

# Bactericide Update for Ornamental Diseases

## By A. R. Chase, Chase Research Gardens

Bacterial disease control has meant COPPER sprays for much of the twenty years I have been working in the field. I have trialed all of the common copper products as well as years spent on using Aliette for bacterial leaf spots on ornamentals. When I worked at the University of Florida we even had a few experimental products over to check in the mid 80's. The overall result has been- COPPER!

Late in the summer of 2003, Agraquest received registration for a new biological control agent called Rhapsody. We have been testing Rhapsody (which contains *Bacillus subtilis*- strain QST 713) for quite some time previously for bacterial leaf spot control. I was skeptical when we started these trials but have been pleased (and surprised) by the results. While it is the same type of bacterium as Companion, the range of activity of this strain differs.

Two trials were conducted with *Pseudomonas* leaf spot and the third on *Xanthomonas* blight. All of the trials were preventative with a single spray applied before we inoculated with the appropriate pathogen. The sprays were applied three times on a weekly interval before the final evaluation.

The first trial was run on Delphiniums which are frequently attacked by *Ps. delphinii* in both cut flower and perennial production. We found good control (63%) with Camelot at either 16 or 48 oz/100 gal. Phyton 27 provided better control with 15 or 25 oz/100 gal (74-90%). Rhapsody gave 84% control when used at 1% (128 oz/100 gal) but the combination with Phyton 27 was very poor (essentially no control).

Agraquest reports testing on vegetables with a similar combination (copper and Serenade) has been good. We also checked out ZeroTol and Ecoclean (two hydrogen peroxide products) and found that Ecoclean was safer and somewhat more effective than ZeroTol.

In the second trial, we checked control of *Pseudomonas* leaf spot on Impatiens (caused by *Ps. syringae*). We saw 62% control with Phapsody at 2% and Phyton 27 gave 76% control. In this test, we included Actigard (SAR= a systemic acquired resistance product). A SAR acts a little like an immunization by convincing the plant that it should beef up its natural defenses against disease. When used preventatively, Actigard gave excellent control (92-98%) of *Pseudomonas* leaf spot on Impatiens. Syngenta does not currently have plants to market in ornamentals but we are hoping they change their minds.

Our final trial was conducted with many of the same products for control of *Xanthomonas* blight on geraniums. This disease is caused by *X. campestris* pv. *pelargonii* and is hard to control even under the best conditions. The most obvious results appeared within a week of the first bactericide spray.

Actigard is very toxic to geraniums. The plants were dramatically and irretrievably damaged by this chemical at both rates tested. Despite severe phytotoxicity, we were able to tell that very few Xanthomonas spots started on any Actigard sprayed geranium. All of the other treatments were safe on these geraniums.

All rates of the products tested showed some control of Xanthomonas blight on geranium. Disease was in the moderate range for this test. Best control of Xanthomonas blight was found on geraniums sprayed with Camelot (16 oz/100 gal), Rhapsody at 2% or Phyton 27 at 50 oz/100 gal.

It is nice to finally have something besides copper to trial on bacteria disease and one of the most exciting developments is the ability to rotate chemical classes. Rhapsody can be used in rotation with copper or even combined in a tank mix.

### Cultural Control of Bacterial Diseases

1. Check new plugs and cuttings for symptoms- discard them when found.
2. Keep leaves as dry as possible- use fans and space plants.
3. Water early and if you spray, skip normal watering.
4. Scout at least once a week and discard infected plants.
5. Keep plants fertilized appropriately- not too much or too little.
6. Use copper bactericides preventatively- no more than once a week.

| Product                | Rate/100 gal                         | Percent control              |                         |                        |
|------------------------|--------------------------------------|------------------------------|-------------------------|------------------------|
|                        |                                      | Xanthomonas Geranium         | Pseudomonas Impatiens   | Pseudomonas Delphinium |
| Actigard               | 2 or 4 oz                            | 100 (severe phytotoxicity)   | 92 to 98 (excellent)    | Not tested             |
| Camelot                | 16 or 48 oz                          | 60 to 85 (good to very good) | Not tested              | 63 (good)              |
| Phyton 27              | 15 or 25 oz (25 and 50 for geranium) | 50 to 75 (good to very good) | 76 (very good)          | 74 to 90 (very good)   |
| Rhapsody               | 64-256 oz (0.5-2%)                   | 35 to 80 (some to very good) | 18 to 62 (some to good) | 84 (very good)         |
| Rhapsody and Phyton 27 | 64 and 15 oz                         | Not tested                   | Not tested              | 5 (none)               |
| ZeroTol                | 128 oz                               | Not tested                   | Not tested              | 0 (none)               |