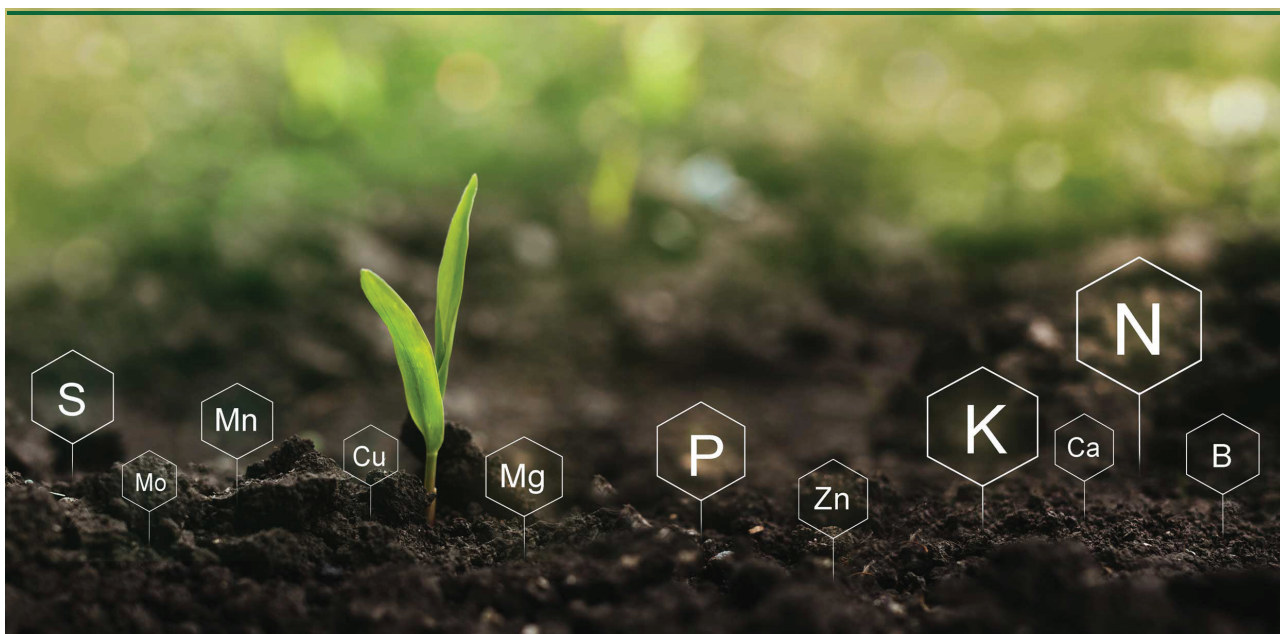




Why Plants Need Boron

Boron is one of the most deficient and fertilized micronutrients in plant production. The issue of boron deficiency is frequently reported because it is an element that can be transported very little in the plant, as well as its deficiency in the soil. With the exposure of plants to boron deficiency, many different morphological and physiological deteriorations and problems arise in the plant, from changes that occur within minutes to changes that occur after days, which in turn affects growth and yield.

Boron deficiency actually causes a series of morphological and physiological changes and problems that adversely affect growth and development in plants. These changes are very fundamental and critical changes that show why plants are so dependent on boron.



- **Cell wall:** The cell wall not only gives the plant physical integrity and stability, but also has a fundamental function in cell growth and differentiation. As a structural element of the cell wall, boron is an indispensable element for the physical integrity, resistance and mechanical properties of the cell wall. More than 90% of the boron in the plant is found in the cell walls.
- **Pollination:** Pollen viability plays a decisive role in pollen germination and pollen tube development. It is an element that has a direct effect on the seed and fruit formation. For this reason, the yield of the plant may decrease as a result of boron deficiency, although sometimes there is no disruption in vegetative growth and no signs of deficiency on the green part.

- **Stress Tolerance:** Boron is an element that protects plants against aluminum toxicity, which is common in acidic soils, and also reduces the negative effects of environmental stress factors such as extreme temperatures, drought and high light intensity on plants.
- **Disease Tolerance:** Soil-borne or airborne disease agent, i.e. the pathogens, penetrates into the tissues to initiate plant infection. Boron, as stated above, is a critical element that plays a defense role against the penetration of pathogens into plant tissues with the mechanical resistance and physical stabilization it provides to the cell walls.
- **Nitrogen Fixation:** Boron is an element that plays a very important role in nodule formation and nitrogenase enzyme activity, which provides usable mineral nitrogen to the plant by binding the nitrogen of the air in legumes. Compared to roots, nodules contain up to 4 times more boron.
- **Nutrient Intake by Roots:** Boron is an element that promotes ion uptake, especially potassium uptake, with its effects on the function of H⁺-ATPase enzyme activity, which has an important role in ion (nutrient) uptake from the roots' nutritional medium.

Boron is one of the rare nutrients that play such critical roles at the same time. For this reason, there are great benefits in monitoring the boron nutrition status of plants with soil and leaf analyzes and providing boron nutrition to plants in recommended doses and forms.



"For more information: <https://tarim.etimaden.gov.tr/en>"