ASSESSMENT OF PLANT POTASSIUM UPTAKE, CROP YIELD AND EXCHANGEABLE POTASSIUM CONTENT IN MAIZE - COWPEA INTERCROPPING SYSTEMS

by

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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

June 1993

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ABSTRACT

Effects of added potassium and different cropping combinations on exchangeable soil potassium, potassium uptake, and grain yield in maize-cowpea intercropping systems were studied on NCB soils at Aralaganwila and on RBL soils at Dodangolla in Maha 1990/91 season. Three potassium fertilizer levels and five cropping combinations were tested in a randomized complete block design with 3 replicates. An additional higher potassium level was used at Dodangolla.

Results show that exchangeable potassium in both soils were significantly increased by potassium fertilizer application. Availability of potassium declined with the growing season. The depletion was more aggravated in NCB soils compared with RBL soils.

The exchangeable potassium content varied in different cropping systems. In all cases, the lowest depletion of exchangeable potassium content was recorded by the soils with sole crop of cowpea and it was followed by sole crop of maize. The soils with intercropping systems showed the highest depletion of potassium.

Application of potassium fertilizer increased the potassium uptake with respect to application levels. However, plant uptake varied depending on the cropping system. Although uptake was higher under sole crops, total removal of potassium in individual plots was greater in intercrop than in sole crops.

In general, grain yield of both crops did not show a response to added potassium except for maize at Aralaganwila. Maize showed a response upto the second level of 45kg K_2O/ha. Sole crops always gave higher yields than when it was grown as a intercrop. However, the combined yield of intercropping combinations were always greater than sole crops in terms of LER and it indicated greater efficiency of land utilization.

The present study suggests that the intercropping combinations used for the experiment were superior in terms of combined yield. An adequate amount of potassium fertilizer should be provided to maintain soil potassium levels and to meet the additional crop demand, especially in intercropping systems.