



Response and critical limits of zinc for wheat 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 mgkg⁻¹) in each pots of the low, medium and high Zn status. Fertilization of Zn significantly increased grain and straw yields and Zn content in plant as well as in soil. The critical limit of DTPA extractable Zn was obtained 0.5 mg kg⁻¹ in medium black calcareous soils, while Zn content in plant of wheat at 60 DAS to be found 20 mg kg⁻¹.

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INTRODUCTION

The medium black calcareous soils considerably declined in available Zn, therefore, the crops respond to Zn application. There is need to establish a threshold level of Zn concentration in plant below which the crop may respond to Zn application. Now a day wide spread deficiency of Zn and Fe has been observed in the soils of Saurashtra Region of Gujarat. The farmers of Saurashtra Region adopt *Rabi* wheat – *Kharif* groundnut crop sequence. Since last decade, wheat yield is either sustained or showed a decreasing trend, probably due to calcareous soil resulting in problems of Zn absorption. So far, such information is not available for the wheat crop in this region. Hence, an experiment was conducted to determine the critical levels of Zn in soils and plants (wheat).

MATERIALS AND METHODS

Twenty four surface (0-15 cm) soil samples from (*Typic Ustocrept*) a wide variation in soil properties were

collected from different research station of Junagadh Agricultural University, Junagadh. Samples were grouped on the basis of Zn status (low <0.5, medium 0.5-1.0 and high >1.0mg kg⁻¹) and were used for a pot experiment of wheat crop. For the investigation the soils were contained in polythene-lined earthen pots (10.0 kg soil/pot). Each soil received 0, 5 and 10 mg of Zn per kg air dry soil as ZnSO₄·7H₂O. The physico-chemical properties of tested soil are given in Table 1. The experimental design was a completely randomized block with three replications. Nitrogen and phosphorus were applied uniformly to all pots at the rates of 120 and 60 mgkg⁻¹ through urea and DAP. Phosphorus was applied as basal while nitrogen was applied in two equal splits one at time of sowing, second at one month after sowing. Fifteen seeds of wheat variety GW-496 were sown in each pot and after germination, ten healthy plants were maintained. The crop was raised upto maturity. Grain and straw of wheat were oven dried (60^o C) to record grain and straw yield. The Zn content in plant (at 60 DAS and at harvest) and soils

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