



Research Article

Influence of organic and inorganic fertilizers on growth, yield, quality of soybean [*Glycine max* (L.) Merrill] and soil properties

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Summary

A field experiment was carried out on loamy sand soil at Agriculture Research station Farm Derol, Anand Agricultural University, Anand, during *Kharif* 2010, to study the influence of organic and inorganic fertilizers on growth, yield, quality of soybean [*Glycine max* (L.) Merrill] and soil properties. The experimental results revealed that an application of FYM @ 5 t ha⁻¹ recorded maximum plant height (99.69cm), pod length (3.68cm), seeds per pod (3.08), seed yield (1,908 kg ha⁻¹), haulm yield (3,588 kg ha⁻¹), protein content (40.73%), oil content (19.59%), organic carbon (0.307%), available P₂O₅ (55.49 kg ha⁻¹) and available K₂O (245.38 kg ha⁻¹) than rest of the treatments. Application of inorganic fertilizer @ 100 % RDF (*i.e.* 60 kg N: 30 P₂O₅: 0 kg K₂O) recorded significantly higher plant height (99.53cm), pod length (3.71cm), seeds per pod (3.09), seed yield (1,868 kg ha⁻¹), haulm yield (3,537 kg ha⁻¹), protein content (41.21%), oil content (19.91%), organic carbon (0.310%), available P₂O₅ (56.26 kg ha⁻¹) and available K₂O (246.61 kg ha⁻¹).

Key words : Soil properties, Soybean, Protein, Inorganic, Organic, Yield

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Introduction

Soybean [*Glycine max* (L.) Merrill] is known as soja bean, soya bean, chinese pea and manchurian bean which belongs to family Fabaceae, sub family Faboideae and has Eastern Asian origin. This legume is making straight way in Indian agriculture to meet protein and oil requirement. It is outstanding in its nutritive value with enhanced protein and oil content and is also rich in vitamins, minerals, salts and other essential amino acids. Madhya Pradesh, Maharashtra, Rajasthan, Andhra Pradesh, Karnataka and Chhatisgarh are the leading soybean growing states. Soybean production has not only gained the vital importance in the Indian agriculture, but also plays an important role in oil economy of India as it contributes more than 10 per cent of total foreign revenue (Anonymous, 2005).

Different organic manures like castor cake, vermicompost, and FYM which resulted in greater assimilation of photosynthates and their accumulation in yield components.

Careful management of nutrient resources *i.e.* organic manures and inorganic fertilizers is a application of pre-requisite for sustainable crop production in soybean. For higher production and better soil health the combined organic manures and inorganic fertilizers is required.

Resources and Research Methods

The experiment was conducted at Agriculture Research station Farm Derol, Anand Agricultural University, Anand, during *Kharif* 2010. The soil of experimental field was loamy sand in texture having pH 7.1 and organic carbon content of soil was 0.45 per cent. The fertility status of experimental field was found to be low in available P₂O₅ (26 kg ha⁻¹) and high in available K₂O (350 kg ha⁻¹) (Table A).

The experiment was laid out in Factorial Randomized Block Design with four replications. The treatments were four different organic manures *i.e.* No (No organic), CC (castor cake @ 0.5 t ha⁻¹), VC (vermicompost @ 1 t ha⁻¹), and FYM