Research Paper

An Asian Journal of Soil Science

Vol. 6 No. 1 (June, 2011) : 80-84

Received : April, 2011; Accepted : May, 2011

Effect of organic and inorganic fertilization on soil fertility and productivity of french bean in Vertisol

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ABSTRACT

The field experiment was conducted during 2006-2007 to study the effect of organic and inorganic on soil fertility and productivity of French bean in Vertisol. The highest grain yield, straw yield and growth parameters were observed where 150 % RDF of NPK through chemical fertilizer including micronutrient and biofertilizers were applied. The higher level of NPK application that 150% RDF through chemical fertilizer recorded higher available N, P and K; while absence of chemical fertilizer that use of only vermicompost showed lower availability in soil. Application of $FeSO_4$, $ZnSO_4$ and vermicompost showed higher available Fe and Zn. It can be concluded that supply of higher quantity of NPK through chemical fertilizer was more efficient for harvesting maximum grain yield of French bean and improving quality parameters like protein content.

Metkari, Prajakta M. and Dhok, Swati P. (2011). Effect of organic and inorganic fertilization on Soil fertility and productivity of french bean in Vertisol. *Asian J. Soil Sci.*, **6**(1): 80-84.

Key words : Organic and inorganic fertilizer, Soil fertility and productivity, French bean

INTRODUCTION

The productivity of french bean is low in Maharashtra. Inadequate supply of nutrient is one of the most important reasons of its low productivity under situation of Marathwada, where the black soil (Vertisols) are deficient in both nitrogen and phosphorus while these are sufficient in potassium. Therefore, nitrogen and phosphorus application is considered to be necessary for development of french bean.

It is need of the hour to make all possible efforts to utilize various sources for increasing nutrient levels in plant or soil in order to increase the production and maintain the soil fertility of french beans. Vermicompost and chemical fertilizers along with phosphate solubalizing bacteria and *Rhizobium* as a biofertilizer are essential components which are required in large quantities for growth and higher yield of this crop. The combined use of organics and chemical fertilizers not only increase the yield of crop but improve the physical, chemical and biological properties of soil. Use of organic manures with optimum rate of fertilizers under intensive farming system increased the turnover of nutrients in the soil plant system. Hence, the present investigation was undertaken to be focus on nutrient management with organic manure, chemical fertilizers, biofertilizers and micronutrient effect on yield of crop and available nutrient status of soil.

MATERIALS AND METHODS

The field experiment was conducted in *Rabi* season of 2006 and 2007 at Experimental Farm of Department of Soil Science and Agricultural Chemistry, college of Agriculture, Parbhani. The experiment was started in the year 2006 and it was continued for the two successive years. Since the data followed the homogeneity test, pooling was done over two seasons and mean data are given. The treatment consisted of T_1 - no application of manure or chemical fertilizers, T_2 - NPK @ 120:60:60 Kg ha^{-1} (RDF through chemical fertilizers) at sowing, T_3 - NPK @ 120:60:60 Kg ha^{-1} + *Rhizobium* + PSB (at sowing), T_4 - NPK @ 120:60:60 Kg ha^{-1} + Zn + Fe+

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