

Effect of boron application on yield and quality of tomato grown on alkaline calcareous soils

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ABSTRACT

The effect of application of boron through solubor and borax as foliar spray and soil application of borax was studied on boron deficient alkaline calcareous soil by conducting a field experiment on tomato. It was observed that foliar application of boron through both solubor and borax @ 140 mg kg⁻¹ recorded significant increase in yield over control. The soil application of borax was also found equally beneficial. However, application of boron through solubor and borax @ 280 mg kg⁻¹ was found to significantly improve the quality of tomato suggesting that foliar application of solubor or borax @ 280 mg kg⁻¹ is beneficial for increasing yield as well as enhancing quality of tomato grown on alkaline calcareous soils.

Key words : Boron, Tomato, Quality, Inceptisol.

For the successful and economic production of tomato, it is necessary to give emphasis on the use of micronutrients along with the application of major nutrients. Balanced fertilization, thus, is helpful for obtaining sustainable production so also to improve the quality of produce. Boron is known to reduce the cracking of fruits in tomato. The quality of crops is also influenced due to boron and the timely application of boron helps in increasing the size of fruits as well as firmness. Tomato crop is responsive to foliar application of nutrients especially during critical stages. This method provides for utilization of nutrients more efficiently and for correcting the deficiencies rapidly (Palaniappan *et al.*, 1999). The effect of boron through application of foliar spray of highly soluble sodium borate *viz.*, solubor and borax as well as soil application of borax was studied by conducting a field experiment to ascertain the influence on yield and quality of tomato.

MATERIALS AND METHODS

A field experiment on tomato (Namadhari-2535) was conducted on a boron deficient soil at the Post Graduate Institute Research Farm, Department of Soil Science and Agricultural Chemistry, M.P.K.V., Rahuri during *rabi* 2002-03. The soil belongs to Inceptisol order and Sawargaon series which is a member of fine hyporthmic, montmorillonitic, Vertic Haplustepts. The treatments for field experiment comprised of control, three levels of foliar

application of boron each through two sources *viz.*, solubor and borax and soil application of borax. The eight treatments were replicated four times in a randomized block design. The recommended dose of fertilizers for tomato hybrid *viz.*, 300:150:150 kg N P₂O₅ K₂O ha⁻¹ along with 10 Mg FYM ha⁻¹ was given to all the treatments.

Boron was applied as foliar application through solubor and borax as per the treatments twice at 15 days interval starting from just prior to flowering. For treatment 8, boron was applied at the time of transplanting through borax @ 5 kg ha⁻¹. The crop was raised according to the standard recommended practices and harvested at maturity. The experimental soil was moderately alkaline in reaction, calcareous, clay in texture with medium organic carbon content, low available nitrogen, medium phosphorus and high available potassium status.

Fruit analysis was carried out for quality parameters. About half kg of uniform ripened fruits collected from each treatment at intermediate stage were washed and cleaned, crushed and juice was extracted and used for estimating quality parameters as acidity, total soluble solids, ascorbic acid, lycopene, sugars and pectin by using standard methods of analysis.

RESULTS AND DISCUSSION

The data obtained on yield and quality parameters of tomato as influenced by various treatments under study involving foliar application of boron through solubor and borax and soil application of borax is presented in the Tables 1, 2 and 3.