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RESEARCH ARTICLE

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Effect of integrated nutrient management on growth and yield of soybean [*Glycine max* (L) Merril]

B.S. GUNJAL, A.D. PAWAR, N.S. UGALE AND S.S. CHITODKAR

ABSTRACT

The study revealed that the growth attributes *viz.,* plant height, number of branches, leaf area, dry matter and number of root nodules per plant were significantly increased with increased levels of fertilizers application upto to 50 kg N + 75 kg P_2O_5 + 50 kg K_2O + 5 t FYM ha^{-1}. Integrated use of inorganic fertilizer with combination of FYM increased the yield attributes and yield. Highest yield attributes *viz.,* number of pods, pod weight, number of grains, grain weight per plant were significantly increased with increased levels of K_2O and FYM levels. Highest grain yield (28.01 q ha^{-1}), biological yield (61.33 q ha^{-1}) and harvest index (45.68%) was recorded with the application of 50 kg N + 75 kg P_2O_5 + 50 kg K_2O + 5 t FYM ha^{-1}.

KEY WORDS : Growth attributes, Yield, Organic manures FYM, Organic manures and Soybean

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INTRODUCTION

Average productivity of soybean in India (750 kg ha^{-1}) and Maharashtra (810 kg ha^{-1}) is very low (Anonymous, 2006). This is due to low use of chemical fertilizers and organic manures/ bio fertilizers. Soybean requires proper supply of plant nutrients especially NPK fertilizers for ensuring good plant growth and higher yield. The fertilizers are powerful tools for better crop management and can make effective contribution to crop production factors with reasonable balance and receive appropriate attention. Several workers reported significantly higher seed yield of soybean through use of different fertilizer levels. The basic concept underlying the integrated nutrient management system is the maintenance of yield stability through correction of marginal deficiencies of secondary and micro-nutrients, enhancing efficiency of applied nutrients and providing favourable soil physical conditions (Bisht and Chandel, 1996). Incoming decades in addition to nitrogenous and phosphoric fertilizer, potassic fertilizers are used. Potash plays an important role in protein formation in soybean. Diseases resistant balance the effect of very excess nitrogen and phosphorous etc. Hence, present investigation was carried out with view to study the effect of integrated nutrient management on growth and yield of soybean.

Correspondence to:
B.S. GUNJAL, Department of Agronomy, College of Agriculture, DHULE (M.S.) INDIA

Authors' affiliations:
A.D. PAWAR, N.S. UGALE AND S.S. CHITODKAR, Department of Agronomy, College of Agriculture, DHULE (M.S.) INDIA

MATERIALS AND METHODS

The field experiment was laid out in a Randomized Block Design (RBD) with eight treatments replicated thrice during *Kharif* season 2005 at 'D' block, Director of Farms, Mahatama Phule Krishi Vidyapeeth, Rahuri Dist. Ahmednagar (Maharashtra). There were following eight treatment combinations formed due to fertilizers levels *viz.*, T_1 : Control, T_2 : 50 kg N + 75 kg P_2O_5, T_3 : 50 kg N + 75 kg P_2O_5 + 25 kg K_2O, T_4 : 50 kg N +75 kg P_2O_5 + 50 kg k_2O, T_5 : 50 kg N + 75 kg P_2O_5 + 25 kg + 2.5 t FYM, T_6 : 50 kg N + 75 kg P_2O_5 + 25 kg K_2O + 5 t FYM, T_7 : 50 kg N+75 kg P_2O_5 + 50 kg K_2O+ 2.5 t FYM, T_8 :50 kg N+75 kg P_2O_5 + 50 kg K_2O+5 t FYM ha^{-1}. The fertilizer dose NPK and organic material through urea, single superphosphate, muriate of potash and FYM, respectively were incorporated basally, as per treatment at the time of sowing. The seeds were inoculated with *Rhizobium* and PSB culture for all treatments before sowing. The gross and net plot size were 4.80 x 3.60 m and 4.20 x 3.00 m, respectively. Sowing was done on 5th July, 2005 by dibbling the seeds of soybean variety DS-228 (Phule Kalyani) at spacing of 30x10 cm. All recommended management practices were followed. Need-based inter culture and