Volume 4, Issue 7

July, 2005

CHASE RESEARCH GARDENS, INC.

CHASE NEWS

THANKS FOR YOUR SUPPORT

When I started working at the Central Florida Research and Education Center in Apopka Florida in 1979, I was impressed by the generous donations of plant material that the Florida growers made to our research programs. The savings this afforded the University of Florida was significant not to mention the knowledge that we were working on the right crops and problems when the growers participated in this way.

We started our research in California in 1994 in a small way and I resorted to buying plants. By 1997 we were really growing and I started asking for donations of plants for research trials. Despite the fact that we are a private business, the growers once again supported our work by very generous plant donations. This has been critical in my view since it validates the value of our work when growers participate in the process. While a great deal of our trials are industry or product sponsored, we are back to doing quite a bit of work that is strictly based on what I see when I visit growers.

I wanted to take this opportunity to thank all of these donors since we truly could not do this work without your help. The following is a list of the operations that have donated materials to our trials in the past few years. I have probably forgotten someone and I apologize for such omissions. As long as you keep supporting our trials with plants, I will know we are on the right track—at least part of the time!

Ball Tagawa Growers—Arroyo Grande, CA
Bay City Growers—Half Moon Bay, CA
Bear Creek-Jackson Perkins—Wasco, CA
Bordiers Nursery—Irvine, CA
Color Spot—Lodi, CA
Dramm & Echter—Encinitas, CA
First Step Greenhouses—Temecula, CA
Golden State Bulb Growers—Moss Landing, CA
Goldsmith Seeds— Gilroy, CA
Greenheart Farms—Arroyo Grande, CA
Hines Color—Chowchilla, CA
Kallisto Greenhouses—Fontana, CA
Matsudas of Sacramento—Sacramento, CA
Mellano and Company—San Luis Rey, CA
Nurserymen's Exchange—Half Moon Bay, CA
Paul Ecke Ranch—Encinitas, CA
Raker—Litchfield, MI
Sunrise Ranch—Ventura, CA
Sun Valley Group—Arcata, CA
Van Wingerden Intl.—Asheville, NC

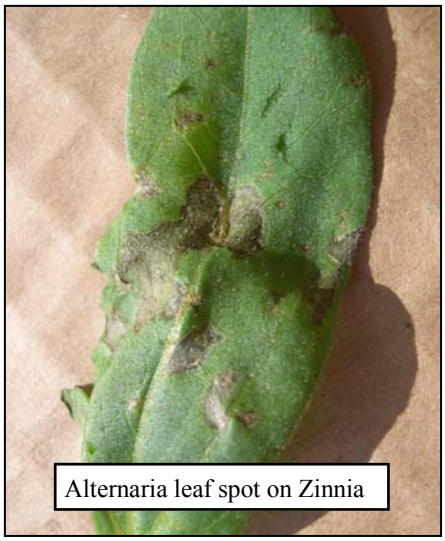
Inside this issue:

More Alternaria Leaf Spot

Alternaria leaf spot can attack many plants during their production including pansy, impatiens, *Alstroemeria* and zinnia. We started a trial on prevention of Alternaria leaf spot on zinnia in June. Plants were sprayed to drip, three times on a 14-day interval. They were inoculated with spores of A. zinniae about 7 days after the first fungicide application and we counted the number of spots per plant about 7 days after the third fungicide application. The specific products and rates used are given in the table to the right.

We saw the first spots on July 1, about 18 days after inoculation. By the end of the trial, the best control was achieved with an experimental product or Chipco 26019. Other products that provided the same level of control included Heritage, Medallion, Daconil Ultrex and Terraguard. Experimental 2 provided less control and Phyton 27 did not give any control of Alternaria leaf spot in this trial.

Last month we reported on an earlier trial with Alternaria leaf spot on zinnia. In that trial, we saw excellent prevention of the disease with the four strobilurins tested (BAS500, Compass O, Cygnus and Heritage).



Alternaria leaf spot on Zinnia

These trials demonstrate that both newer products like strobilurins and older products like Chipco 26019 and Daconil Ultrex can give excellent control of Alternaria leaf spot when used on a preventative basis. These products are broad-spectrum and work on a number of other fungal leaf spots such as *Helminthosporium, Bipolaris, Heterosporium, Phyllosticta, Colletotrichum* (anthracnose) and sometimes *Cercospora*. Get an accurate diagnosis of leaf spot diseases since some fungicides work better on one disease than another.

