

Fall 2012 Bedding Plant IPM results
Christine Casey, University of California, Davis Department of Entomology

Goal: Compare the effect of various IPM treatments for root rots used in two different growing media on plant quality during production and post-harvest. Work was done in October and November 2012 at a grower in the south San Francisco Bay area. Funding for the project was provided by the California Department of Food and Agriculture.

Plants: Iceland poppy; Pansy ‘Mammoth Masquerade’; Snapdragon ‘Sonnet Rose’; and Viola ‘Sorbet Coconut’. Plugs were moved to six packs on October 3 and treatments were applied weekly from October 10 to November 14.

Media: grower’s in-house mix (peat/vermiculite) or commercial peat-based biocontrol mix with *Bacillus subtilis* premixed in the media.

Treatments:

| Product | Active ingredient(s) | Rate | Target pests |
|-------------------|---|----------------|--|
| Ag1000™ | Multiple organisms | 1:500 | Plant growth promoter; not labeled for disease control |
| Cease® | <i>Bacillus subtilis</i> QST 713 strain | 4 oz./100 gal. | <i>Phytophthora</i> spp. |
| RootShield Plus | <i>Trichoderma harzianum</i> Rifai strain T-22 <i>Trichoderma virens</i> strain G-41 | 4 oz./100 gal. | <i>Pythium</i> and <i>Phytophthora</i> spp. |
| Untreated control | n/a | n/a | n/a |

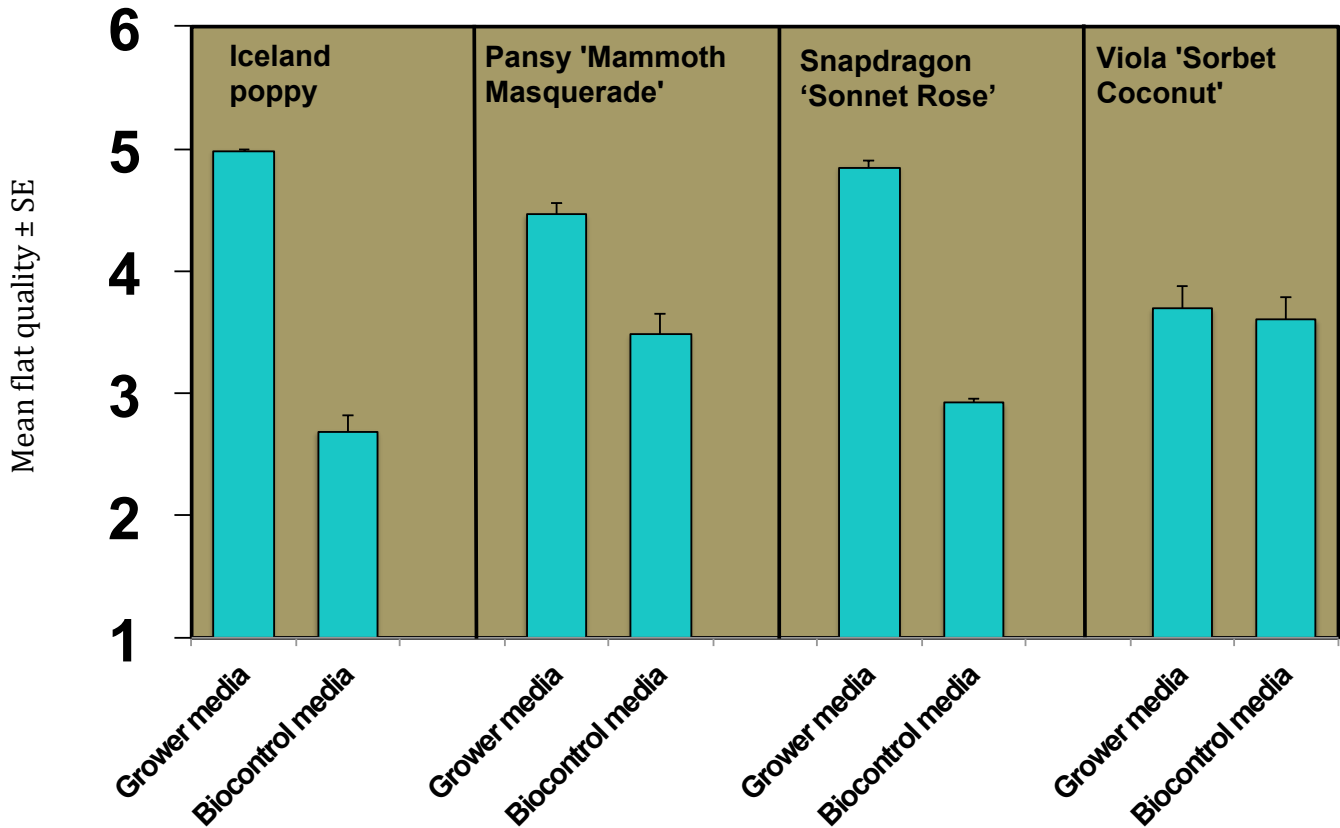
Each sample unit was one flat of 6 six-packs; there were 12 replications of each treatment.

