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BORON NUTRITION FOR NUTRIENT CONCENTRATION, UPTAKE AND YIELD OF TOMATO ON INCEPTISOL

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Correspondence to : **DIPTI S. WAGHADHARE** Department of Soil Science and Agricultural Chemistry Mahatma Phule Krishi Vidyapeeth, Rahuri, AHMEDNAGAR (M.S.) INDIA ABSTRACT

A field experiment was conducted to study the effect of application of boron through foliar spray of solubor and borax and soil application as borax on nutrient uptake and yield of tomato on Inceptisol. The foliar application for 0 (280 mg kg⁻¹ through solubor recorded significantly higher yield of tomato over control as well as soil application. Both the sources of boron i.e. solubor and borax were found superior and equally effective for increasing nutrient concentration and uptake, when applied as foliar spray as compared with soil application of borax. Boron showed synergistic interaction with P, K, Zn and antagonism with Ca and Fe at higher levels of boron. Foliar application of boron (280 mg kg⁻¹ through solubor or borax twice at 15 days interval starting from just prior to flowering was found beneficial for increasing nutrient uptake and yield of tomato on alkaline calcareous boron deficient soils.

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Balanced fertilization of crops is important for higher crop production, improving quality of produce, maintenance of soil health and thus beneficial in achieving sustainability of agriculture. Tomato (*Lycopersicon esculentum* Mill) a solanaceous fruit vegetable is a native of Central and South America and in sub-tropical region, its cultivation is possible almost through out the year. It is most popular vegetable all over the world due to its versatility in fresh and processed form. Today, tomato out ranks all other vegetables, except potato in popularity and also in value.

There is a large scope for increasing the production of tomato through efficient use of fertilizers. Along with the application of macronutrients, it is necessary to give emphasis on the use of micronutrients for the successful and economic production of tomato. Among the different micronutrients, boron plays a very import role in boosting the yield of tomato. A small but continuous supply of boron is required by plants from germination to maturity. This continuous boron supply is necessary because boron is used and fixed in the plant and does not move to new growth areas as does nitrogen (Terner, 1980).

Boron is recognized as an essential micronutrient for vascular plants and is believed to be involved in nucleic acid metabolism, cell division, sugar biosynthesis and translocation, active nutrient absorption, regulation of rate of photosynthesis and nodulation process. Boron is associated with the reproductive phase in plants and its deficiency is often found to be associated with sterility and malformation of reproductive organs. Although most of the black clayey soils derived from basalt in semi arid eco-regions have sufficient amount of boron, the associated relatively shallow, alkaline calcareous soils pose the problem of boron deficiency (Nayyer, 1999).

The efficiency of soil applied nutrient to low due to various losses and fixation in soil. Foliar nutrition is designed to eliminate the problems like fixation and immobilization of nutrients. In the present study the effect of foliar application of boron through solubor and borax as well as its soil application through borax on nutrient concentration, uptake and yield of tomato in Inceptisol has been studied.

MATERIALS AND METHODS

A field experiment on tomato (Namdhari 2535) was conducted on a boron deficient soil at the Post Graduate Institute Research Farm, Department of Agriculture Chem. and Soil Sci., M.P.K.V., Rahuri during *rabi* 2002-03. The soil belongs to Inceptisol order and Sawargaon series which is a member of fine, hyperthermic, montomorillonitic, *Vertic Haplustepts*. The treatments comprised of control, three levels of foliar application of boron each through two sources *viz.*, solubor (19 % β) and borax (11 % β) and soil application of borax. These eight treatments were replicated four times in a