



**Antitranspirant and  
folia crop nutrients**



## Ortho silicic acid plant nutrition and protection

Ortho silicic acid is recognised for its benefits within plant nutrition and structural development. It helps to reinforce plant cell walls by forming solid amorphous, hydrated silica gell between the cuticle and cell wall, and between the cell membrane and cell wall, creating stronger plants with greater tolerance toward drought, heavy metals, pests and diseases.

As ortho silicic acid accumulates within cell walls it quickly hardens to provide structural support. The xylem and phloem are also strengthened and expanded to enable higher sap pressures, enabling important nutrients like calcium to move extensively throughout the plant. With the provision of improved osmoregulation, ortho silicic acid reduces stress from cold, heat, drought and environmental issues.



## The effect of treating plants with Silicon

The upper leaf is on a cucumber plant treated with foliar applied nutrients plus silicon, while the lower leaf was treated with a nutrient solution that was unamended with silicon. Both leaves were inoculated with equal amounts of conidia of (*S. fuliginea*) Powdery Mildew.

*(R Belanger, P. Bowen, D Ehret & J. Menzies)*



**With Silicon**



**Without Silicon**

**Not all sources of silicon are the same!**

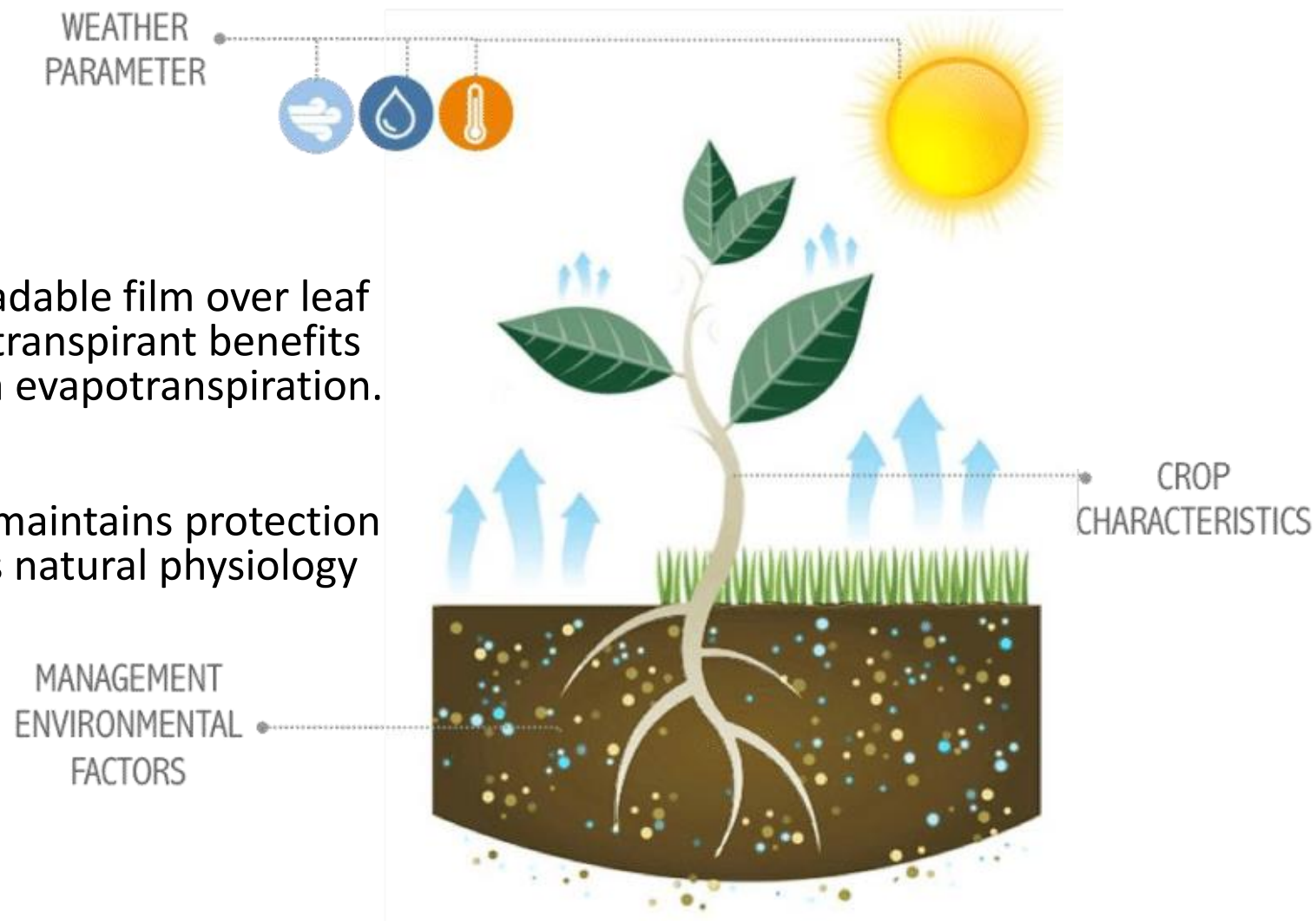
Silicon source	Plant availability	Declaration
Ortho Silicic acid	Within hours	Organic certified
Oligomeric silicic acid	Within days	Synthetic
Potassium silicate	Within weeks	Industrial
Calcium silicate	Within months	Mining
Sand	Within years	Natural



