

The role of boron in flowering and fruit, nut and seed formation

- Boron is actively involved in pollen germination and fruit, nut, and seed formation.
- The boron requirement for flowering and seed set may be higher than that needed for vegetative growth.
- Boron can become limiting at critical periods during seed set due to drought periods which reduces boron mobility in the soil, or when heavy rainfall has leached available boron from the root zone in soil.
- One or more foliar sprays of *Solubor*® just prior to, or at flowering and seed set can ensure that there is a sufficient supply of boron during this critical period of reproductive growth.

Boron has a significant effect in pollen germination and pollen tube growth. The viability of pollen grains also decreases when boron is deficient. Production of fruit, nut, and seed crops is adversely affected much more than vegetative growth with a low supply of available boron in soil.

Boron deficiency increases the drop of buds and flowers, resulting in significant reductions in seed and fruit set and also in the quality of developing fruit, nuts, and seed.

Cereals and grasses are less sensitive than legumes and some vegetable crops to low levels of available boron. Differences in boron requirements among species may be related to differences in cell wall composition. Boron deficiencies occur more frequently in some legumes than in grasses. The critical deficiency concentration of boron is three to four times greater for younger than older leaves in dicots such as alfalfa and soybean, an indication of immobility of boron in the phloem of these species.

Environmental conditions affecting available boron in soils

Environmental conditions can lead to low availability of soil boron. Leaching of available boron from the root zone due to high rainfall is a major problem, especially if heavy rainfall occurs on coarse-textured soils just before the rapid growth of leaves and development of flowers. Another adverse environmental condition is when a drought period occurs just prior to, or during, flowering and seed set. Boron moves in soils through “mass flow” which is linked to plants absorbing water for transpiration. In dry soils; consequently, boron uptake may be reduced at the time of maximum boron utilization in plants.

Correction of boron deficiencies with *Solubor* foliar sprays

Soil conditions are highly variable. Therefore, it is important to determine the available boron supply when fruit, nut and seed crops are grown. Both soil and plant tissue analyses are strongly recommended to assess the available boron status for fruit and nut crops, and also for agronomic or forage crops that are grown for seed production. A combination of soil applications and foliar sprays, depending on the plant species, may be needed when results of soil and/or plant analyses indicate a low supply of available boron for the current crop.

There is increasing evidence that correcting foliar symptoms of boron deficiency in various fruit and nut crops may not be sufficient to result in full production in some regions. Results of research have shown that fruit and nut yields have been increased by foliar sprays of *Solubor* to plants which do not have visual symptoms of boron deficiency. This suggests that flowering and fruit set may have a greater demand for boron than does vegetative growth.

The role of boron in flowering and fruit, nut and seed formation

Foliar sprays of *Solubor* at the pre-bloom or bloom stages of fruit and nut crops supplies available boron at the critical periods of pollen formation, germination and fertilization just prior to seed and fruit set. Foliar applied boron is rapidly absorbed by the leaves and flower buds.

This application will help ensure that flower buds have enough boron to carry them through flowering, fertilization, and fruit or nut set. However, such sprays may not be sufficient to supply the plant's vegetative requirements on soils which may be low in available boron.

For plant species in which boron is mobile in the phloem tissue, foliar sprays containing 1-2 lbs of *Solubor*/100 gallons of water appear to provide sufficient available boron for subsequent flower development. Leaf boron concentrations also are increased by these foliar sprays. In deciduous fruit and nut trees, the boron supply for flowers is derived from stored boron, because flowering precedes root uptake of boron in the spring. This may result in a temporary boron deficiency unless dormant sprays have been applied.

Species in which boron is immobile in the phloem need a constant supply of available boron, so soil applications may be more appropriate. Timing and rates of foliar *Solubor* applications should be determined by referring to recommendations for specific crops growing in your region. More than one foliar spray may be needed for correction of severe boron deficiencies in some crops.

Summary

One of the important functions of boron in plant nutrition is its role in fostering pollen growth and development, which is important in seed set and the resulting fruit, nut, and grain production. Therefore, it is important to know the available boron status for specific crops and the environmental conditions which may reduce boron availability prior to, and during the critical period just before and during seed set.

One or more foliar sprays of a boron source such as *Solubor*, depending on the specific crop, can help ensure that there is sufficient available boron at this critical period.