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C. F. KINMAN

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YAM CULTURE IN PORTO RICO.

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THE YAM AS A FOOD CROP IN PORTO RICO.

The yam is one of the important foods of Porto Rico, and among the root crops is second in this respect only to the yautia. The quantity consumed is far greater than of either the Irish potato or the sweet potato. It is found in nearly every family garden in Porto Rico, because it is well adapted to most soils of the island and is almost entirely free from destructive insect pests and plant diseases. Notwithstanding its importance and wide local distribution, very little has been written regarding its culture, at least so far as this has a bearing on the agricultural conditions of Porto Rico. Planters are so sure of obtaining a fair yield that they have developed to a large degree a tendency to be content with a moderate crop from a moderate outlay. Practically the entire production is for home consumption.

With the great increase in price of all food products, the yam, which is still among the least expensive of the food crops, is more in demand than formerly. Yet, despite the fact that high prices for foods have prevailed and the local consumption of the yam has been stimulated, its use in other countries has increased but little. If properly handled, however, it might be shipped to other markets with little fear of loss by deterioration. In the continental United States the yam is rarely purchased by any other than people from the Tropics, and it is still practically unknown. In the Southern States the name "yam" is commonly applied to a certain type of sweet potato, which, however, is a different plant. The high food value of the yam, due mainly to its very large starch content, the many ways in which it can be prepared for the table, and its low cost should serve greatly to stimulate extension of its use.

The yam has been grown in all parts of Porto Rico for many years, cultural practices having developed in accordance with local needs. Little progress has been made in adopting improved methods of culture or in introducing or disseminating imported varieties. Experiments having in view the introduction of new and improved varieties and methods of culture have been in progress at the experiment station for a number of years.

GENERAL PRACTICES IN YAM GROWING.

The kinds of yams commonly grown in Porto Rico are not particularly sensitive to the type of soil in which they grow, provided the weather conditions are favorable and the proper cultural practice is followed. They are most prolific, however, in a deep, fertile clay, and give poorest yields in light, sandy soils. Some varieties make good yields when grown in heavy, sandy loams. Other varieties yield very well in the heaviest clays where the ridges are sufficiently high to enable the plant to develop a good root system. Compacted and wet soil hinders the growth of the plant and prevents normal root development. Where ridge planting is practiced the roots make a normal growth above the zone of wet soil.

In all frost-free countries yams may be planted at any time of the year, though not always profitably in a long rainy season, nor where there is a protracted drought such as sometimes occurs in Porto Rico and other islands of the West Indies. During the season of rains the heavy wet soil tends to hasten any decay that has started in the seed yams, and too frequent rains retard and stunt the growth of the young plants. On the other hand, a long dry season, if it is followed by drought, is even more detrimental to them. Young plants set out in the dry season may not obtain sufficient nutriment to continue growth after the supply in the seed tuber is consumed. The best time to plant in western and southern Porto Rico, and probably through this island, is after the usual winter drought—that is, from late February to April—when the soil has been left in good condition for planting by the spring rains. Normal growth is then assured. Fall plantings should be made after the time of most frequent rains, but while they are still sufficiently abundant to cause a thrifty growth of the young plants. This particular period is during the last of November in Mayaguez, where the seasons are well defined.

The crop which is planted in the spring matures late in the fall and winter, and may be left in the ground during the dry winter without fear of deterioration. This crop is available for table use through a long period or for disposal at a satisfactory price, depending upon the demands of the local market. Yams intended

for the succeeding crop may be left in the soil until planting time the following spring. In this way good seed may be preserved from decay. Clean seed is an important factor in establishing a good stand of new plants. Should a drought follow planting, the root sections, if they are free from decay, will remain in good condition for many weeks, owing to the thick corky covering of the yam, which enables the seed pieces to retain for a long time sufficient moisture for the growth of the plant.

The yam, though very resistant to severe drought, requires a heavy rainfall for its best production. The plant does not have an extensive root system, nor roots that work deep into the earth, yet it secures sufficient moisture to carry it through long rainless periods. This is observed along the southern and western parts of Porto Rico, where the vines make a moderate growth and show no effect from a drought which injures other vegetation.

In preparing the land for planting care should be taken to bring the soil into good mechanical condition. Substantial ridges or hills should be made, to protect against excessive soil moisture and to secure good aeration of the soil. An excess of water in the soil invariably results in a crop of poorly developed roots. The deep-rooted varieties when grown in heavy unloosened soil are rather angular and irregular in shape, and the production is small.

To avoid such results, ridges of loose earth and vegetable matter should be constructed from 1 to 1½ feet high, depending upon the locality and the subsoil drainage. These ridges should be made by plowing the land deeply and thoroughly and by opening a wide furrow over which the ridge is to be made. In this furrow a few inches of dead vegetable matter should be placed and covered with 2 or 3 inches of earth. This should be followed by another layer of vegetable matter, the layering being continued thus until the ridge is finished. As the vegetable matter decays it causes a settling of the earth. The beds should, therefore, be made a few inches higher than otherwise would be necessary for the growth of the plants.

These ridges may be cheaply constructed with a plow, the only hand labor needed being in the application of the vegetable matter and the final rounding up of the ridge with hoes. The layers of manure or other vegetable matter in the ridges insure a loose, well-aerated medium for the development of the roots, and seem to be required for their best development. The ridges do not need to be large in sand or sandy loam unless the subdrainage causes poor aeration of the strata occupied by the roots. In these soils the humus-providing material should never be omitted.

When seed is scarce, either crowns or entire small tubers may be successfully used, or a cross section of a slender, cylindrical root