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Research Article

Integrated nutrient management practices on soil NPK nutrient balance under organic cultivation of chickpea (*Cicer arietinum* L.) grown in vertisol of northern dry zone of Karnataka

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Summary

A field experiment was conducted for two consecutive years to study the Influence of Integrated nutrient management practices on soil NPK nutrient balance under organic cultivation of chickpea (*Cicer arietinum* L.) grown in vertisol of northern dry zone of Karnataka, at Agricultural Research Station, Annigeri, UAS, Dharwad, Karnataka during *Rabi* season of 2009-2010 and 2010-2011.The experiment was laid out in RCBD with three replications. There were 18 treatment combinations consisting of four different organic manures in combination *viz.*, farmyard manure (FYM), vermi compost (VC), glyricidia leaf manure (GLM), enriched compost EC, neem cake (NC) and four different liquid manures *viz*., panchagavya, biodigester, cow urine and vermiwash with two control treatments RDF and absolute control (water spray). Soil nutrient balances were worked for major nutrients (NPK) taking the initial soil status, nutrient addition, crop uptake and nutrient left in the soil after harvest. The maximum gain of NPK nutrients in soil over initial recorded with the treatment EC 1/3rd + VC 1/3rd + GLM 1/3rd equivalent to 100% RDN + panchagavya @ 3 % spray at flower initiation and 15 days after flowering(DAF) during both the years.

Key words : Nutrient management, Liquid manure, Nutrient balance, Chickpea

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Introduction

Chickpea is the premier *Rabi* pulse crop of India, grown over an area of 7.54 Mha with an annual production of 5.7 million tonne (FAO, 2008). The productivity of the crop is remained low because of several biotic and abiotic constraints. Among abiotic constraints, imbalance use of nutrients is major one. Although, chickpea is a leguminous pulse, it responds positively for the application of nutrients. Use of chemical fertilizers has increased the crop yield, but caused many environmental problems including soil, air and water pollution and finally human health hazards and making the crop productivity unsustainable (Eid *et al.*, 2006). There is a need to reduce the ill effects of these chemicals on environment and human health. In this direction, efforts were made to produce crops with reduced / sidestepped synthetic chemical inputs (Singh *et al.*, 2011). The nutrient demand of the crop can be supplemented organically through many sources in solid as well as liquid form. Application of solid organic sources basally and top dressing with liquid manures at critical stages for moisture stress (flower initiation and pod development stage) might solve the dual problem of nutrient