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Effect of integrated nutrient management on quality and economics of soybean

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ABSTRACT

The quality components *viz*. Oil, oil yield, protein and protein yields were found to be superior under potassium and integrated nutrient management over rest other treatments and control. The application of 50 kg N + 75 kg P_2O_5 + 50 kg K_2O + 5 t FYM ha^{-1} was found to be superior over other treatments. The highest gross income (Rs. 36420), net monetary returns (Rs.18210) and B : C ratio (2.00) were observed with the application of 50 kg N + 75 kg P_2O_5 + 50 kg K_2O + 5 t FYM ha^{-1}. Increasing the levels of fertilizer in combination of K_2O and FYM levels enhanced the quality as well as economic of soybean.

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Key words : Integrated nutrient management, Yield, Quality soybean and economic returns, FYM

INTRODUCTION

Soybean [*Glycine max* (L) Merrill] is one of the important pulse and oilseed crops of the world. It becomes miracle crop of twentieth century and designated as "Golden Bean". It has high nutritive value and it is extensively grown verticals of India because of its wider adaptability to agro-climatic condition and high market value.

The crop soybean was introduced in sixties as supplementary oilseed crop to overcome the edible oil shortage in the country. Among all oilseed crops, soybean occupied third position in the edible oil scenario of India. It contains high quality of protein 43.2 per cent and oil 19.5 per cent. It also contains 26 per cent carbohydrates, 4 per cent minerals and 2 per cent phospholipids. (Halvankar *et.al.*,1992) It is rich source of vitamin A,B and D. Being best and cheapest source of high quality protein amongst vegetable and animal protein source. The protein from soybean is equivalent to that of milk product, eggs and meat in quality, hence it is called as "poor man's meat". In coming decades in addition to nitrogenous and phosporic fertilizer, potasisic fertilizers will be used. Nitrogen important role in early growth, green colour and vegetative growth. Phosphorus helps to improve quality of grain and to increase amount of protein in soybean. Potash plays an important role in protein formation in soybean.

MATERIALS AND METHODS

The field experiment was conducted at the Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar during rainy (*Kharif)* 2005 at Director of Farm, 'D' Block, Mahatma Phule Krishi Vidyapeeth, Rahuri. (Maharashtra) The experimental soil was Clayey in texture, contains 0.42% organic carbon, 209.52 kg N, 21.73 kg /ha available P and 313.20 kg/ha available K. The experiment consisted of 8 treatments *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 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 FYM was incorporated at the time of sowing. The seeds were inoculated with *Rhizobium* and PSB culture to all treatments before sowing. Soybean variety DS-228 (Phule Kalyani) was grown on 5th July 2005 sown at spacing of 30x10 cm. The full dose of NPK and organic manure through urea, single superphosphate, muriate of potash and FYM, respectively were applied basally as per treatment at the time of sowing. The grain and haulm were analyzed for nitrogen content by micro-Kjeldhal's method, potassium by flame photometer method and phosphorus was estimated by Vando-molybdate-yellow colour method as per A.O.A.C. (1992) and Jackson (1973), respectively. Protein content (%) was worked out by multiplying N content with 5.71 and protein yield per hectare was calculated by multiplying the protein content with per hectare grain yield of respective treatments. The oil content (%) in grains of soybean was estimated with the help of soxhelt apparatus using ether as solvent for oil extraction. Oil yield per hectare was calculated by

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