



Rhizoctonia Cutting Rot Control on Poinsettias

One of the first diseases confronted by many growers is Rhizoctonia. This disease can cause damping-off of bedding plants, cutting rot on woody ornamentals and poinsettias, root rot on potted flowers like hydrangea, geranium and foliage plants and sometimes root rot on a few ornamentals.

Poinsettias are affected by *Rhizoctonia solani* especially during the rooting process. If the cuttings are infected with this fungal pathogen they can succumb to stem rot and root rot later in the production cycle. Over the past two months, we conducted three trials with a variety of fungicides including some of the best bio-control agents. While these products may be very effective in root disease control, their efficacy in a stem rot disease is not as well known.

The trials were performed on 'Freedom Red' cuttings, stuck in Oasis rooting blocks. They were treated once with each product, the day before they were inoculated with *R. solani*. In two of the three tests, the product were reapplied at 14 days. Disease severity was recorded a few days after the final fungicide application. Results of the trials are shown in the table to the right.

The biological control agents did not provide any control of Rhizoctonia cutting rot on poinsettia. Previous testing with PlantShield demonstrated excellent control of Rhizoctonia root rot on poinsettia. The action of these biological controls is apparently tied to an actively growing root system.

Excellent prevention of Rhizoctonia cutting rot was achieved with a variety of fungicides including 3336, Medallion, Terraclor, Terraneb SP and Terraguard. Very good control was seen on plants treated with Heritage and BAS500 (a strobilurin under development by BASF Corporation). Compass O gave good control at 1 oz while Banrot and Contrast provided some control. Higher rates of some of these products (Contrast and Compass O) may have been more successful. The labeled rate of Contrast is 3 oz/100 gal, but we chose 1 oz based on other trials we have conducted.

There are quite a few products that provide excellent control of this disease. The choice is yours.

Fungicide	Rate/100 gal	Efficacy
Actinovate	6 oz	None
Banrot 40W	8 oz	Some
BAS500	8-16 oz	Very good
Companion	16 oz	None
Compass O	1 oz	Good
Contrast	1 oz	Some
Heritage	1 oz	Very good
Medallion	1 oz	Excellent
PlantShield HC	4 oz	None
Rhapsody	192 oz	None
Terraclor 75W	8 oz	Excellent
Terraguard	8 oz	Excellent
Terraneb SP	12 oz	Excellent
3336	8-16 oz	Excellent



Rhizoctonia stem rot on poinsettias usually occurs during the rooting process but can develop at any time during the production cycle. (Thanks to Marge Daughtrey for use of this image)

Inside this issue:

Heritage for Pythium Root Rot Control	2
Direct Comparison of Compass O and Heritage	3
Poinsettia Scab Sightings on the East Coast	4
Artillery Fungus—Mulch Preference	4

Heritage for Pythium Root Rot Control

We recently completed two trials using Heritage and Subdue MAXX for control of Pythium root rot on Geranium and Pansy. The work was an outgrowth of a trial we reported on earlier in the summer (Chase News 3[5]:3). In that trial, we compared Heritage (0.9 oz/100 gal) alone or with Subdue MAXX (0.5 oz/100 gal) for control of Pythium root rot on pansy. The results showed the combination to be very effective. These results were promising and led to the trials described below.

