

liquid logics

agronomy update

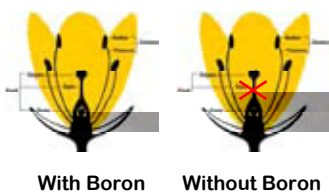
November 28, 2006

Is boron mobile or immobile?

Is it possible that an element can be both mobile and immobile in plants? Do you need to sample your crop differently as a result of boron mobility? In which plant species is boron immobile? How is it possible that plants can show boron deficiency symptoms but sap tests indicate adequate levels of boron?

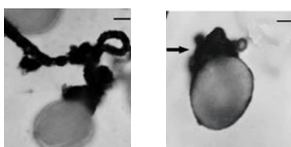


Application of boron suspensions such as Supa Bor (NPK 4-0-0 + 10% B) or Supa Bor Plus (NPK 7-0-0 + 15% B) quickly solve deficiency problems and increase the boron content of plants to the desired level. Because of differential mobility of boron in different plant species, extra care needs to be taken when assessing boron levels.



With Boron

Without Boron



With Boron

Without Boron

Boron is required for all plant growth. Although deficiency symptoms may differ in various species, the general function of boron is the same in every crop. It is essential that boron is available for new growing tissues. Boron takes part in pollen germination and style tube formation and therefore has a vital function in fertilisation of flowering crops. Boron is also responsible for sugar translocation in the leaves. When boron is deficient in tissue, cambial cells cease to divide but cell elongation continues in growing zones, and as result, cells are displaced from their original position which leads to failure of translocation of carbohydrates and sugars to fruits.

Boron immobile crops		
Broadacre	Vegetables	Fruits/Nuts
Corn	Bean	Figs
Cotton	Lettuce	Pecans
Lucerne	Potato	Pistachio
Peanuts	Tomato	Strawberry
Sorghum		Walnut
Sugar Beet		
Tobacco		
Wheat		

The mobility of boron in different species relates to transportation of polyols (a type of sugar alcohol) because boron forms a complex with these molecules which are transported to the active growing phloem tissues. In those species which only produce a small quantity of polyols, boron cannot re-enter the transpiration system and will accumulate in the leaves, thus becoming immobile.

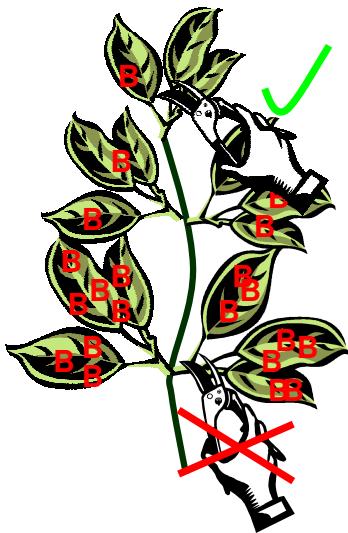


Boron mobile crops		
Broadacre	Vegetables	Fruits/Nuts
Canola (limited)	Asparagus	Almond
	Beans	Apple
	Broccoli	Apricot
	Carrot	Cherry
	Cauliflower	Coffee
	Celery	Grapes
	Onion	Nectarine
	Pea	Olives
	Radish	Peach
		Pear
		Plum

It is vital to identify the boron mobility of the crop to be sampled, as boron immobile crops require different sampling methods compared with boron mobile crops. The ability to diagnose boron deficiency and the use of boron fertilisers in the most effective way is important to achieving optimum yields.

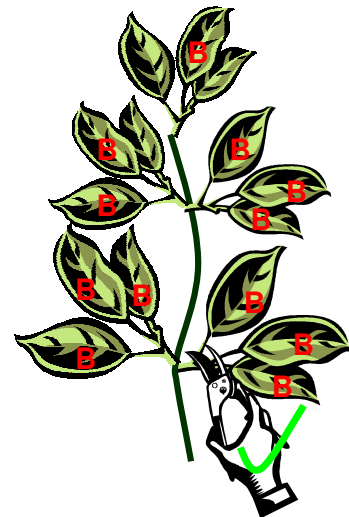
Sampling methods for accurate results

Boron immobile plant



- Accumulates boron in older leaves
- Do not sample older leaves
- Sample new growth

Boron mobile plant



- In contrast, sampling mature leaves of B-mobile plants is appropriate because they reflect the boron status of the entire plant

Should you have any questions in regards to boron mobility or deficiency contact your area manager or our agronomy team.