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Effect of various tillage and nutrient management practices on growth and yield attributes of groundnut (*Arachis hypogaea* L.)

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ABSTRACT

A field study was conducted during *Kharif* season of 2007 to study the effect of various tillage and nutrient management practices on growth and yield attributes of groundnut (*Arachis hypogaea* L.) under rainfed condition. Three tillage and four nutrient management practices were tried. Among tillage practices, mechanical tillage + two intercultivations registered significantly higher growth and yield attributes and pod and haulm yield (1307 and 2733 kg ha^{-1}, respectively) compared to conventional tillage practices. Amongst the nutrient management practices, combined application of 50 per cent organics + 50 per cent inorganics registered higher pod and haulm yield (1282 and 2729 kg ha^{-1}, respectively) compared to 100 per cent inorganics and 100 per cent organics. Net return with B:C ratio was maximum in mechanical tillage + two intercultivations with combined application of 50 per cent organic manure with 50 per cent inorganic fertilizer (Rs. 12,903 and 1.86 ha^{-1}, respectively).

Key words : Conventional tillage, Mechanical tillage, Intercultivation, Nutrients, Groundnut

INTRODUCTION

Groundnut (*Arachis hypogaea* L.), king of oilseeds belongs to the family Leguminosae. The groundnut seed is valued both for its oil and protein content. The seeds contain about 40-45 per cent oil, 25 per cent protein and 18 per cent carbohydrates in addition to minerals and vitamins. Groundnut is grown in an area of 26.4 million hectares with a total production of 36.1 million metric tons and an average productivity of 1.4 metric tons ha^{-1} in the world (Anonymous, 2007). Karnataka stands fourth with an area of 10.4 lakh hectares with annual production of 6.71 lakh tonnes and average productivity of 679 kg ha^{-1}. Tillage helps to improve looseness, oxygen supplies and water intake among other things (Donahue *et al*., 1987). Integrated use of both chemical fertilizers and organic manures is needed to check the depletion of soil and enhance the yield levels. The importance of organic manures in promoting soil health and better plant nutrition has started receiving much recognition in the world as a whole in recent years. The supplementary and complementary use of organic manures along with chemical fertilizers, besides improving physico-chemical properties also improves the use efficiency of applied fertilizers. Farmyard manure (FYM) is one of the important organic manures that improves the soil physico-chemical properties and use efficiency of applied fertilizers. Keeping these points in view, the present investigation was undertaken to study the effect of various tillage and nutrient management practices on growth and yield attributes of groundnut (*Arachis hypogaea* L.) under rainfed condition

MATERIALS AND METHODS

Field experiment was conducted at Agronomy field unit, University of Agricultural Sciences, GKVK, Bangalore during *Kharif* season in 2007. The soil of the experimental field was red sandy loam, having pH 6.6 and EC 0.15 dS m^{1}, available N (189.6 kg ha^{1}), available P_2O_5 (29.3 kg ha^{1}), available K_2O (202.8 kg ha^{-1}) and organic carbon (0.56%). The experiment was laid out in a Split Plot Design with four replications. The twelve treatment combinations comprised of four tillage practices *viz*., T_1: Conventional tillage (bullock drawn desi plough twice + bullock drawn cultivator twice) + one intercultivation at 25 days after sowing (DAS), T_2: Conventional tillage + two intercultivations at 25 and 40 DAS, T_3: Mechanical tillage (tractor drawn disc plough once + tractor drawn cultivator twice) + one intercultivation at 25 DAS and T_4: Mechanical tillage + two intercultivations at 25 and 40 DAS in main plots and three nutrient management practices *viz*., F_1: 100% organics (FYM at 25 kg N equivalent), F_2: 100% inorganics (25:50:25 kg N, P_2O_5, K_2O ha^{-1}) and F_3: 50% organics (FYM at 12.5 kg N equivalent) + 50% inorganics (12.5:25:12.5 kg N, P_2O_5, K_2O ha^{-1}) in sub-plots. Groundnut cultivar TMV-2, was sown in last week of July, 2007 by hand dibbling by adopting a spacing of 30 cm x 15 cm.

All agronomic practices were carried out as per schedule to raise the crop growth attributes such as plant

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