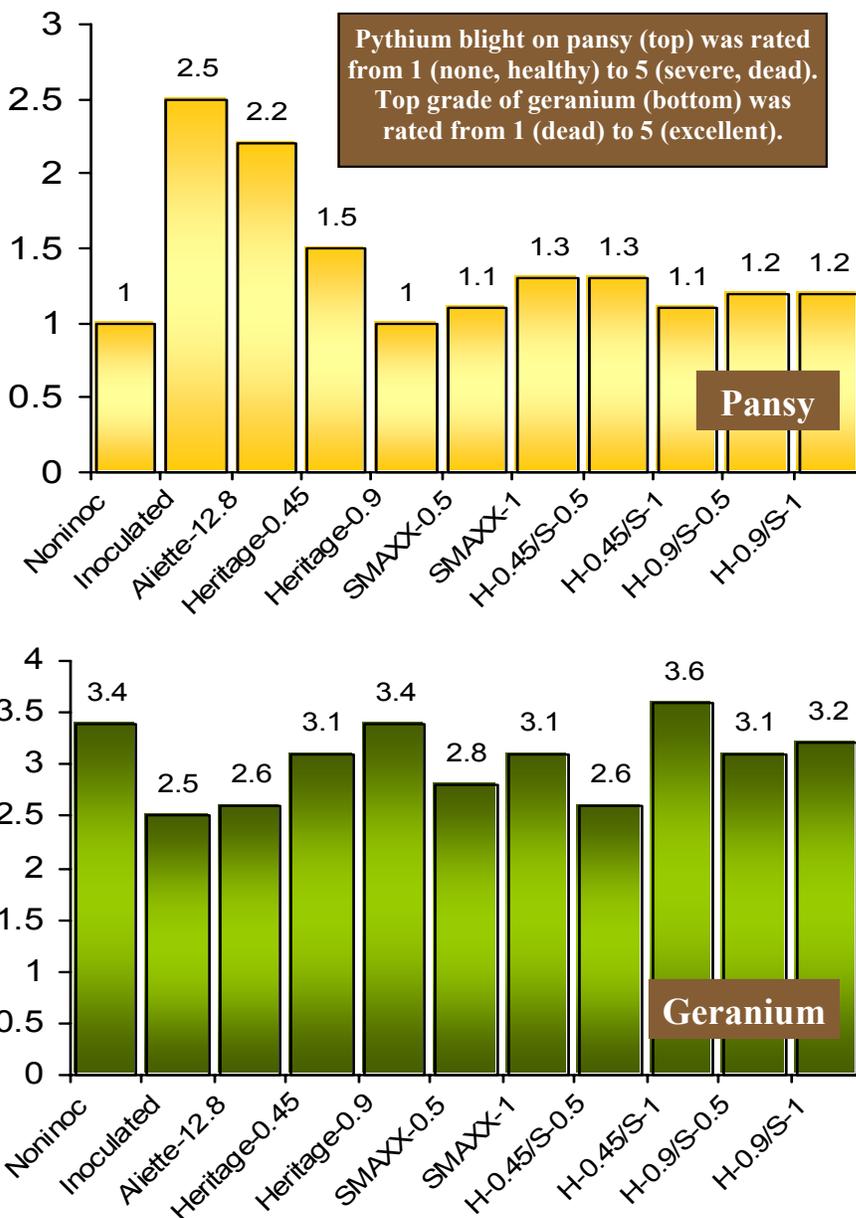
Heritage (0.45 and 0.9 oz) and Subdue MAXX (0.5 and 1.0 oz) were each used alone and in every possible combination of rates. Plants were drenched once before inoculating with *Pythium irregulare* (geranium) or *Pythium* sp. (pansy). Treatments were applied three times on a 14-day interval at a rate of 1 pint/square foot surface area. This delivered enough product to drip through and thoroughly saturate the potting medium.

The isolate from geranium was identified as mefenoxam-resistant through lab analysis when it was originally isolated (1997). Over the past 7 years, our lab culture died and we had to re-isolate it from an infected geranium in a trial that was running at the time. The greenhouse tests over that time with geranium do show that Subdue MAXX did not control Pythium root rot. That is until now. The bar graph to the right (bottom) shows good control of Pythium root rot on geranium was achieved with 1 oz/100 gal Subdue MAXX. Apparently, the mefenoxam-resistant isolate has reverted to sensitive. Only a lab analysis can confirm this but these results are very interesting.

Pythium blight on pansy was effectively controlled with all rates and combinations of Heritage and Subdue MAXX we tested. The best control was seen on plants treated with Heritage alone at 0.9 oz, Subdue MAXX alone at 0.5 oz, and the combination of Heritage (0.45 oz) and Subdue MAXX (1 oz).

Similar results were seen in the geranium trial. Best plants were produced when treated with Heritage at 0.9 oz and the combination of Heritage at 0.45 oz and Subdue MAXX at 1 oz.

We have been testing Heritage since 1999 on anything and everything and I thought we had thoroughly explored testing on Pythium control. When I went back to our original tests I found two trends. First, we had been testing Heritage at rates around 4 oz/100 gal



as a drench every 14-28 days. This is much higher than the 0.9 oz/100 gal rate used most effectively in the recent trials.

Second, I hate to admit we wasted a lot of time trying to do Pythium trials. When I checked I could only say that only 1/3 of the trials was good enough to determine anything at all from the treatments. That is to say we had to repeat all trials at least once to get anything useful out of them.

