



Fertibor®

15% B Typical



Disodium Tetraborate Pentahydrate

Background

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. Perennial and annual crops can also be sprayed with boron containing solutions. These are normally tank mixed with other micronutrients or with agrochemical products.

The latter method of application may be preferable since at peak requirement times the boron needs of the growing plant can frequently

exceed its ability to obtain its needs through the roots. Mixing with other sprays as part of a program enables the grower to time this availability and save application cost.

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.

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

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

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

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.

Tyler mesh size	mm	Percent cumulative retained
16	1.000	7.5
24	0.710	23.2
32	0.500	45.0
42	0.355	66.2
60	0.250	82.7
80	0.180	92.1
115	0.125	96.6
170	0.090	98.3
250	0.063	99.0
325	0.045	99.3

Fertibor® is a white free flowing granular material which is highly soluble without residue.

These characteristics make *Fertibor* a versatile source of elemental boron in solid, liquid, or suspension fertilizers, and for direct soil application.

Main uses

- Manufacture of solid, liquid and suspension fertilizers
- Manufacture of compound fertilizer
- Manufacture of liquid micronutrient formulations
- Direct soil application to correct deficiency in some perennial plantation crops
- Incorporation into solid growing media or composts

Advantages

Easy handling

Fertibor granules are free flowing and easily handled by pneumatic or mechanical means — a valuable property in the manufacture of compound fertilizers.

Fertibor®

Highly soluble

Fertibor is highly soluble — a feature valued in a number of incorporation processes.

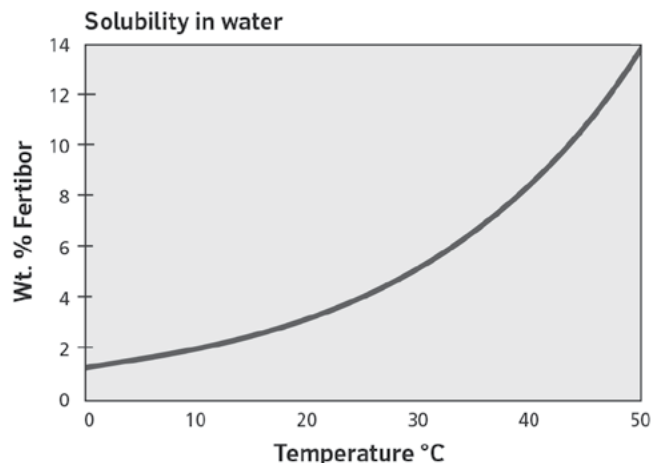
Highly consistent

The consistent particle size of *Fertibor* renders it ideal for use as a micronutrient supplement to crops, particularly perennials, where mechanical application methods (eg fertilizer spreading or spraying) may be difficult or inappropriate.

Bulk density		
Pack type	kgm ⁻³	lb./cu. ft.
Loose pack	1009	63
Tight pack	1137	71

pH buffering action	
Percent <i>Fertibor</i> by weight of solution	pH at 20°C (68°F)
0.1	9.25
0.5	9.22
1.0	9.23
2.0	9.25
5.0	9.32*

*pH of *Fertibor* saturated solution (3.59%)



Temperature		Weight % of <i>Fertibor</i> in saturated solutions	Percent concentration of boron (B) in saturated solutions
°C	°F		
0	32	1.52	0.5
10	50	2.36	0.7
20	68	3.59	1.1
30	86	5.50	1.6
40	104	8.59	2.6
50	122	13.68	4.1



Notice: Before using these products, please read the Product Specifications, the Safety Data Sheets and any other applicable product literature. The descriptions of potential uses for these products are provided only by way of example. The products are not intended or recommended for any unlawful or prohibited use including, without limitation, any use that would constitute infringement of any applicable patents. Nor is it intended or recommended that the products be used for any described purposes without verification by the user of the products' safety and efficacy for such purposes, as well as ensuring compliance with all applicable laws, regulations and registration requirements. Suggestions for use of these products are based on data believed to be reliable. The seller shall have no liability resulting from misuse of the products and provides no guarantee, whether expressed or implied, as to the results obtained if the products are not used in accordance with directions or safe practices. The buyer assumes all responsibility, including any injury or damage, resulting from misuse of the product, whether used alone or in combination with other materials. THE SELLER MAKES NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE SELLER SHALL HAVE NO LIABILITY FOR CONSEQUENTIAL DAMAGES.