

INFLUENCE OF ZINC ON YIELD, NUTRIENT UPTAKE AND JUICE QUALITY OF ADSALI SUGARCANE ON INCEPTISOL

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Accepted : October, 2007
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ABSTRACT

In order to assess the "Influence of zinc on yield, nutrient uptake and juice quality of adsali sugarcane on inceptisol" a field experiment was carried out at Post Graduate Institute Farm, Department of Soil Science and agricultural Chemistry, MPKV., Rahuri. The experiment was laid out in Randomized Block Design consisting nine treatments with three replications. The soil was calcareous, alkaline in reaction with low salt content. The highest cane (155.55 t ha⁻¹) and CCS (20.64 t ha⁻¹) yield of adsali sugarcane was recorded in the plots received NPK through straight fertilizers along with zinc coated suphala @ 2.1 kg ha⁻¹. The zinc application to adsali sugarcane through zinc coated suphala along with NPK through straight fertilizers significantly increased the uptake of nitrogen (349 kg ha⁻¹), phosphorus (102 kg ha⁻¹) and potassium (475 kg ha⁻¹). However the uptake of iron (9278 g ha⁻¹), manganese (2605g ha⁻¹) was noticed due to zinc application zinc coated suphala and NPK through straight fertilizers. While the copper uptake (509 g ha⁻¹) was reported in the treatment of NPK through straight fertilizers + zinc @ 4.2 kg ha⁻¹ through zinc sulphate. The juice quality of adsali sugarcane was not significantly influenced by zinc nutrition.

Key words: Sugarcane, Zinc, Yield, Nutrient uptake and Juice quality

Sugarcane is one of the important pride cash crop of Tropical region and source of sugar and sugar by products in India. It acts as bread and butter for millions of agriculturist, laborers and their dependent. The area under sugarcane during 2002-2003 was 4361 thousand hectare with annual production of 281.58 thousand ton with an average yield of 64.60 t ha⁻¹ in India whereas, the area in Maharashtra was 599 thousand hectare and production of 50.00 thousand ton with average yield of 63.80 t ha⁻¹.

The adsali sugarcane crop exhausts a large quantities of nutrients, as it stands in the field for 18 months. Micronutrients have assumed a greater importance in modern agriculture. It is due to multiple cropping, use of improved crop varieties, high response to added fertilizers, use of NPK fertilizers and intensive cropping leading to nutritional imbalance. Among the micronutrients Zn deserves a special attention due to its wide spread deficiency in all the states. Analysis of more than 2.5 lakh soil samples from 16 states and union territories for available micronutrients indicated more than 47 per cent samples deficient in Zn. The major reason for wide spread occurrence of Zn deficiency in soils is low availability of Zn to plant roots rather than low Zn concentration in soils.

Many research workers reported major area under deficiency of Zn in soils of Maharashtra and subsequent obtained the responses to added Zn in various crops. The sugarcane crop is widely grown as a cash crop intensively cultivated in the majority of alkaline calcareous black soils of Deccan Plateau in most of the canal command areas of Maharashtra.

Zinc plays a vital role in metabolic activities, sugar and auxin synthesis in sugarcane. The optimum level of zinc makes the optimum level of auxin catalyze essential reaction connected with oxidation processes. The zinc deficient plants have less sucrose and more of reducing sugars thereby causing low sugar recovery. Spectacular responses to added zinc have been reported in various crops like wheat, groundnut, sugar on the fine textured alkaline calcareous soils. Soil application with zinc sulphate @ 20 kg ha⁻¹ have shown promising results. Among the fertilizer sources of zinc, zinc sulphate through soil is commonly adopted for correcting the deficiency.

Therefore, the experiment was carried out in order to assess the effects of different sources of zinc along with straight NPK fertilizers and compound fertilizers on yield, nutrient uptake and juice quality of adsali sugarcane.

MATERIALS AND METHODS

The field experiment was carried out at Post Graduate Institute Farm, Department of Soil Science and