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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.

Wuxal Calcium Xtra Uptake is recommended for the control of physiological conditions caused by calcium deficiency in a range of crops, such as blossom end rot in tomato, watermelon and capsicum.

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.

### Blossom End Rot

Blossom end rot is usually seen as a circular area of water soaked tissue, eventually becoming sunken dead tissue at the base of the piece of fruit. It is commonly seen in tomatoes, watermelons and capsicums. This disorder is linked to a deficiency of calcium in the fruit.

### Background

In plants, 60% of the calcium is associated with the cell wall, 7% with membranes and 33% with the soluble fraction inside the cell. Hence calcium plays a key role in membrane stability and cell integrity. Low levels of calcium mean leaky membranes and materials can be lost from inside the cell.

### Factors

- Growth rate of the crop. Fast growing crops may be unable to keep up with calcium requirements of rapidly growing fruit. Warm temperatures, excessive fertiliser use, increased light intensity and increased leaf area increase crop growth rates.
- Low evapotranspiration (ET) due to weather conditions like fog reduces transpiration in leaves and therefore reduces potential calcium movement. Fruit transpire less than leaves so at higher rates of transpiration, more calcium can move to the leaves than the fruit.
- Irrigation practice. Calcium moves in the water stream of the plant and so water stress will reduce calcium uptake. Water stress can also see preferential water flow to leaves rather than fruit.
- Potassium, magnesium and ammonium application. Higher transpiration rates increase magnesium uptake compared to calcium. Calcium uptake can be reduced if proportionally high levels of these nutrients are found in the plant.

- Rapid fruit expansion. Fruit a third to half the size of final harvest fruit size is very susceptible to water stress and calcium deficiency. This is typically when the waxy cuticle develops further slowing the transpiration rates of fruit.

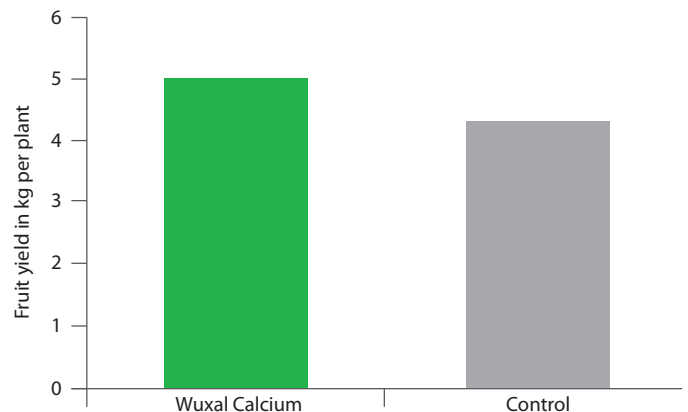
### Control

Apply calcium sprays throughout the growing season to ensure adequate calcium levels.

Choose varieties that are less susceptible to blossom end rot.

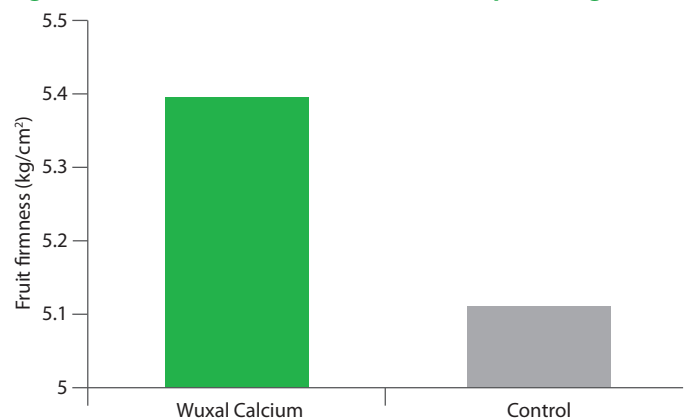
Manage irrigation to ensure plants do not experience periods of water stress.

**Figure 1. Effect of Wuxal Calcium<sup>†</sup> on yield of processing tomatoes**



CIRIO Tomato Company, Massa, Italy, 1998  
Variety: Alican  
Wuxal Treatments: June 18, July 4, July 10 (30-60-90% flowering)

**Figure 2. Effect of Wuxal Calcium<sup>†</sup> on firmness of processing tomatoes**



CIRIO Tomato Company, Massa, Italy, 1998  
Variety: Alican  
Wuxal Treatments: June 18, July 4, July 10 (30-60-90% flowering)

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

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## Which Calcium Spray do I Use?

There are numerous calcium sprays on the market, from binary salts such as calcium chloride and calcium nitrate to formulated products such as Wuxal Calcium Xtra Uptake.

The main advantage of formulated products is their ability to improve the uptake of calcium via stickers and spreaders when compared with simple binary salts.

- 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.

| 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    |
| 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   |
| This product contains:   |    |                                      | % w/w |
| Water  |    |                                      | 21.5  |
| Total solids   |    |                                      | 78.5  |
| 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/SPRAY | L/HA/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, 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.                               |
| Brassicas                         | Internal browning control | NSW, Vic, Tas, 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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