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RESEARCH PAPER

Influence of integrated organic nutrient management practices on soil physico-chemical properties, available nutrients and their uptake by chickpea grown on vertisol of northern dry zone of Karnataka

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Abstract : Field trials were conducted on Vertisols at Agricultural Research Station, Annigeri, UAS, Dharwad during *Rabi* season of 2009-10 and 2010-11 to study the influence of various organics on soil physico- chemical properties, available nutrients in soil and their uptake by chickpea (*Cicer aeritinum* L.) grown under Vertisol of northern dry zone of Karnataka. Soil application of various organic manures and foliar spray of liquid organic manures at flower initiation and 15 days after flowering (DAF) significantly improved the soil physico-chemical properties, available nutrients in the soil and their uptake by chickpea. Among the treatment combinations, application of enriched compost (EC) (1/3) + vermicompost (VC) (1/3) + glyricidia leaf manure (GLM) (1/3) equivalent to 100 per cent RDN and foliar spray of panchagavya @ 3 per cent at flower initiation and 15 DAF has recorded significantly lower bulk density (1.28 g/cc), higher soil organic carbon (0.56 %), higher available N, P_2O_5, K_2O in soil (245 kg N, 25.18 kg P_2O_5, 357 kg K_2O/ha), higher nutrient uptake by chickpea (128.34 kg N, 16.41 kg P, 76.96 kg K/ha) higher grain yield (2400 kg/ha), haulm yield (3423 kg/ha), number of pods per plant (66.38) and 100-seed weight (20.91 g) compared to other treatment combinations. Integrated application of EC + VC + GLM and liquid organic manures (panchagavya) foliar application individually and their combinations produced higher net returns (Rs. 41677, 42237 and 48344/ha, respectively) and B:C ratio (3.34, 3.31 and 3.69, respectively).

Key Words : Organic, Chickpea, Enriched compost, Liquid organic manures, Physico-chemical properties, Uptake of nutrients

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INTRODUCTION

Maintaining favourable soil physical, chemical and biological condition is a need of the hour. Various forms of degradation causing decline in soil fertility and productivity of crops. Deficiency of macro and micronutrients due to inadequate and superior nutrient management practices and use of straight fertilizers is rampant today.

Further, higher temperature and intensive microbial activity, the soils in tropics and subtropics are poor in soil organic matter content. It has been estimated that the soil organic carbon content in India has drastically reduce from 1.2 per cent to 0.60 per cent in 2000 (Devsenapathy, 2008.) and its declining further. Hence, the maintenance of soil structural

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