

CHASE NEWS

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Pythium Control with Fungicide Standards

I have been summarizing data from our trials as well as many other researchers recently. One of the topics I began to wonder about is whether or not the standard fungicides are still performing as well as they did when first introduced. I also wondered if they were any less effective than the newer products being brought to the market today. The most critical needs still appear to surround prevention of root loss—especially due to Pythium.

When I started work at the University of Florida in 1979, one of the first fungicides I worked with was etridiazole. I have continued testing this fungicide over the past 28 years and the table to the right shows results of trials performed over the past ten years with Terrazole 35W.

The types of crops are listed and the results were very good usually with the exception of some of the trials where the application interval was 28 days. This is obviously too long for some situations. The other interesting point was that the 6 oz/100 gal rate appears to be very good unless disease pressure is too high and then 10 oz/100 gal provides far better control. So our trials do indicate that etridiazole remains a viable choice for Pythium control on ornamentals.

The second product I reviewed was Fosetyl aluminum. I started by reading over the work I did at U of Florida and ended with the trials we have done in California since 1996.

Terrazole Trials for Pythium Control

| Plant | Rate/100 gal | Interval | Level of control |
|------------|---------------|----------|------------------|
| Calla lily | 6 oz | 28 days | None |
| Calla lily | 3.5, 6 oz | 14 days | Excellent |
| Geranium | 6 oz | 14 days | Very good |
| Geranium | 3.4, 5.1 oz | 28 days | Poor |
| Geranium | 6 oz | 14 days | Excellent |
| Geranium | 2.5, 5, 10 oz | 30 days | Very good |
| Lily | 3.5, 6 oz | 28 days | Some |
| Lisianthus | 5 oz | 21 days | None |
| Lisianthus | 6 oz | Once | Very good |
| Lisianthus | 5 oz | 28 days | Very good |
| Pansy | 6 oz | Once | Very good |
| Pansy | 6 oz | 28 days | None |
| Snapdragon | 6 oz | Once | Very good |
| Snapdragon | 3.5, 6 oz | 28 days | Poor |

We have tested several phosphonates including Biophos, Alude, Aliette, Nutri-phyte and Vital. The plants have been geranium, snapdragon, Asiatic lily, pansy, lisianthus, ranunculus and wax begonia. There were a total of 17 trials with one or the other phosphonate. The rates tested were from 64 to 128 oz/100 gal for phosphonates except Aliette. In Aliette trials we used either 12.8 oz/100 gal or 16 oz/100 gal. The results were variable to say the least. The phosphonates (except Aliette) showed very good control 30% of the time and essentially no control the rest of the time. Higher rates were needed but did not always result in significant control. Moving on to Aliette we had 1 of 3 trials with very good control when it was used at 12.8 oz/100 gal and 3 of 9 trials with very good results when it was used at 16 oz/100 gal. The rest of the trials showed little to no control with either rate.

This does represent only our trials in the past 10 years with phosphonates for Pythium control. I did check as many other sources as I could find for other research and found similar results. I can also report that in checking the same products for control of Phytophthora results were almost always very good to excellent.

Watch for new chemistries like FenStop (newly labeled by Bayer) available from OHP for Pythium. In addition, there are a series of other active ingredients under development for Pythium on ornamentals.

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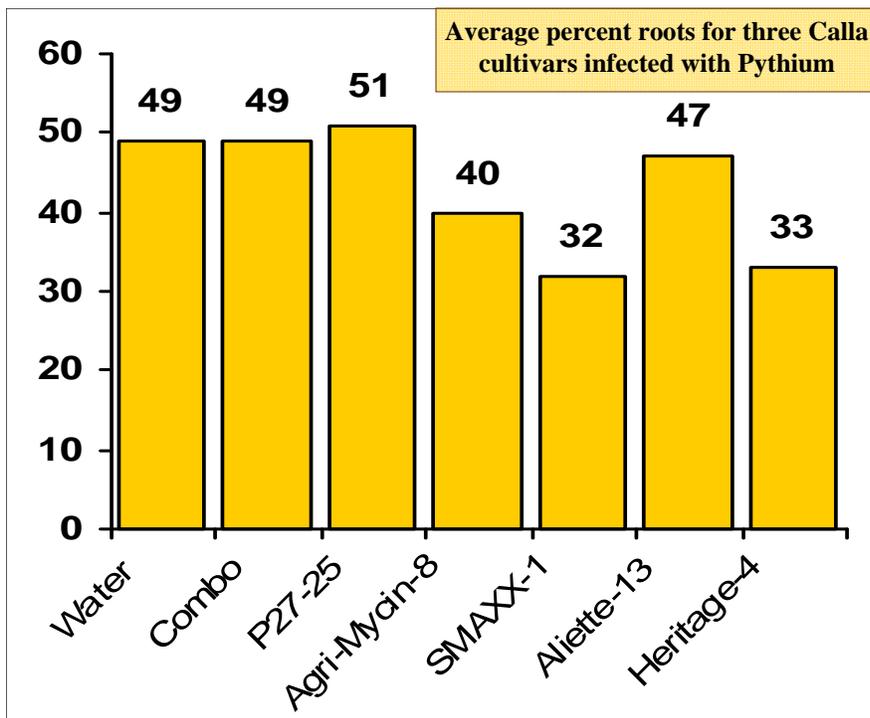
Callas—To Drench or Not to Drench

