

Average Yields (Porto Rico), Years 1922 to 1927 Inclusive

Fertilizer: 500 pounds per acre analyzing 9% Phosphoric Acid, 2% Ammonia and 3% Potash.

Average Date Harvested: November 1st.

Date Planted	Yield in Bushels per Acre						No. Growing Days
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**	
April 1st	152.64	44.51	25.43	45.73	23.89	**292.20**	218
April 15th	133.67	52.87	25.07	36.83	10.27	**258.71**	203
May 1st	117.60	48.35	24.66	15.22	1.86	**207.69**	188
May 15th	120.46	45.21	22.60	10.21	1.41	**199.89**	173
June 1st	78.59	35.71	22.77	4.55	.25	**141.87**	157
June 15th	66.31	27.08	20.67	6.81	-------	**120.87**	142
July 1st	35.86	21.55	15.59	.47	-------	**73.47**	127
July 15th	21.17	16.02	22.08	-------	-------	**59.27**	112
August 1st*	6.42	11.83	11.60	-------	-------	**29.85**	97

*Five-year average.

CULTURAL METHODS

In studying methods of cultivating sweet potatoes it has been found that the highest yields result from plantings made on high ridges. These ridges were thrown up with a two-horse turn plow, thus obtaining the greatest height that could be secured with this implement, in three and one-half foot rows. The beds in this area ranged from 12 to 15 inches in height, while the standard beds were about eight inches high. It will be observed in the accompanying Table, No. XXIII, that the standard bed which was sub-soiled and cultivated came second in yield.

TABLE XXIII—METHODS OF CULTIVATION

Average Yields (Porto Rico), Years 1925 to 1931 Inclusive

Fertilizer: 800 pounds per acre analyzing 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Planted: April 22nd. Average Date Harvested: Nov. 4th. Average Number Growing Days 197.

METHOD	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	Total
High Bed, cultivated	95.15	23.53	21.26	1.03	.14	**141.11**
Standard Bed, subsoiled and cultivated	85.96	24.01	21.43	2.26	.53	**134.19**
Level (no bed), cultivated	81.89	17.69	16.58	2.20	.74	**119.10**
Standard Bed, cultivated	79.62	22.61	23.84	2.94	2.11	**131.12**
Standard Bed, uncultivated	77.93	21.21	16.71	.89	1.47	**118.21**

CULTIVATION

The type of soil on which sweet potatoes are usually planted and the tendency of the vines to cover the ground early in the season reduces the cultural requirements of this crop to considerably less than that of the average truck and field crops. Weather conditions and the amount of weed growth will determine, to a large extent, the number of cultivations that should be given, although as a general rule the first cultivation should be delayed until the plants have become well established. This usually requires 10 to 15 days. Other cultivations should follow at such intervals as will keep grass and weeds under control. When the vines begin to interfere with further cultivation, the crop should be "laid by". At the last working it is often necessary to turn the vines out of alternate middles until they have been plowed out. The vines should then be turned back into the freshly cultivated middles in order that those remaining may be worked. The vines may be turned with a round

stick or cane. Cultivating should be done with such implements as will gradually build the bed to the desired height. A cultivator with turnshovels or discs is desirable for this purpose. It also may be necessary to hoe the potatoes once or twice through the early part of the growing season.

THE EFFECT OF VINE PRUNING ON SWEET POTATO YIELDS

It is a practice among sweet potato growers to cut potato vines from early plantings for the purpose of procuring additional planting stock. In order to determine the resulting effect of vine pruning on sweet potato production a test was begun in 1926 in which varying amounts of vines were cut from different areas. In Table No. XXIV it will be observed that the resulting yields are in reverse proportion to the amount of vines cut away.

TABLE XXIV—EFFECT OF VINE PRUNING ON SWEET POTATO YIELDS

Average Yields (Porto Rico), Years 1926 to 1931 Inclusive

Fertilizer: 800 pounds per acre analyzing 8% Phosphoric Acid, 4% Ammonia and 4% Potash.

