



Research Article

Optimization of zinc levels for groundnut in coastal sandy soil

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Summary

Zinc deficiency associated reduction of yield is well known in coarse textured sandy soils. A pot experiment was carried out in the Department of Soil Science and Agricultural Chemistry, Annamalai University with groundnut var. VRI 2 during June - September 2006, to evaluate different levels of zinc on the yield and nutrients uptake by groundnut in coastal sandy soil. The experimental soil was sandy, taxonomically classified as *Typic udipsaments* with pH-8.39; EC- 1.61 dS m⁻¹ and represented low status of organic carbon and zinc. The following treatments studied: T₁- NPK; T₂- NPK + ZnSO₄ @ 20 kg ha⁻¹; T₃- NPK + ZnSO₄ @ 25 kg ha⁻¹; T₄- NPK + ZnSO₄ @ 30 kg ha⁻¹ and T₅- NPK + ZnSO₄ @ 35 kg ha⁻¹. All the treatments received a common organic addition of composted coirpith @ 12.5 t ha⁻¹. The experiment was arranged in a Completely Randomized Design (CRD) with four replications. The experimental results revealed that, the application of NPK + ZnSO₄ @ 30 kg ha⁻¹ was significant in increasing the nutrients uptake and yield of groundnut. The percentage yield increase recorded with ZnSO₄ application @ 30 kg ha⁻¹ along with CCP was 15.25 percentage of pod and 15.81 percentage of haulm yield as compared to control.

Key words : Coastal sandy soils, Zinc, Nutrients uptake, Yield, Groundnut

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Introduction

The major production constraints in coastal sandy soils are mainly the low organic matter, poor nutrient retention and deficiency of nutrients, especially zinc. Groundnut is the main oil seed crop grown in sandy soil of the coast and the yield reduction due to Zn deficiency is well documented (Kathmale *et al.*, 2000 and Chaube *et al.*, 2002). Zinc is one of the micronutrient which plays a significant role in influencing the growth and yield of groundnut. Influence on the growth and yield of groundnut by its effect, zinc recognized protein synthesis, biological nitrogen fixation and enzymatic activities (Nayyar *et al.*, 1990; Subramaniyan *et al.*, 2001). Hence, the present investigation was carried out to optimize the level of Zn for groundnut in coastal sandy soil.

Resources and Research Methods

A pot experiment was carried out in a coastal sandy soil

to optimize the level of Zn for groundnut in coastal sandy soil. The experimental soil was collected from a farmer's field at Ponnanthittu coastal village. Texturally, the experimental soil was sandy with pH 8.39, EC- 1.61dS m⁻¹ and organic carbon status of 0.27%. The status of alkaline KMnO₄- N, Olsen- P and NH₄OAc- K were low, low and medium status, respectively. The treatments were T₁- Control; T₂- NPK + ZnSO₄ @ 20kg ha⁻¹; T₃- NPK + ZnSO₄ @ 25 kg ha⁻¹; T₄- NPK + ZnSO₄ @ 30 kg ha⁻¹ and T₅- NPK + ZnSO₄ @ 35 kg ha⁻¹ with four replications in a Completely Randomized Design (CRD) using groundnut variety VRI 2. Composted coirpith @ 12.5 t ha⁻¹ were applied as organic amendments to all the treatments. The plant samples were collected at different critical stages of groundnut viz., flowering, peg formation and at harvest stages of crop growth and analyzed for the concentration of N, P, K and Zn in diacid extract (1:4 HClO₄ :H₂SO₄) using standard procedure of Jackson (1973). At harvest stage, pod and haulm yield were recorded.