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Impact of organic nutrition on productivity and nutrient uptake of rice under upland eco-system

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SUMMARY
A field experiment was conducted during *Kharif* season of 2005 to study the impact of organic nutrition on productivity and nutrient uptake of rice (*Oryza sativa* L.) under upland eco-system. Application of RDF (80 : 50 : 50 NPK kg/ha) recorded significantly more grain, straw and biological yield over rest of the treatments. Among organic nutrient treatments, application of green leaf manuring (Glyricidia) 5 t/ha + farmyard manure (FYM) 10 t/ha recorded significantly higher yield over rest of the treatments. The increase in yield was attributed to grains/panicle, panicle weight (g) and panicles/m^2. Nutrient uptake was significantly more in treatment T_2 and among organic nutrient treatments treatment T_5 has recorded significantly more nutrient uptake over other organic nutrient treatments and control.

Key words : Organic nutrition, Upland eco-system, RDF, Nutrient uptake.

In India rice (*Oriza sativa* L.) occupies pivotal place in Indian agriculture and is the staple food of more than 70 per cent population. It accounts for about 45 per cent of total food grain production and 55 per cent of cereals production. Presently indiscriminate use of chemical fertilizers alone has led to environmental pollution and deterioration of soil health, so balance use of nutrients through organic sources like FYM, vermicompost, green manuring, neem cake, bio-fertilizers is prerequisite to sustain soil fertility and to provide maximum crop yield with optimum input level. Green manuring of soil is essential for building up soil fertility supplementing plant nutrients as green manuring crops fix varying amount of nitrogen but after considering various losses (leaching and denitrification) approximately 50 kg N/ha is available to crop (Sreekantan and Palaniappan, 1990). Constant N supply due to slow release from the incorporated green manure and FYM would match with the absorption pattern of rice resulting in improved crop performance and soil sustainability. In view of this, the study was undertaken to find out impact of organic nutrition on productivity and nutrient uptake of rice under upland eco-system.

MATERIALS AND METHODS

A field experiment was conducted during *kharif* season of 2005 and was laid down in randomized block design with three replications on the farm of Upland Paddy Research Scheme, Marathwada Agricultural University, Parbhani. The soil was clayey in texture and slightly alkaline in reaction with pH 8.25, low in available nitrogen (267.45 kg/ha), medium in P (22.48 kg/ha) and high in K (353.41 kg/ha). In this experiment there were 12 treatments. T_1-Control, T_2-RDF (80 : 50 : 50 NPK kg/ha), T_3- GLM (10 t/ha), T_4- GLM (5t/ha) + wheat straw (10 t/ha), T_5 - GLM (5t/ha) + FYM (10 t/ha), T_6 - FYM (10 t/ha), T_7- GLM (5t/ha) + FYM (5 t/ha), T_8 - Neem cake (1.5 t/ha), T_9 - Vermicompost (2.5 t/ha), T_{10} - GLM (5t/ha) + *Azotobacter* (1.5 kg/ha), T_{11} - GLM (5t/ha) + PSB (5 kg/ha), T_{12} - GLM (5t/ha) + *Azotobacter* (1.5 kg/ha) + PSB (5 kg/ha).The variety tried in experiment was Parbhani Avishkar. Spacing was 30 x 10 cm. The gross and the net plot size was 5.4 x 4.5 m and 4.5 x 3.6 m, respectively. The seeds sown by hand drilling method. The basal dose of RDF i.e. 20% N, 100% P_2O_5 and 100% K_2O applied at sowing and 50% N at 30 DAS and 30% N at 60 DAS, respectively. FYM, Vermicompost, neem cake and wheat straw applied before sowing. Green leaf manuring of glyricidia was applied to soil 21 DAS. All the agronomic practices were carried out as per the recommendation. N uptake, P uptake and K uptake was estimated by following Kjeldahl's method (Piper, 1952), Olsen's method (Jackson, 1967) and Flame Photometer Method (Jackson, 1967), respectively.

RESULTS AND DISCUSSION

Effect on yield contributing characters :

It is evident from the data presented in Table 1 that difference in all the yield contributing characters were significant due to treatment T_2 i.e. RDF, treatment T_2 was found significantly superior over control and organic

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