



## Optibor®

17.5% B

Grades for agriculture: Technical Granular



Boric acid

### Boron, an essential plant nutrient

Boron is one of seven micronutrients essential to all plant growth. Its role was recognized first in the 1920s and since that time, boron deficiency has been recognized in a wide range of crops.

### Correcting boron deficiency

Boron deficiency can be remedied by the correct application of a borate containing material in solid or liquid fertilizers, to the seedbed in annual crops or under the foliar canopy of perennial crops.

### Detecting boron deficiency

Boron deficiency shows in clearly defined ways in certain crops. Generally, by the time visible symptoms are seen, yields will already have been adversely affected. The best way to establish need is either through soil testing or through tissue analysis. In this way, boron supplementation can form part of a 'balanced nutrition' approach to crop fertilization.

### Predicting boron deficiency

Certain crops worldwide are known to be more susceptible to boron deficiency than others. These are shown in the tables.

There are several factors which need to be taken into account when boron deficiency may be suspected:

- High rainfall
- Recent liming (pH over 6.6)
- Previous cropping
- Boron removal by previous crops
- No boron nutrition
- Sandy soils
- High organic matter

Susceptible to B deficiency		
Alfalfa (Lucerne)	Coffee	Peanuts
Apple	Cotton	Pine
Broccoli	Eucalyptus	Red beet
Carnation	Grape	Rutabaga
Cauliflower	Mangold	Sugar beet
Carrot	Oil palm	Sunflower
Celery	Oilseed rape	Swede
Chrysanthemum	Olive	Turnip

Moderately susceptible to B deficiency		
Banana	Cocoa	Pear
Brussels sprout	Coconut	Poppy
Cabbage	Flax linseed	Potato
Chinese cabbage	Hop	Tea
Citrus	Maize Corn	Tobacco
Clover	Papaya	Tomato

## Advantages of *Optibor* in agriculture

### Organic product

*Optibor* TG is listed by the Organic Materials Review Institute (OMRI), and may be used in accordance with the USDA National Organic Program regulations as a fertilizer for organic crops that are boron deficient.

### Ease of handling

*Optibor* is a stable crystalline product that does not change chemically under normal storage conditions. Wide fluctuations in temperature and humidity can cause recrystallization at particle contact points, resulting in caking. Care should therefore be taken to avoid such fluctuations during storage of the product. Also, it is, of course, essential to maintain the integrity of the packaging.

*Optibor* is easily handled by means of air or mechanical conveying.

### Product quality

When it comes to boron supplementation, quality matters. Like all U.S. Borax refined boron products, *Optibor* is made from only high-quality sodium borates, with no intentionally added impurities, fillers, coatings, or added ingredients.

The product doesn't leave behind the sticky, difficult-to-clean residue that some other products do.

### Solubility

It is 100% water-soluble but with a gradual release rate.

### Registrations

*Optibor* TG is registered for use as a micronutrient fertilizer in the states of California, Idaho, Oregon, and Washington.

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## Main uses

*Optibor* can be used in the following agriculture applications:

- One of the most common uses of *Optibor* is to produce liquid boron fertilizer for use in foliar application and fertigation.
- *Optibor* can also be used in the production of boron-enriched compound fertilizers as an intermediate ingredient.

*Optibor* is NOT recommended for direct soil application due to the high risk of boric acid leaching.



## Additional reading

*Boron Deficiency—Its Prevention and Cure*, by V.M. Shorrocks  
(available from U.S. Borax on request)

*Mineral Nutrition of Higher Plants*, by Horst Marschner,  
Academic Press.

*Boron and its Role in Crop Production*, by Umesh C. Gupta. CRC Press