



# & HOW & WHY

- INCREASES WEIGHT AND BULK
- HELPS NUTRIENT UPTAKE
- STRENGTHENS PLANTS
- IMPROVES DISEASE RESISTANCE
- IMPROVES CELL INTEGRITY

### **Why can't silica be included in the components of two-part nutrients to the level that it is in say BudLink®?**

For silica to remain in solution at high concentration it requires alkaline conditions (i.e. pH greater than 7). If a silica solution concentrate were added to the 'A' or 'B' parts of a two-part nutrient solution, a precipitation reaction with nutrient elements would occur. Nutrient deficiency problems are likely to result from this. This is why BudLink® provides the grower with a separate, easy to use silica supplement. Also by keeping silica separate, it allows the grower to apply silica at any desired rate. This is an advantage especially when crop specific rates are required. Another advantage is that BudLink® can be applied as a separate foliar application to help fight pests. BudLink® should be considered as part 'C' to all existing two-part nutrients.

### **How does it reduce moisture loss?**

BudLink's active silica compound accumulates largely as hydrated silica (silica bound by water) most abundantly in walls of epidermal cells in root, stem and leaf cells. This binding relationship leads to improved growth resulting from a higher mechanical stability and strength in leaves and stems. This in turn also leads to an improved light interception and higher photosynthetic capacity. This gives rise to a more efficient utilization of water and hence reduced moisture loss.

### **In what way does BudLink® assist in the efficient uptake of nutrients?**

By adding increasing quantities of silica to the nutrient solution there is a corresponding increase in uptake and deposition of silica in the plant tissue. It has been found that there is also a competitive uptake between silica and other elements such as manganese and iron, at the solution/root interface. This competition is beneficial since it prevents the build up of toxic levels of manganese in plant tissue through uptake. It has also been reported that the silica may actually increase the tolerance to high manganese concentrations or to an imbalance in phosphorus and zinc supply. Silica can be regarded as a facilitator of a more efficient nutrient uptake process.

### **How does it improve cell development?**

Silica is readily deposited into the cell walls of plants during cell development and division. This produces a 'silica-cellulose framework', which in turn strengthens cell walls. A little like adding mortar to brickwork. It has been demonstrated, by way of scanning electron microscopy and energy dispersive X-ray analysis, that once deposited into cell walls, the silica cannot be remobilized by the plant. It is recommended that a continuous supply of BudLink® be added to the nutrient solution thus allowing its incorporation into new growth from transplanting onward.

### **How does it stimulate plant immune system & resistance to pest attack?**

Plants grown hydroponically have been found to be more prone to insect and bacterial attack than their soil grown counterparts. Research has shown that this is partly due to the lack of silica in hydroponic nutrient formulations, normally present in soil (ca. 10ppm). Since the silica is deposited into the cell structure it provides a physical barrier against fungal attack. The use of BudLink® has demonstrated a significant reduction in bacterial attack such as pythium and powdery mildew when applied to the nutrient solution or as a foliar spray. Silica accumulates around points of infection with a similar increase in plant produced anti-infection compounds thus improving protection. The improved cell integrity brought on by the deposition of silica into the cell structure also provides a barrier to insect attack. In trials on commercial crops it was found that insect numbers did not increase due to their inability to penetrate and feed from the plants. Once applications ceased all new growth was attacked. It should be noted that the Organic Growers groups approve the use of silica for disease and pest control.

### **How do you account for the increase in weight & bulk?**

As the concentration of silica in nutrient solutions is increased, there is a corresponding increase in the accumulation of silica in plant tissue. This improves photosynthetic capacity, cell development, water utilization, nutrient uptake and disease resistance. These factors give rise to a healthier more highly productive plant, which results in an increased production, weight and bulk per plant as demonstrated by research.



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