## Antitranspirant benefits

**DYASIL-OSA** creates a light biodegradable film over leaf pores that provides temporary antitranspirant benefits through reductions in water loss via evapotranspiration.

Regular applications every 14 days maintains protection without risk of degrading the plants natural physiology



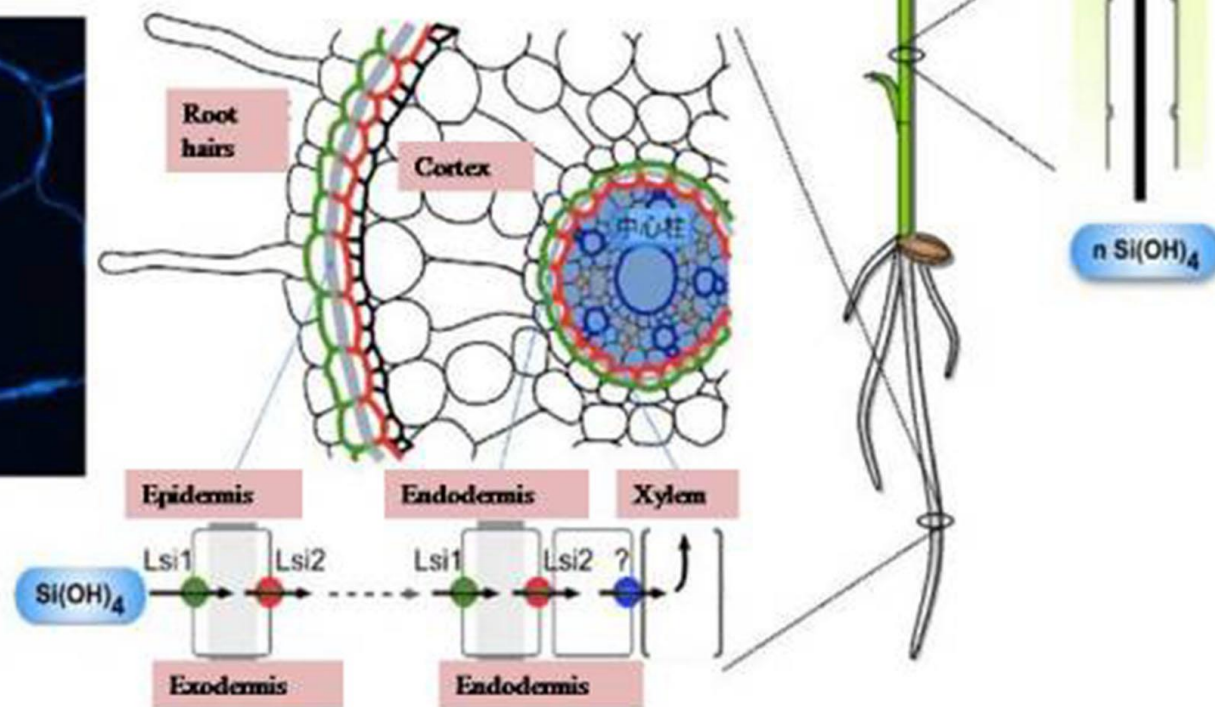
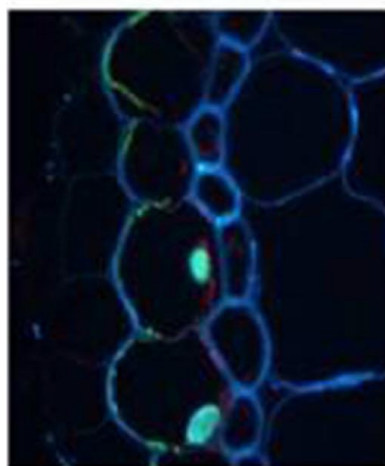
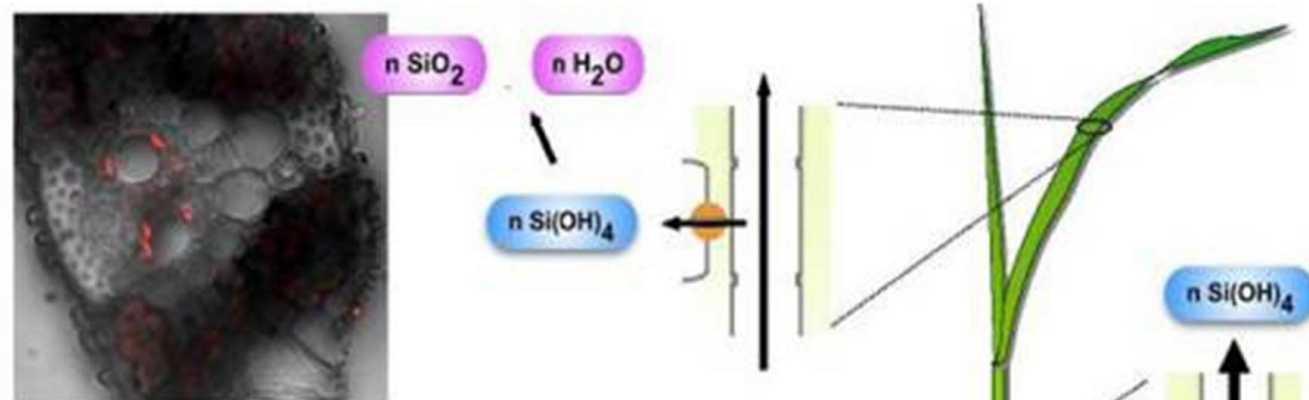




