

CHASE NEWS

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CHASE HORTICULTURAL
RESEARCH, INC.

Update on Biological Products

We have been working on biological agents for disease control on ornamentals for over 20 years starting with SoilGard in the early 1990's. Since that time we have done a number of trials on both foliar and soil-borne fungal and bacterial diseases. The products that received the most focus include those listed in the table to the right. The most recent products we have been testing include EcoGuard GN and Taegro. I have been reporting on these trials over the past few months with overall good results. This work started in 2007 and hopefully will continue into next year at least. In general, we have found good results with EcoGuard GN at 64 oz/100 gal applied as a drench on a 14 day interval. Tests on Pythium, Phytophthora and Fusarium have shown that this biological can work as well and sometimes better than the fungicide standards it was compared to.

I am very encouraged by these results and look forward to exploring further with EcoGuard GN as well as other biologicals currently under development by a variety of companies.

Product	Agent	Disease	Efficacy
Actinovate	<i>Streptomyces lydicus</i>	Powdery mildew, Botrytis, Pythium, Cylindrocladium, Phytophthora, Fusarium	Some to good
		Rhizoctonia, Downy mildew, rust	None
Cease (Rhapsody)	<i>Bacillus subtilis</i>	Colletotrichum, Peronospora, Botrytis, Pythium, Fusarium	Some
		Pseudomonas, Xanthomonas, Powdery mildew, Phytophthora	Good
		Alternaria, Cylindrocladium, Rhizoctonia	None
EcoGuard GN	<i>Bacillus licheniformis</i>	Fusarium, Phytophthora, Pythium	Good
		Rhizoctonia	None
PlantShield HC	<i>Trichoderma harzianum</i>	Alternaria	None
		Pythium, Rhizoctonia	Some to excellent
		Cylindrocladium, Fusarium	Some to good
Taegro	<i>Bacillus subtilis</i> var. <i>amyloliquifaciens</i>	Powdery mildew, rust, downy mildew	Some to very good
		Pythium, Fusarium, Phytophthora, Rhizoctonia	None

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Biological Control of Fusarium on Cyclamen

We have been testing chemical and biological products for control of Fusarium in the past couple of years with rather limited success. This pathogen seems to be especially hard to control even with the best chemical products. We have seen good control of Fusarium wilt on cyclamen with Terraguard, Medallion, Insignia and Heritage. We applied these products to Phormium with Fusarium crown rot and at least part of the time the untreated plants were actually better than anything we treated.

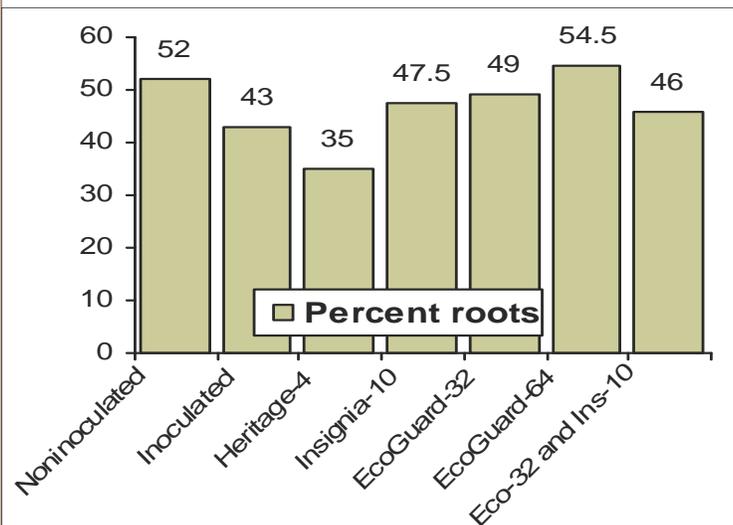
In June we started a trial with some biological agents and some chemical fungicides for cyclamen wilt. In this case, we applied the products on a 14 day interval for a total of 7 applications. Unfortunately, our pathogen (*Fusarium oxysporum* fsp. *cyclamenis*) did not cause the typical wilt symptom. Treatments are shown in the graph with rates given in oz/100 gal. We never did see any signs of Fusarium wilt in the trial and had to settle for root rot alone. The roots were rated on 25 Sept.



Fusarium wilt infection in cyclamen corm

As you can see from the graph the best roots were found on plants treated with EcoGuard GN at 64 oz/100 gal. This biological control product gave better results than chemicals including Heritage and Insignia. The Heritage rate was very high (4 oz/100 gal) and actually resulted in phytotoxicity by causing leaf crinkling.

The highest labeled rate for drenching is 0.9 oz/100 gal. Following label rates is critical if you are to obtain the best results and avoid phytotoxicity. The use of 4 times the labeled rate of Heritage reduced root quality too.



