

Disease Prevention

Zantedeschia Technical Bulletin C03/12



BLOOMZ has developed a management plan to help control disease and soft-rot (*Erwinia* – refer bulletin C02/12). This is being used by growers in New Zealand, Kenya, Colombia and several other countries with extremely good success. Note these chemical preventive practices have been developed by practical application and are part of an overall crop management approach.

A strong plant is the first line of defense to lower opportunities for entry of bacterial infection.

1. Soil/Media

Cropping in soil without rotation of EVERY crop can result in severe disease pressure, unless soil is fumigated and/or steamed, however even this is only fully effective in sandy soil.

Growing semi hydroponically in a range of substrates (pine bark, coco peat, peat moss, rice husk or a combination of these ingredients) can be a good alternative.

2. Pre-plant Preparation

Inclusion of **Rizolex**® (100g/kg tolclofos-methyl) @ 0.07kg/m³ and **Ridomil 2.5 G** (25g/kg metalaxyl) @ 0.10 kg/m³ well mixed into the soil or media.

This will give 8-10 weeks protection. If possible, mix this in the soil as a dry component rather than drenching so that irrigation activates the chemical in the soil at planting time.

3. Water

Water quality is one of the most critical precursors to disease prevention in Zantedeschia. This has been one of the MOST successful factors in helping preventing soft-rot (*Erwinia*) and maintaining maximum growth.

Include **Chlorine** (calcium hypochlorite) in all irrigation (1.5-2ppm) at point of discharge.

Pre-treat water to allow 2-3 hours of mixing before discharge to ensure all pathogens are completely eradicated and a residual disinfectant remains. **pH** of water can also be adjusted with acid during pre-treatment.



BLOOMZ Chlorine Injection Unit

Alternatively hanging large 'swimming pool' type chlorine tablets in the treatment tank are a simple and effective way of disinfection. Check chlorine levels regularly with a pool test kit.

4. Air movement

This is essential throughout the cycle. Ventilation combined with ground level irrigation keeps plant foliage drier and helps reduce fungal infection.

5. Chemical Treatment

5.1. Weekly application of **Kocide**® (copper hydroxide) at 1-2g/l to runoff especially round base area of plants

Use **Kocide**® at higher concentration (3-5g/l) for spot application on any affected plants, especially around their base where the plant emerges from the soil. An alternative copper based product found to be effective by USA growers is **Phyton 27**®.

5.2. Application of **Aliette**® (fosetyl aluminium) or similar active ingredient as a systemic overspray at 8-10 weeks but at least two weeks after last foliar application of copper.

Use high rate (5ml/l) to ensure up to 28 days protection from *pythium* / fungal infection. Alternative chemicals to **Aliette**® are Phosphorous Acid formulations (e.g. **Foli-R-Fos**®, **Foschek**™ or **Phosgard**™).

Do not use copper within 2 weeks of **Aliette**® application apart from regular basal spot application in event of specific affected plants to avoid phytotoxicity.

These systemics should be used sparingly as repeated applications may affect plant performance

5.3. Three-four weeks after **Aliette**® apply a drench of **Ridomil Gold EC** (480g/l metalaxyl) at (2.5g/l per 10 m²) of actual planted area. Ensure good penetration of chemical.

5.4. *Pseudomonas bacterial blight* can attack the leaf area of the plant in cold damp conditions, especially when the crop canopy is heavy and the greenhouse unventilated.

Leaves become translucent and turn to a slimy mush and may lead to further bacterial infection. Remove infected material and treat with **Mankocide DF**® (mancozeb & copper hydroxide) or **Kocide**®. Dry the leaf canopy.

6. Daily Monitoring

Continually observe all plants; pay attention to hygiene and removal of any dead or affected material out of the growing area. Continue weekly copper application.

Avoid pooling water between rows to reduce incidence of scarid fly which can spread fungal infection. Spray with diazinon (**Dew**™) or imidacloprid formulations (**Admire**®, **Confidor**®, **Marathon**®, **PilarKing**®).

7. Insecticide Programme

Both aphids and thrips can transfer virus and are phytosanitary pests. There is much higher risk in transfer of virus (*Impatiens necrotic spot virus*, *Dasheen mosaic virus*, *Zantedeschia mosaic virus*, *Tomato spotted wilt virus* and *Cucumber mosaic virus*) and disease in areas of intensive vegetable and ornamental production.

Spray for insects on 7-10 day rotation throughout the crop cycle. It is important to commence the programme at first sign of green shoots to avoid thrip damage on the flower spathe.

Use insect specific insecticides including imidacloprid, **Decis**®, **Mavrik**®, **Orthene**®, **Attack**®, **Diazinon**. Check compatibility if mixing with other chemicals; use label rates.

Organo-phosphates can be used in severe infestations, but are not recommended for regular use from a human health perspective.

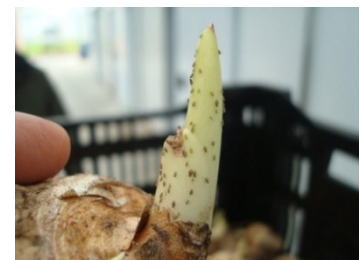
8. Crop Cycle

Try to achieve a minimum of 28-30 weeks of growing and post senescence, dry down and lift as soon as hair roots reduce and disappear.

9. Tuber Harvest

1. Take absolute care to handle tubers very gently to avoid surface abrasions.
2. Do not remove roots or damage shoots.
3. Remove any rot affected material.
4. Lightly spray (do not dip) with **Kocide**®, **Virkon**®S etc. prior to drying to reduce any transfer of bacterial/fungal infection.
5. Take care with transport from field to handling area to avoid bruising or damage.
6. Damage to the skin prior to full curing can lead to infection, onset of soft rot and calcification (chalking) during storage.

10. Aphids can transfer virus between tubers in the cool store when any green shoots are present. Maintain a fogging programme with appropriate insecticide e.g. Imidacloprid.



Aphids on tubers in storage

11. Fog cool stores regularly with disinfectant/bactericide (eg **Fungaflo**®) to control storage moulds.

Disclaimer - No guarantee of production performance is expressed or implied by BLOOMZ. All chemical products recommended are those found to be appropriate by Calla growers and are a guide rather than registered products with specific application to Zantedeschia (Coloured Calla Lily).

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