**DYASIL-OSA** improves the physical functionality of cells throughout the plant.

Si in plants is found to alleviate many biotic and abiotic stresses.

It does not form a constituent of any cellular component but is primarily deposited on the walls of the epidermis and vascular tissues conferring strength, rigidity and resistance to pests and diseases.





## Agriculture and horticulture

- Stronger stalks and stems for reduced risk of lodging
- Improved photosynthesis through extended leaf and chlorophyll life
- Reduced transpiration, heat and drought stress
- Greater resistance to cell penetration by pests, fungi and mildew



## Fruit, vegetables and flowers

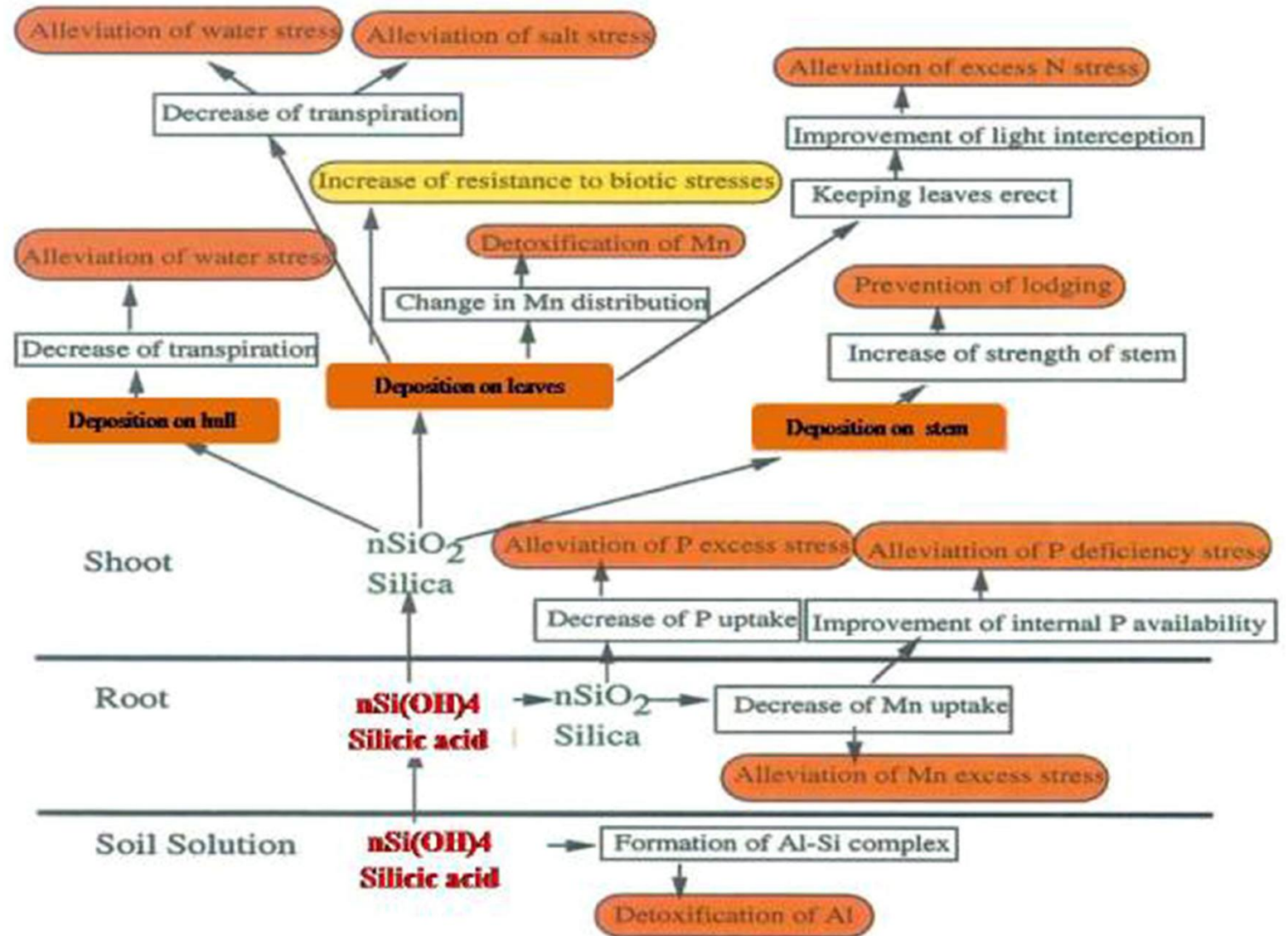