Phytotoxic reaction from excessive use of Heritage

Two more trials are underway with EcoGuard GN for Fusarium control. Watch for results in the upcoming months.

Xeroton-3 for Control of Xanthomonas in Mist Propagation

We just completed a trial with Xeroton-3 applied through an overhead mist system. We started out testing safety of Xeroton-3 (1:5000) compared to ZeroTol (1:1000) on a variety of bedding plants in plug trays and 3.5 inch pots. We also had some strips of rooted lavender cuttings with an active Xanthomonas infection. Mist was applied for 1 minute every hour for 12 hours a day.

After two weeks the lavender in the Xeroton-3 treatment showed a positive response with new shoot growth that was significantly better than the water control. The ZeroTol-treated lavender in contrast showed significant damage. In the picture to the left the bottom row is the water control, the middle row is ZeroTol and the top row is Xeroton-3. Note green shoot tips on the Xeroton-3 strip. Xeroton-3 was safer on vinca, gerber daisy, pansy, snapdragon, alyssum and stock. In contrast, ZeroTol did prevent algae growth in perlite while Xeroton-3 did not prevent growth compared to the water control.



Phytophthora Root Rot on Vinca

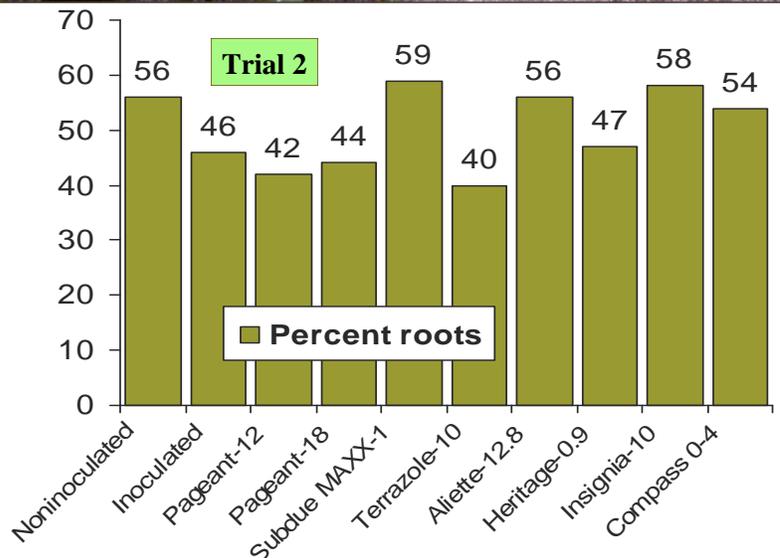
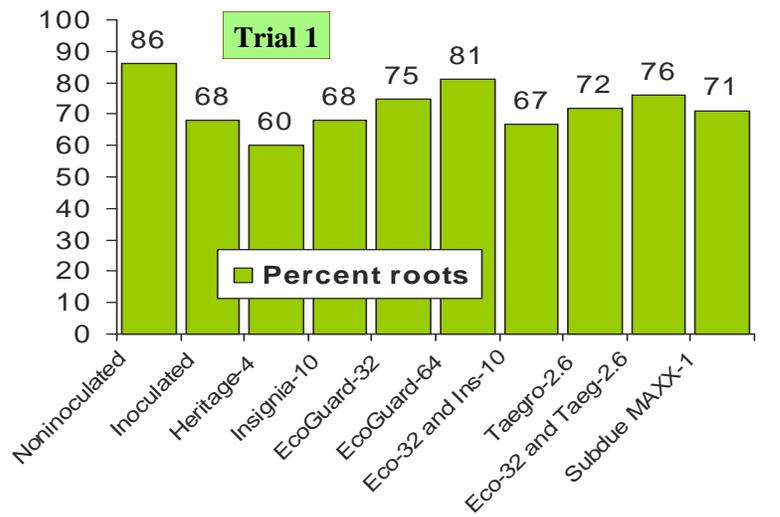
Last month, we reported on two trials with Phytophthora root rot on lavender and this month there are two on vinca. We used *Catharanthus roseus* 'Pacifica Punch' in the first trial and Pacifica Pure White' in the second trial. Fafard Mix 2B (trial 1) or Fafard Mix 2 (trial 2) and Osmocote Plus 15-9-12 were employed for the work.

In the first trial, we evaluated some of the same biological agents and chemicals we did on the lavender including EcoGuard GN, Taegro, Heritage, Insignia and Subdue MAXX. Products were applied as drenches on a 14 day interval starting on 6 August for a total of 6 applications. We rated the percentage of healthy appearing roots a final time on 25 September. There were no above-ground symptoms of Phytophthora root rot in this trial.

