

Mineral Mulch

Cost-effective Sustainable Soil Amendments

Improving sugarcane yields through the addition of low cost Calcium Silicate

Silicon (Si) may be one of Earth's most prevalent macronutrients in fact it is the second most abundant element in the earth's crust after oxygen, however only recently has it become recognised as a beneficial element for plant growth and development. Its significance for rice cultivation was recognised early by Japanese researchers early in the 20th Century, but due to translation difficulties this information was not made publicly available to the wider scientific community until recently. In recent years the importance of silicon to plant growth has been more widely researched and recognised with many reports of yield responses in a wide range of crops.

“Silicon deficiencies in the plant reduce the plant's ability to resist disease and pest attack due to a loss of strength and cell structure.”

Benefits of silicate for sugarcane have been known since the mid-1970s from research across several countries. The symptoms of silicon deficiency in sugarcane are distinctive on the upper side of lower leaves in the canopy develop a white fleck and a bronze freckle which can cover the whole leaf surface (*see photo*). Symptoms tend to develop during the peak growth phase in summer when the soil can longer meet crop requirements. Commercial-scale field trials in sugarcane with Mineral Mulch applied at 6 t/ha were conducted from 2014 to 2016 in the Bundaberg region in collaboration with Dr **Graham Kingston**. The results showed not only an improvement in sugarcane health and an increase in stalk height, but also an average sugarcane yield increase of 21% over a plant and first ratoon crops. These observations were seen in conjunction with an increased level of silicon in the leaf tissue.



As sugarcane is a silicon accumulator an average crop can remove between 100 to 175 kg/ha of silicon from the soil per average crop and a very high yielding crop can contain over 250 kg/ha of silicon in the harvested biomass¹.

Silicate forms although high in silica complex silicates in rocks and sand generally do not supply plant available silicon as its availability to plants is

limited unless the following requirements can be met:

- It must have a relatively high content of silicon.
- Be able provide sufficient water-soluble available silicon to meet the plants needs.
- It must be cost-effective.
- Have a physical nature that facilitates storage/application.
- Not contain any substances that will contaminate the soil.

Many potential sources meet the first requirement however very few meet them all. The best sources contain both calcium and silicate. Silicon availability to plants relies on the release of monosilicic acid from the weathering of clay minerals and certain fertilisers. Mineral Mulch contains calcium silicate which supplies available calcium and silicon therefore making it an ideal source of agricultural silicon and calcium. Mineral Mulch also has a pH neutralization value of 32% for the correction of soil acidity. Inorganic materials such as quartz, clays, micas, and feldspars, although rich in silica, are poor silicon fertiliser sources because of the low solubility of the element in this form.

Mineral Mulch Calcium Silicate is a unique product as it contains 27% silicon (Si), 14% plant available calcium (Ca) and a host of essential trace elements, including Iron, Copper, Zinc, Boron and Manganese. Mineral Mulch products have been manufactured with the end-user in mind being both easy to store and apply, best of all they are sourced from 100% sustainable and recycled materials, containing no substances that will contaminate the soil.

FUTHER INFORMATION

For further information on Mineral Mulch or the benefits of calcium silicate on your tree crops please call us on 1300 895 988, email info@mineralmulch.com or follow us on Facebook www.facebook.com/mineralmulch ■

¹ AUSTRALIAN SUGARCANE NUTRITION MANUAL June 2019 Chapter 21: Silicon (Si) 91.