HORTICULTURE

SWEET POTATOES

A study of sweet potato culture has been in progress nine years (1922 to 1930 inclusive). The experiments underway with this crop are being continued as in the previous report (Bulletin 12).

These experiments are:

1. Variety Test (early maturity).
2. Planting Dates (early maturity).
3. Spacing Test (row width).
4. Spacing Test (in drill).
5. Fertilizer Formula Test.
6. Concentrated Fertilizer Formula Test.
7. Rates of Applying Fertilizer.
8. Sources of Ammonia.
9. Sources of Potash.
10. Influence of Light and Heavy Applications of Fertilizer on Early Maturity.
11. Miscellaneous Plant Nutrients.
12. Methods of Cultivation.
13. The Effect of Vine Pruning on Sweet Potato Yields.
14. The Influence of Vine Parts on Sweet Potato Yields.
15. Color Inheritance in the Sweet Potato.

In the reports which accompany the studies listed above it should be kept in mind that the sweet potato tests are incomplete and that the tables and discussions are in the nature of a progress report.

Sweet Potato—Variety Test (Early Maturity): In the study of early maturity of sweet potato varieties it will be of interest to note that the order of yield has changed very little as compared

with that of the 1929 report. The principal change is in the Yellow Jersey, which dropped from third to tenth place in the production of No. 1 potatoes.

TABLE XXV—EARLY MATURITY OF SWEET POTATO VARIETIES

Average Yields for Years 1924 to 1930, Inclusive

Average date planted, April 1st. Average date harvested, Aug. 6th

VARIETY	YIELD IN BUSHELS PER ACRE				
	No. 1's	No. 2's	Strings	Jumbos	Total
1. Porto Rico	96.65	20.58	18.50	5.53	141.26
2. Southern Queen	95.23	18.88	14.61	5.43	134.15
3. Triumph***	80.51	18.32	16.28	2.55	117.66
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. Hardshell†	63.37	13.22	12.64	----------	89.23
9. Shoer's Early***	63.22	15.49	19.80	3.57	102.08
10. Yellow Jersey†	61.45	28.72	49.83	----------	140.00
11. Yellow Yam***	56.25	20.86	21.57	----------	98.68
12. Jerusalem Yam**	55.33	26.74	17.04	----------	99.11
13. Big Stem Jersey*	45.22	20.06	35.97	.49	101.74
14. York Yam**	35.24	20.36	16.24	----------	71.84
15. Pumpkin Yam***	27.50	10.79	16.25	----------	54.54

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

Sweet Potato, Planting Dates (Early Maturity): In order to determine the number of growing days required to produce a profitable yield of sweet potatoes for the early market, three plantings are made at fifteen-day intervals, beginning March 15th and extending through April 15th. The varieties that are being used are Porto Rico and Big Stem Jersey. In this study, as in Variety Trials for Early Maturity, Porto Rico produces more marketable potatoes in a given number of growing days than does the

Big Stem Jersey. Also, it will be observed that the high yields in each variety are resulting from early plantings, March 15th giving an increase of 91 bushels of No. 1 potatoes over April 15th in Porto Ricos and an 80 bushel increase in Big Stem Jerseys.

TABLE XXVI—INFLUENCE OF DATES OF PLANTING ON EARLY MATURITY OF SWEET POTATOES

Average Yields for Years 1927, 1928, 1929 and 1930

Average date harvested, July 29.

AVERAGE DATE PLANTED	Yield in Bushels per Acre					Average No. Growing Days
	No. 1's	No. 2's	Strings	Jumbos	Total	
Porto Rico:						
March 15th	132.55	17.27	14.78	7.87	**172.47**	136
April 1st	106.48	15.44	15.75	11.29	**148.96**	120
April 15th	41.51	9.75	19.89	.38	**71.53**	105
Big Stem Jersey:						
March 15th	98.68	18.83	19.62	.54	**137.67**	136
April 1st	57.85	18.87	29.44	.....	**106.16**	120
April 15th	18.70	9.67	24.34	.....	**52.71**	105

Sweet Potato, Spacing Test (Row Widths): A study with spacings in row widths has been in progress six years. Data in hand are showing the most economical yields resulting from three foot rows in which the plants are spaced 16 inches in the drill.

