



## **Project Report**

# **Silicon Fertiliser in Onions Demonstration**

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# Silicon Fertiliser in Onions Demonstration



## **Objective**

The overall objective of this crop demonstration was to investigate the effects of a soil-applied silicon fertiliser on onion production.

## **Site Details**

|                             |  |
|-----------------------------|--|
| <b>Location</b>             | Hagley, TAS  |
| <b>Soil type</b>            | Red/Brown Dermosol   |
| <b>Crop</b>                 | Regular 'Cream Gold' onions grown for fresh market   |
| <b>Demonstration Design</b> | Grower / On-farm demonstration – a single 3ha area of the paddock received the fertiliser while the remainder received none. |
| <b>Replicates</b>           | 1  |
| <b>Plot size</b>            | Treated - 3ha; Control – 3ha. (2m bed widths).   |
| <b>Planting date</b>        | 7 <sup>th</sup> August 2010  |
| <b>Harvest date</b>         | 25 <sup>th</sup> February 2011   |
| <b>Irrigation</b>           | Supplied by traveling irrigator  |
| <b>Cropping History</b>     | Intensively cropped with a recent rotation of poppies (09/10), wheat (08/09) and carrots (07/08).                            |

## **Methodology**

This demonstration was undertaken within a 6ha onion crop over the 2010-2011 growing season on a farm in Hagley, Northern Tasmania. The trial was on a uniformly flat paddock, consisting primarily of dermosol soils.

The MaxSil™ product used in the demonstration was supplied by Advanced Crop Nutrition Pty. Ltd. (APN). It was formulated as a granular product of dark brown to grey colour. MaxSil™ has a soluble silicon content of approximately 1,600ppm. MaxSil™ has been granted certification as an 'allowed input' by the Biological Farmers Association.

The MaxSil™ was broadcast over half of the paddock after planting at early post emergent, 58 days after planting, at a rate of 100kg/ha. This provided one treated and one control replicate, both approximately 3ha in size. The crop was managed using standard agronomic practices, with other required fertilisers and pesticides applied evenly to the entire site as required.



Yield was assessed from onions harvested within four, 3 metre long strips in both the treated and control plots. In each strip, onion bulbs were graded, counted and weighed. The bulbs had been mechanically lifted three weeks prior to the assessments being conducted.

The onions were graded by diameter according to industry standards, in the size ranges detailed below:

- Small - <60mm
- Medium - 60 – 80mm
- Larger - >80mm



## Yield Results

The results in Table 1 show a significant difference in the mean number of bulbs in the three metre strips between the treatment and the control. This difference is attributable to a significantly ( $P=0.015$ ) greater number of small bulbs in the treated plots since the average number of medium and large bulbs in the three metre strips were comparable between treatments (Graph 1). The greater number of small onions also resulted in a significantly ( $0.010$ ) larger average weight of smalls in the treated plot compared to the control (Graph 2). Interestingly, the average 'per bulb' weight of the small size onions was comparable for both the treated (9.58g) and control (10g) replicate.

**Table 1:** Effect of silicate treatment on onion yield for regular 'Cream Gold' variety. Results are the average for 3m strips (equivalent to  $6m^2$ ).

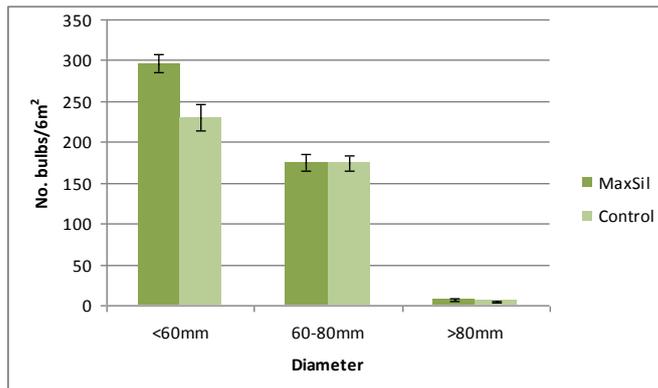
|                               | <u>MaxSil™</u> | <u>Control</u> | <u>P=</u>   |
|-------------------------------|----------------|----------------|-------------|
| <b>No. bulbs</b>              |                |                |             |
| Mean no. bulbs                | 477            | 408.5          | 0.002       |
| Smalls                        | 296            | 230            | 0.015       |
| Mediums                       | 174.5          | 174.5          | ns          |
| Large                         | 6.5            | 4.5            | ns          |
| <b>Weight of bulbs</b>        |                |                |             |
| Mean weight (kg)              | 65.84          | 57.53          | 0.002       |
| Smalls                        | 29.74          | 22.04          | 0.010       |
| Mediums                       | 33.12          | 33.95          | ns          |
| Large                         | 2.09           | 1.55           | ns          |
| <b>Estimated yield (t/ha)</b> | <b>108.90</b>  | <b>95.89</b>   | <b>.020</b> |

