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## Calcium

### The Product

Wuxal® Calcium Xtra Uptake, a proven formulation containing nitrogen, calcium, magnesium and trace elements, is a suspension concentrate specifically designed for foliar application to crops for the prevention of calcium deficiency. The new Xtra Uptake technology offers an advanced penetrant and surfactant, enhancing rapid foliar nutrient absorption which increases efficiency, especially on plants with hard-to-wet foliage and under suboptimal weather conditions.

### Calcium Deficiency and Disease in Grapes

Inadequate levels of calcium have long been associated with the development of physiological disorders in many types of fruits and vegetables. Nutrient levels may also exert secondary influences on the growth and yield of plants by causing changes in chemical composition, plant morphology and anatomy which may affect their resistance to pests and diseases.

Research indicates that applications of calcium to fruit crops can affect disease incidence and, in particular, reduce damage caused by *Botrytis*. Calcium may show an impact in several different ways. Firstly, by direct effects on the growth and development of the fungus and, secondly, by increasing the resistance of the host. Calcium can also enhance the efficacy of biocontrol agents.

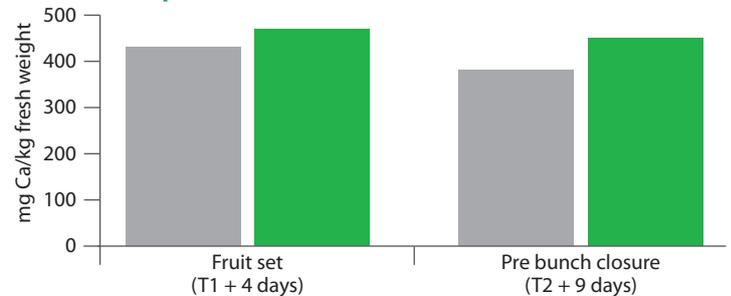
Wuxal Calcium Xtra Uptake is recommended for the control of physiological conditions caused by calcium deficiency in a range of crops, and may reduce severity of diseases such as those caused by *Botrytis cinerea* by increasing calcium levels in grapes. It has been shown the higher the calcium content of grape berry cell walls, the less susceptible they are to attack from *Botrytis cinerea*.

Timing the application of Wuxal Calcium in viticulture for optimal effect is important. The calcium content of the skin of Cabernet Sauvignon berries increases threefold between fruit set and 46 days after flowering and then doubles up to veraison. However calcium content in the pulp remains constant. Therefore the most important time to supply additional calcium to grapes is between fruit set and veraison.

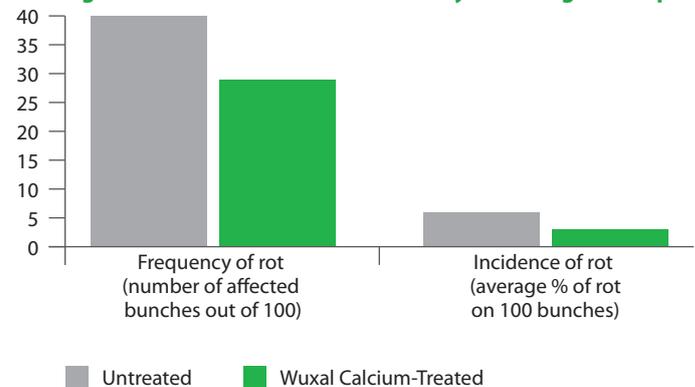
Winter and Nicol (1998) undertook a study assessing the impact of Wuxal Calcium<sup>†</sup> on *Botrytis* in Chardonnay grapes in the Hunter Valley. The block had a large carryover of the disease from the previous year. Four applications of Wuxal Calcium at 5 L/ha were applied at fortnightly intervals from fruit set to veraison.

In the important early stages of development, calcium content in grape berries was higher in the Wuxal Calcium-treated block than in the untreated block (Figure 1).

**Figure 1. Wuxal Calcium increases Calcium Content in Grape Berries**



**Figure 2. Wuxal Calcium reduces Botrytis Damage in Grapes**



There was a lower frequency and incidence of *Botrytis* damage in the Wuxal Calcium-treated block compared to the untreated block (Figure 2).

The inclusion of Wuxal Calcium Xtra Uptake in spray programs early during grape berry development may help with control of frequency and incidence of *Botrytis* at harvest.

### Wuxal Calcium Xtra Uptake

- Highly concentrated foliar fertiliser with a significantly higher calcium uptake efficiency than binary salt sprays. This improves application efficacy and so less applications are required compared to binary salt sprays, reducing freight and handling costs.
- Contains stickers, surfactants, humectants and anti-evaporants which improve the application efficacy and plant uptake, reducing wastage and improving plant performance.
- Has superior crop safety compared to binary salt sprays, which may cause phytotoxicity.
- Has a pH of approximately 6.5. Its buffering capability can make mixing easier and cheaper. Expensive buffering solutions may not be needed with Wuxal Calcium Xtra Uptake and it is compatible with most commonly used fungicides and insecticides (except lime sulphur and Bordeaux mixtures).
- Can be applied with high or low volume equipment.

