

Effect of integrated use of organic and inorganic sources of phosphorus on acid and Alkaline Phosphatase activity in soil phosphorus nutrition, yield and protein content of chickpea (*Cicer arietinum* L)

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A field experiment was conducted during 2009-10 on sandy loam soil Alfisol at College Farm, College of Agriculture, Rajendranagar, Hyderabad, A.P, India to study the response of phosphorus levels in combination with FYM @ 10 t ha⁻¹ and phosphate solubilising bacteria (PSB) @ 2 kg ha⁻¹ on the acid and alkaline phosphatase activity in the rhizosphere soil of chickpea at flowering. The acid and alkaline phosphatase activity decreased with increasing inorganic phosphorus levels and significantly lower activity of both the enzymes were observed in the treatment receiving 75 kg P₂O₅ ha⁻¹ alone. The highest alkaline phosphatase activity was 292.6 µg p-nitrophenol g⁻¹ soil h⁻¹ with 50 kg P₂O₅ + PSB @ 2kg ha⁻¹. Application of 75 kg P₂O₅ ha⁻¹ to chickpea resulted in a significantly lower acid phosphatase activity of 84.4 µg p-nitrophenol g⁻¹ soil h⁻¹ was recorded with highest P application that is 75 kg P₂O₅ ha⁻¹. When inorganic P at 50 kg P₂O₅ ha⁻¹. Significantly higher removal of P by chickpea at flowering was 2.90 kg ha⁻¹ when inorganic P at 50 kg P₂O₅ ha⁻¹ was applied in combination with FYM and PSB. The mean P uptake by seed also showed a significant influence of the integrated use of the organics and inorganics supplying P to chickpea. The highest level of P application i.e 75 kg P₂O₅ ha⁻¹ brought about 44.0 per cent increase in seed yield. Protein content of the seed was influenced positively and significantly due to the application of P at 50 kg P₂O₅ ha⁻¹. Highest seed protein content of 23.93 per cent was obtained with the combined application of 75 kg P₂O₅ ha⁻¹ + FYM @10 t ha⁻¹ + PSB@ 2 kg ha⁻¹.

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