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Research Article

Impact of phosphorus and zinc application and their interactions on yield and uptake of nutrients by maize in vertisols

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ABSTRACT : Field experiment was carried out to study the effect of phosphorus and zinc application and their interactions on yield and uptake of nutrients by maize during *Kharif season* of 2006-2007 at Extra Assistant Director (EAD) Farm, College of Agriculture, Nagpur. Response of maize was found significant due to application of P and Zn. Application of P @ 40, 60 and 80 kg ha^{-1} resulted in increased grain yield to the tune of 11, 18 and 20 per cent, respectively, over no use of P. The highest grain yield of 59.44 q ha^{-1} was obtained with P applied @ 80 kg ha^{-1}. Increasing levels of zinc gave significantly increased grain yield of maize. The highest grain yield 58.10 qha^{-1} was obtained by the application of 20 kg $ZnSO_4$ ha^{-1}. The increase in grain yield of maize was to the extent of 9 per cent with increasing levels from 0 to 20 kg $ZnSO_4$ ha^{-1}. Interaction effect of phosphorus and zinc levels on grain yield revealed significant. The maximum grain yield 61.28 qha^{-1} was recorded with P_{60} Z_{20} combination followed by P_{80} Z_{20} combination 60.77 qha^{-1}. The highest fodder yield (135.55 q ha^{-1}) was obtained with P application of 80 kg ha^{-1} which was found significantly at par with P level receiving 60 kg P ha^{-1} having yield (129.68 q ha^{-1}). With the application of 0 to 20 kg $ZnSO_4$ ha^{-1}, the increase in fodder yield wasfrom 117.72 q ha^{-1}to 128.53 q ha^{-1}, which accounted for 5 to 9 per cent. Results regarding the interaction effects of phosphorus and zinc levels on fodder yield indicate that, the higher fodder yield 136.39 q ha^{-1} was obtained with the application of 80 kg P ha^{-1} coupled with 20 kg $ZnSO_4$ ha^{-1}. Highest total uptake of N 165.77 kg ha^{-1}, P 30.71 kg ha^{-1} and K 161.18 kg ha^{-1} were obtained with P applied @ 80 kg ha^{-1}. Treatment receiving 20 kg Zn SO_4 ha^{-1} recorded highest total uptake of N 160.52kg ha^{-1}, P 27.88 kg ha^{-1} and K 155.69 kg ha^{-1}. Treatment combination P_{60} Z_{20} recorded maximum total uptake of N 171.56 kg ha^{-1}where as P_{80} Z_{10} recorded total uptake of P 31.22 kg ha^{-1}.

KEY WORDS : Fodder yield, Nitrogen, Phosphorus, Vertisols, Zinc

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