Fungicide effects on Alternaria leaf spot on zinnia

Treatment	Rate/100 gal.	No. spots per plant
Water - Noninoculated	-----	0 a
Water - Inoculated	-----	9.2 c
Experimental 1	1 x	0 a
Experimental 1	2 x	0.2 a
Experimental 1	4 x	0 a
Phyton 27	20 oz	9.4 c
Medallion 50WP	1 oz	0.2 a
Medallion 50WP	2 oz	0.7 a
Experimental 2	1 x	4.1 b
Experimental 2	3 x	1.8 ab
Chipco 26109 50WP	16 oz	0 a
Terraguard 50WP	4 oz	3.0 ab
Heritage 50WDG	2 oz	0.2 a
Daconil Ultrex	22.4 oz	2.7 ab

Numbers with the same letter are not different.

Shore Flies, Fungus Gnats and Moth Flies Move *Fusarium* Spores

Fusarium crown rot and stem rot on Lisianthus is caused by *Fusarium avenaceum*. The disease was described in 1996 and has continued to appear in both Florida and California where Lisianthus are grown for cut flowers as well as a pot crop.

El-Hamalawi and Stanghellini at the University of California at Riverside published research (Plant Disease 89:619-623) in June of this year describing the movement of this fungus by flies including moth flies, fungus gnats and shore flies.

Their trials employed naturally infected Lisianthus stems which could be used as a source of *Fusarium* spores for all three types of flies. The results clearly demonstrated that all three types of flies could become contaminated with *Fusarium* spores and transmit the disease to previously healthy Lisianthus plants. It was interesting that they found disease started to appear 40 days after infection by any of the flies while it only took 25 days if the plants were inoculated by spores added to the potting medium of the plants. This is probably simply a matter of the number of spores that a shore fly, fungus gnat or moth fly can carry compared to the inoculation method many researchers use.

These researchers also found that all three flies became contaminated externally but only shore flies ate *Fusarium* spores and were able to transmit them after passing through their digestive tract.

The most obvious control strategies would be removinh infected plants before *Fusarium* makes spores as well as controlling the fly populations.

Research has also shown that *Pythium aphanidermatum* can be moved by fungus gnats, *Thielaviopsis basicola* and *Verticillium* can be moved by shore flies and that fungus gnats move *Fusarium* spores in greenhouse tomatoes. These results are not isolated and it appears that we have been missing an important part of controlling at least some diseases in our greenhouse crops. It seems reasonable and prudent to start controlling these pests with increased vigor in order to limit movement of soil-borne fungal pathogens in greenhouse crops. Insect vectors of viruses are well-known and documented and it is clear that disease transmission is not just for viruses anymore.

AVOIDING CROWN ROT (*Myrothecium* and *Rhizoctonia)*

One of the hardest diseases to control is a crown rot. Symptoms may not be obvious since leaves sometimes look yellowish or die prematurely, but they often appear to simply be growing slowly. Crown rots like *Myrothecium roridum* on pansy also occur on syngonium and Spathiphyllum but cause leaf spot on New Guinea impatiens and dieffenbachia.

If you attempt to control a crown rot with a foliar spray it may not result in sufficient fungicide reaching the crown area and control will be poor. If, however, you apply a drench and it does not thoroughly cover the crown, control will again be poor. The optimal method for crown rot control with a fungicide is a sprench. This is usually defined as heavy spray that penetrates the upper inch (more or less) of the potting medium. Thus, a sprench will nearly always contact the crown thoroughly.

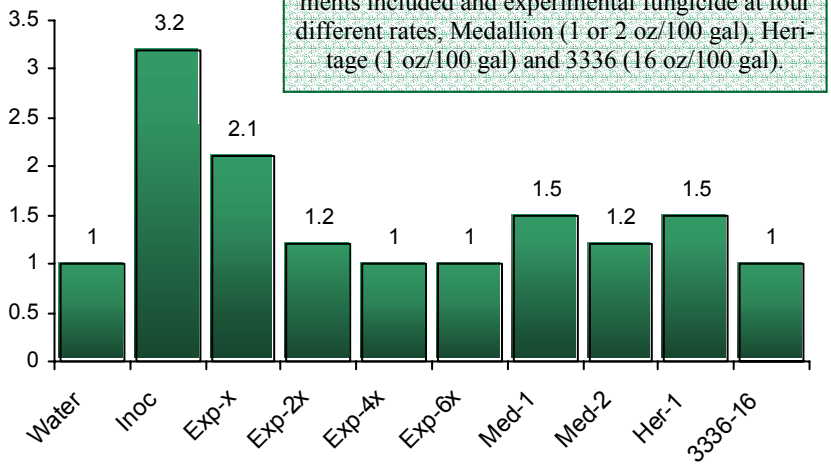
Another type of crown rot is usually more dramatic and rapid in its effects. These are the stem and crown rots caused by *Rhizoctonia solani*. Once infected, this fungus can kill plants in less than a week when the weather conditions (hot and wet) are present. We see Rhizoctonia crown rot on impatiens and vinca as well as Rhizoctonia stem rot and cutting rot on many woody ornamentals (like hydrangea), poinsettia and damping-off on bedding plants like celosia.