The best roots in the trial were on plants in the noninoculated controls closely followed by those treated with the 64 oz/100 gal rate of EcoGuard GN. Lowest quality roots in the trial were found on plants treated with Heritage at 4 oz/100 gal. This rate is well above the highest labeled rate for drenching this fungicide (0.9 oz/100 gal) and clearly resulted in slight root damage.

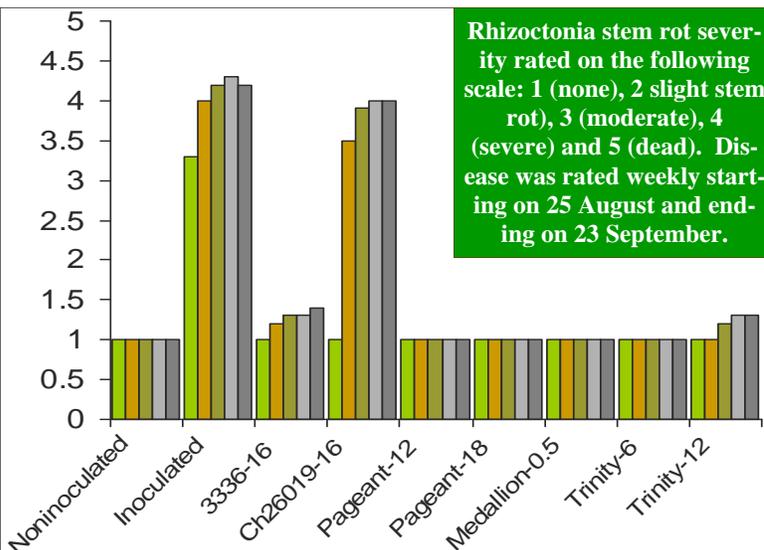
The second trial was started on 19 August and treatments were applied as drenches every 14 days a total of four times. Treatments are shown in the graph below. We did see height slightly reduced for the inoculated controls compared to the noninoculated controls. We also saw the Terrazole treatment significantly shorter than the noninoculated controls. Earlier this summer we reported on another trial where we used the high rate of Terrazole 35WP (10 oz/100 gal) on vinca with similar phytotoxicity. This rate, at least, should not be used on annual vinca. At the end of the trial we evaluated the percentage of healthy appearing roots on the plants (8 October 2008).

Best roots were found on plants treated with Subdue MAXX (1 oz/100 gal), Insignia (10 oz/100 gal), the noninoculated control and Aliette (12.8 oz/100 gal). Other fungicides were not effective in this trial at the rates and intervals tested.



Longevity of Fungicides for Powdery mildew and Rhizoctonia Stem Rot

This month we are reporting on two more trials evaluating a variety of fungicides for long term disease control. In the first trial, we tested Rhizoctonia stem rot caused by *R. solani* on common impatiens. Plugs of 'Dazzler Rose' were planted in 3.5 inch pots containing Fafard Mix 2B on 11 August. They were top-dressed with Osmocote Plus 15-9-12 and maintained in a greenhouse for the trial period. The fungicides were applied as spruches (about 20 ml per pot) to reach an initial depth of about 1 inch on 14 and 21 August. Plants were inoculated on 19 August. Treatments included: non-inoculated and inoculated controls, Cleary's 3336 (16 oz/100 gal), Chipco 26019 (16 oz/100 gal), Pageant (12 and 18 oz/100 gal), Medallion (0.5 oz/100 gal) and Trinity (experimental sterol inhibitor at 6 and 12 oz/100 gal).



We saw the first signs of disease less than a week after inoculation and kept rating the plants every week until the 23rd of September. As early as 25 August (first bar in chart), we also saw some phytotoxicity from both rates of Trinity. The first product to fail in the trial was Chipco 26019 which had the same level of disease as the inoculated controls on 2 September (2 weeks after the final fungicide application). We saw a very small level of disease start in the 3336 treatment which increased very slowly over the trial period. The same thing happened in the highest Trinity treatment. None of the other products developed any Rhizoctonia stem rot during the month after the second application. Clearly choosing the right product for the right disease will allow us to reduce the frequency of fungicide application.



The second trial we completed on prevention of powdery mildew on Gerber daisy using Pageant once or on a 7 or 14 day interval. We also included addition of Latron B 1956 in some treatments and compared everything to Hoist (Eagle or Systhane). The trial started on 19 August with the first application to well established Gerber daisy 'Revolution Mega Mix' in 3.5 inch pots containing Fafard Mix 2B. The table shows the treatments used on 19 and 26 August and 2 September. The first signs of powdery mildew appeared about 10 days after the final fungicide treatment and disease was rated as the percentage of the leaf area with powdery mildew sporulation on 15 and 22 September.

