

INTRODUCTION.

It has been stated by Cobley (1956) that "a large proportion of the population of the Tropics, and especially the inhabitants of the wetter parts of the Tropics, depend on the various root crops as a source of starch and although these rarely appear on the world markets and are never cultivated on large scale lines, they are of immense importance locally and as constituents of the daily diet are as important as the potato to the European."

Of the Tropical root crops, yams, cassava and sweet potatoes have been regarded as the most important. Yams are a popular food in Puerto Rico and also provides a staple food for natives of wetter parts of West Africa. Sweet potatoes are very important in the Caribbean. The edible aroids [eddoes and dasheens (*colocasia* spp.) and tannias (*xanthosoma* spp.)] have long been regarded as minor root crops. However, Hodge (1954) remarked that in the Lesser Antilles, the dasheen (*colocasia esculenta* (L.) Schott, constitutes a stable vegetable for the creole population providing an excellent substitute for the white potato (*Solanum tuberosum* (L.)). In the Southern Cameroons in West Africa and in St. Vincent island in the Caribbean, tannias are popular.

A comparison of the nutritive value of potatoes and the edible aroids has been given below to indicate that the edible aroids are good substitutes for potatoes and that they could, by increasing the demand for them, be elevated from their present low status:

Percentage Composition:

	<i>Solanum tuberosum</i> .	<i>Xanthosoma</i> spp.	<i>Colocasia</i> spp.
Water	79	63	61
Carbohydrate	19	18-30	30
Protein) 2	1.2-1.8	1
Fat		-	3 (Sugar)
Minerals	-) .9-1.6	Good supply of Ca. & P.
Vitamins	140 ppm. (v.c.)		High vitamin content of Leaves.
Calorific value	82		

Whereas carbohydrates constitutes the chief nutritive material, the protein content is low in all. According to Cobley (1956), "*Colocasia* spp. provide a more nutritious vegetable than *Solanum tuberosum* (L.), since they contain more protein, appreciable quantities of calcium, phosphorus, some vitamins A & B and a trace of V.C." Langworthy and Holmes (1917) showed that the digestibility of the carbohydrate of the dasheen compared very favourably with that of potatoes. Mac Caughey and Emerson (1914) gave the diameter of the dasheen starch grains as from 1/25,000 - 3/25,000 of an inch. The starch grains in the *Colocasia* spp. are thus very small and about 1/5th the size of those of *Xanthosoma* spp., hence the latter are less digestible owing to the larger size of starch grains.

Although the chief disadvantage of the aroids is that they contain poisonous alkaloids (sapotoxins and Calcium Oxalate crystals which are responsible for itching when they are consumed raw), these disappear on boiling. Further, Young (1924), remarked that the Trinidad dasheen differs from most others in having its corms and cormels practically free from acridity so common to the aroids.

Thus, from the nutritive point of view, the edible aroids and *Solanum tuberosum* (L.) are very similar.

The importation of large quantities of potatoes is not therefore justifiable. The magnitude of the imports into Trinidad for the past 6 years and their corresponding value is given below (Table I):

TABLE I:

Year	Total Quantity of Potatoes including seed potatoes lbs.	Value (\$ B.W.I.)
1953	18,417,464	949,665
1954	20,363,415	813,099
1955	24,003,940	1,075,432
1956	22,930,232	1,116,314
1957	23,384,117	1,140,090
1958	24,036,118	1,317,022
=====		6,411,622

There has therefore been a steady increase in the volume of imports and a corresponding increasing drain on the national economy.

There has also been a marked drop in the acreage of ground provisions in Trinidad from 13,137 acres in 1946 to 5,500 acres in 1956, a drop of 7,637 acres equivalent to 58%. This is shown below in Table 2:

TABLE 2:

Year	Ground Provisions	Acreage
1946	Eddoes	1,544
	Dasheens	2,848
	Tannias	2,052 6,444
	Cassava	3,171
	Sweet Potatoes	1,805
	Yams	1,717 13,137
1956	Ground Provisions	- 5,500

No
The reduction in acreage is likely to continue as more and more manufacturing industries are introduced with a consequent drift of peasants away from the rural to the urban areas.

The introduction of new manufacturing industries necessitates a high capital expenditure and Trinidad would be in a more advantageous position if she could at least increase the production of those commodities best suited to her climate for local consumption and export so as to reduce her financial drain.

At the first meeting of the Caribbean Advisory Council on Agriculture, Animal Health and Husbandry, Forestry and Fisheries in 1951, the urgent need to reduce the imports of those commodities which could be produced in the area and to level out periods of gluts and food shortages was emphasized. There is therefore great need for effective extension services to bring home to the inhabitants of this island the relative nutritive values of the potato and the edible aroids with the hope of increasing the consumption of, the demand for, and consequently increased production of the latter. Assuming the size of the peasant's holding is fixed, the increase of local production can probably be accomplished by either one of two methods or by a combination of both:-

- (1) by increasing the present acreage devoted to the crop with a consequent reduction of the land area under less paying crops.
- (2) by increasing the yields obtained from existing acreages by efficient cultural practices, application of fertilisers, the use of high yielding clones and so on.

At the present time owing to poor methods used, the production of local food crops is uneconomic. Added to these are problems of theft, poor prices, and bad storage because of the high water content of the root crops.

Consequently, alternating periods of glut and scarcity are common. The major problem is how to alleviate this position.

The problems concerning each root crop have been tackled by various investigators. The main object of this work concerns the edible aroids about which practically nothing has been done.

General notes on experiments:

The series of experiments in this thesis are grouped into 4 main sections:-

Section I : Dormancy Breaking in Eddoes:

The aim is to investigate the dormancy period if any in eddoes, and whether this supposed dormancy can be broken by Ethylene Chlorhydrin. Thus where out-of-season production of eddoes is undertaken, any problems concerning the supply of planting material would be overcome.

Section II : Life Cycle Development Studies in Colocasia spp.

In connection with this, plots were laid out in the new College farm to enable the writer to follow month by month the development of the root and shoot of Colocasia spp. when planted out of season and the establishment of the maturation period.

Section III: Storage of Edible Aroids:

Since their availability can be increased by extending their storage periods, storage experiments under ordinary farm store and cold store conditions were investigated.

Section IV : Organoleptic Assessment of Quality in Tannia Varieties.

High yield and high quality are both essential in food crops. In this section therefore, a number of tests were carried out to assess quality in tannia varieties, ~~using~~ ^{were} ~~the experimental subject~~. Yield and quality/also correlated.