*ns=not significant*

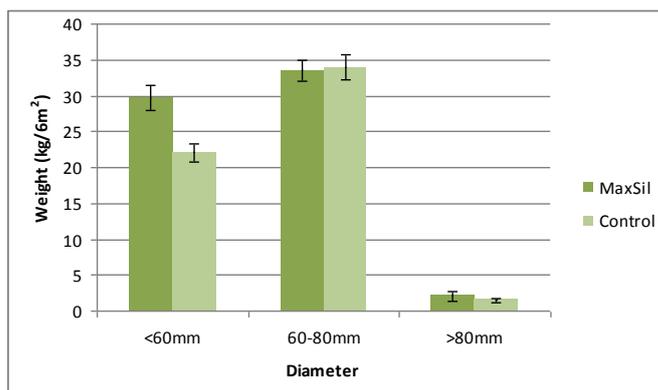
There was a significant difference ( $P=0.02$ ) in the mean weight and estimated yield ( $P=0.20$ ) between treatments, with an overall greater yield observed in the MaxSil™ treated onions (108.90T/ha) compared to the control (95.89T/ha) (Graph 3). This observed yield difference is largely attributable to a greater weight of the small onion grade.

The higher number of small onions in the MaxSil™ treated replicate could be a treatment effect however; other environmental or cultural influences may also have influenced the results. Losses of seedlings can occur due to errors with the drilling equipment, microclimates or chemical damage by herbicides. Loss of seedlings by herbicide damage is common and it is possible that the MaxSil™ treatment may have aided seedling survival, thus resulting in a greater number of the smaller bulbs.

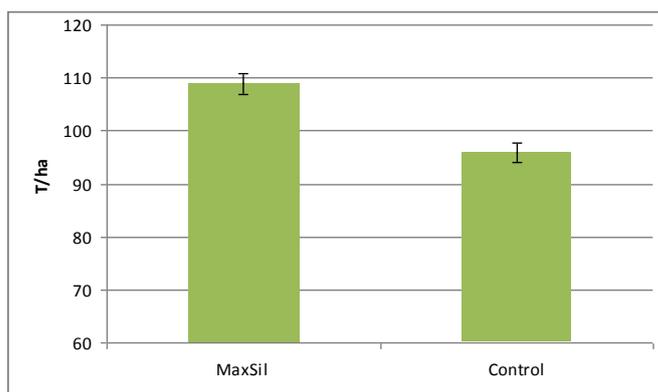
A larger number of smaller onions is not a negative result as these smaller onions (40-60mm) are generally exported to European markets or sold as pickling onions to supermarkets. It is generally the larger onions (>80mm) that are unwanted.



**Graph 1:** Average number of bulbs for control and MaxSil™ treated onions (cv. Cream Gold), per 3m harvested strip, graded into size classes. Bars represent the SE.



**Graph 2:** Average weight per 3m strip of control and MaxSil™ treated onions (cv. Cream Gold), graded into size classes. Bars represent the SE.



**Graph 3:** Estimated yield (t/ha) of control and MaxSil™ treated onions (cv. Cream Gold). Bars represent the SE.

## **Conclusion**

This silicon demonstration in onions resulted in statistically larger yields of onions treated with MaxSil™. While this is a positive result it is difficult to confidently conclude that the improved yield was a treatment effect or due to other environmental or cultural influences.