Average Date Planted: May 14th. Average Date Harvested: Oct. 31st.

Average Number Growing Days 171.

METHOD	Yield in Bushels per Acre					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
Unpruned	88.79	23.02	21.85	13.09	2.07	**148.82**
¼ Pruned	85.91	23.20	23.30	1.15	1.10	**134.66**
½ Pruned	80.11	26.74	19.35	1.17	.07	**127.44**
¾ Pruned	71.97	24.12	19.78	.78	.41	**117.06**
All Pruned	62.29	14.36	19.35	1.11	.29	**97.40**

HARVESTING SWEET POTATOES FOR THE EARLY MARKET

Where sweet potatoes are grown for the early market they may be harvested as soon as the roots reach marketable size, regardless of season or maturity, as they are to be used for immediate consumption. A profitable yield of marketable potatoes, under normal seasonal conditions, may be expected in about 120 days from the date of planting.

Sweet potatoes harvested during the hot summer months should not be exposed to the sun. Possibly 30 minutes will cause blistering which is followed by severe rotting. Cars of potatoes often arrive at their point of destination in bad condition because of exposure in the field.

HARVESTING THE LATE CROP

The late crop which is to be placed in storage or consumed over a long period of time should be well matured before being dug. Under favorable seasonal conditions the roots continue to grow until late in the fall, as will be seen from Table No. XXV. Therefore, an increase in yield may be realized by leaving the potatoes in the field until just previous to the time the first frost is expected. During late falls, however, harvesting should not be delayed as there is a tendency toward excess rotting and the production of over-sized potatoes when left in the ground too long. Data from tests that are under way indicate that the maximum yield of No. 1 potatoes may be expected in about 185 to 200 days from the date of planting. Growth after that time tends toward the production of Jumbos. Toward the latter part of the growing season the yellowing of the vines will indicate that the potatoes are mature and ready for digging. Another test for maturity is that of cutting or breaking a potato and leaving it exposed to the air for a few minutes. The cut or broken surface dries if it is mature.

but remains moist if it is not ready to be dug. Under no conditions should the potatoes be left undug until the appearance of cold weather, as frost or a freeze may injure the stem end of many of the roots and cause them to decay in storage.

The type of implement most generally used in digging sweet potatoes is a turn-plow with a vine cutter attached to the beam, although a middle buster is quite satisfactory and there seems to be fewer injured potatoes where it is used. Regardless of the implement used, it should be set deep to reduce the percentage of cut and bruised potatoes. Where vine cutters are not available a riding cultivator may be used for this purpose by attaching two discs and running them on the edges of the bed. This cuts the vines well, but at the same time cuts many of the potatoes that are growing near the surface. Every possible precaution should be observed to prevent bruising or cutting the roots, as every bruise gives an opportunity for rot fungi to enter.

The following are pointers that will be useful in harvesting the sweet potato crop:

1. Sweet potatoes that are to be placed in storage should be harvested when mature and before being injured by frost.

2. Remove vines by any means that will not injure the potatoes, and only as many as can be dug each day.

3. In case of frost, cut the vines at the main stem as soon thereafter as possible, and let the potatoes remain in the ground until the weather permits digging.

4. Plow deep in order to prevent cutting and bruising the potatoes.

5. Remove the harvest of each day and place it in storage.

TABLE XXV—HARVESTING DATES (LATE MATURITY)

Average Yields (Porto Rico), Years 1922 to 1927 Inclusive

Fertilizer: 500 pounds per acre analyzing 9% Phosphoric Acid, 2% Ammonia and 3% Potash.

Average Date Planted: April 10th.