TABLE XXVII—SWEET POTATO, SPACING TEST (ROWS)

Average Yields of Porto Ricos for Years 1925 to 1930, Inclusive

ROW WIDTH	YIELD IN BUSHELS PER ACRE					
	No. 1's	No. 2's	Strings	Jumbos	Rot	Total
2 Feet	114.79	24.04	28.26	1.33	.....	**168.42**
3 Feet	103.90	23.55	24.14	1.33	1.34	**154.26**
4 Feet	82.30	29.43	18.33	3.71	.....	**133.77**
5 Feet	66.10	16.70	12.84	4.48	3.02	**103.14**

Sweet Potato, Spacing Test (In Drill): In this study the fertilizer is applied in proportion to the number of plants per acre and not on a fixed acre basis. For example, a sixteen inch spacing in the drill received 800 pounds of fertilizer per acre, whereas an eight inch spacing in the drill carries twice the number of plants per acre and will, therefore, receive 1600 pounds of fertilizer to the acre. The data resulting from the three-year period over which this test has been in progress indicates that the most profitable returns may be expected from sweet potatoes planted eight inches in the drill and in 3½ foot rows.

TABLE XXVIII—SWEET POTATO, SPACING TEST (DRILL)

Average Yields for Years 1928, 1929 and 1930.

DISTANCE IN DRILL	YIELD IN BUSHELS PER ACRE					
	No. 1's	No. 2's	Strings	Jumbos	Rot	**Total**
4 Inches	170.78	31.47	27.71	4.75	3.69	**238.40**
8 Inches	136.83	32.69	24.17	2.86	.63	**197.18**
12 Inches	103.97	25.29	27.55	1.37	.72	**158.90**
16 Inches	85.26	19.18	27.51	2.25		**134.20**
20 Inches	74.13	18.94	24.43	2.33	.36	**120.19**
24 Inches	67.85	16.92	20.61	1.68	.41	**107.47**
28 Inches	50.43	12.59	17.51	.76	.58	**81.87**

Sweet Potato, Fertilizer Formula Test: It will be observed that the complete formulas in this test are grouped into three series. In the first the phosphoric acid variable ranges from 2 to 12 per cent. In the second, the ammonia variable ranges from 2 to 8 per cent and in the third, the potash variable ranges from 2 to 10 per cent. In this study it seems that highest returns may be expected from a formula carrying 8 per cent phosphoric acid, 4 per cent ammonia and 6 per cent potash.

TABLE XXIX—SWEET POTATO, FERTILIZER FORMULA TEST.

Average Yield for Years 1928, 1929 and 1930.

FERTILIZER FORMULA*	YIELD IN BUSHELS PER ACRE					
	No. 1's	No. 2's	Strings	Jumbos	Rot	Total
Phosphoric Acid Series:						
2-4-4	107.92	28.36	17.70	2.66	.29	**156.93**
4-4-4	113.02	25.62	18.64	2.05	.14	**159.47**
6-4-4	106.40	19.18	19.81	2.64	.28	**148.31**
8-4-4	115.34	18.69	16.75	3.91	.67	**155.36**
10-4-4	104.10	23.40	18.25	3.03	.92	**149.70**
12-4-4	109.93	20.43	19.34	4.36	.08	**154.14**
Check (No fertilizer)	38.71	10.90	16.67	.14	.36	**66.78**
Ammonia Series:						
8-2-4	151.05	21.45	18.58	2.79	1.57	**195.44**
8-4-4	162.28	21.14	19.33	3.31	.93	**206.99**
8-6-4	109.06	23.57	18.78	3.57	1.22	**156.20**
8-8-4	131.70	18.10	19.50	10.45	.08	**179.83**
Potash Series:						
8-4-2	90.32	24.90	21.91	3.20	.08	**140.41**
8-4-4	132.23	22.81	19.43	4.02	.59	**179.08**
8-4-6	153.86	23.21	19.76	4.54	.06	**201.43**
8-4-8	153.58	22.42	20.04	8.70	.80	**205.54**
8-4-10	154.82	25.08	20.11	12.74	2.15	**214.90**
Incomplete Formulae:						
0-4-4	114.42	22.46	18.79	1.54	1.50	**158.71**
8-0-4	89.67	19.48	18.10	1.58	.10	**128.93**
8-4-0	78.03	29.69	17.50	.62	.11	**125.95**
Check (No fertilizer)	57.21	16.92	16.84	.34	.06	**91.37**

*Phosphoric acid, ammonia and potash, in the order named.

Sweet Potato, Test With Concentrated Fertilizer Formulas: This test is being conducted to determine the effect of concentrated fertilizers on sweet potato yields. Results obtained thus far indicate that higher yields may be expected from the fertilizers of medium to low concentration.