

THE SIGNIFICANCE OF SILICON

Silicon dioxide or Silica is a naturally occurring mineral that comprises 5% of limestone, 44% of basalt and 68% of granite. Silicon is a mineral with similar chemical properties to carbon, and just as basic in the earth's composition.

Virtually unknown for most farmers as a fertiliser, it is a specific requirement for rice production, and is in some ways a replacement for calcium in grasses. Silicon gives them structural support or stiffness, and sometimes sharp edges to the leaves. It enables grass leaves to stand more erect, thus enabling them to catch more light, hence enhancing the process of photosynthesis. A bristly surface caused by strongly silicified glandular hairs on the leaf surface or stem is produced by some plants. Already in 1930 B.V. Rossi claimed that silicon was necessary for healthy roses, specifically for the firmness of the stem and the glossiness of the leaves.

By contributing to the strength of plant cell walls, silicon enhances disease-resistance, inhibiting the ability of pathogenic fungi to penetrate leaf surfaces. For example, cucumber plants grow more slowly and are more susceptible to powdery mildew in silicon-deficient potting mix. It also makes it more difficult for a variety of herbivores to chew the leaves. This is not a foolproof defence, however, as caterpillars simply start with the youngest and softest leaves.

Where leaching of native soils has occurred, where rainfall is high, where irrigation has been practised for a long time, or where soil organic levels are low, available silicon may be in short supply. Low levels of silicon in leached soils contributes to the lock up of phosphorus, because research has demonstrated that silicon causes an increase in absorption of phosphorus by plants.

There are indications that enhanced flavour and keeping qualities of fruit and vegetables can be attributed to adequate supplies of silicon in the growing medium. Watermelon in particular uses and concentrates silicon, and will not thrive where a deficiency exists. Grapes may also benefit from the presence of silicon actually thickening and strengthening the skin cells of the berries. Flavour is known to be borne in the skins, and the stronger skins will be less permeable to moulds and fungi directly, and less likely to split in wet weather.