Date Harvested	Yield in Bushels per Acre						No. Growing Days
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**	
July 1st	7.03	5.35	9.61			**21.99**	81
July 15th	20.49	11.82	11.76			**44.07**	96
August 1st	49.74	18.45	19.99			**88.18**	111
August 15th	60.00	20.96	22.02	6.26		**109.24**	125
September 1st	82.70	28.84	22.86	6.96		**141.36**	141
September 15th	110.35	29.54	18.63	13.76		**172.28**	156
October 1st	118.99	34.93	24.73	15.99		**194.64**	171
October 15th	134.72	36.52	22.43	17.90		**211.57**	186
November 1st	129.68	41.62	22.11	31.97	2.15	**227.13**	201

GRADING

Appearance is a big factor in the successful marketing of sweet potatoes. Caution must be used in digging and handling to prevent them from becoming unsightly because of the presence of cuts, bruises and other defects. Not only is it important that potatoes be of attractive appearance, but they also should be separated into well defined grades. It is essential that potatoes be carefully graded if they are to be marketed to best advantage. The work of grading the crop may be facilitated and less handling required if done before being removed from the field.

In order that the grading of sweet potatoes may be standardized the specifications adopted by the U. S. Bureau of Agricultural Economics should be carefully adhered to. A general summary of these grades follows:

GRADE REQUIREMENTS

All grades shall consist of sound sweet potatoes of similar varietal characteristics and shall be practically free from dirt or other foreign matter, frost injury, decay, bruises, cuts, scars, cracks, and damage caused by heat, diseases, insects (including weevils), or mechanical or other means.

U. S. No. 1. The diameter of each potato shall not be less than 1¾ inches nor more than 3½ inches, and the length shall not be less than 3 inches nor more than 10 inches. Exception: the length may be less than 3 inches if the diameter is 2 inches or more.

U. S. No. 2. The diameter of each potato shall not be less than 1½ inches nor more than 4 inches. The potatoes may be of any length.

U. S. Jumbo Grade. The diameter of each potato shall not be less than 4 inches. The potatoes may be of any length.

Strings. All roots smaller than 1½ inches in diameter are designated in this bulletin as strings.

In order to allow for variations incident to proper grading and handling, five per cent, by weight, of any of the above grades may not meet the requirements as to diameter, and, in addition, six per cent, by weight, may be below the remaining requirements of the grade.

STORAGE

The proper storage of sweet potatoes should be more generally practiced as it makes the product available over a greater portion of the year and often obviates the necessity of selling the crop as soon as harvested, at which time

prices are usually low.

If sweet potatoes are to be kept in good condition in storage they must be mature before being dug, carefully handled, the curing process begun immediately after they are placed in the curing house, and a uniform temperature maintained after being cured.

Where a large quantity of potatoes is to be stored it is advisable to build a substantial storage house as it will last longer and require less attention than a cheap, poorly constructed one. In sections of South Georgia where tobacco is grown, the use of tobacco barns for curing the sweet potato crop is becoming a general practice. The only change necessary in converting the barn into a curing house is that of putting in a temporary floor on the first tier poles. The principal objection to this type of storage house is that the temperature fluctuates more than in a specially constructed house. This condition makes it necessary to give the potatoes more careful attention during the winter months when freezing is likely to occur.

STORAGE TEST WITH SWEET POTATO VARIETIES

Each variety of sweet potatoes that was included in the variety trial was graded and placed in storage immediately after being dug and was allowed to remain there until the potatoes were removed at bedding time in the spring. The period of storage was approximately 90 days. The potatoes used in this test were grown from draws. The curing house was a tobacco barn equipped as described under "Storage."

Southern Queen and Triumph are outstanding varieties from the standpoint of keeping quality, while Big Stem Jersey seems to be the most susceptible of all varieties included in the test, to storage rots.

TABLE XXVI—STORAGE TEST WITH SWEET POTATO VARIETIES

Per Cent Rot for Years 1922 to 1927 Inclusive

Potatoes Grown from Draws. Ninety Days in Storage.

	VARIETY	Per Cent Rot
1.	Southern Queen	7.7
2.	Triumph	8.6
3.	Nancy Hall*	14.0
4.	Dooly Yam	15.6
5.	Schroer's Early	18.3
6.	Norton Yam**	19.0
7.	Porto Rico	21.4
8.	York Yam	22.5
9.	Golden Beauty	23.9
10.	Yellow Yam	25.1
11.	Pumpkin Yam	26.0
12.	Jerusalem Yam	36.3
13.	McMillan Cluster	38.2
14.	Hardshell	42.0
15.	Purple Yam**	43.0
16.	Big Stem Jersey	49.2

*Five-year average.