Assessments: Flats were assessed for quality on October 26 and November 9 using a one to five (lowest to highest) visual assessment scale. Soil samples were collected at the end of the trial to determine if any species of pythium were present. Post-harvest evaluations were conducted from November 19 to 28.

Results:

Overall plant quality: As shown below, overall quality was better in the grower media. Testing revealed a fertility problem with the biocontrol media that led to high EC values.

1 = lowest quality and 5 = highest quality.



Effect of each treatment on flat quality in the grower or biocontrol media by crop:

| Iceland poppy | | |
|----------------------|---|---|
| Treatment | Mean quality grower mix Oct. 26/Nov. 9 | Mean quality biocontrol mix Oct. 26/Nov. 9 |
| Control | 5/5 | 3.42/3 |
| Ag1000™ | 4/4.92 | 2.67/2.75 |
| Cease® | 5/5 | 2.67/2.5 |
| RootShield Plus | 4/5 | 2.25/2.5 |

| Pansy 'Mammoth Masquerade' | | |
|-----------------------------------|---|---|
| Treatment | Mean quality grower mix Oct. 26/Nov. 9 | Mean quality biocontrol mix Oct. 26/Nov. 9 |
| Control | 4.42/4.25 | 2.58/3.25 |
| Ag1000™ | 3.83/4.67 | 2.58/3.5 |
| Cease® | 4/4.67 | 2.75/3.25 |
| RootShield Plus | 3.75/4.25 | 2.92/3.92 |

| Snapdragon 'Sonnet Rose' | | |
|---------------------------------|---|---|
| Treatment | Mean quality grower mix Oct. 26/Nov. 9 | Mean quality biocontrol mix Oct. 26/Nov. 9 |
| Control | 4.83/4.83 | 4.92/2.92 |
| Ag1000™ | 4.67/4.75 | 4.08/2.92 |
| Cease® | 4.67/4.92 | 5/2.92 |
| RootShield Plus | 4.5/4.92 | 4.92/2.92 |

| Viola 'Sorbet Coconut' | | |
|-------------------------------|---|---|
| Treatment | Mean quality grower mix Oct. 26/Nov. 9 | Mean quality biocontrol mix Oct. 26/Nov. 9 |
| Control | 3.33/3.25 | 3.08/3.75 |
| Ag1000™ | 3.92/4.33 | 2.75/3.08 |
| Cease® | 3.5/3.17 | 3.33/3.83 |
| RootShield Plus | 3.25/4 | 3.5/3.75 |

Post-harvest effects: Only plants in the grower media were evaluated since the poor quality of the biocontrol media plants rendered them unsalable. No differences were observed between any of the treatments.

Plant disease: Soil samples were collected from the control treatments and the potting area on November 9 for *Pythium* spp. analysis. Only the media from the viola plants was found to contain *Pythium* spp.

Conclusions: The plants grown in the biocontrol mix were generally of poor quality due to a fertility problem with the media. The poppy, pansy, and snapdragon plants produced in the grower mix were free of pathogens and of good quality, even when no pesticide was applied. Viola plants did have some *Pythium* spp. infection; both Ag1000™ and RootShield Plus applications resulted in quality that was improved relative to the control. Cease® is not labeled for control of this pathogen.