

## Implementation and Demonstration Report in Integrated Pest Management Microbial Products for Poinsettia Disease Suppression

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### ABSTRACT

The microbial efficacy trials took place in several commercial greenhouses during the period 1997-2000, funded by the IPM Program and IR-4. We are very grateful for the opportunity to work closely with growers to understand the cultural requirements of the crop and site-specific factors that impact on prevention of root and crown diseases. Together with the growers we stuck cuttings, scouted, transplanted, monitored EC and pH, applied treatments, and sent off samples for diagnosis. We have determined that microbials can be used in combination with early detection, careful diagnosis, and rogueing to improve disease management and reduce the total number of conventional fungicide drenches. This was a very successful project from an IPM perspective, resulting in beautiful poinsettia crops and opportunities to deliver our expanded knowledge in New York state.

The treatments at different sites included microbial products such as RootShield (*Trichoderma harzianum*), Mycostop (*Streptomyces griseoviridis*), Actino-Iron (*Streptomyces lydicus* WYEC 108), and AgBio Endos (mixed mycorrhizae species). Fungicides applied at different sites included Banrot, Subdue MAXX, Terraclor, and Truban. At one location with disease last year there was no problem in 2000 and fungicide was applied, even on the plot designated the fungicide control plants; at two sites, only the plants in the fungicide control plot received chemical treatments. In contrast, one grower chose to drench all plants in the trial with fungicide since the fungicide control plants looked best.

At sites where disease was present, the plants treated with microbials tended to look better than the untreated control plants. Each microbial product tested was beneficial in suppressing disease at some site, but we could not predict the same effects at different sites. Weather affects disease development via temperature and relative humidity, and the prior crop in the greenhouse affects the types and amounts of inoculum present. Poinsettia resistance to disease is affected by the amount of sunshine, the type of heating, nutrient management, and watering style. An example of a very significant effect: the mycorrhizal product (AgBio Endos) was very helpful when a proportioner broke, which suggested that it developed a symbiotic relationship with poinsettia roots when the nutrition level was low. RootShield improved root quality in different settings, verifying what satisfied repeat customers tell us about the product. This beneficial fungus colonizes roots and protects them if established in a preventive manner. Many growers apply a fungicide to cuttings, control fungus gnats, then rely on RootShield after transplanting for protection the rest of the season.

We learned that success with microbials for root rot suppression will depend on the history of the site and cultural conditions. The main key for success is to be aware of the status of the roots through monitoring and take rapid action if fungicide is needed. Important factors include:

- \* watering style- keeping plants wet favors disease
- \* pH- alkaline conditions favor *Pythium aphanidermatum* and *P. ultimum*
- \* EC- high electrical conductivity or saltiness makes roots more susceptible to *Pythium*
- \* cool temperature- favors some of the pathogens, e.g. *Pythium ultimum*

- \* fungus gnats vector *Pythium*
- \* cuttings may need shade cloth for better rooting
- \* *Thielaviopsis* may be present in native soil added to mixes
- \* bottom heat reduces disease
- \* Oasis cubes should be soaked in water to remove chemical byproducts harmful to microbes

Progress reports were presented at the Poinsettia Education Day in Erie County and the CCE Update in Ithaca, and will be reported at the Hudson Valley Bedding Plant School. We plan to prepare a factsheet explaining options and techniques for root rot management.

The greatest expense related to the use of pesticides is the labor. The use of conventional fungicides adds the inconvenience of suiting up in protective gear for application and also the worker down time during reentry periods. When not used properly, many of the fungicides labeled for greenhouse use may cause adverse health effects; this leads extension educators and growers to prefer low-risk alternatives.

#### Relative Cost of Fungicides and Microbials

product	price per unit	rate	cost per pot
Actino-Iron	\$81 per 50 lb	5 lb/cubic yard mix apply once	1.5 cents
Mycostop	\$30 per 5 grams	5 g/100 gal, 8 oz/pot apply 3 times	2 cents 6 cents total
RootShield WP	\$30 per lb	1 lb/200 gal, 8 oz/pot apply once	1.2 cents
AgBio Endos	\$55 per gal granules	1/4-1/2 tsp/cutting apply once	1.8-3.6 cents
Subdue MAXX (Pythium)	\$196 per qt	<b>0.5</b> -1.0 oz/100gal 4oz/pot <b>monthly</b>	0.1 cent 0.4 cents total
Cleary's 3336 WP (Rhizoctonia)	\$29 per lb	1 lb/100 gal, 8 oz/pot <b>monthly</b>	1.8 cent/pot 7.2 cents total
Truban 30% WP (Pythium)	\$68 per 2 lb	3- <b>10</b> oz/100 gal 8 oz/pot	1.3 cents
Banrot 40% WP (Pythium, Rhizoctonia)	\$72 per 2 lb	6- <b>12</b> oz/100 gal 8 oz/pot	1.7 cents
Terraclor 75% WP (Rhizoctonia)	\$50 per 5 lb	5- <b>15</b> oz/10 gal, 4 oz/pot	3 cents

Application time not added to cost per pot. Combinations would be needed in many cases.

Notes:

**RootShield=PlantShield** 1 pound/200 gallons. 8 ounces/6 inch pot. \$30/pound. Cannot protect unrooted cuttings. Oasis cubes contain by products that discourage beneficial microbes. Easiest way to use is to order soil mix with product incorporated. Do not store soil mix more than 3 months.

**BioTerra Plus=AgBio Endos** (mixed mycorrhizal spp.) \$25/qt, \$55/ 1 gal bag. 1/4-1/2 tsp/cutting. 768 tsp/gal. 384 1/2 tsp/qt bottle.

**Mycostop** costs \$6.75/gram, \$30/5 grams, \$144 /25 grams, 15% discount for 20 grams or more. Typical use rate 5 grams/100 gal, 8 oz/pot, about \$25-30/100 gal. Results on poinsettia root rot not consistent.

**Primastop** (*Gliocladium catenulatum*) is not yet available for sale. Good activity for Rhizoctonia; improved poinsettia root development observed.