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Effect of phosphorus and weed control measures on growth and yield of chickpea (*Cicer arietinum* L.)

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ABSTRACT : The field experiment was conducted during the *Rabi* season of 2005-06 at Agronomy Research Farm at Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj) Faizabad, U.P. to, study the effect of phosphorus and weed control measures on growth and yield of chickpea (*Cicer arietinum* L.) variety Udai (KPG-59). Sixteen-treatment combinations comprised of four levels of phosphorus (control, 20, 40 and 60 kg P₂O₅ ha⁻¹) and four treatments of weed control measures (weedy check, hand weeding at 30 DAS, pendimethline@ 1 kg ha⁻¹ and rice straw mulch) were tested in Randomized Block Design with three replications. Growth and yield attributes as well as root length, number of nodules were affected significantly due to increase the phosphorus levels. However, weed density and weed dry weight were decreased significantly with increasing levels of P. Among the weed control measures, hand weeding at 30 DAS was found promising to reduce the weed density as well as weed dry weight. Hand weeding at 30 DAS proved its superiority over other methods of weed control in respect of all the growth characters and yield attributes as well as grain and straw yield of chickpea crop followed by pendimethlin@ 1.0 kg ha⁻¹. On the basis of economics the highest net return was recorded under hand weeding at 30 DAS alone and found most remunerative, which was recorded the highest net income in rupee invested of Rs 3.52.

Key Words : Chickpea, Phosphorus levels, Weed control measures

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The pulses in the dietary to the mankind make high edible protein which contains essential amino acid to meet the optimum protein requirement of vegetation population. The pulses fix the atmospheric nitrogen into the soil thereby enriching the soil with nitrogen at no extra cost among the winter season pulses. Chickpea has diversified uses such as dal, basan, fresh green seeds for vegetable and fresh green leaves for sag for human consumption and feeding to animals. It is considered to have medicinal effect and it is used for blood purification, chickpea contains 18- 22 per cent protein, 52- 70 per cent carbohydrate, 4- 10 per cent fat and sufficient quantity of minerals and vitamins. Besides, being a rich source of protein it is also considered important for sustainable agriculture, improves the physico- chemical characteristics as well as biological properties of soil and function as mini nitrogen factory. Chickpea is one of the important pulse crops of *Rabi* season. The chickpea is grown in India on an area of 8.81 mha. With production of 6.68 mt which

amount 65 and 68 per cent of the global area and production, respectively. In Uttar Pradesh, it is cultivated on an area of 868 lakh hectares with an annual production of 828.4 lakh tonnes. Thus, the average productivity of chickpea in Uttar Pradesh is very low out of several reasons for low productivity, soil fertility status and inadequate weed management may be considered as major constraints. Phosphate fertilization of chickpea promotes growth nodulation and enhance yield. Phosphorus imparts hardness shoots, improves grain quality, regulate the photosynthesis is govern physico-biochemical processes and also helps in root enlargement, nodule production and there by increases nitrogen fixation (Chaudhary *et al.*, 1975). Weed control is achieved through direct methods and by adopting indirect methods such as altered land preparation, soil moisture regulation, planting methods and fertility management. Manual weeding at 25 and 40 days after sowing increased seed yield of chickpea by 170 per cent over weedy check. Mulch also increased the grain yield and straw yield of chickpea.