We performed one trial on Myrothecium crown rot on pansy and another on Rhizoctonia crown rot on Impatiens. Fungicides were applied as sprenches on a 14-day interval. Plants in each trial were inoculated with the appropriate pathogen after the first fungicide application. Disease was monitored and the final rating for each trial is presented in the graphs on this page.

In the Rhizoctonia trial (top graph, green) we tested an experimental compound from Syngenta at four different rates as well as some industry standards. Medallion 50WP was used at 1 or 2 oz/100 gal. Heritage 50WDG was used at 1 oz/100 gal and Cleary's 3336 was used at 16 oz/100 gal. Disease was rated 14 days after a single application on a scale from 1 (no disease) to 5 (dead plant).

The two higher rates of the experimental compound, as well as the 16 oz rate of 3336 were 100% effective in preventing any Rhizoctonia crown rot on these impatiens. Other fungicides provided statistically equivalent control, but slight symptoms did develop.

Rhizoctonia crown rot on Impatiens (1=no disease, healthy, 2=slight crown rot, 3=moderate crown rot, 4=severe crown rot, and 5=dead plant). Treatments included and experimental fungicide at four different rates, Medallion (1 or 2 oz/100 gal), Heritage (1 oz/100 gal) and 3336 (16 oz/100 gal).

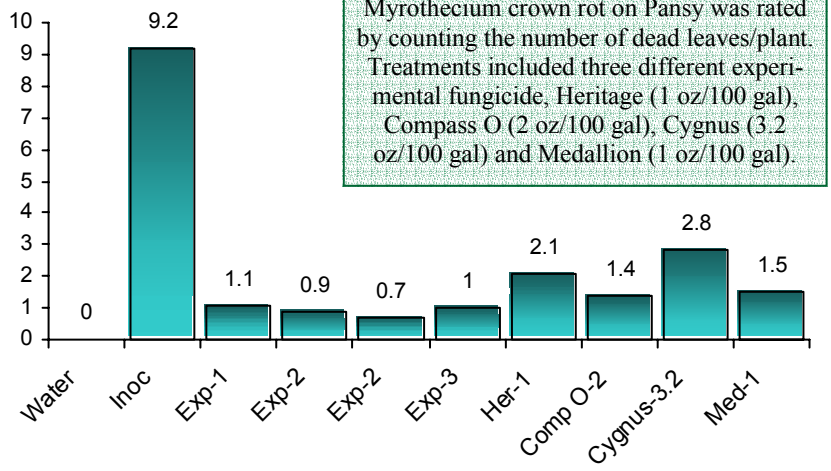


Myrothecium crown rot on pansy was tested much the same way as the Rhizoctonia trial although it was a much longer trial, lasting for four applications of the products. In this trial, we tested three different experimental fungicides (none were the same as used in the Rhizoctonia trial), Heritage (1 oz/100 gal), Compass O (2 oz/100 gal), Cygnus (3.2 oz/100 gal) and Medallion (1 oz/100 gal).

One of the easiest symptoms to rate for this disease is to simply count the number of dead or dying leaves per plant. Myrothecium attacks the leaf petioles and slowly kills basal leaves on infected plants. All of the fungicides tested gave the same level of control statistically. However, the best control of Myrothecium occurred with the three BASF experimental products, Compass O and Medallion.

Our previous trials on Myrothecium confirm that Medallion and the strobilurin fungicides (especially Compass O and Heritage) do provided excellent control. Additionally, these same products give very good to excellent control of Rhizoctonia diseases. While 3336 gave excellent control of Rhizoctonia it is not the best choice for Myrothecium. It is critical to obtain an accurate disease diagnosis if you are to choose the most effective product. Remember that using a product with poor efficacy costs you more than the product itself.

