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Research Article

Soil test based zinc fertilizer recommendation for sustainable pearl millet (*Penisetum glaucum* L.) production in ustipsamment soils of Rajasthan

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Summary

Field experiments were conducted at five sites in typic ustipsamment soil having 0.28, 0.36, 0.48, 0.54 and 1.20 mg kg^{-1} available zinc, during *Kharif* 2008 to 2010 to assess the best suitable dose of zinc fertilizer for sustainable and economical pearl millet production as per available zinc status of soil. Treatment consisted of 0, 5, 10, 15, 20, 25, 30 and 35 kg zinc sulphate ha^{-1} in a Randomized Block Design with three replications taking pearl millet, var. Raj-171 as test crop. Grain and stover yield of pearl millet increased with increasing doses $ZnSO_4$. The significantly higher economic yield of pearl millet grain 22.75, 26.03, 24.48, 20.68 and 24.41 qha^{-1} was obtained by application of 30, 25, 25, 20 and 5 kg $ZnSO_4$ ha^{-1} at site I, II, III, IV and V, respectively. Similar trend was also obtained for stover yield. Zn uptake increased with increasing levels of applied $ZnSO_4$ at all the sites. P uptake increased at lower level at site I and II and decreased at higher levels of Zn application at site III, IV and V where the initial status of Zn was 0.48, 0.54 and1.20 mg $kg.^{-1}$Application of $ZnSO_4$ significantly increased the DTPA- extractable zinc in post harvest soil. A regression equation Y = 35.844-25.951X was derived to quantify the dose of zinc sulphate for sustainable and economical pearl millet production, where X is available zinc status of soil in mg kg^{-1} and Y is dose of zinc sulphate in kg $ha^{-1}$and ready reckoner was prepared for recommendation of zinc sulphate as per available zinc status of soil.

Key words : Zn status of soil, Regression equation, Zn and P uptake, Pearl millet, Ustipsamment

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