



MAY 2019



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CALCIUM CYANAMIDE FERTILISER IN CARROTS: ECONOMICS

KEY MESSAGES

- ✓ Calcium cyanamide fertiliser can potentially reduce *Pythium* incidence and severity in carrots
- ✓ Calcium cyanamide fertiliser can potentially reduce *Pythium* inoculum numbers
- ✓ Nitrogen and liming programs should be adjusted when using calcium cyanamide fertiliser, and should be based on soil testing
- ✓ Further work is needed to understand how long a beneficial effect will last and the economics of using calcium cyanamide fertiliser

This demonstration was conducted as part of the Soilborne Disease project - VG15010

WHAT DID WE DO?

Calcium cyanamide, $\text{Ca}(\text{CN})_2$, was applied as a wax coated fertiliser prior to a carrot crop in Western Australia in a grower led demonstration in 2017. The demonstration consisted of four beds:

1. $\text{Ca}(\text{CN})_2$ @ 300 kg/ha
2. Control 1 - with nil $\text{Ca}(\text{CN})_2$
3. $\text{Ca}(\text{CN})_2$ @ 500 kg/ha
4. Control 2 - with nil $\text{Ca}(\text{CN})_2$

WHY DID WE TRIAL $\text{Ca}(\text{CN})_2$?

The aim of the demonstration was to find out:

- whether $\text{Ca}(\text{CN})_2$ has efficacy against *Pythium sulcatum* and *Pythium violae*,
- whether it contributes to maintained / increased marketable yields; and
- whether any adjustments to standard nutrient management would be required.

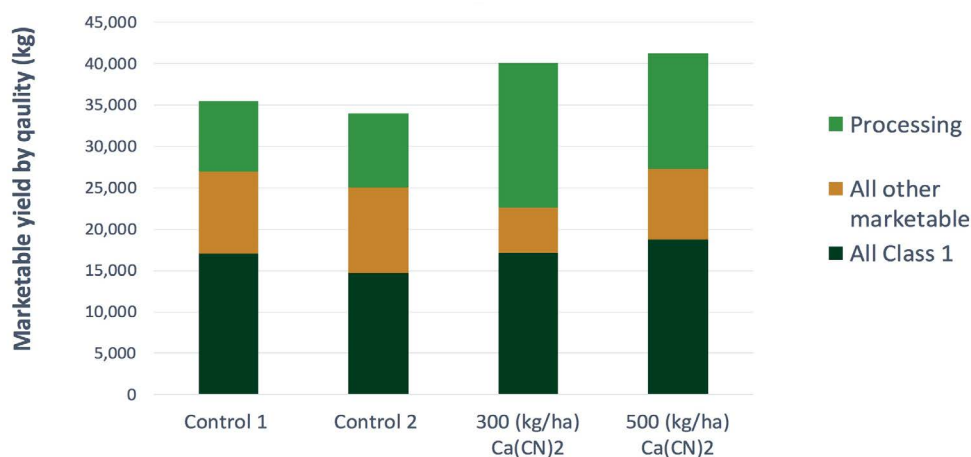


Figure 1: Carrot packout

WHAT DID WE FIND?

Packout figures showed that total fresh yields were greater in the Ca(CN)₂ beds (Figure 1). The greatest difference was the weight in processing carrots. One reason for this increase in processing carrots may have been the impact of additional nitrogen from the Ca(CN)₂ fertiliser that became available early in the season. While it reduced root length it may have had an impact on the timing of bulking and thus final root weight at harvest.

DNA testing results from root and soil samples suggested that cavity spot symptoms seen on carrots after harvest maybe mainly caused by *P. sulcatum*. Both soil and root DNA tests suggest that Ca(CN)₂ may have reduced inoculum levels of *P. sulcatum*.

The project team would like to acknowledge Center West Export, Francis Tedesco for conducting the trial, and Justin Wolfgang for assistance with sampling.

THE BOTTOM LINE – WAS IT WORTH IT?

The estimated discounted price for large orders of Ca(CN)₂ at 2017 prices was \$1,580 per tonne.

Based on results from the demonstration site, the increased yield would cover the cost of the Ca(CN)₂ depending on market prices. In addition, if Ca(CN)₂ reduces the inoculum levels of *Pythium*, there may be benefits in subsequent crops from reduced disease pressure and maintained / improved marketable yields.

Additional potential cost savings include reduced costs for nitrogen fertilisers other than calcium cyanamide.

Further research to establish the best use of calcium cyanamide fertiliser in carrots has to include whether the timing of nitrogen release can be delayed coinciding with crop needs; and thus a positive effect on Class 1 yield.

This may include the use of nitrification inhibitors.

Another option of using the effect of the fertiliser on soilborne diseases and managing nitrogen is to use calcium cyanamide ahead of a cover crop that can utilise the N and recycle it to the following carrot crop.