

Disease Prevention

Technical Bulletin C04/11



BLOOMZ has developed a management plan to help control disease and soft-rot (*Erwinia* – refer bulletin C02/11). 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. Inclusion of **Chlorine** (calcium hypochlorite) in all irrigation (1.5-2ppm) at point of discharge.

It is best to 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 tables in the treatment tank is a simple and effective way of disinfection. Check chlorine levels regularly with a pool test kit.

We note this practice has been one of the MOST successful methods of preventing soft-rot (*Erwinia*) problems and maintaining maximum growth.

2. Pre-plant 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. Good air movement is essential throughout the cycle. Ventilation combined with ground level irrigation keeps plant foliage drier and helps reduce fungal infection.

Absolute attention to crop hygiene and immediate removal of all affected or dead material.

4. Spot spraying of **Kocide**[®] (copper hydroxide) 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**[®].

Weekly application of **Kocide**[®] (2-3g/l) to runoff especially round base area of plants.

5. 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 **Fostonic 80WP**[®] or Phosphorous Acid formulations (**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

6. 3-4 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.

7. *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.

8. Continual daily monitoring of all plants; attention to hygiene and removal of any dead or affected material out of the growing area. Continuation of 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**[®]).

9. Spray for insects on 7-10 day rotation throughout the crop. Both aphids and thrips can transfer virus and are a phytosanitary risk. It is important to commence the programme at first sign of green shoots to avoid thrip damage on the flower spathe.

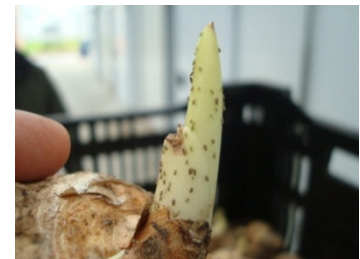
Use insect specific insecticides including imidacloprid - see above, **Decis**[®], **Mavrik**[®], **Orthene**[®], **Attack**[®], **Diazinon**. Check compatibility if mixing with other chemicals; use label rates.

10. 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.

11. Take absolute care at lifting to handle tubers in an extremely gently. Remove any rot affected material. Spray down (do not dip) with chlorine etc to reduce any bacterial infection. Take care with transport of tubers from field to handling area so that they are not bruised or damaged in any way.

Handling damage to the surface skin of the tuber prior to full curing can lead to infection and onset of softrot. An excellent pre-cure spray is DuPont[™] **Virkon**[®]S - also very effective for disinfecting machinery.

12. Aphids can transfer virus between tubers in the coolstore when any green shoots are present. Maintain a fogging programme with appropriate insecticide eg. imidacloprid (see above).



Aphids on tubers in storage

13. Fog cool stores regularly with disinfectant/bactericide (eg **Fungafloor**[®]) 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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