



## CalSap<sup>®</sup> Horticulture for use in Potato Production

A major benefit of applying CalSap<sup>®</sup> Horticulture to potatoes is that it increases the calcium content in the tuber skin. This has a number of benefits including; improving the handling, yield and storage life of the potato.

### Why CalSap<sup>®</sup> Horticulture for Potatoes?

CalSap<sup>®</sup> Horticulture can be applied to potatoes to economically improve production. CalSap<sup>®</sup> has been designed to be a highly water soluble calcium product that remains soluble and plant available in the soil when compared to compound sources such as calcium chloride and calcium nitrate.

When the potato plant takes up calcium via the roots, calcium does not translocate from the plant to the tuber (Ozgen and Palta 2005). Instead, calcium is taken up by the tuber by fine hairs on the tuber or roots at the stolon nodes from the surrounding soil. Therefore soluble calcium products are the only source of calcium recommended for tuber nutrition (Kleinheinz et al. 1999). Other calcium products, such as lime and gypsum are not highly water soluble and are not recommended for application to potatoes as a calcium source. CalSap<sup>®</sup> is also nitrate, chloride and phosphate free, allowing for more precise fertigation mixes.

By applying CalSap<sup>®</sup> Horticulture to potatoes, the following benefits to the grower can include:

- Increased calcium content in the skin of the tuber
- Decreased harvest and handling damage, therefore improving marketable yield
- Improved yield and storage life
- Improved resistance to soil borne diseases
- Reduced uptake of sodium and chlorides

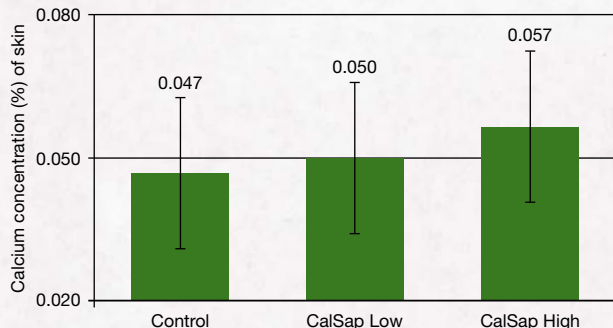


CalSap<sup>®</sup> Horticulture

Want to talk more about the Optima range?  
Call us toll free on 1800 246 546 or visit [www.optimaagriculture.com.au](http://www.optimaagriculture.com.au) for more information

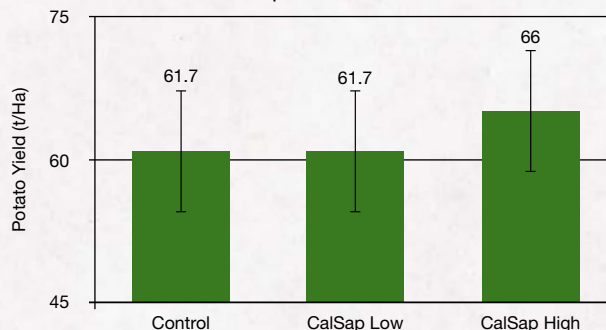


Average increase in Calcium % in potato skin (2nd cut)



Increase in calcium content of the skin with CalSap® application, even after 200 kg/Ha of calcium in the basal fertilizer had been added at seeding in field trials near Pemberton WA (Source: Optima Agriculture 2010)

Average Potato Yield (t/Ha) with variable rates of CalSap Horticulture



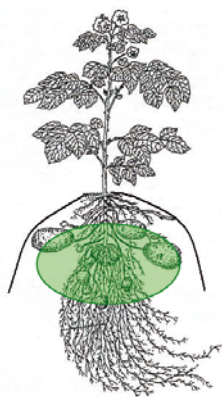
An increase in the average yield of potatoes was seen at a higher rate of CalSap® applied near Pemberton WA (Source: Optima Agriculture 2010)

## Application and timing

### Liquid Injection at hilling

The most efficient use of CalSap® as a calcium source for improving the quality of potatoes is by injection of CalSap® Horticulture into the 'tuber zone' at seeding.

When the hill is being formed, CalSap® Horticulture mix can be injected into the area where tubers are going to form, which provides the most efficient and effective use of CalSap® Horticulture. Therefore a high concentration of CalSap® Horticulture in these areas provides more economic and efficient use of the product.



As calcium is taken up by the tuber in the tuber zone, calcium applications should be targeted in this area if possible.

Based on soil test results suggested application rates of CalSap® are listed overleaf. Some soil tests list hydrogen % (H) as part of the Base Saturation, while others do not. Please refer to the tables for calcium % and recommended application rates.





## Dilution Rates

CalSap® Horticulture can be diluted to a minimum of 1:5 in water when applying through a boom spray

CalSap® Horticulture can be diluted to a minimum of 1:500 in water when applying through sprinklers or centre pivots

A minimum of 1:5 dilution of CalSap in water or UAN is recommended. Alterations to dilution rates may be required depending on application machinery used.

## Rates of Application for Liquid Injection (Litres per Ha)

Calcium Level in Soils	Base Sat % (Incl. H)*	Base Sat % (Not Incl. H)#	Light Soils CEC = < 10	Medium Soils CEC = 11-18	Heavy Soils CEC = > 19
Very Low	< 35 %	< 40 %	50-70L/Ha	60-80L/Ha	80-100L/Ha
Low	35-50 %	40-58 %	40-60L/Ha	40-60L/Ha	60-80L/Ha
Medium	> 50 %	> 58 %	20-30L/Ha	20-40L/Ha	30-60L/Ha

\*Standard soil tests including H as a % base saturation are APAL or SWEP #Standard soil tests not including H as a % base saturation are CSBP, Summit or Incitec-Pivot

## Fertigation and Boom Spray Applications

In addition to liquid injection, CalSap® Horticulture can also be applied through fertigation, sprinklers, centre pivots and boom spray equipment. Calcium is predominately taken up by the tuber during “tuber bulking” (Kleinheinz et al. 1999). CalSap® Horticulture can take time to move into the ‘tuber zone’ from the surface, so if fertigating, best results are achieved via multiple applications not exceeding 20L/ha per irrigation.

Heavier soils will require applications to begin earlier in the season, giving time for the calcium to reach the ‘tuber zone’. This will provide adequate calcium for skin firming.

Rates of application suggested for foliar’s and fertigation are higher than liquid injection due to the larger soil surface contacted by the product.



## Rates of Application per season for fertigation/boom spray (Litres/Ha)

Calcium Level in Soils	Base Sat % (Incl. H)*	Base Sat % (Not Incl. H)#	Light Soils CEC = < 10	Medium Soils CEC = 11-18	Heavy Soils CEC = > 19
Very Low	< 35 %	< 40 %	60-80L/Ha	80-100L/Ha	100-120L/Ha
Low	35-50 %	40-58 %	60L/Ha	60-80L/Ha	80-100L/Ha
Medium	> 50 %	> 58 %	40-60L/Ha	40-60L/Ha	60-80L/Ha

\*Standard soil tests including H as a % base saturation are APAL or SWEP #Standard soil tests not including H as a % base saturation are CSBP, Summit or Incitec-Pivot

### REFERENCES

Kleinheinz, M.D., Palta, J.P., Gunter, C.G. and Kelling, Keith A. 1999. Impact of source and timing of calcium and nitrogen applications on ‘Atlantic’ potato tuber calcium concentrations and internal quality. J. Amer. Soc. Hort. Sci. 124(5):498-506. Ozgen, S. and Palta, J.P. 2005. Supplemental calcium application influences potato tuber number and size. HorticultureSci. 40:102-105