Myrothecium crown rot on Pansy was rated by counting the number of dead leaves/plant. Treatments included three different experimental fungicide, Heritage (1 oz/100 gal), Compass O (2 oz/100 gal), Cygnus (3.2 oz/100 gal) and Medallion (1 oz/100 gal).



Pythium Root Rot Control Update (geraniums and callas)

Pythium root rot is very common on some ornamentals such as geranium. Zonal geraniums were stuck in rooting cubes and treated with a fungicide before inoculating with the fungus causing black leg (*Pythium ultimum*). We included the fungicides listed in the table to the right at the rates given in the second column. I had planned to rate stem rot or black leg but apparently our isolate did not know that and we saw none during the trial. After 21 days we rated root development. The numbers in the final column are the percentage of roots that developed (numbers in the column followed by the same letter were not statistically different).

It was interesting to see that although stem rot was absent, the Pythium did cause root loss. Unfortunately, none of the treatments provided significant control of this Pythium root rot, perhaps since we did not apply the product more than a single time. The best treatment was Subdue MAXX but even this was not as good as the noninoculated controls. Further it appears that some of the fungicides may have caused some root damage. Repeating this trial in the fall will be necessary before concluding that any of the fungicides did result in root loss.

In a separate trial on Calla lilies, we tested efficacy of a few fungicides for Pythium control. The bulbs that were naturally infected with Pythium were used to test the efficacy of Banrot (8 oz/100 gal), Terrazole 35W (3.5 or 6 oz/100 gal) and Terraneb (12 oz/100 gal). After potting in April, treatments were started within a week of planting. Drenches were applied at the rate of 1 pint/square foot surface area on a 14-day interval. We applied them a total of five times and recorded the date of emergence, plant height, number of shoots and finally the root grade at the end of the trial.

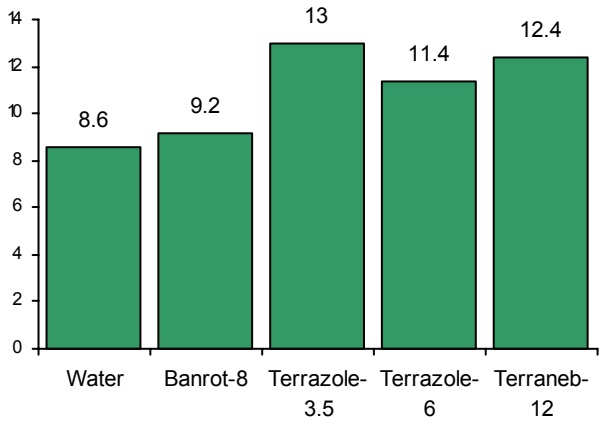
The two graphs to the right show the data for plant height (dark green, top) and root grade (light green, below) . Plant height is given in cm (2.5 cm = 1 inch) and root grade was rated on the following scale: 1 (no live roots), 2 (few-slight roots), 3 (some roots), 4 (good roots) and 5 (excellent roots). All of the products resulted in taller plants than the water treated control except for Banrot. Root grade was, however, improved by all products including Banrot.

Remember that Banrot is a combination of etridiazole (same active ingredient as Terrazole) and thiophanate methyl. Terraneb (Kincaid Enterprises) is in a different grouping and contains chloroneb. This product is most often used in woody ornamentals and should be tested for crop safety if it is new to you. We saw no damage by any treatment on these Calla lilies and indeed all treated plants were better than those that were not treated (water).

Effect of fungicides on rooting on Geranium cuttings with Pythium

Treatment	Rate/100 gal	% Roots
Water-noninoculated	——	14.2 c
Water-inoculated	——	7.1 ab
Subdue MAXX	0.5 oz	10.0 b
Aliette 80WDG	12.8 oz	2.1 a
Aliette 80WDG	16 oz	5.0 ab
Banrot 40WP	8 oz	7.9 ab
Terraneb	12 oz	3.8 a
Heritage 50WDG	0.9 oz	4.6 ab
Subdue MAXX/Heritage	0.5/0.45 oz	3.3 a

Effect of fungicides on height of Calla lilies with Pythium



Effect of fungicides on root grade of Calla lilies with Pythium (1=no roots to 5=excellent roots)