**Four-year average.

DIRECTIONS FOR CURING AND STORAGE

The following rules should be observed during the curing and storage periods, in the operation of the sweet potato curing house.

DURING THE CURING PERIOD:

1. Maintain a temperature of 80 to 90 degrees F., during the curing period, which is usually 10 to 15 days.

2. Give thorough ventilation during the day but do not allow the temperature to fluctuate.

3. Close the floor ventilators at night if there is danger of frost.

4. During severe weather, close all ventilators in the floor and roof.

5. Examine the curing house at frequent intervals during the curing period.

6. When the curing period is over (indicated by sprouting or a purplish blue spot at the buds), gradually reduce the temperature by slowly discontinuing the fire.

AFTER THE CURING PERIOD:

1. Maintain a dry atmosphere and a uniform temperature.

2. As often as weather conditions permit, open the ventilators and outside doors and windows, but close them completely early each afternoon.

3. During wet weather, if the house appears damp, open the ventilators and keep a slow fire until all dampness has been driven out.

4. During severely cold weather keep a slow fire to prevent the potatoes from freezing.

5. Have a regular time, preferably the middle of the day, to remove potatoes from the house, and do not return potatoes that have once been removed.

6. Do not grade or handle potatoes until they are ready to be taken immediately from the house. Such practice causes severe rotting.

7. Let one person be responsible for and entirely in charge of the house.

DISEASES AND THEIR CONTROL

Sweet potato growers should give careful consideration to the eradication of diseases of this crop. The distribution of diseases, particularly stem-rot and black-rot, has become so general within recent years that heavy losses are being sustained annually from these two sources. Proper methods of prevention and control should be adhered to in order that the future of the industry may not be threatened. It is imperative that growers use every method at their disposal to

safeguard the sweet potato crop.

Stem-Rot: The first indications of stem-rot in the field is a slight yellowing of the leaves of diseased plants. The leaves later become somewhat puckered and the vines finally wilt and die. If the diseased stems are split or cut in two, it will be noticed that they are dark or discolored on the inside. The discoloration is a sure sign of stem-rot. It sometimes extends several feet from the hill and may also enter the potato. Sprouts from such potatoes are likely to be diseased and thus carry the disease to the succeeding crop. The fungus also lives over in infested soil.

Stem-Rot Control: The fungus causing stem-rot attacks the interior of the potatoes and of the sprouts, therefore, seed treatment or fungicides cannot be depended upon for control. The only successful control measure is the selection of healthy seed potatoes and the growing of the crop on disease-free soil. Healthy seed potatoes may be secured by selection in the fall at digging time, while the potatoes are still attached to the green vines. Each hill should be examined by splitting the stem, and the seed potatoes taken only from those plants where the inside of the stems show no discoloration. Selections should be made before frost, as frost injury produces a similar discoloration.

In the spring just before bedding the sweet potatoes they should be treated with corrosive sublimate as described under "Seed Potato Treatment," to kill any disease spores that may be on the surface of the potatoes.

Black-Rot: Black-rot may occur on any of the underground parts of the plant. It may be recognized on the potato by a dark, somewhat sunken spot which is rather circular in appearance and underlaid by a greenish tissue. On the plants the infection begins as a small black spot, gradually enlarging until the stem has rotted off.

Black-Rot Control: Control measures for black-rot are

similar to those of stem-rot. The principal ones are seed-bed sanitation, selection of seed potatoes, crop rotation and seed potato treatment. Although, where black-rot alone is concerned the seed may be selected in the spring as the disease is easily detected on the surface of the potatoes. This does not mean, however, that the presence of spores on healthy potatoes can be detected. Therefore, seed treatment cannot be dispensed with.

