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Effect of N regimes and green leaf manure application on nutrients uptake by rice plant and grain

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SUMMARY

Field experiments was conducted during 2001-2002 on a sandy loam soil (*Fluventic haplustept*) to study the effect of N regimes and green leaf manure (GLM) application on the nutrients uptake by rice and rice grain. The treatments included different N regimes *viz.*, 100 kg N ha⁻¹, 150 kg N ha⁻¹, LCC 3, LCC 4, SPAD 33, SPAD 35 and SPAD 37 with two short duration rice genotypes *viz.*, ADT 39 and CORH 2 with or without application of green leaf manure. Application of higher levels of N resulted in the significantly higher uptake of N, P, K, Fe, Zn, Cu and Mn by the plant. It enhanced the N, P, Zn and Mn uptake by the grain. Addition of green leaf manure had significantly increased the N, P, Zn, Mn, and Cu uptakes by the rice plant, but it did not show any significant differences among the nutrients uptakes by grain. The uptake of nutrients by rice was also increased with the advancement of crop growth.

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ice is very responsive to N fertilization and its high Nyield potential can not be realized without adequate N supply to the plant during the entire crop growth period. But the important aspect of realizing the potential yield is to supply the N either from the native supply or through external application in the required proportion at the appropriate period of crop growth at the rate equivalent to crop uptake. The uptake of a nutrient is a function of dry matter production and nutrient concentration in the plants parts. Any strategy that increases either the dry matter production or the nutrient concentration would definitely result in the increased uptake of that nutrient. There could be a definite relationship between nutrient uptake and the nutrient supplying power of the soil influenced by the method and quantum of application of manures and fertilizer. The uptake of nutrients was higher with the combined use of organic manure along with inorganic fertilizer than with application of fertilizer alone (Jayabal et al., 1999). Nitrogen promotes rapid growth, increased height and tiller number (De Datta, 1981) and it has close association between height of the plants and grain yield (Yoshida, 1972).

EXPERIMENTAL METHODS

A field experiment was conducted at eastern farm

of Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal, Puducherry during the samba season of 2001-2002 with nine N levels *viz.*, control (T_1), 100 kg N ha⁻¹ (T_2), 150 kg N ha⁻¹ (T_3), application of N through LCC 3 (T_4), LCC 4 (T_5) and LCC 5 (T_6), N through SPAD 33 (T_7), SPAD 35 (T_8), and SPAD 37 (T_9) in two cultivars *viz.*, ADT 39 (V_1) and CORH 2 (V_2). These treatment tried with (G_1) or without the application of green leaf manure (GLM) (G_2) (*Crotoleria juncea*) at the rate of 6.25 mg ha⁻¹.

Experimental site belonged to sorakkudy soil series, taxonomically Fluventic hplustept, having a texture of sandy loam. The bulk density of the soil was 1.25 mg m^{-3} ³ with the particle density of 2.45 Mg m⁻³ and the total porosity of 50.94 per cent. The soil was non-saline (0.25 dSm⁻¹) and pH was almost neutral (6.99). The cation exchange capacity of the soil was 11.4 cmol (p+) kg⁻¹ with dominant proportion of Ca followed by Mg, and K. The base saturation percentage was 80.08. With respect to the available nutrient status of the experimental site, it was seen that the soil was low in available N, high in available P and medium with respect to available K. The experiment was conducted in a Factorial Randomized Block Design (FRBD) with two replications. The data collected from field observations and laboratories analyses

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