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Effect of integrated nutrient management on nutrient uptake and soil fertility of soybean [*Glycine Max* (L.) Merril]

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ABSTRACT

The uptake of NPK was significantly increased with increased levels of FYM. Further it was observed that nitrogen uptake showed graded response to increase levels of FYM. Recommended dose of fertilizer when applied with organics *i.e.* FYM 5 t ha^{-1} recorded significantly higher total uptake of N, P and K (218, 28.48 and 125.51 kg ha^{-1}) over the control (135.84, 14.66 and 82.68 kg ha^{-1}). Increasing the soil fertility status (available NPK) upto of 50 kg N + 75 kg P_2O_5 + 50 kg K_2O + 5 t FYM ha^{-1}. (N 237.32, P 26.30 and K 337.03 kg ha^{-1}). The soil fertility status declined in control treatment at initial value of available NPK. This might be owing to increased supply of nutrient source to the crop as well as due to indirect effect resulting from reduced loss of organically supplied nutrient.

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Key words : Integrated nutrient management, Nutirent uptake, Soil fertility, Soybean

INTRODUCTION

Imbalance nutrition is one of the important constraints of soybean productivity in North Indian Plains (Chandel, 1989; Tiwari, 2001). Continuous use of high level of chemical fertilizers has led to problems of soil degradation, which is proving detrimental to soybean production. A crop producing 6,720 kg/ha biomass removed about 614 kg N, 148 kg P and 486 kg K/ha (Nelson, 1989). Therefore, adequate and balanced fertilization is necessary to increase soybean productivity. The supplementary and complimentary use of organic mannures and bio-fertilizer improve soil physical, chemical and biological properties, fertilizer-use efficiency, mitigates short supply of micronutrients, stimulates the proliferation of diverse group of micro-organisms and plays and important role in the maintenance of soil fertility and improves the ecological balance of rhizosphere. Hence, an experiment was conducted to study the performance of soybean with different integrated nutrient management systems in terms of nutrient uptake and soil fertility.

MATERIALS AND METHODS

The field experiment was conducted at the M.P.K.V., Rahuri, Dist. Ahmednagar during rainy (*Kharif*) season of 2005. The experimental soil was clayey in texture, contains 0.42% organic carbon, 209.52 kg/ha available N, 21.73 kg/ha available P and 313.20 kg/ha available K. The experiment consisted of 8 treatments *viz.*, different combination of integrated nutrient management comprised of fertilizer levels. 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 K_2O + 2.5 t FYM ha^{-1}, T_6 : 50 kg N + 75 kg P_2O_5 + 25 kg K_2O + 5 t FYM ha^{-1}, T_7 : 50 kg N + 75 kg P_2O_5 + 50 kg K_2O + 2.5 t FYM ha^{-1}, T_8 : 50 kg N + 75 kg P_2O_5 + 50 kg K_2O + 5 t FYM ha^{-1} was laid out in randomized block design with 3 replications. The fertilizer dose of NPK and organic material through urea, single superphosphate, murate of potash and FYM, respectively were incorporated bassally, as per treatment at the time of sowing. The seeds were inoculated with *Rhizobium*

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