- Improved firmness and colour of flowers
- Helps resistance to frost, fungi, pests and environmental stresses
- More fruit remains on the plant until maturity building sugars for higher Brix values and improved taste
- Reduction in skin splitting, shape distortion of fruits and tubers, while also extending shelf life





**DYASIL-OSA** liquid ortho silicic acid is recognised for its benefits within plant nutrition and structural development.

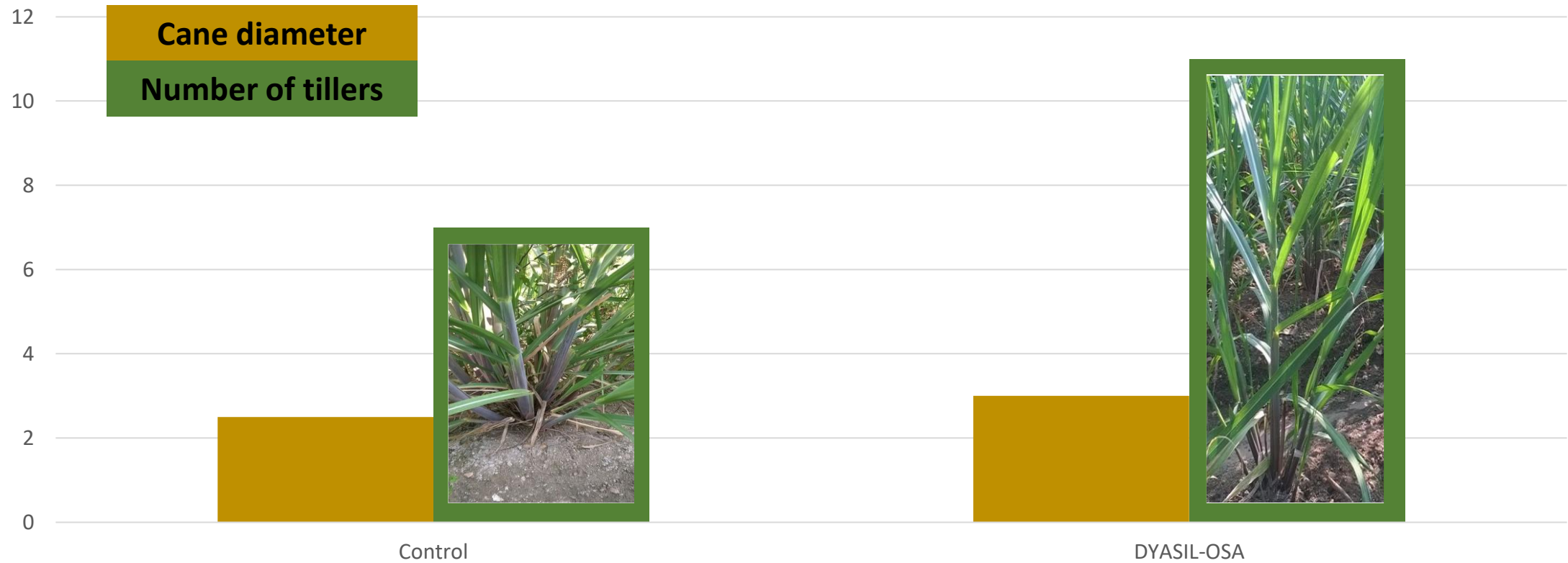
Ortho silicic acid provides a range of agronomic benefits within the soil around the root zone, and also forms beneficial complexes within the soil solution.



