

GROWERTALKS

Culture Notes

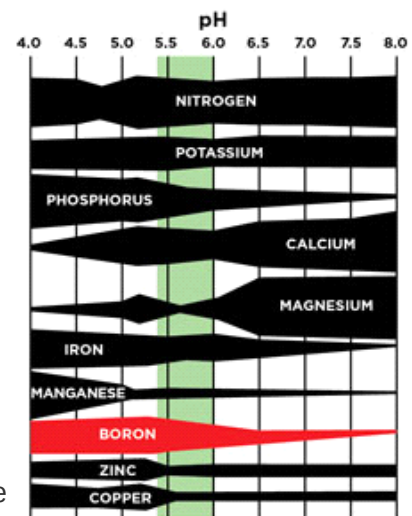
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Dealing with Boron Deficiency

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Boron (B) is classified as an immobile element in plants. Once boron has been taken up by the plant, it cannot be reallocated to other portions of the plant when boron availability in the substrate is limited. As with other immobile elements, symptoms first appear on new leaves.

Boron is required to build plant cell walls; therefore, when not enough boron is available, the areas of the plant with rapidly growing new cells (i.e. the growing point and new leaves) are affected first. The growing point often aborts (effectively “pinching” the plant) leading to proliferation of branches. The branches and new growth are distorted, thick and brittle, along with upper foliage that can exhibit a mottled chlorosis (i.e. scattered yellowing of leaves). When the roots are examined, they’re often short and stubby. Unlike most nutrient deficiencies that typically exhibit symptoms uniformly across the crop, boron symptoms can appear randomly within a crop, section or even a flat/pot.



Causes

Boron is absorbed by plant roots and moved through the plant in the transpiration stream, and similar to calcium, active water movement through the plant is required to drive boron uptake. Conditions that can cause boron deficiency include low boron in tap water or fertilizer; high calcium levels (which can inhibit boron uptake); inactive roots (waterlogged or dry soil, cold root zone); high humidity; soil packed too tightly; or high pH. Boron deficiency is most often noted on pansy and petunia plants—especially those growing with a limited soil volume (i.e. in plug trays or packs).

Prevention and solutions

Prevention is key. While plants that exhibit boron deficiency symptoms usually recover after corrective measures have been taken, the time required for recovery will be lengthy. In many cases, boron deficiency occurs early in the germination/seedling stage (in particular with pansies and petunias). At this growth stage, symptoms of boron deficiency are subtle and often go unnoticed. Symptoms may become more obvious later in production, although the actual deficiency conditions occurred earlier. Therefore, proactive cultural practices to prevent boron deficiency from developing—especially for crops with a history of boron deficiency—are most effective.

Cultural practices that can help prevent boron deficiency from developing include avoiding overwatering plug trays and flats; lowering greenhouse humidity by venting in outside air; using fans to promote air movement; or raising greenhouse/root zone temperatures.

Drench applications with a product containing boron can also be used for preventative and corrective measures. Use caution when applying supplemental boron; plants require only a small amount and an over-application of boron leading to toxicity is easily done.

Products that can be used are:

- Soluble Trace Element Mix (S.T.E.M.) at 4 oz. per 100 gal. (supplies 4 ppm boron, plus other trace elements)
- Borax (11% boron) at 0.75 oz. per 100 gal. (supplies 6 ppm boron)
- Solubor (20% boron) at 0.4 oz. per 100 gal. (supplies 6 ppm boron) **GT**

Note: Trade names used herein are for convenience only. No endorsement of products is intended, nor is criticism of unnamed products implied. Cooperative Extension assumes no liability for the effectiveness or results of an product.

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