



# CALLA LILY APPLICATION GUIDELINES

October 2002

## Erwinia Soft Rot

Bacterial rot, caused by *Erwinia carotovora* is a major disease of calla lily. Calla rhizomes, stems, and leaves can be infected with *Erwinia*. The disease, which results from a soft rot of the affected plant parts, is easily diagnosed by the characteristic water-soaking of tissue, collapse of stems, and a foul odor reminiscent of rotting garbage. It generally begins as a soft rot at the base of the stem, near the soil level. Rhizomes become infected later, and then the bacteria travel upward and the leaves become blighted. The entire plant eventually wilts and dies.

### Preventing Infections

Phyton-27® works best when applied preventively or when the disease is caught early and treatment begins before the *Erwinia* is entrenched in the crop.

Apply 1.3 to 2.0 fluid ounces per 10 gallons water as a foliar spray, or as a soil drench, every 10 to 14 days. Begin applications shortly after planting or transplanting. A couple of early well timed applications can protect the crop during the whole growth cycle. Low volume applications may be effective in disease prevention. Consult your low volume equipment manufacturer for conversion rates.

### Managing Active Infections

Bacterial infections are highly contagious. The exudate from disease damaged tissue is laden with infectious bacteria which are easily spread to other plants through dripping or splashing water, insect carriers, plant to plant contact, or contaminated hands or tools.

Once an *Erwinia* infection is present, a risk management approach is needed. A successful program combines spray or drench applications with strict sanitation, including roguing or removal of diseased plant tissue before and after spraying.

Start with the clean plant material, from a reputable source, and a clean growing area. Inspect rhizomes prior to planting. Discard all decayed rhizomes. Rhizomes must be handled with care from harvest to shipping and planting.

Rogue out all visibly diseased tissue. Then apply a wet foliar spray to runoff of Phyton-27® at the rate of 2.0 fluid ounces per 10 gallons. Spray should be heavy, enough to run down the stem. Continue to scout the crop and remove any diseased plant tissue as soon as further symptoms appear. Spray again with Phyton-27® in 3 to 5 days. Repeat the roguing and spraying until no disease appears after spraying.

### Efficacy on Seedlings

Calla lily seedlings, (cv. Golden Supreme), were grown on benches in 36 cell trays under plastic in 50 % shade. 6000 seedlings were sprayed with Phyton-27® at the rate of 7 fluid ounces per 100 gallons water. No occurrence of *Erwinia* infection was seen in plants treated with Phyton-27®. 144 of the 6000 (2 %) untreated (control) seedlings showed signs of *Erwinia* infection. (1990, Miami, FL)

### Grower Reports

Growers apply Phyton-27® as a preplant dip, drench, and/or heavy, foliar spray. As one grower puts it, "Phyton-27® is the best thing for calla lily".

A grower from Iowa has been using Phyton-27® on his calla lily crop for six years. He has cut his losses to *Erwinia* from 30% to less than 1% by spraying or drenching with Phyton-27®.

A Pennsylvania grower reports that Phyton-27® is an essential component of their calla lily program. They used a coarse, wet spray once a month to prevent and control *Erwinia*. This operation began experimenting with spraying the rhizomes, with 2.0 fluid ounces per 10 gallons before planting, for the past two growing seasons. They cut their losses from 80% to 25% the first season and this current season haven't seen any *Erwinia* in the crop.

## Bulb/Rhizome Dip

### Research Results

Research done at the University of Guelph, Ontario confirmed the effectiveness of Phyton-27<sup>®</sup> as a pre-plant bulb dip in reducing the incidence of *Erwinia* soft rot. This trial was run on yellow calla lily tubers (*Zantedeschia elliottiana*) which are particularly susceptible to *Erwinia* infection. Tubers were dipped for 5 minutes in a 2.5 ml per liter (3.2 ounces per 10 gallons) solution of Phyton-27<sup>®</sup> in combination with Promalin. The tubers were allowed to dry before planting. Phyton-27<sup>®</sup> treatment cut losses to 30% as compared with 98% in the inoculated control.

An alternative method for treatment is to spray the bulbs to drip due to some concern with the possibility of cross-contamination

### Grower Reports

A Wisconsin grower drastically reduced losses to *Erwinia*, from 50% to 5% or less, by dipping the bulbs for 5 minutes in 5.0 fluid ounces Phyton-27<sup>®</sup> per 10 gallons water.

A Minnesota grower has cut losses to *Erwinia* from 15% to less than 3% by dipping bulbs for 5 minutes in 4.0 fluid ounces Phyton-27<sup>®</sup> per 10 gallons water.

A grower from Indiana dips the bulbs and then follows up with a spray, using 1.5 fluid ounces per 10 gallons, one to two weeks after emergence. He has reduced his losses to *Erwinia* from 50% to 15%.

### Recommendations

Effectively reduce *Erwinia* infection and subsequent plant losses by dipping calla lily bulbs for 5 minutes in 3.0 fluid ounces of Phyton-27<sup>®</sup> per 10 gallons of water. An alternative method is to spray the bulbs to drip. Allow the bulbs to dry before planting. For optimal protection against *Erwinia*, apply a coarse foliar spray or a drench 5 to 7 weeks after planting.

## Botrytis

*Botrytis* spores are almost everywhere, waiting for the perfect environmental conditions to germinate and infect plants. Outbreaks typically occur in cool, humid environments.

### Prevention

Prevention should be the main focus of a *Botrytis* blight management program. Combine environmental management, cultural practices, and timely fungicide applications to effectively manage this ever-present pathogen.

Spray or fog with Phyton-27<sup>®</sup> at the rate of 1.3 to 2.0 fluid ounces per 10 gallons water every 7 to 10 days when conditions are conducive to *Botrytis* development.

### When Disease is Present

Spray Phyton-27<sup>®</sup> at the rate of 1.3 to 2.0 fluid ounces per 10 gallons water every 3 to 5 days. Continue applications until conditions improve and no longer favor disease development.

## Plant Safety

Phyton-27<sup>®</sup> is gentle and safe to use on foliage and open flowers. Stay with the low end of the labeled rates, 1.5 fluid ounces per 10 gallons water, when applying to open flowers. Two growers have reported some edge burn on flowers when using the higher, labeled rate of 2.0 fluid ounces per 10 gallons water.



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