

Effect of organic and inorganic fertilizers on yield and nutrient uptake of hybrid rice under upland condition

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SUMMARY

A field experiment was conducted during *kharif* season of 2007 to study the effect of organic and inorganic fertilizers on yield and nutrient uptake of hybrid rice under upland condition. The experimental results revealed that application of 100 % N through inorganic fertilizer recorded significantly more grain, straw and biological yield over rest of the treatments. Among combination of organic, inorganic nutrient sources and biofertilizer (75 % N through inorganic fertilizer + 25 % N through vermicompost (3.57 t/ha) + Azotobacter (0.75 kg/ha)) recorded more grain, straw and biological yield over rest of the treatments. The increased in yield was attributed to grains/panicle, panicle weight (g) and panicle /m². Nutrient uptake was significantly more in treatment T₁. As regards to combination of organic inorganic nutrient sources treatment T₉ has recorded significantly more nutrient uptake over rest of the treatments.

Key words : WUE, Photosynthetic rate, Transpiration and *kharif* groundnut.

Rice (*Oryza sativa* L.) is one of the important cereal crop of the world as it is staple food of over half of the world population and more than 70 per cent people obtained energy from rice. India has the largest area among rice growing countries and it stand second in production. Integrated nitrogen management involving organic and inorganic sources of nutrition has a great scope to increase the productivity by proper management. This not only sustain the soil fertility and productivity but also keeps the environment intact with reduced cost increment (Swaminathan, 1987). 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 and biofertilizer is prerequisite to sustain soil fertility and to provide maximum crop yield with optimum input level. In view of this, the study was undertaken to find out effect of organic and inorganic fertilizers on yield and nutrient uptake of hybrid rice under upland condition.

MATERIALS AND METHODS

A field experiment was conducted during *kharif* season of 2007 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 8.26, which was low in available nitrogen (240.36 kg/ha), medium in P (17.81 kg/ha) and high in K (351.48 kg/ha). In this experiment there were 10 treatments. T₁ - 100 % N through inorganic, T₂ - 100 % N through FYM (20 t/ha), T₃ - 75 % N through inorganic + 25 % N through FYM (5 t/ha), T₄ - 50 % N through inorganic + 50 % N through FYM (10 t/ha), T₅ - 75 % N through inorganic + 25 % N through FYM + Azotobacter (0.75 kg/ha), T₆ - 50 % N through inorganic + 50 % N through FYM + Azotobacter (0.75 kg/ha), T₇ - 75 % N through inorganic + 25 % N through vermicompost (3.57 t/ha), T₈ - 50 % N through inorganic + 50 % N through vermicompost (7.14 t/ha), T₉ - 75 % N through inorganic + 25 % N through vermicompost (3.57 t/ha) + Azotobacter (0.75 kg/ha), T₁₀ - 50 % N through inorganic + 50 % N through vermicompost (7.14 t/ha) + azotobacter (0.75 kg/ha). The rice hybrid KRH-2 was sown at spacing of 25 cm x 25 cm. The recommended dose of fertilizer is 100 : 50 : 50 kg NPK/ha. The basal dose of fertilizer *i.e.* 20 % N, 100 % P₂O₅ and 100 % K₂O applied at sowing and 50 % N at 30 DAS and remaining 30 % N/ha at 60 DAS, respectively. FYM, vermicompost applied before sowing. 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

Result obtained are summarized in Table 1 and 2. Analysis of variance revealed that different level of organic

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