Soft-Rot: This is the most common of the storage house rots and is a very serious menace to the sweet potato industry. Probably the most effective control measure for this disease is careful handling of the crop while being harvested and stored, as it seems to attack only bruised or injured roots.

Dry-Rot: Dry-rot is another disease that attacks the potato in storage. Its control is the same as that for soft-rot. For detailed information and description of sweet potato diseases see Farmers Bulletin 1059, published by the U. S. Department of Agriculture, Washington, D. C.

SUMMARY

The sweet potato is the most important truck crop grown in Georgia, both from the standpoint of acreage planted and of monetary value, and is particularly adapted to the climatic conditions and soil types of the coastal plain area where it is most extensively planted.

It is highly important that a system of crop rotation be followed which will maintain soil fertility and prevent frequent planting of potatoes on the same land.

A variety study indicates that Porto Rico should be grown for local consumption and southern markets, while Big Stem Jersey is best suited for early shipment to northern markets.

In order to keep varieties pure, fields should be rogued and seed stock hand-picked, thus eliminating all potatoes that are not true to type.

Draws and vines are the most economic source of plants from which sweet potatoes can be grown. Draws are essential in growing potatoes for the early market and for high production where early planting is necessary. Vines should always be used as the source of plants for producing seed potatoes. Also, they may be used in late commercial plantings, although because of resulting low yields it is doubtful if this practice is a profitable one to the grower.

The tip end and central part of sweet potato vines seem to be more desirable for use as plants than the more fibrous, woody part near the base.

Plants taken from the tip and stem ends of sweet potatoes seem to exert no varying influences on color and productivity of succeeding crops.

In growing sweet potatoes for the early market, hotbeds are indispensable in the production of early plants.

Approximately seven bushels will be required for each acre to be planted.

Twenty square feet of bed space should be allowed for each bushel of "field-run" potatoes.

Manure is the most practical source of heat for plant beds. Only unweathered stall manure produces satisfactory heat.

Plant beds should be constructed of tongue and grooved material and covered with glass or waterproofed sheeting.

Before planting, seed potatoes should be immersed for ten minutes in a one to 1000 strength solution of mercuric chloride.

It is very essential that plant beds be properly watered and ventilated and that plants be gradually hardened to outside conditions before being transplanted to the field.

Approximately 45 days are required to produce Porto Rico plants in a hotbed, while about 60 days are required for Big Stem Jersey.

Data obtained from a ten-year study of sweet potato fertilizer requirements indicate that the most desirable com-

bination of plant food elements for this crop is a formula consisting of 8 per cent phosphoric acid, 4 per cent ammonia and 6 per cent potash.

Under soil and climatic conditions of South Georgia, profitable returns may be expected from rates of application of fertilizer ranging as high as 800 pounds per acre.

Fertilizers of medium concentration compare favorably with standard mixtures.

The highest yields are resulting from fertilizer in which half of the ammonia is derived from nitrate of soda and half from cotton seed meal, and in which the potash is derived from kainit.

Spacing tests with sweet potatoes indicate that the most profitable returns may be expected from plantings spaced 12 inches in the drill and 3 to 3½ feet in the row.

Both planting and harvesting dates indicate that the minimum growing period for profitable yields is 115 to 120 days, and that the maximum production of No. 1 potatoes is reached in 185 to 200 days.

High beds, or ridges, seem to be more conducive to heavy yields than do medium to low beds.

Pruning sweet potato vines reduces yields in direct proportion to the amount of vines that are cut, therefore, only a small portion of the vine from each hill should be taken in procuring vines for planting purposes.

Grading is very essential in the successful marketing of sweet potatoes, therefore, it is necessary to adhere strictly to grade specifications as adopted by the U. S. Bureau of Agricultural Economics.

Storage is an important factor in orderly marketing of sweet potatoes. When large quantities are to be handled, storage houses are desirable. Tobacco barns may be used very satisfactorily for curing and storing this crop.

Sweet potatoes are highly susceptible to both field and storage diseases, therefore, it is important to follow a rigid program of disease control.