



## DOWNY MILDEW HOST GROUPS

Downy mildew has been a growing problem during the past ten years. This is undoubtedly due to a combination of factors including weather patterns, crop mobility and introduction of new crops. When downy mildew occurs it is easy to assume that the same fungus is attacking all of the crops with symptoms. This is not the case since many downy mildew pathogens are host specific. The diagram below shows some of the groups attacked by the same downy mildew. Each bubble contains plants that are attacked by a specific fungus. For example, Kale, Iberis, Alyssum, Broccoli, Erysimum, stock (*Matthiola*) and cabbage are all hosts of *Peronospora parasitica*. Pansy and viola are attacked by both *Bremiella megasperma* and *Peronospora violae*. Lettuce and Osteospermum (and many other composite plants) are both hosts of *Bremia lactucae*. Felicia, Gaillardia, Osteospermum and Helianthus (sunflower) are attacked by *Plasmopara halstedii*. It is important to recognize that vegetables and ornamentals often share a downy mildew pathogen (such as crucifers).

Knowing the specific host range of a downy mildew pathogen is important in a couple of ways. First, it allows you to target crops with preventative fungicides. Unless you know all of the possible hosts you cannot protect them from infection. Second, you can sometimes determine the source of a downy mildew outbreak if you know all of the hosts that have that downy mildew. For instance, if you are producing *Osteospermum* routinely and start growing Felicia or Gaillardia you might see down mildew appear on all three crops if one of trays of liners or rooted cuttings has a latent infection with *Plasmopara halstedii*.

Do you have to protect plants from downy mildew year-round? Unless you live along the Pacific coast you can target your fungicide program for the cool, wet season. This does not mean that places like Texas and Florida are safe. The downy mildew on salvias (*Peronospora lamii*) actually appears when the seasons change from spring to summer in many locales. In my experience, this downy mildew tolerates the warmest conditions. Watch out!



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# Minor Diseases Become Major Issues by Marianne Waindle

California's spring weather patterns this year have encouraged many periodic diseases to become major issues for several woody ornamental nurseries in 2005. We have seen more Pythium root rot on both container and field grown trees that in a normal rainfall year would not be of concern. Wilting, poor bud break and the obvious brown to black, mushy root systems are key symptoms of Pythium root rot. Water management in containers is difficult with more than 1-2 inches of rain per week and growers have had to shut off irrigation by removing drip tubes and shutting off valves in particular sections of the nursery.

Without the excessive rainfall, Pythium does not usually cause such extensive damage on containerized trees. Thus, many trees and other woody landscape plants are not often treated with a preventive fungicide for root rot control. This year, a Subdue MAXX drench has proven beneficial in a number of situations.

Another problem we have been seeing on some fruit trees is brown rot (top, right). Symptoms range from random leaf scorch



to total bud collapse on stone fruits. Trees particularly susceptible to cool, wet spring rains are the ornamental cherry, almond, and peach varieties. Examination of the base of affected stems, however, reveals cankers scattered along their

length as well as dark staining in the wood. This is a sure sign of bacterial canker (*Pseudomonas morsprunorum*). In almost all situations, bacterial canker cannot be controlled chemically once infection occurs and the plants are destined for the landfill. Careful examination of new seedlings is the first step in preventing bacterial canker. Removal of infected trees is critical to avoid spread throughout the area.



## Cleaning Before Disinfesting—*Thielaviopsis*

Last month I reported on a trial we performed using a new cleaning/disinfestation program by Floralife. This month I report on the second trial.

We tested the efficacy of using P.A.C. a chlorinated cleaner, prior to applying a disinfestant. The disinfestants were Micro-Bloc Ultra (a quaternary ammonium), GreenShield and ZeroTol. We tested efficacy on 4 ml polyethylene film, wood and concrete block with *Thielaviopsis basicola* (the cause of black root rot on pansy, vinca and other bedding plants).

Surfaces were dirty when we started with obvious algae growth. The P.A.C. was applied to each surface as a spray (40 ml/liter) and rinsed after 5 min. This was followed by one of the disinfestants Micro-Bloc Ultra (8 ml/liter), GreenShield (1 tbsp./gal), and Zeritol (1%). The pathogen was recovered after 24 hours. The entire

test was performed in a greenhouse.

