

RESPONSE OF SWEET POTATO PLANT TYPES TO
RATES OF INORGANIC N, P AND K FERTILIZERS

By

PRIYANWADA SURANGANI ANOMA DEVI PREMATHILAKE

Thesis

Submitted in partial fulfilment of the requirements

for the degree of

MASTER OF PHILOSOPHY

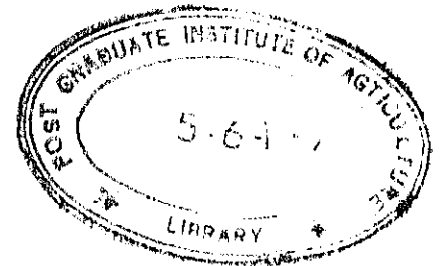
in the

POSTGRADUATE INSTITUTE OF AGRICULTURE

of the


UNIVERSITY OF PERADENIYA

SRI LANKA

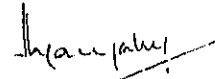


Approved by

Supervisor


(Dr. K.P. Premaratne)

Examiner


(Dr. U.R. Sangakkara)

Examiner


(Dr. S. Kulasegaram)

August 1988,

C 635.22

P62



402178

AGRICULTURE LIBRARY
UNIVERSITY OF PERADENIYA

402178/X

ABSTRACT

Two field experiments, with the objective of optimizing the productivity of sweet potato, were carried out at the Visayas State College of Agriculture (VISCA) Philippines during the dry season (February to May) and wet season (June to October) in 1986. The response of N, P and K fertilizer combinations (0-0-0, 30-0-0, 30-30-0, 30-30-30, 30-30-60 and 60-30-30 kg NPK/ha) on the growth and yield of 3 different plant types namely bush (VSP-2 and VSP-4), semi-vine (VSP-1, VSP-3 and V3-190) and viny type (Ciete flores) of sweet potato were studied.

The growth parameters (vine length, number of major branches, internode length, petiole length and vine weight) increased specially with the increase of nitrogen in the dry season. However, the response was not prominent during the wet season. With the increase of nitrogen fertilizer, the biomass production in terms of vine weight at harvest was significantly higher in viny type followed by semi-vine and bush type respectively. There was no significant difference in growth parameters with the increase of phosphorus and potassium fertilisation.

Considering the yield parameters the results revealed that the tuber yield increased significantly at the highest N fertilizer level (60 kg N/ha) tested in the dry season whereas in the wet season the yields were comparatively low and there was no significant difference between the highest N fertilizer level and the other fertilizer combinations. Further in the dry season

there was a 48% yield increase with the highest N combination (60-30-30 kg/ha) compared with the control or no fertilizer treatment. It was clear that irrespective of the season, the phosphorus and potassium had little or no effect on tuber yield. However, the number of tubers per plant and harvest index were significantly increased with the increase of potassium fertilizer.

Among the cultivars tested semi-vine and bush type recorded significantly higher yields (19.0 and 18.1 t/ha respectively) than viny type (10.7 t/ha) in the dry season. In the wet season bush type gave higher yields (10.5 t/ha) than semi-vine (8.5 t/ha) and viny type (4.2 t/ha).

Seasonal effects showed that irrespective of cultivar and fertilizer the dry season was superior to wet season for growing sweet potato.

Based on above results the highest amount of N with moderate level of P and K (60-30-30 kg NPK/ha) could be recommended for the dry season crop, while the 30-30-30 kg/ha N, P, K the recommended mixture would be suitable for sweet potato cultivation in the wet season under Philippine conditions.

Among the plant types the bush and semi-vine types could be recommended for obtaining high yields of tubers during the dry season and viny type could be identified as a leafy vegetable. If it is necessary to grow sweet potato during the wet season, the bush type is preferred.