



Montag Manufacturing, Inc.

2737 Van Dorn Rd
Milford, NE 68405

3816 461st Ave
Emmetsburg, IA 50536

Phone: (712)-852-4572

Email: info@montagmfg.com

Website: www.montagmfg.com

THE AGRONOMY CORNER

MICRONUTRIENTS

There are several important nutrients that must be available to growing plants in order for them to thrive. They are called micronutrients because they only need to be available in very small quantities. However, they all must be available or the plant will not grow well. The micronutrients are boron, chlorine, cooper, iron, manganese, molybdenum, and zinc. Some resources also include nickel as a micronutrient. Other resources also include carbon, hydrogen and oxygen.

BORON

The nutrient that is most likely to be deficient in crop production is boron. However, it is critically important due to its role in forming and strengthening cell walls. Boron also strongly impacts the germination of pollen as well as the growth of pollen tubes and leads to maturity of a growing plant. Without it, reproduction processes would be greatly curtailed.

Boron is essential in the translocation of sugars within the plant as well as assisting in the uptake of potassium and phosphorus. Boron has also been shown to have a positive effect on the conversion of nitrogen into carbohydrates. Legumes utilize boron in the fixation and nodulation of nitrogen.

The avoidance of low boron levels is particularly important for fast growing plants like corn and alfalfa, where low boron levels can cause poor tissue growth and plant development. The fast developing tissue can put a heavy demand on the available boron. Boron is not easily transported within the plants and must be continuously replaced by uptake by the roots, especially prior to flowering, as mentioned earlier, because it is vital to the reproduction process.

Boron is absorbed as boric acid by the roots. For some unknown reason, plants are very poor regulators of the amount of boron absorbed. Thus plant accumulation of boron depends on both an adequate amount of boron in the soil as well as adequate water uptake. Because the range between deficiency and too much is very narrow, the best way to make certain that boron is always available when needed is through a soil applied boron as part of a fertility program.

It should be noted that since boron is poorly translocated in a plant, deficiency signs will appear on new growth first. Also, boron deficiency cannot be corrected with foliar addition because



boron is constantly needed for the new growing tissue. It must be available all the time not just as a one shot of boron on the leaves.

Different plant species require different amounts of boron to support their growth and development. As mentioned, fast growing plants will require more boron than slower growing plants. Thus, these crops require more boron in the soil.

Most field crops cannot remobilize boron from old tissue to new but must rely on boron moving up the stem with water flow to the new growth. This new growth is especially sensitive to low levels of boron. Even a short time deficiency can cause problems with the fast growing plant, especially during reproduction stages of growth.

Deficiency of boron causes short thick cell walls and restricts the elongation of roots and pollen tubes. Flowers can fail to set seeds thereby hurting yields. Later stages of more severe deficiency can cause stunted growth and death of new tissues. Boron deficiencies are difficult to diagnose in most crops. The best cure is prevention of boron deficiency through soil applied fertilization.

Take aways.

Boron is vital for cell walls and reproduction. It is the most likely micronutrient to be deficient in crop production.

Boron is moved through the plant from the roots to new growth as boric acid and requires both adequate soil boron and water uptake. Drought can cause boron deficiencies.

Plants are very poor regulators of boron accumulation. Thus boron needs to always be available to the new tissue.

Boron deficiencies are difficult to diagnose. By the time you see them, it is too late to help the crop.

Foliar application is not feasible for boron since it moves very poorly in the plant and must be constantly available for new growth. One shot will not be sufficient.

Fast growing plants like corn and alfalfa require more boron to ensure adequate levels for the tissue growth rate.

Best defense against boron deficiency is adequate boron available in the soil. "Adequate" varies by crops and locations. Consult your agronomy advisor or your local extension service.

Links to the sources for this discussion:

<http://www.cropnutrition.com/borons-importance-in-plant-development-and-growth>

<http://eldoradochemical.com/fertiliz1.htm>