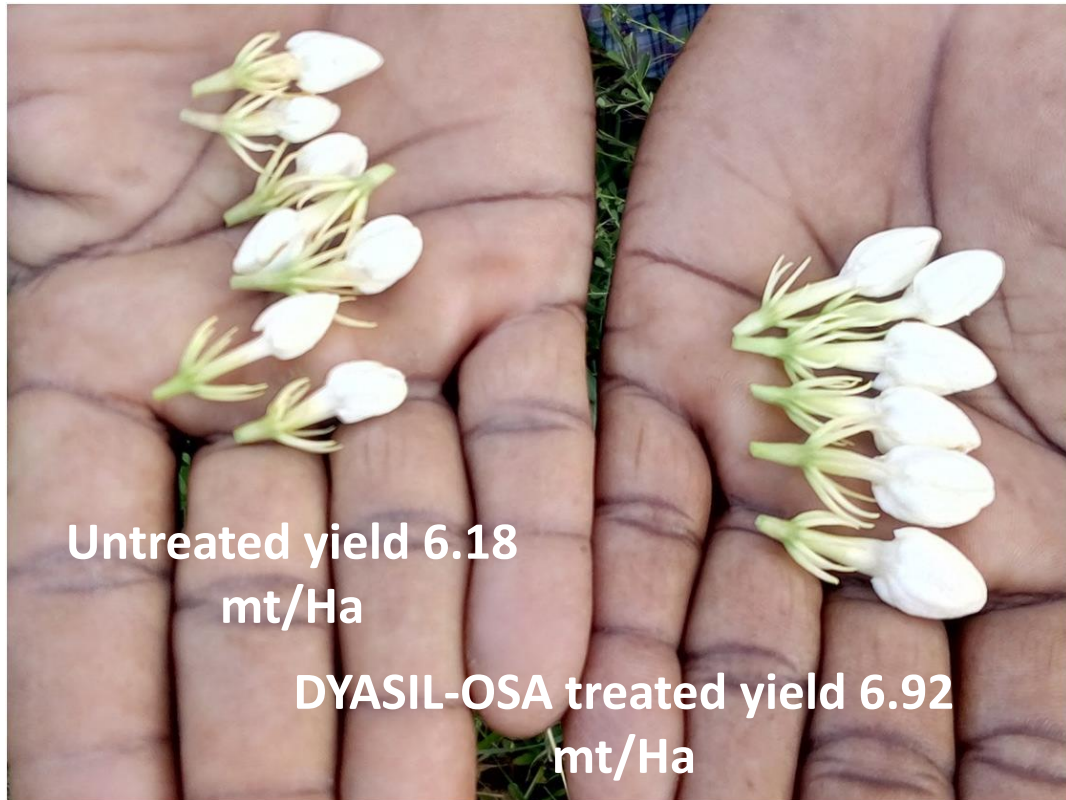




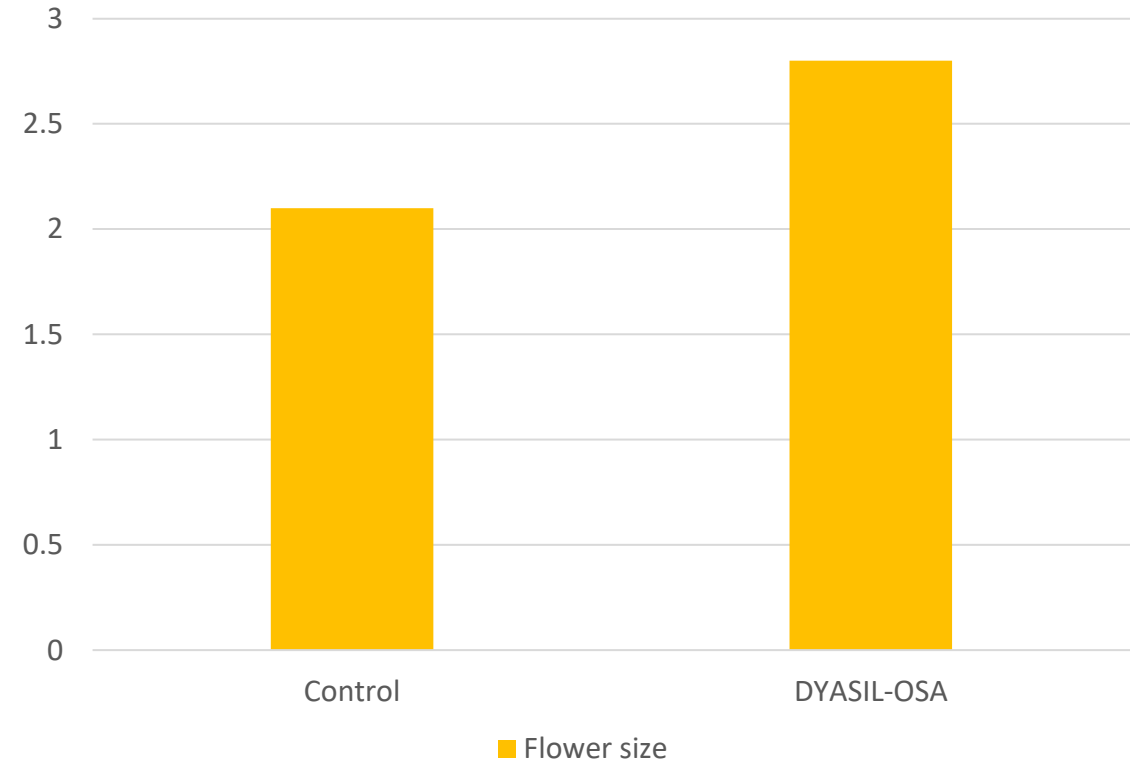
## Sugarcane Trial



*Independent trial - December 2018 -Viggi Agro Products, Namakkal, Tamil Nadu, India*



### Jasmine



Independent trial - Ecogreen Foundation, Namakkal, Tamil Nadu, India October-December 2018



- Unique highly stabilized formulation of Ortho silicic acid
- Molecular Formula  $H_4O_4Si$
- Molecular weight 96.11 g/mol
- CAS Number 10193-36-9 (62647-18-1)
- Orthosilicic acid ( $H_4SiO_4$ ) % w/v: 2.0
- Plant available silicon % w/v: 0.6
- Nitrogen % w/v: 4.0
- $P_2O_5$  % w/v: 3.0
- $K_2O$  % w/v: 1.0
- Colour Yellow
- 100 % solubility in water
- pH (1% solution in distilled water) : 1.10-2.20
- Specific gravity (g/m) : 1.07-1.15
- Sodium maximum (as Na) % w/v: (Less than) 0.1





**DYASIL**

Ortho Silicic Acid

DYACARE

### **Root watering and drip irrigation**

- 400 ml in 500 litres each watering

### **Foliar application**

- 200 ml/ha in 200 litres – 500 litres water
- Apply at 7 - 14 day intervals during stem elongation, flowering and early fruit/tuber/seed formation.

### **Application on amenity grasses**

- 1 litre per hectare / 1 ml per M<sub>2</sub>

When applied to greens, tees & sport pitches

- The anomaly of silicon in plant biology; Epstein E.; Department of Land, Air and Water Resources, Soils, and Biogeochemistry, University of California, Davis, CA 95616-8627; september15, 1993
- Benefits of plant silicon for crops: a review; Guntzer et al.; INRA & Springer Science +Business Media; published online 30 June2011
- Uptake system of silicon in different plant species; Mitani et al.; Faculty of Agriculture, Kagawa University, Ikenobe2393, Kagawa, Japan; accepted21 January2005
- Role of silicon in enhancing the resistance of plants to biotic and abiotic stresses; Jiang Feng Ma; Soil Science and Plant Nutrition, 50:1, 11-18, 2004

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