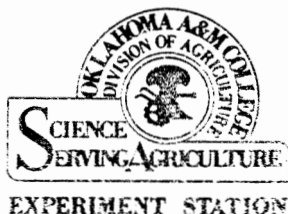


A SUMMARY OF EXPERIMENTAL WORK CONDUCTED  
AT THE OKLAHOMA IRRIGATION STATION  
DURING 1948-1956

F. A. Romshe and H. B. Cordner  
Department of Horticulture



A SUMMARY OF EXPERIMENTAL WORK CONDUCTED AT  
THE OKLAHOMA IRRIGATION STATION, <sup>1</sup> DURING 1948-1956

F. A. Romshe and H. B. Cordner, Department of Horticulture

IRISH POTATOES

Two to three acres of Irish potatoes were planted each year for test purposes. Irrigation studies were made primarily to determine the soil moisture level at which irrigation water should be applied for maximum production. Use of tensiometers as an indicator of the soil moisture content and as a guide to the irrigation schedule, was investigated. Several different fertilizer treatments were tried. Twenty new varieties and advanced breeding lines were planted to compare with Triumph and Red Warba.

Production sufficiently high to make this crop commercially profitable resulted in only two years out of the nine. Heavy rainfall near or during the harvest period ruined the crop during three years, and temperatures were too high during May and early June for satisfactory tuber development during two other years.

Results from the irrigation tests indicate it is necessary to maintain a fairly high soil moisture level for maximum yields. Irrigation water should be applied when the soil moisture drops to the mid-point between the wilting point and field capacity. This level of moisture was indicated by a reading of 25 to 30 on tensiometers purchased from the Irrigation Engineering Co. of Riverside, California. 2/

The best yields developed when fertilizer was supplied at the rate of 36 pounds of nitrogen, 72 pounds phosphorus (P<sub>2</sub>O<sub>5</sub>), and 36 pounds potash (K<sub>2</sub>O) per acre applied in bands at planting time and supplemented with 33 pounds of nitrogen when plants were 4 to 6 inches tall. No benefit was secured from phosphorous and potash applied the preceding fall or early winter, compared with spring applications. Non-treated check plots produced less than half the yields obtained from best fertilized plots.

None of the following varieties tested produced significantly higher yields than Triumph and Red Warba:

Kennebec  
Cherokee  
White Cloud  
Dazoc

Sheridan  
26-41-1  
Ontario  
Sebago

Essex  
Houma  
Placid  
Chippewa

SWEET CORN

Attempts to grow sweet corn have been unsuccessful. Plantings were made each year during a six-year period. High temperatures at silking which interfered with pollination were the major factor causing low yields. Variations in planting time and the use of varieties ranging in season from early to late failed to solve the pollination problem. Corn

1/ Experiments reported here were conducted at the horticultural site of the station located 15 miles north of Altus

2/ Mention of this company is not meant to be a particular recommendation.

earworms were serious and severely damaged most of the ears that did develop. The following varieties were tested:

Gold Rush  
Golden Security  
Marcross

Golden Cross Bantam  
Victory Golden

### VINE CROPS

Watermelons, muskmelons, cucumbers and bush squash have been grown successfully. The major difficulty with these crops was wind damage and blowing sand. Allowing strips of fall-planted rye to grow between the rows of vine crops provided effective protection against wind damage.

In 1947 a comparison of the Black Diamond watermelon grown for seed at different spacings was made. Seventy five percent or more of the melons harvested weighed 25 lbs or more. The results are summarized as follows:

Hill Spacing	Lbs. of seed harvested per acre	Ave. wt. of melons (lbs.)
7 x 7'	338	35.9
7 x 14'	206	32.4
14 x 14'	130	40.2

Muskmelon trials included different varieties, plant spacing, irrigation, and transplanting tests. The four varieties tested produced equally well but varied in shipping quality. Mildew Resistant 45 fruits were observed to hold in a firm condition longer after harvest than those of Purdue 44, Superfecto, or Hales 936.

Starting muskmelons in plant bands or pots in a hotbed was helpful in establishing a full stand of plants on schedule, as compared to field seeding. <sup>1/</sup> Earlier and higher production from transplants was secured during seasons when adverse weather prevailed at the usual field seeding time.

