



## Response and critical limits of zinc for groundnut grown in medium black calcareous soils

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### ABSTRACT

A pot culture experiment was conducted by using bulk soil samples collected from different Agricultural Research Station, Junagadh Agricultural University, Junagadh and were categorized as low, medium and high with respect of available zinc. Three treatments were imposed in triplicate with common recommended dose of N and three levels of Zn (0, 5, and 10 mg kg<sup>-1</sup>) in each pots of the low, medium and high Zn status. Fertilization of Zn significantly increased pod and haulm yields and Zn content in pod and haulm as well as in soil. The critical limit of DTPA extractable Zn was obtained 0.6 mg kg<sup>-1</sup> in medium black calcareous soils, while Zn content in plant of groundnut to be found 14 mg kg<sup>-1</sup>.

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**Key words :** Critical limits, Zinc, Wheat, Calcareous soils

### INTRODUCTION

Each essential nutrient has certain specific role to play in the plant and their presence in above critical concentration is a must for a plant to complete its life cycle. The critical limits/ levels is quite often employed for a wide variety of soils and crops, even though these critical limits may be different not only for soils crop species but also for different varieties of a given crop (Singh and Agarwal, 2007). Now a day wide spread deficiency of Zn has been observed in the soils of Saurashtra Region of Gujarat. In Saurashtra Region, farmers are adopting *Rabi* wheat – *Kharif* groundnut crop sequence from many years. Since last decade, groundnut yield is either sustained or showed a decreasing trend, probably due to imbalance nutrition. Minimum practices of recycling of organic residue and use of FYM may deplete nutrients particularly micronutrients in soils. We had established the critical limit of Zn in cotton and wheat crop. However, such studies have not yet been carried out for zinc in groundnut crop in saurashtra region of Gujarat. Hence, an experiment was conducted with

an objective to determine the critical levels of Zn in soils and plants (Groundnut).

### MATERIALS AND METHODS

Thirty two bulk soil samples from the plough layer (0-15 cm) soil varying widely in characteristics were collected from different research station of Junagadh Agricultural University, Junagadh. The soils (< 2mm) were analyzed for some of the important properties by standard procedures. The physico-chemical properties of tested soil are given in Table 1. Samples were grouped on the basis of Zn status (low <0.5, medium 0.5-1.0 and high >1.0 mg kg<sup>-1</sup>) and were used for a pot experiment of groundnut crop. A pot experiment was conducted by using 10 kg air dried soil in polythene-lined earthen pots and treated with a basal dose of 25 mg N, and 50 mg P<sub>2</sub>O<sub>5</sub> kg<sup>-1</sup> of soil through urea and DAP, respectively. Three levels of Zn viz., Zn<sub>0</sub> (No zinc), Zn<sub>5</sub> (5 mg Zn Kg<sup>-1</sup>) and Zn<sub>10</sub> (10 mg Zn kg<sup>-1</sup>), were applied through ZnSO<sub>4</sub>.7H<sub>2</sub>O in suspension form. The experimental design was a completely randomized block with three replications. Ten

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