All treatments prevented disease nearly 100% over the course of the trial. For the Pageant treatments applied with or without Latron B 1956 only once (19 Aug.), the

long term prevention was about one month. The number of applications may not be important if the timing related to when the disease started is met. In this case, it is possible that the 19 August application was the most critical one for eradicating a low level infection or preventing infection since this worked as well as treatments applied three times on a weekly interval. So it all goes back to scouting! If you don't know it is there you cannot time your fungicide use effectively.

Treatment	Interval	Rate/	% PM	% PM
Water	7 days	—	35 b	65 b
Pageant	7 days	6 oz	0 a	0.2 a
Pageant and Latron B 1956	7 days	6 oz and 4 oz	0 a	0 a
Pageant	14 days	6 oz	0 a	0.1 a
Pageant and Latron B 1956	14 days	6 oz and 4 oz	0 a	0.1 a
Pageant	once	6 oz	0 a	0.2 a
Pageant and Latron B 1956	once	6 oz and 4 oz	0 a	0 a
Hoist 40WP	7 days	4 oz	0 a	0 a

Control of Black Spot on Rose in the Field with Gary W. Osteen

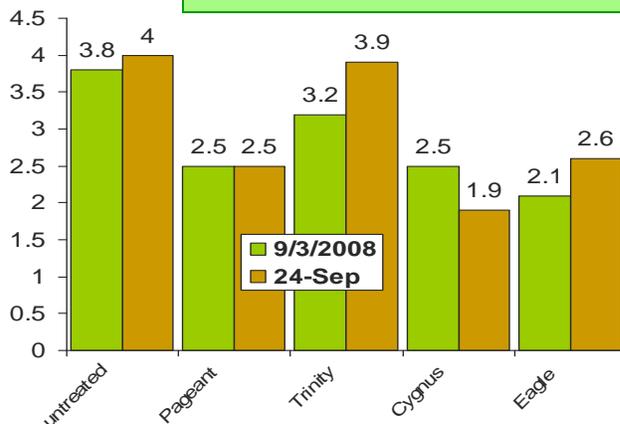
We have been trialing some products in field production of rose in the Wasco, CA area. The particular trial was conducted with overhead irrigation which promotes black spot in our environment. We used plots about 3.5 feet wide by 10 feet long of 'Sun Sprinkles' and applied the products five times on a 14 day interval. Black spot was rated on 3 and 24 September on the following scale: 1 (none), 2 (slight), 3 (moderate), 4 (high) and 5 (severe). We included the following treatment: untreated, Pageant (new combination fungicide from BASF Corp. at 16 oz/100 gal), Trinity (an experimental sterol inhibitor from BASF at 12 oz/100 gal), Cygnus (kresoxim methyl from BASF at 6.4 oz/100 gal.) and Eagle (myclobutanil from Dow at 6 oz/100 gal). There were no obvious signs of any phytotoxicity during the trial.



Black spot severity was significantly lower for the plants treated with Pageant, Cygnus and Eagle. None of the products gave a high level of control in this trial. These results are similar to those obtained by other researchers across the country.

Severity of black spot on rose

1 (none), 2 (slight), 3 (moderate), 4 (high) and 5 (severe).



TERRAZOLE CA vs. TERRAZOLE 35WP

I wrote a summary of our Terrazole work a couple of months ago and have been informed that my statements concerning the use of this product in California were not accurate. I print here an official response from OHP.

“Terrazole CA is a limited use label when compared to our Terrazole 35WP label that is registered in other states. Chemtura received California registration in 2003 as a result of several key growing operations and research cooperators supporting a 24C label. The registration granted was a sec3 label which has some limitations when compared to the 35WP label.

Terrazole CA is labeled for use in commercial greenhouse and nursery operations and may be used only on containerized plants at the rate of 4-6 oz/100 gal. The application should be made directly to the soil through appropriate injection equipment. The reason to this is to minimize worker exposure. The application should be watered in to further incorporate the material into the soil. Drench volumes are the same as the 35WP label—i.e. 2 fl. oz./4-inch pot, 4 fl. oz./6-inch pot, etc. Two applications per crop are allowed at 30-day intervals. Refer to the Terrazole CA label for further use information or contact Dave Barcel, OHP Senior Technical Service Manager, for more information.”



Watch out for INSV!!

We just received two samples in our diagnostic lab that turned out to be INSV. As the seasons change yet again, many viruses express symptoms that may have been latent over the summer. Check for ring spots and black wavy lines such as those on this cyclamen and Nemesia.



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