Irrigation tests were started in 1955 to study the most desirable frequency and timing for application of water to muskmelons. Adequate rainfall in May and June of 1955 and restrictions on water for irrigation in 1956 disrupted this work, however, and the results are not conclusive.

A study of the influence of plant spacing on the number and size of marketable melons produced was initiated in 1956. The lack of water for irrigation hampered this work to the extent that these results also are inconclusive. There was indication, however, that a hill spacing of 24 inches was better than 12 or 36 inches, with rows spaced seven feet apart.

### CABBAGE AND ONIONS

Cabbage (Golden Acre) and onions (White and Yellow Sweet Spanish and Crystal Wax) were planted during a five-year period. These crops grew and produced satisfactory yields. High costs of production and the general market situation at the time of harvest in this area, however, make these crops doubtful for profitable commercial production. High temperatures

<sup>1/</sup> See Oklahoma Agricultural Experiment Station Bulletin No. B-421.

and/or rainfall near or during the harvest period of onions ruined the crop.

### HEAD LETTUCE

It was difficult to establish lettuce plants in early fall and in both 1955 and 1956 damaging cold weather occurred prior to harvest. The problem of developing marketable heads before freezing weather in the fall probably eliminates head lettuce as a safe commercial crop.

### OTHER CROPS

The following vegetables were planted in small lots as part of the home garden plantings or as limited commercial trials:

Tomatoes:	<u>Sioux, Firested, Stokesdale, D x F Hybrid, Porter</u>
Snapbeans:	<u>Topcrop, Contender</u>
Lima Beans:	<u>Henderson Bush, Bixby</u>
Sweet Peppers:	<u>Calwonder</u>
Eggplant:	<u>Black Beauty</u>
Radishes:	<u>Early Scarlet Globe</u>
Beets:	<u>Detroit Dark Red, Early Wonder</u>
Carrots:	<u>Chantenav Red Core, Nantes, Danver Half Long</u>
Spinich:	<u>Long Standing Bloomsdale</u>
Mustard:	<u>Giant Southern Curled</u>
Leaf Lettuce:	<u>Grand Rapids</u>
English Peas:	<u>Thomas Laxton, Freezonian, Little Marvel</u>
Okra:	<u>Clemson Spineless</u>

Satisfactory production and quality were obtained with spinach, mustard, radishes, beets, and okra. The other vegetable crops listed above did not develop good crops and would be of dubious commercial value. Apparently vegetables which require pollination and the subsequent development of a "fruit" (except for vine crops and okra) are not well adapted to commercial production in southwestern Oklahoma.

### SWEET POTATOES

The Irrigation Station has served well as a proving ground for new varieties and lines originated in the sweet potato breeding program of the Oklahoma Agricultural Experiment Station. Studies relating to the time and number of applications of irrigation water and the use of fertilizer in sweet potato growing were conducted. The results of these studies are incomplete and therefore inconclusive at this time. Sixty pounds per acre of 10-20-20 fertilizer applied as a starter solution appeared to supply sufficient nutrients for irrigated sweet potatoes on this moderately fertile soil. Additional fertilizer increased vine growth and occasionally resulted in decreased yields. Similar results occurred with irrigation experiments. The most abundant applications of water resulted in excessive vine growth and depressed yields. The roots under these conditions were elongated and required a long season to attain market size.

The possibility of making sweet potato chips was investigated in cooperation with the Southwest Products Company at Mangum, Oklahoma. A procedure for making chips was perfected. It was demonstrated that the chips prepared from the high carotene Oklahoma

bred varieties such as Allgold and Nemagold were superior to those made from the older varieties such as Porto Rico and Nancy Hall.

The Allgold, Redgold, and Nemagold varieties proved to be outstanding in trials at the Irrigation Station. As a result, they are now widely grown in Southwestern Oklahoma and in the Mooreland-Woodward area.

A survey of the commercial sweet potato fields in the southwestern area in the fall, 1955, indicated that some growers were using fertilizers and/or water excessively to the detriment of the crop. It also was apparent that these cultural treatments must be regulated according to the specific needs of the different varieties.