Research Paper

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Yield maximization of hybrid rice (*Oryza sativa*. L.) through integrated nutrient management

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ABSTRACT : The experiment was laid out in Complete Randomized Block Design (RCBD) with ten treatments replicated thrice. The treatments consisted of 100 per cent, 75 per cent and 50 per cent recommended doses of nutrients (RDN) through chemical fertilizers and 25 per cent and 50 per cent RDN through organic sources like farm yard manure and blue green algae (BGA). Application of 75 per cent of recommended NPK through inorganic + FYM @ 10 t ha^{-1} + BGA @ 15 kg ha^{-1} recorded significantly higher plant height, more No. of tillers/ hill and yield.

Key Words : Organic, Inorganic, INM, Hybrid rice, BGA

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Rice is one of the most important cereal crops in India.The country has to produce about 130 mt of rice by 2025 to feed the ever growing population. Meeting the targeted demands of rice is a challenging task. Decreasing in the soil fertility and increasing in water scarcity is becoming threat for rice cultivation. Hence, the technology which maintains the soil health and water scarcity and as well as economically beneficial needs to be developed. The role of organic fertilizer in plant nutrition is now attracting the attention of agriculturists and soil scientists throughout the world. Chemical fertilizers, no doubt have the positive impact on crop growth and yield, but had negative impact on soil organic matter, soil structure, and microbial population. Application of organic materials along with inorganic fertilizers into soil results an increase in productivity of the system and also sustain the soil health for longer period. Rice being a crop having water requirement, there is a need to search for alternative method to reduce water requirement of rice without reduction in yield. In low land rice cultivation, biological nitrogen fixation (BNF) has been the most effective system in sustaining production which is being considered not only as a strategic necessity but also an economic advantage. The main agents of BNF in a paddy field are blue green algae (BGA) and the water fern Azolla. The surface of rice field water provides a suitable environment for their growth and multiplication. Azolla, a water fern that assimilates atmospheric nitrogen in association with N fixing blue green algae, *Anabaena azollae*. This Azolla-Anabaena complex is considered to be the potential biological system for increasing rice yield. BGA not only fix atmospheric nitrogen but also ameliorate the soil water. The growth of BGA in soil seems to influence the physical and chemical properties of soil. Keeping above factors in mind, present investigation was conducted to study the effect of integrated nutrient management on growth and yield of hybrid rice.

Research Procedure

Field experiment was conducted during *Kharif* season of 2010 at central research farm, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad. The soil of the experimental site was sandy loam with pH (7.7) and medium in organic carbon (0.4%). The initial status of available N, P_2O_5 and K_2O of the experimental site was 220.0, 18.8 and 250.0 kg ha^{-1}, respectively.The experiment was laid out in a Randomized Complete Block Design with ten treatments replicated thrice. The treatments were control (T_1), BGA @ 15 kg ha^{-1} (T_2), FYM @ 10 t ha^{-1} +BGA @ 15 kg ha^{-1} (T_3), 50% of recommended NPK through inorganic (T_4), 50% of recommended NPK through inorganic + BGA @15 kg ha^{-1} (T_5), 50% of recommended NPK through inorganic + FYM @ 10 t ha^{-1} + BGA @ 15 kg ha^{-1} (T_6), 75% of recommended NPK through inorganic (T_7), 75% of recommended NPK through inorganic+BGA @15kg ha^{-1}(T_8),75% of recommended NPK through inorganic + FYM @ 10 t ha^{-1} + BGA @ 15 kg ha^{-1} (T_9), 100% of recommended NPK