PlantoSys
PLANT STRENGHTENING

# SilicaPower

## Silicon fertilizer with 3% orthosilicic acid

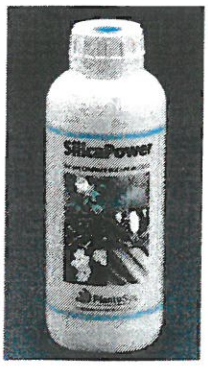
**SilicaPower from PlantoSys stimulates production of the plant's natural defences against fungal infections and strengthens the cell walls and epidermis. With 3% orthosilicic acid, SilicaPower has a high concentration of silicon that is readily taken up by the plant. SilicaPower can be applied via the A-fertilizer feeder or as a foliar spray.**

SilicaPower contains orthosilicic acid (OSA). SilicaPower from PlantoSys is a purely $SiO_2$ colloidal solution of micro $SiO_2$ in vitalised water. These silicon particles, just one millionth of a millimetre across, are encased in $H_4SiO_4$ (orthosilicic acid). This is the smallest possible form of silicon. Unlike many other forms of silicon, this form is easily absorbed by plants. Following application, the silicon is taken up by the plant where it accumulates in the epidermis and is subsequently incorporated into the cell wall. This improves the plant's natural resistance, making it more difficult for fungi, such as powdery mildew, to penetrate into the plant.

Orthosilicic acid also has a regulating effect on turgor under osmotic stress, with the direct result that plants lose moisture less quickly.

**Positive effects of silicon:**

- Strengthens the natural defences and therefore the production of substances which are toxic to fungi
- Stimulates chlorophyll production ➡ higher light absorption efficiency ➡ more photosynthesis
- Increases osmotic tension in the cells
- Redistributes minerals in the plant
- Increases potassium absorption
- Larger quantity of the $CO_2$ fixation enzyme Rubisco
- Stimulates root hair production
- Improved leaf arrangement (phyllotaxis)
- Reduces sodium uptake and lowers salt stress
- Facilitates production of an important enzyme which regulates carbon conversion into sugars




**With the following results:**

- In Saintpaulia: 35 – 80% less powdery mildew
- In cucumbers: 5 – 10% increase in yield
- In lettuce: fewer brown leaf edges – better distribution of Mn and Ca throughout the leaf

**Application of SilicaPower:**

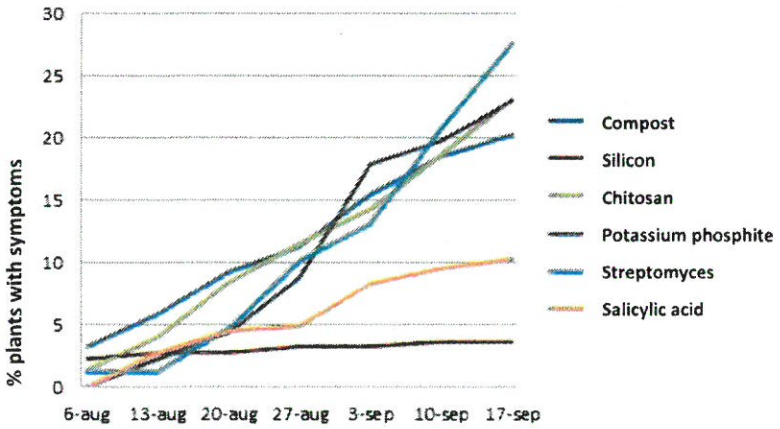
- Via the A-fertilizer feeder or as a foliar feed:
  - 350 ml/ha/week via the A-fertilizer feeder or separate OF fertilizer injector
  - 500 ml/ha/week as a foliar spray
- SilicaPower is 25% to 50% cheaper than other liquid silicon fertilizers

Alwin Scholten | +31 (0)6 49 33 49 30 | alwin.scholten@plantosys.nl | www.plantosys.com

**Research demonstrates the effects of using silicon as a fertilizer**

Studies have shown that using silicon as a fertilizer improves crop quality (e.g. fruit firmness, shelf life). It can also increase yields and promote resistance to biotic (fungi) and abiotic stress factors (drought, heat).

***Wageningen UR, December 2014: use of silicon in Kalanchoe; up to 80% reduction in Phytophthora***




*Development of Phytophthora symptoms in Kalanchoe with six treatments. The untreated control and Metalaxyl-M (Ridomil Gold) exhibited no symptoms of Phytophthora infestation and are not shown on the graph.*

**How silicon works - in detail**

Silicon is stored in the epidermis as a microscopically thin silicon-cellulose layer which strengthens the cell wall. This protective layer reduces moisture evaporation. It also makes the layer harder; as a result it is more difficult for insects and fungi to enter.

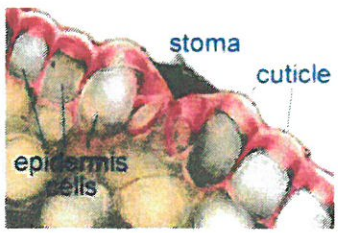



**Illustration:** Cross-section through a leaf of a living plant showing the epidermis where the silica gel is polymerised and the protective wax layer (the cuticle - coloured red). The cross-section also shows a stoma with a substomatal chamber (Uni-Münster.de).

**Silicon protects against:**

| Biotic stress | Abiotic stress |
|---|---|
| **Mechanical,**<br>through the silicon layer in the cuticle:<br>• Reduced insect infestation<br>• Reduced fungal penetration | **Physical stress resulting from:**<br>• Wind<br>• Drought<br>• (UV) radiation<br>• High and low temperatures |
| **Chemical**<br>Facilitates production of phenols, phytoalexins and other signal molecules and enzymes which activate the defence system. | **Chemical stress resulting from:**<br>• High salt levels<br>• Metal toxicity<br>• Nutrient imbalance |

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