

ABSTRACT

QUANTITATIVE EVALUATION OF N UPTAKE AND UTILISATION IN PLANTAIN (*MUSA AAB*)

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Three field studies were conducted at the University Field Station on the River Estate Series (*Fluventic Eutropepts*) in Trinidad and Tobago. The first study determined the zone of nutrient uptake by *in vitro* propagated plantain at one and five-months old using $(^{15}\text{NH})_2\text{SO}_4$. This zone was within a 30 cm radius circle around the plant and incorporated to a depth of 10 cm.

The second study evaluated leaf analysis as a diagnostic tool in ^{15}N studies. There was a very strong relationship between ^{15}N analysis of total foliage, 1st leaf and 3rd leaf with % Nitrogen derived from fertilizer (%Ndff) and fertilizer use efficiency obtained from total plant analyses. Therefore leaf analysis can be used for diagnosis in ^{15}N research of plantain nutrient requirements at different stages of development especially in conditions of differential fertilizer availability and soil N in time and space.

The third study compared the relative efficiencies of banded Urea on growth, yield, nutrient uptake and ^{15}N use efficiency of *in vitro* propagated French plantain as compared to Horn plantain plants derived from sword suckers. *In vitro* propagated French plantain gave superior growth and yield (50t ha^{-1}) than Horn plantain (sword suckers) (30t ha^{-1}). Banded Urea was more efficient than fertigated Urea, giving a more vigorous plant with 27% higher fruit yield, significantly higher uptake of N, P, K, Mg and a 14% higher ^{15}N recovery. The higher fertilizer N efficiency of banded Urea was attributed to the spatial availability of nutrients to plantain roots under tropical conditions. The superiority of banded $\text{CO}(\text{NH}_2)_2\text{-N}$ observed, deserves further investigation moreso in the dry season.

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