

ABSTRACT

**Use of Urea in Dasheen (Colocasia esculenta
var esculenta in an acid Vertisol in Trinidad****Naitram Ramnanan**

The Bejucal clay (Chromic Dystraquerts, very fine, mixed, acid) is an important agricultural soil in North Trinidad. A survey of the area occupied by this soil showed that except perhaps for sugar cane (Saccharum officinarum) and rice (Oryza sativa) commercial production no sound fertility maintenance recommendations for this soil exists. In practice, there is excessive use of $\text{CO}(\text{NH}_2)_2\text{-N}$ to facilitate vegetable and root crop production which are also important. A research project was therefore undertaken on the use of $\text{CO}(\text{NH}_2)_2$ to determine its optimum rate, best time of application, and to quantify its efficiency using dasheen (Colocasia esculenta var esculenta) as a test crop which is an important root crop to the region.

A field experiment was conducted which employed a randomized incomplete design. The treatments were 4 levels of N with 2 levels of P and K, respectively, replicated 3 times and confounded in blocks of 24 units with a no N control treatment added to each block. Three application times were used as sub-plots of each N plot. The optimum rate was found to be 280 kg N/ha with an apparent N recovery of 10 per cent when $\text{CO}(\text{NH}_2)_2$ was applied at 14 days after planting (DAP). A decrease in N uptake with increasing levels and later application were observed.

The efficiency of applied N was determined using ^{15}N in a green house experiment. A randomized block design with 3 levels of N and 3 split application regimes replicated 4 times was used. The optimum level as found in the field experiment was 280 kg N/ha but with an efficiency of 49 per cent; efficiencies of 43 and 40 per cent at the 140 and 420 kg N/ha of applied N levels, respectively, were also observed. A single application at 14 DAP resulted in an efficiency of 41 per cent compared to 44 and 47 per cent,

respectively, with the 2 split and 3 split applications. Split applications increased N uptake but without a corresponding increase in yield.

Unaccounted for N, presumably lost to the soil/plant system, was less than 8 per cent at the 140 and 280 kg N/ha, respectively, and it was not significantly affected by split applications ($p > 0.05$). However, significant ($p > 0.01$) losses of approximately 32 per cent occurred with a single application at 420 kg N/ha which was reduced to 19 per cent and 13 per cent with the 2 split and 3 split applications, respectively.

An evaluation of the production cost and yield due to fertilizer application to various dasheen cropping systems showed that it can be a profitable crop for small farmers who do not cost their labour or purchase planting material.

These studies showed that N applied as $\text{CO}(\text{NH}_2)_2$ at 280 kg N/ha at 14 DAP is optimum for dasheen production under upland conditions in the Bejucal clay. Since the N uptake by the crop from the field experiment was much lower than that of the green house, it is inferred that much of the applied N in this case was lost through surface run-off.

This work could not have been completed without the competent assistance of Mr. B. Lauckner (CARDI's Biometrician) on statistical matters and Mr. J. Barrios and E. Lequay of the U.S.I. Main Library. A special thanks is extended to Mr. J. Barrios for his assistance in the laboratory and the favourable conditions of the work. The author wishes to express his appreciation to the Director of CARDI for his interest and support.