



Solubor® Flow

Aqueous solution of sodium borate for foliar spray
 10 % B p/p
 130g B/l
Solubor Flow protects against boron deficiency

Background

Boron is one of seven trace elements essential for plant growth. Its role was discovered in the 1920s and since then, boron deficiency is found in many crops.

Correcting boron deficiency

Boron deficiency can be corrected by applying a product containing boron in the form of solid or liquid fertilizers. In fact, solutions based on boron can be sprayed on perennials and annuals. These solutions are generally mixed in the spray tank with other agrochemicals or fertilizers.

This application method may be preferable because at the time of peak boron needs of the plant, these can often exceed the capacity of the plant to feed the roots. Mixing with other spray solutions as part

of a comprehensive program allows farmers to supplement at precise times.

Detecting boron deficiency

Boron deficiency results in clearly identified symptoms on certain crops. Generally, once these symptoms appear, yields are already compromised. The best way to determine the boron needs of a crop is either by soil analysis or by tissue analysis. Thus, the supplementation of boron can be assured as part of a nutritionally balanced program of fertilizer application.

Predicting boron deficiency

It is known worldwide that certain crops are more susceptible to boron deficiency than others. They are presented in the following tables.

Susceptible		
Peanuts	Cauliflower	Turnips
Sugar beets	Kohlrabi	Carnations
Chrysanthemums	Mangel	Olives
Beets	Rapeseed	Pine
Broccoli	Cotton	Apples
Coffee	Eucalyptus	Rutabaga
Carrots	Alfalfa	Sunflowers
Celery	Palm oil	Grapevines

Moderately susceptible		
Citrus	Hops	Peas
Bananas	Flaxseed	Potatoes
Cocoa	Corn	Tobacco
Cabbage	Coconuts	Tea
Brussels sprouts	Papaya	Tomatoes
Oriental cabbage	Poppies	Clover

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However, it should take into account various factors when boron deficiency is suspected:

- Abundant precipitation
- Recent addition of lime (pH above 6.6)
- Previous crop
- Subtraction of boron by the previous crop
- Absence of boron intake
- Sandy soils
- Rich in organic matter

Additional reading

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

Mineral Nutrition of Higher Plants, de Horst Marschner,
Academic Press.

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

Appearance: Brownish liquid

Normal bulk density: 1300 kg/m³

Action of pH buffering: The aqueous solutions of *Solubor* Flow range from a moderately alkaline character at low concentrations to a substantially neutral character as and when measuring the increase of the concentration.

Packaging: *Solubor* Flow is available in 10-liter cans.

Main uses

- As a spray to prevent the occurrence of boron deficiency in sensitive crops.
- To provide the boron by fertigation or hydroponic growing where these systems are used.

Solubor Flow can be used on several crops. These include :

Field crops: Alfalfa, cotton, corn, rapeseed, sugar beets, sunflowers

Tree crops: Apples, citrus, coffee, olives, grapes, peaches, pears

Vegetable crops: Cabbage, carrots, cauliflower, celery, beets

It is mainly used as a foliar spray on young plants, but it can also be sprayed on the ground in a mixture with nitrogen solution.

Advantages

U.S. Borax, for which the Sustainable Development Policy was set up several years ago, wants to meet a growing demand for clean and environmentally-friendly products. *Solubor* Flow is a new liquid formulation, unique on the market, which offers the following features:

Aqueous formulation of sodium borate

Solubor Flow is the first and only aqueous suspension of sodium borate microcrystals. The sodium borate readily dissolves when added to water and therefore more effective for agriculture. Additionally, in the formulation of *Solubor* Flow, sodium borate is placed in suspension without the use of chemical solvents. This is a new, clean formulation. *Solubor* Flow is an aqueous formulation of boron - a chemical that is non-viscous, non-oily, and solvent-free.

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Sodium content

Because *Solubor* Flow is a sodium borate, it also provides sodium in significant quantities for demanding crops like sugar beets (the content of the *Solubor* Flow solution is a concentration of boron with 200 ppm B and 89 ppm Na) : « Fertilization with salt always increases the yield of sugar beets even if potassium fertilization is already sufficient. » Cooke 1972.

Product stability

It is necessary to shake only the can before use. No crystal formation by sedimentation at low temperatures. If frozen, the product returns to solution when the temperature rises. It thus has a more stable formulation than conventional liquid boron.

Compatibility

Solubor Flow is compatible with most phytosanitary products. It has been tested in combination with the most known and used products in modern agriculture. Compatibility lists are available from your distributor.

With this new liquid formulation, U.S. Borax sought to complete its line of borates for agriculture, by providing products that meet the needs of each user in respect to the environment:

Solubor (powder)

Solubor DF (dry flow)

Solubor Flow (clean liquid)

Traceability is another important feature of this U.S. Borax product line, which is provided on the agricultural market with full guarantees. In fact, U.S. Borax controls the entire production from the mine to the user.

Recommendations for use

Solubor Flow should be dissolved in water and applied by spraying onto crops or also, by mixing with nitrogen solution for direct application on the ground. It can be introduced by using the hydromixer (when the sprayer is equipped) or directly in the tank.

(In both cases, vigorous stirring must be maintained during the filling and mixing operations.)

Use as directed. Do not exceed the recommended doses and a maximum dose of 4 kg of boron B/ha/year (30 liters/ha/yr of *Solubor* Flow). For doses on crops other than those listed, please contact your distributor.

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