The results are shown in the table below. The % kill for the *Thielaviopsis* was affected by the type of surface. Plastic was the easiest surface to clean and concrete block the most difficult. P.A.C. alone was somewhat effective on wood and concrete block but not plastic. Micro-Bloc Ultra was very effective on all three surfaces used alone or with P.A.C. GreenShield was slightly more effective used alone on plastic and concrete. ZeroTol was

least effective in this test with mixed results on the different surfaces. On wood it was more effective with P.A.C. applied first but it was not affected much by this treatment on either plastic or concrete.

Further testing on other pathogens will be presented as it becomes available. At present we have trials planned with the same pathogens and three surfaces with another Floralife cleaning product called Strip-It (a sunblock remover).

Treatment	Wood (% <i>Thielaviopsis</i> kill)	Plastic (% <i>Thielaviopsis</i> kill)	Concrete (% <i>Thielaviopsis</i> kill)
Water	None alone 85% with P.A.C.	None alone None with P.A.C.	None alone 100% with P.A.C.
Micro-Bloc Ultra	92% alone	100% alone	69% alone
GreenShield	81% alone 90% with P.A.C.	100% alone 86% with P.A.C.	96% alone 80% with P.A.C.
ZeroTol	22% alone 88% with P.A.C.	99% alone 92% with P.A.C.	81% alone 68% with P.A.C.



# Research Highlights

**CONTROL OF RHIZOCTONIA BLIGHT ON IMPATIENS AND PHYTOPHTHORA BLIGHT ON VINCA** — McMillan, Johnson and Graves published a description of web blight on Impatiens in Florida. They also completed a trial on fungicide prevention of the disease (Table at the left).

Treatment	Rate per	% Web
Control	—	83.9 d
Tebuconazole	4 oz	3.5 b
Tebuconazole	6 oz	0.2 a
Heritage	4.2 oz	3.3 b
Heritage	6.2 oz	0.3 a
Daconil	48 oz	24.4 c

Numbers followed by the same letter are not significantly different.

Daconil is recognized as a very good fungicide for prevention of aerial blight on many ornamentals in the southeast. They compared Heritage at two rates and tebuconazole (Folicur) also at two rates. All products were applied as sprays. The higher rates of Heritage and tebuconazole were very effective. We worked on with tebuconazole several years ago and saw excellent prevention of powdery mildew and Alternaria leaf spot on zinnias and black spot on rose. Many other researchers have seen excellent control of rose rust with a drench application only.

For the complete report see Proc. Fla. State Hort. Soc. 117:318-320.

McMillan and Garofalo also performed a trial on *Catharanthus roseus* (vinca) caused by *Phytophthora parasitica*. Stem and root rot was controlled significantly with each of the treatments (Table, right). Aliette was applied as a foliar spray while Banrot and Subdue MAXX treatments were applied as drenches. Products were applied a single time before inoculation. We have seen similar results with these products as well as several others.

For the complete report see Proc. Fla. State Hort. Soc. 117:316-317.

Treatment	Rate per	% stem/
Control	—	93.9 d
Aliette	16 oz	2.5 c
Aliette	80 oz	0.2 a
Banrot	6 oz	3.2 c
Banrot	12 oz	2.8 c
Subdue MAXX	0.5 oz	1.3 a
Subdue MAXX	1 oz	0.1 a

Numbers followed by the same letter

**THIELAVIOPSIS BUD ROT ON PALMS AND OTHER ORNAMENTALS** — University of Florida researchers, Garofalo and McMillan reported on Thielaviopsis diseases of Florida plants.

The table (right) shows the summary of reported hosts. The cause of bud rot, stem-bleeding, black scorch, dry basal-rot and heart-rot is *T. paradoxa*.

Field trials on coconut palms evaluated thiophanate methyl and related compounds for ability to prevent the disease in small seedlings or cure the disease in large specimen palms. The work showed Benlate 50W, Topsin M and Cleary 3336 equally effective on both preventing seedling disease and curing trunk lesions. For the full report see Proc. Fla. State Hort. Soc. 117:324-325. Feel free to contact me at

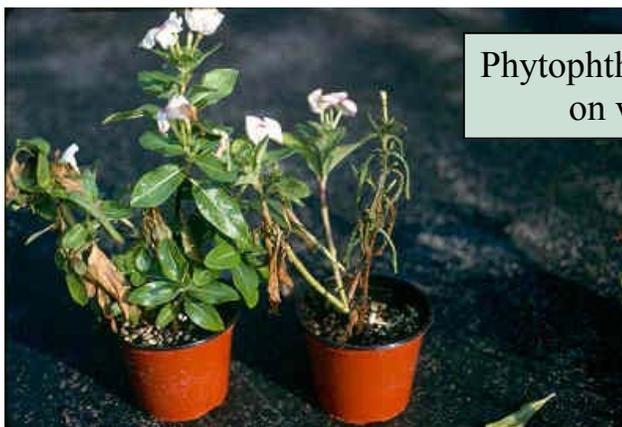
## Susceptible Plants

- African oil palm
- Aglaonema
- Betel nut palm
- Cabbage palm
- Canary Island date palm
- Christmas palm
- Coconut palm
- Date palm
- Dracaena
- Figs
- Fishtail palm
- Kentia palm
- Lady palm
- Nephytis
- Pineapple
- Queen palm
- Royal palm
- Sugarcane
- Washington palms