Heritage provided good control used at 4 oz every 14-28 days. The trials were run on geranium (1 trials) and lisianthus (3 trials). The more recent trials indicate that 0.9 oz/100 gal is a better rate of Heritage

for Pythium control on bedding plants. In addition, the combination of Heritage at 0.45 oz and Subdue MAXX at 1 oz shows excellent Pythium control. This combination will also aid in development of resistance to either Subdue MAXX or Heritage since both active ingredients are effective in controlling the pathogen.

The fact that Subdue MAXX gave very good control of a *Pythium irregulare* isolate that previously tested resistant is a good sign that this active ingredient may not be lost. Always rotate or tank mix products to delay the onset of resistance.

Direct Comparison of Compass O and Heritage

I always like a challenge and last week at the Western Garden Expo in Las Vegas I was presented with a nice one. Apparently some of the growers and/or distributors have started using Heritage at reduced rates compared to Compass O to reduce costs. Since Heritage is more expensive than Compass O it is a natural step. However, there was a belief that the same degree of control could be obtained using less Heritage than Compass O.

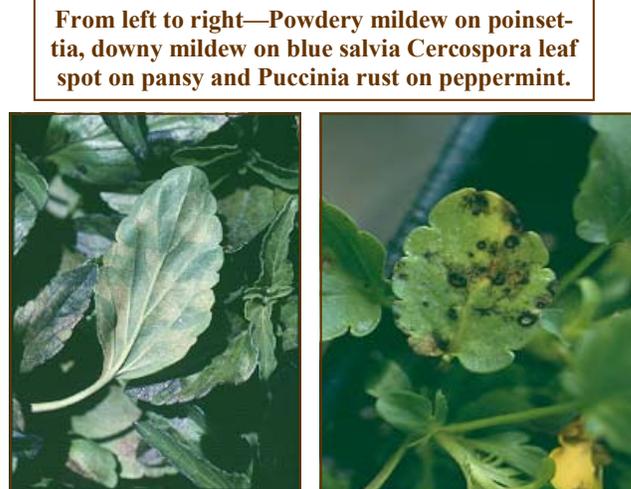
I did not think our trials would support this conclusion and immediately searched out as many as I could find where we tested both products at comparable rates in a single trial. The table to the right is the result of that effort. It is by no means comprehensive with respect to the number of trials we have run with these two products but it does represent results in side-by-side comparisons.

Our trials, at least, show the products to be more or less comparable. It is true that I have found Heritage to work a little better than Compass O on downy mildew and Rhizoctonia cutting and stem rot. In contrast, I have found Compass O to work a little better than Heritage on Botrytis blight and *Cylindrocladium* cutting rot. However, as you scan down the table you can see that the products are remarkably similar on many of the diseases we tried.

Of course, if your use of these products indicates something else then by all means stick to your guns. I think it is likely that they are being used at higher rates than needed so reducing the rate of either one may be good.

Percentage control (rate/100 gal)		
Disease—Crop (s)	Compass O	Heritage
Alternaria leaf spot – Dusty Miller and Impatiens	70 (1 oz) - average of three trials	77 (1 oz) - average of three trials
Cercospora leaf spot—Pansy	100 (2 oz)	100 (2 oz)
Cylindrocladium cutting rot – Azalea	34 (0.5 oz), 39 (1 oz), 49 (2 oz), 59 (4 oz)	17 (0.5 oz), 10 (1 oz), 20 (2 oz), 41 (4 oz)
Downy mildew—Alyssum	80 (1 or 2 oz)	100 (1 or 2 oz)
Downy mildew—Snapdragon	27 (2 oz)	100 (2 oz)
Fusarium leaf spot– Dracaenas	83 (4 oz) - average of two trials	95 (4 oz) - average of two trials
Fusarium wilt—Cyclamen	100 (4 oz)	100 (4 oz)
Myrothecium leaf spot—New Guinea Impatiens and Dieffenbachia	85 (2 or 4 oz) - average of two trials	85 (2 or 4 oz) - average of two trials
Phytophthora aerial blight—Petunia	91 (1 oz)	85 (1 oz)
Phytophthora aerial blight—Vinca	95 (2 oz)	95 (2 oz)
Powdery mildew—Gerber daisy, Salvia and Hydrangea	87 (1 oz) - average of three trials	100 (1 oz) - average of three trials
Rhizoctonia cutting rot—Poinsettia	41 (1 oz)	56 (1 oz)
Rust (<i>Coleosporium</i>) - Bellis	100 (2 oz)	100 (1 oz)
Rust (<i>Uromyces</i>) - Hypericum	55 (2 oz)	26 (2 oz)
Rust (<i>Puccinia</i>) - Geranium	100 (4 oz)	97 (1 oz)

