

TOMATO

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Tomato is one of the most widely produced vegetables in the world. Soil conditions, variety and climatic characteristics are considered as important factors in tomato cultivation, and mineral nutrition of the plant is also determinant on the yield and quality parameters of tomatoes. In this context, it is known that the boron nutritional status of the plant is important. Boron deficiency causes many structural, physiological and biochemical changes in plants. As in many plant species, the mobility of boron from vegetative parts to shoots, root tips, flower organs, seeds or actively growing plant tissues such as fruit is very low in tomato plants. Therefore, boron deficiency symptoms in tomato plants are first seen in young leaves and generative organs.

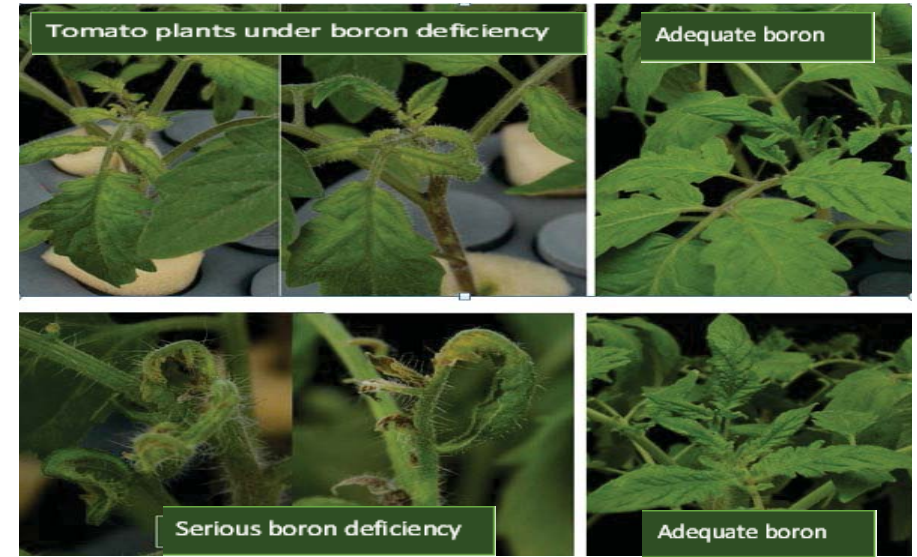


Figure 1. Boron deficiency symptoms appearing in young leaves and growth points of tomato plants [Çakmak et al. 2022, unpublished results].

In case of boron deficiency, remarkable morphological changes, significant and sudden reductions and necrosis [dead tissues] occur in the development of the meristematic tissues of the plant [active growing points of the plants][Fig 1 & 2] If boron deficiency occurs, flowering and fruit formation are disrupted first, and there is loss in fruit yield. It has been reported that under boron deficiency conditions, leaves are fragile and have a pale green appearance, fruit stiffness problem is observed and this problem get worse during storage.

Soil Application:

1.5-2 kg ha⁻¹ B can be applied before or during sowing.

Yaprak Uygulaması:

30 grams of B dissolved in 100 liters of water can be applied 10-15 days before blossoming, at the beginning of fruit setting period.



Figure 2. Yellowing and shrinkage of young leaves in tomato plants [top] and the emergence of sudden deaths at growth points [bottom] [Çakmak et al. 2022, unpublished results].

In case of boron deficiency, striking morphological changes and sudden stops in growth in the youngest parts of the plant are also reflected in the growth of all green parts, and the biomass production capacity of the plant generally declines. [Figure 3] In many plant species, root growth is much more affected by boron deficiency stress than the green parts of plants.

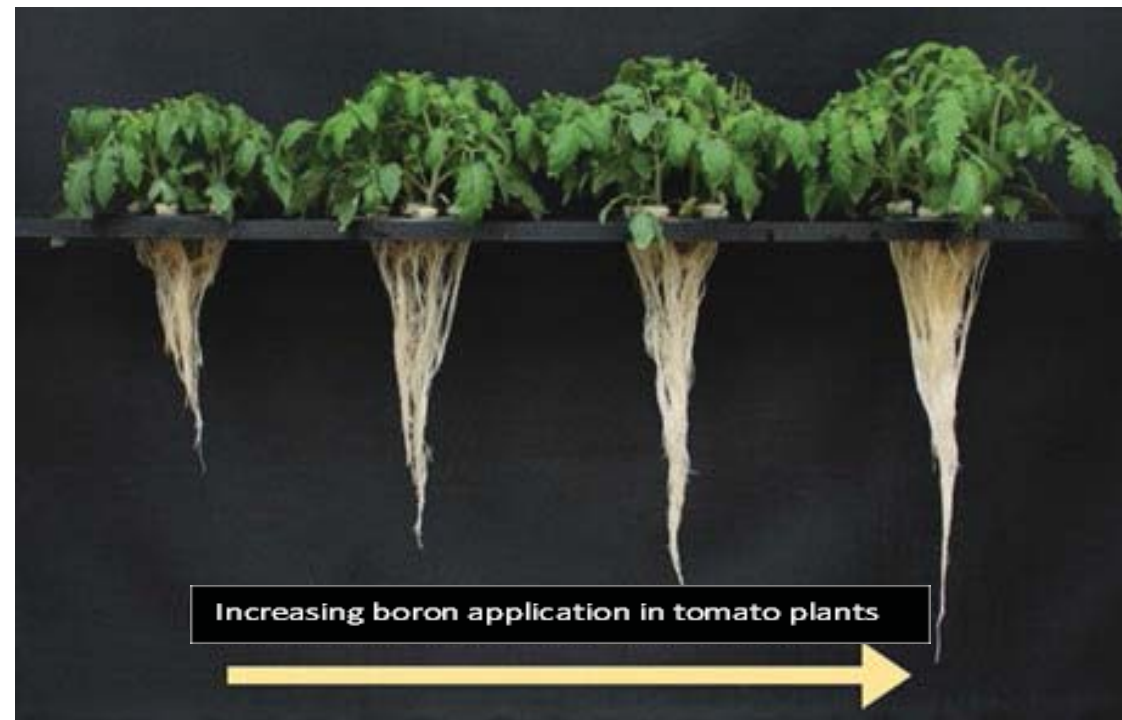


Figure 3. Changes in green parts and root growth in tomato plants in different boron nutrition conditions [Çakmak et al. 2022, unpublished results].

Values of 20 mg kg^{-1} and below are accepted as the critical limit value for boron deficiency in mature leaves in tomatoes. On the other hand, values between 20 and 40 mg kg^{-1} are recommended as a sufficient boron limit value. In another report, sufficient boron concentration values for tomato leaves that have just completed their growth are recommended as 30 to 75 mg kg^{-1} , while the critical boron toxicity concentration is specified as 200 mg kg^{-1} . In tomato projects carried out under BOREN Agriculture Projects in Turkey, applications of 250 - 300 mg B/liter from the leaf and 2 kg of B/ha from the soil have significant yield increases in tomatoes, and these doses were reported as the doses need to be used in practice. Soil analysis must be done before boron fertilization to determine the boron needs of the soil.