[archase@chaseresearch.net](mailto:archase@chaseresearch.net) for copies of any of these papers.

## WATCH FOR THESE UPCOMING TRIALS

- Powdery Mildew Eradication on Rosemary
- Fire Blight Prevention on Cotoneaster
- Cercospora Leaf Spot Prevention on Myrtle
- Alternaria Leaf Spot Prevention on Zinnia
- Rust Eradication on Solidago



Phytophthora aerial blight on vinca (left)



Rhizoctonia stem rot on impatiens (right)

# BOTRYTIS BLIGHT UPDATE

One of the most difficult trials for us to perform is Botrytis blight. We keep trying and sometimes we get good infection while other times the weather changes and disease is too low to rate. This year, all of the extra rainfall combined with slightly warmer temperatures resulted in four Botrytis trials. There were two that we inoculated and succeeded with (Blue Salvia and Hydrangea) and two others that had other disease targets. In the Osteospermum trial we were looking for downy mildew control and got Botrytis as well. In the pansy trial we were trying to work with Alternaria leaf spot and got Botrytis blight on the flowers instead.

All fungicides were applied preventively as foliar sprays. Blue Salvia were treated twice on an 8-day interval. Osteospermum being tested were treated three times on a 10-day interval. Two cultivars of Hydrangea including one grown for the landscape 'Preziosa' and another one

used for pot color 'Blue Roja' were tested in the third trial. Hydrangeas were sprayed three times on a 14-day interval. The final trial, on pansy was treated three times on a 10-day interval.

The industry standards continue to perform well in our trials. Chipco 26019, Daconil Ultrex, Decree and Medallion generally provide very good to excellent control of Botrytis blight. We also found very good control with Heritage on the Osteospermum trial and excellent control on both cultivars of Hydrangea with Phyton 27.

While phosphonates are not generally used for Botrytis blight, this trial with Fosphite did show some control although Aliette provided no control. Protect T&O also provided some control of Botrytis blight on the pansy flowers. Finally, we saw no control with either ZeroTol or Rhapsody in the blue salvia trial.

ZeroTol was not effective in the geranium trial by Hausbeck and Webster (see report—bottom, left). In contrast, they found very good to excellent prevention with 2% Rhapsody compared to no control in our trial with 1% Rhapsody which was apparently too low.

## Summary of Botrytis Blight Control on Blue Salvia (S), Osteospermum (O), Hydrangea (H) and Pansy (P)

Fungicide	Rate/100 gal	Results
Aliette	16 oz	None (O)
Chipco 26019	16 oz	Very good to excel-
Daconil Ultrex	22.4 oz	Very good (P)
Decree	12-16 oz	None (S) to excellent
Fosphite	24 oz	Some (O)
Heritage	2 oz	Very good (O)
Medallion	1-2 oz	Very good to excel-
Phyton 27	15-20 oz	None (O), Some (P),
Protect T&O	16 oz	Some (P)
Rhapsody	1%	None (S)
ZeroTol	0.2%	None (S)

### BOTRYTIS BLIGHT ON GERANIUM



**BOTRYTIS BLIGHT ON GERANIUM** — Hausbeck and Webster performed two trials in 2004 that they reported in Fungicide and Nematicide Tests (Volume 60:OT005 and OT009). Both trials were performed on geranium for control of Botrytis blight. In the first trial, ZeroTol was ineffective for Botrytis control when applied either preventively or curatively at 0.3%. Captan applied at 2.5 lb/100 gal gave very good prevention and Daconil Weather Stik applied at 1.4 pint/100 gave excellent prevention of Botrytis in the same trial.

The second trial evaluated Endorse (2.2 lb/100 gal), Daconil Weather Stik (1.4 pint), Rhapsody (2%), Heritage (8 oz) and Decree (24 oz) each gave very good to excellent prevention of Botrytis on geranium. The products were applied four times on a weekly interval.

### Botrytis on Blue Salvia

