PROCEEDINGS OF THE CARIBBEAN FOOD CROPS SOCIETY

SIXTH ANNUAL MEETING
ST. AUGUSTINE, TRINIDAD
JULY 7-13, 1968

VOLUME VI

FERTILIZER EXPERIMENTS WITH *XANTHOSOMA SPP.* IN SURINAM

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INTRODUCTION

One of the choiciest green vegetables consumed in Surinam is the "tajerbald", which is a rather small species of the polymorphic genus *Xanthosoma* (tannia). Because of its sagittated leaves it is believed to be *Xanthosoma* sagittifolium Scott. It is not identifical with *Xanthosoma brasieliense Desf.* Engler from other parts of the West Indies, although the latter is cultivated for the same purpose in other tropical American countries and some Pacific Islands bearing names such as "Tahiti spinach" in Hawaii and "Malanga leaf" in Latin America.

There are no exact figures available on the acreage in Surinam, but it is estimated that about 50 hectares (125 acres) are planted annually. It is grown by smallholders for local consumption on 20 by 20 meter plots or as a back yard crop on smaller plots for snbsistence. The value of the crop is estimated at Sf 5,000.—(TT $5,250.)

The sagittate leaves have, in comparison with other Xanthosomas, no acidity and are very palatable. The tubers are not used, although they are edible. It has been observed that there are three cultivars, which can be used because of the absence or very low percentage of needle-like calciumoxalate crystals and which are readily distinguisable from each other by leaf characters. We distinguish the normal "tajerbald" with a dark purple sheath, "botrobald" (butterleaf) a vernacular name for the cultivar with a lesser dark purple sheath, and "bofroebald" which is quite different from the foregoing types by the colocasialike leafform and no purple sheath.

The crop is very easily grown except for the fact that it needs some manure on sandy soils. Attack from pests and diseases is extremely slight and no research work has been attended to its cultivation in the past.

MATERIAL AND METHODS

Vegetable growers have often experienced that growing "tajerbald" on shell ridges or using sulphate of ammonia on sandy ridges decreases the cooking quality of this vegetable.

In order to test this hypothesis some field experiments were conducted. Unfortunately the data of the first and second experiment were discarded, because of theft during the growing period. Nevertheless the results of the third experiment are striking enough to believe in the casual relationship between treatment with sulphate of ammonia and the accelerated decrease in cooking quality.

This experiment consisted of 5 objects in four replications in a randomized block design. The results of this experiment are given in Tables I and II.

The figures are the number of minutes necessary to cook the leaves until they have lost their texture (cooking quality). The mark denotes that the leaves have not lost their texture after 30 minutes of cooking.

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The cooking test was done with 100 grams mesophyll per treatment and the same amount of water in a closed boiling pan. This test was, however, not carried out in replications.

Although yield was not the main object of the experiment, the yield data were recorded and analyzed. From the number of leaves it can be calculated that a bruto income of Sf 100 (TT $105.)—per 100 plot from 6 harvests can be expected.

The plot size of this experiment was 2 × 3.6 meter = 7.20 m^2 with 60 plants at a planting distance of 40 × 40 cm.

The cultural practices employed during this experiment were planting of rhizomes that were cut back half way, in order to induce leaf formation instead of bulblets, and harvesting of the leaves with the leaf stalk leaving 2 leaves per plant to secure rapid formation. These practices are not backed by experiment but are employed by successful growers.

The rainfall in decades during the experiment suggests that there was no effect of drought. Drought induces a rest period (aging) and the plants rejuvenate by the production of plantlets after some rain. The rainfall data are given in Table III.

RESULTS AND DISCUSSION

From the data we not only see that sulphate of ammonia and urea have a rapid decressing effect on the cooking quality of the leaves, but also the applicaton of NPK 15–15–15 results in a less marked decreasing effect on cookinig quality and in higher yields. From Table I one can further conclude, that the application of 15–15–15 should be given every month.

The most plausible explanation for this reduction in cooking quality is that sulphate of ammonia and urea cause a potassium and phosphorus unbalance. This reduction in potassium and phosphorus uptake is not a new phenomenon in horticulture. It has been established by phloem index studies (index of calcium oxalate crystals) that the uptake of potassium and phosphorus in the tea plant (Camelia sinesens) is reduced by urea and sulphate of ammonia.

The preliminary results of these experiments needs more systematic testing. It is of academic interest to study the uptake of elements by the phloem index method.

ACKNOWLEDGEMENT

The author is indebted to Mr. A. van Dijk M.Sc. for his kind permission to use the experimental data of the third experiment. These experiments were initiated by Mr. A. van Dijk.

TABLE I

Result of a cooking test (number of minutes)

Treatment	Days after fertilizing					
	0	7	14	21	28	36
no manure (Control no. 1)	5	5.5	8	14	15	15
cowdung+sulphate of ammonia (500 kg/ha) ...	7.5	—	—	—	—	—
cowdung+nrea (250 kg/ha)	6	10	10	—	—	—
cowdung+15–15–15 (670 kg/ha)	4	6	10	15	16	25
cowdung (control no. 2)	5.5	8	7.5	14	13	25

TABLE II
Yield data

Treatment	Total yield of 6 harvests/100m2	
	kg	number of leaves
no manuro (eontrol no 1)	59.7	8045
cowdung+sulphate of ammonia	136.9	9448
cowdnng +urea	134.9	9813
cowdung+15–15–15	197.6	9915
cowdung (control no. 2)	166.3	8931

TABLE III

Rainfall data

Decades	mm
3/7–10/7	36.2
11/7–17/7	9.8
18/7–24/7	12.3
25/7–31/7	36.4
1/8– 7/8	103.7

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