Some of the best targets for Compass O and Heritage are powdery mildew, downy mildew, fungal leaf spots (like *Cercospora* on pansy) and rust diseases. Be sure to check labels for legal uses of either product in your state on the crop you are producing.



From left to right—Powdery mildew on poinsettia, downy mildew on blue salvia Cercospora leaf spot on pansy and Puccinia rust on peppermint.

Poinsettia Scab Sightings on the East Coast

The last year we saw significant amounts of poinsettia scab was 2000. Unfortunately, we are hearing of cases on the East coast this season. Scab was originally identified in Florida in 1941 and has been periodically destructive since that time. Scab is caused by the fungus *Sphaceloma poinsettiae* and appears as roughened pale tan to nearly white areas on stems, petioles and leaves. These spots look more like scabs than anything else, thus the common name. In the 1980's this disease was researched at the University of Florida, Gulf Coast Research and Education Center. Tests of 26 cultivars showed no resistance to the disease at that time.

As a result of the 2000 outbreak Margery Daughtrey and I performed some trials on currently available fungicides for prevention of scab. In 2002, I performed another small trial evaluating the strobilurin products that were available and one that is still a numbered compound (BAS500).



The trials show that several products stand out as excellent preventatives. These include all of the strobilurins (Compass O, Cygnus and Heritage) as well as sterol inhibitors (Rubigan, Systhane and Terraguard). Remember that these two groups of fungicides also provide excellent control of powdery mildew too. Another very good group for scab control is mancozeb including Protect, Junction (mancozeb and copper) and Stature MZ (mancozeb and dimethomorph). Keep your eyes open this season. It may be a good idea to make a preventative application for scab control if you have experienced it in the past.

Fungicide	Rate per 100 gal	Degree of control
BAS500	4 oz	excellent
Compass O	4 oz	excellent
Cygnus	4 oz	excellent
Heritage	4 oz	excellent
Junction	48 oz	very good
Kaligreen	24 oz	some
Milstop	40 oz	some
Phyton 27	25-30 oz	slight to very good
Protect T/O	16 oz	excellent
Rubigan	4 oz	very good
Spectro 90WDG	16-32 oz	very good to excellent
Stature MZ	28 oz	excellent
Systhane 20EW	2-8 oz	very good to excellent
Terraguard 50WP	8 oz	excellent

Artillery Fungus—Mulch Preference

One of the most interesting things I saw in a diagnostic clinic when I first went to Florida was the glebal (spore) masses of the artillery fungus. If you are not careful you can mistake this for a scale insect. If you are not located in the southeast you might think you are immune from such fungi but I see as many interesting mushrooms, bird's nest fungi and their relatives in the West as I did in the East.

Davis et. al reported on the ability of *Sphaerobolus* spp. to produce the glebal masses on different mulches (Journal of Environmental Horticulture 22:117-123). The studies were conducted in Pennsylvania over a four year period. Results are presented in the table to the right. Generally, the most processed mulches supported the best populations of the fungus. The authors suggest avoiding these materials or adding a new layer of mulch annually since older mulches support more growth. In production, many of these materials are probably better avoided. Once the fungus sporulates, the damage is done since the spores cannot usually be removed. Many other mushrooms create similar problems in ornamental production. The mat of mycelium often blocks water and nutrient transport into the plant.



Poor substrates	Excellent substrates
White pine bark	Commercial wood and bark mixes
Red oak bark	5% sewage compost
100% spent mushroom compost	5% yard compost
Yellow poplar wood or bark	
Cypress bark or wood	
Pine bark mini-nuggets	

CHASE RESEARCH GARDENS, INC.

8031 MT. AUKUM RD., BOX 529

MT. AUKUM, CA 95656-0529

PHONE/FAX (530)620-1624

MTAUKUM@DIRECTCON.NET

