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Effect of nitrogen levels through organic sources on growth, dry matter production and nutrient uptake of irrigated aerobic rice (*Oryza sativa* L.)

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ABSTRACT

A field experA field experiment was conducted to study the effect of various levels of nitrogen through organic sources on growth, dry matter production and nutrient uptake of irrigated aerobic rice during *Kharif* season 2008 at Zonal Agricultural Research Station, V.C. Farm, Mandya, University of Agricultural Sciences, Bengaluru in red sandy loam soil. The variety used was Thanu (KMP-101). The results of the field experiment showed that application of recommended dose of fertilizer (100:50:50 kg N:P:K ha^{-1}) + 10 tonnes of FYM ha^{-1} recorded significantly higher growth parameters like plant height (63.1 cm), number of tillers (36.2 hill^{-1}), leaf area (1602 cm^2 hill^{-1}) and dry matter production at harvest (151.1 g hill^{-1}). However, it was at par with 200 % recommended dose of nitrogen (RDN) equivalent through vermicompost ha^{-1}, 200 % RDN equivalent through FYM ha^{-1}, 150 % RDN equivalent through vermicompost ha^{-1} and 100 % RDN equivalent through poultry manure ha^{-1}. Significantly higher nitrogen, phosphorus and potassium uptake (124.2, 30.6 and 93.9 kg ha^{-1}, respectively) registered with recommended dose of fertilizer (100:50:50 kg N:P:K ha^{-1}) + 10 tonnes of FYM ha^{-1}. However, it was at par with 200 % recommended dose of nitrogen (RDN) equivalent through vermicompost ha^{-1}, 200 % RDN equivalent through FYM ha^{-1}, 150 % RDN equivalent through vermicompost ha^{-1} and 100 % RDN equivalent through poultry manure ha^{-1}.

Key words : Rice, Nitrogen, FYM, Vermicompost, Poultry manure

INTRODUCTION

Rice (*Oryza sativa* L.) is the major crop of India and occupies larger cropped area of 43.77 million hectares with an annual production of 96.43 million tonnes and productivity of 2203 kg ha^{-1}. In Karnataka, it is grown in an area of 1.49 million hectares with an annual production of 5.74 million tonnes with a productivity of 3868 kg ha^{-1} (Anonymous, 2008). Breeders, Physiologists, Agronomists and soil scientists are striving hard to overcome many difficulties in taking rice out of its natural environment by developing an alternate management systems. Among these, success of aerobic rice depends on efficient management of plant nutrients. Further, it is not desirable to apply nutrients only through inorganic sources. Application of organic manures for increasing soil fertility has gained importance in recent years due to high cost and adverse impact of fertilizers. Incorporation of organic manures has given a hope to reduce the cost of cultivation and minimize adverse effects of chemical fertilizers. Use of different organic manures like farm yard manure, vermicompost and poultry manure deserves priority for sustained production and better resource utilization in the cultivation system. Compared to chemical farming this method was self-sufficient and self-dependent as compared to modern chemical farming relying more on organic in order to assess the utility of locally available resources. Nitrogen is pivotal in realization of rice yield. In India about 67 per cent of rice soils are estimated to be deficit in adequate nitrogen and consequently rice crop has become a major consumer of nitrogen fertilizer. The efficiency of applied nitrogen fertilizer is low, ranges from 20-25 per cent in aerobic soil. Aerobic soil has higher rate of percolation than flooded soil because of lack of flooding. In view of this, an experiment was conducted on "Effect of various levels of nitrogen through organic sources on growth, dry matter production and nutrient uptake of irrigated aerobic rice".

MATERIALS AND METHODS

A field experiment was conducted at Zonal Agricultural Research Station, Visweshwaraiah Canal Farm, Mandya, University of Agricultural Sciences, Bengaluru during *Kharif* 2008. The soil of the experimental site was red sandy loam with neutral pH (6.97) and medium in organic carbon (0.56%) content. The initial status of available N, P_2O_5 and K_2O of the experimental site was 292.5 28.2 and 169.3 and kg ha^{-1}, respectively. The experiment was laid out in a Randomized Complete Block Design with eleven treatments replicated thrice. The treatments were recommended dose of fertilizer (100:50:50 kg N: P: K ha^{-1}) (T_1), recommended dose of fertilizer + 10 tonnes of FYM ha^{-1} (T_2), 100 % recommended dose of nitrogen (RDN) equivalent through FYM ha^{-1} (T_3), 100 % RDN equivalent through vermicompost ha^{-1} (T_4), 100 % RDN equivalent through poultry manure ha^{-1} (T_5), 150 % RDN

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