

Can't beet this

Solubor® DF and Sugarbeets – how sweet it is

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ONCE UPON A TIME, a leafy plant with a thick, fleshy root flourished around the coasts of the Mediterranean Sea in Europe. Called *Beta maritima*, it was the ancestor of today's sugarbeet, from which growers now produce almost half of the refined sucrose used by consumers and industry alike.

The beet prospered in coastal areas where there were abundant reserves of B deposited by sea spray. Huge reservoirs of boron exist in the oceans, and whether this abundance created a boron dependence – or whether beets would not have evolved without it – remains a sweet mystery.

People discovered that the thick roots of the beets contained sugar which could be extracted and crystallized. Years of selective cultivation – choosing the plants with the biggest roots and highest sugar content to breed from – produced what we have today in the sugarbeet *Beta vulgaris*. But while sugar became more plentiful in the crop, the plant had not lost its need for high levels of boron to grow and produce good yields. Borax's Solubor® DF provides the necessary boron for the beet. The foliar spray is the largest selling in Europe, and was introduced to vegetable and fruit growers in North America earlier this year. Solubor DF was first used in

Europe five years ago – it now outsells the original *Solubor* which was developed in the '50s by Borax.

Beet Generation

In its 200-year journey from seashore to inland farm, the sugarbeet brought its boron dependence along with it and is one of the most boron-intensive crops known today. Often, however, beet fields cannot naturally supply enough. A typical 60 tonne per hectare harvest needs 600 grams of Boron per hectare for growth.

What happens when there's not enough boron? The growing points of the root and the shoot languish swiftly and the young leaves in the developing crown die, creating the traditional symptom of 'hollow heart' later in the life of the crop. The hollow fills with rainwater, creating a breeding ground for bacteria and fungi, and 'heart rot' results.

By the time the symptoms are visible, it's usually too late to treat the problem. All the grower can do is top the beets at harvest, cutting off significant root material along with the leaves and stalks. Not only is bulk lost, but also the high-sugar content.

Borax recommends that farmers monitor the

boron status of their fields by periodic soil and plant tissue analysis, particularly on light, sandy and alkaline soils. *Solubor* DF can easily be added to sprayers along with other fertilizers or herbicides. It should be used as a soil spray before or at planting, or as one or preferably two foliar sprays when plants reach four-to-six- and ten-leaf growth stages. A dry summer can also indicate the need for an additional spray later in the season.

Bigger and sweeter with *Solubor* DF

If all the nutrients – including boron – are available in the right amounts, boron-deficiency can be avoided, producing optimal crop and sugar yield. Topping can be limited to the green components alone, leaving beets with maximum root weight and sugar content. Studies have shown that boron-supplemented beet crops can deliver 30 percent higher root weights, and 40 percent greater sugar content than comparable plantings.

A key factor, as with other crops suffering from boron deficiency, is that yield will be reduced even if physical symptoms do not show. Avoiding this hidden hunger with *Solubor* DF ensures the best possible yield – a sweet solution all around.

Portrait of a Beet

In beets, growth springs from meristems. These can be apical, at the tips of shoots and roots, or lateral, which widen the plant, like the vascular tissue of the beet root. The beet leaves grow into the air and the root down into the soil, thickening throughout the growth cycle. Boron plays an essential role by biochemically boosting the meristem's growth function and by assisting in the chemical transport of sugars throughout the plant.