<sup>†</sup> This study used the original formulation of Wuxal Calcium

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### ACTIVE CONSTITUENTS

| w/v   |    | g/L                                  |     |
|-------|----|--------------------------------------|-----|
| 16.0% | N  | Total Nitrogen                       | 160 |
| 2.1%  |    | as amide                             | 21  |
| 0.3%  |    | as ammonium                          | 3   |
| 13.6% |    | as nitrate                           | 136 |
| 17.2% | Ca | Calcium (present as calcium nitrate) | 172 |
| 1.8%  | Mg | Magnesium (present as chloride)      | 18  |

| This product contains: |  | % w/w |
|------------------------|--|-------|
| Water                  |  | 21.5  |
| Total solids           |  | 78.5  |

### TRACE ELEMENTS

| w/v              |    | mg/L                     |      |
|------------------|----|--------------------------|------|
| 0.0800%          | B  | Boron water-soluble      | 800  |
| 0.0016%          | Mo | Molybdenum water-soluble | 16   |
| As EDTA complex: |    |                          |      |
| 0.0640%          | Cu | Copper water-soluble     | 640  |
| 0.0800%          | Fe | Iron water-soluble       | 800  |
| 0.1600%          | Mn | Manganese water-soluble  | 1600 |
| 0.0320%          | Zn | Zinc water-soluble       | 320  |
| 0.05             |    | Maximum level of biuret  | 500  |

When storing the product, temperatures below +5°C (41°F) and above +40°C (104°F) as well as frequent temperature fluctuations should be avoided.

## Directions for Use Table

The following is an extract of the product label and does not constitute the complete directions for use. The product label should be read thoroughly before opening the packaging.

| CROP                              | SITUATION                 | STATE                         | RATE |                |                 | CRITICAL COMMENTS   |
|-----------------------------------|---------------------------|-------------------------------|------|----------------|-----------------|---|
|                                   |                           |                               | L/HA | L/HA/<br>SPRAY | L/HA<br>/SEASON |   |
| All crops                         | Regular fertiliser        | All states                    | 6    | -              | -               | Apply regularly in a tankmix with all normal crop sprays.   |
| Apples<br>(All varieties)         | Bitter pit control        | Qld, NSW, SA,<br>WA only      | -    | 6              | 24-42           | First post-blossom cover spray, then every second cover spray.  |
|                                   |                           | Tas only                      | -    | 6              | 26-36           | First post-blossom cover spray and each subsequent spray.   |
|                                   |                           |                               | -    | 8 or 12        | 26-36           | Last 2 pre-harvest sprays where potential for bitter pit is high.   |
| Jonathan                          | Bitter pit control        | Vic only                      | -    | 8              | 32              | Commence with first post-blossom cover. Spray approximately 2 weeks after petal fall.                               |
| Red Delicious<br>Golden Delicious | Bitter pit control        | Vic only                      | -    | 8              | 40              | Commence with first post-blossom cover. Spray approximately 2 weeks after petal fall.                               |
| Granny Smith                      | Bitter pit control        | Vic only                      | -    | 8              | 48              | Commence with first post-blossom cover. Spray approximately 2 weeks after petal fall.                               |
| Brassicac                         | Internal browning control | NSW, Vic, Tas,<br>SA, WA only | 6    | -              | -               | Apply monthly or with normal crop sprays.   |
| Lettuce                           | Tip burn control          | All States                    | 3    | -              | -               | Apply prior to head formation.  |
| Mangoes                           | Soft nose control         | All States                    | 6    | -              | -               | Apply monthly or with normal crop sprays.   |
| Poppies                           |                           | Tas only                      | 3-5  | -              | -               | Apply 1-2 times prior to flowering.   |
| Tomatoes                          | Blossom end rot control   | All States                    | 3    | -              | -               | Tankmix with every normal crop spray.   |
| Viticulture                       |                           | All States                    | 5    | -              | -               | Apply regularly in a tankmix with all normal crop sprays, beginning after blossom.                                  |
|                                   |                           |                               | 5    | -              | -               | Apply from the beginning of berry softening onwards, thoroughly spraying fruit bunches. Repeat at 14-day intervals. |

The information provided herein may include extracts from the product label and does not constitute the complete directions for use. READ THE PRODUCT LABEL THOROUGHLY BEFORE OPENING OR USING WUXAL CALCIUM XTRA UPTAKE

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