The colored callas have become an important part of the spring pot crop product mix. Sometimes, they can be a real challenge with respect to disease control. This year, we evaluated several cultivars for their response to fungicide and bactericide drenches. We started the trials on January 8th with bulbs donated by Seville Greenhouses in Texas. We decided to take the combination mixture recommended by Golden State Bulbs and dissect its components. The treatments included a 4 way mix of Agri-Mycin (8 oz/100 gal), Subdue MAXX (1 oz), Aliette (13 oz) and Heritage (4 oz). Then we used each alone and included a Phyton 27 (25 oz) treatment. Treatments were applied on January 11 and 24 and February 15.

We recorded the day each plant emerged, the top grade (quality), # shoots, # flowers and finally the percentage of the pot with roots and the % of those roots that were rotted. The cultivars were: Crystal Blush, Garnet Glow and Lavender Gem.

Top grade was the same regardless of the date we evaluated the plants, the cultivar and even the chemical treatment. The number of shoots and flowers was similarly unaffected by treatment. Although there were apparent differences in the emergence dates they were not statistically significant. This was further confused by the fact that the cultivars responded differently to the drenches. The slowest to emerge (in our test) was 'Lavender Gem' and it appeared to be slowed even further by the Heritage drench (although not significantly based on statistics). By the end of the trial, even the more slowly emerging plants were equivalent in their top quality.

Nothing about the plants, at least that we rated, was significantly affected by treatment with the exception of the % roots. Even the presence of root rot (Pythium) in two of the cultivars was not affected by treatment. The graph to the right shows the average % of roots for all three cultivars. Subdue MAXX and Heritage treatments had the lowest %



roots. This was probably not due to phytotoxicity since the combo treatment contained both of these fungicides at the same rates as the individual treatments without decreasing the % roots. It was odd to see that none of the treatments were better than the un-treated controls. The only single treatment that resulted in roots the same as the water-treated control was the Phyton 27 drench.

It is hard to see where using any fungicides or bactericides in calla production is beneficial. In some cases, it even looks like some of the drenches were harmful to the roots. Before, I give up completely we will do a few more trials.

One of the important things I learned in these trials is that the tops do not reflect the roots until it is too late to control root loss. Please do yourself a favor and check the roots periodically on all of your crops. None of our fungicides are so effective that they can resurrect a dead root system. Give them a chance—treat preventatively where warranted and check the roots frequently for signs of off color, sloughing, dead tips and poor growth.

Endorse is Labeled for Ornamentals

Endorse has been labeled for turf for several years but recently received an ornamental label. Endorse has a new active ingredient, polyoxin D zinc salt. Endorse is legal for use throughout the US with the notable exception of Arizona, California, New York and Texas. The target diseases include *Alternaria*, downy mildew, powdery mildew, *Colletotrichum*, *Curvularia*, and *Rhizoctonia*. Preventative sprays at 1.1-2.2 lbs/100 gal are recommended on a 7-10 day interval. Endorse is also labeled for

Apple scab. We started doing trials on Endorse for Cleary Chemical in 2003. We also summarized results from a number of trials performed by Dr. Mary Hausbeck (Michigan State University). The results of those trials are shown in the table below. As you can see we tested the fungicide extensively for *Botrytis* control with results from mediocre (some) to very good. The variability of the results may have resulted in label. Endorse was not effective on *Myrothecium*, *Sclerotinia* or

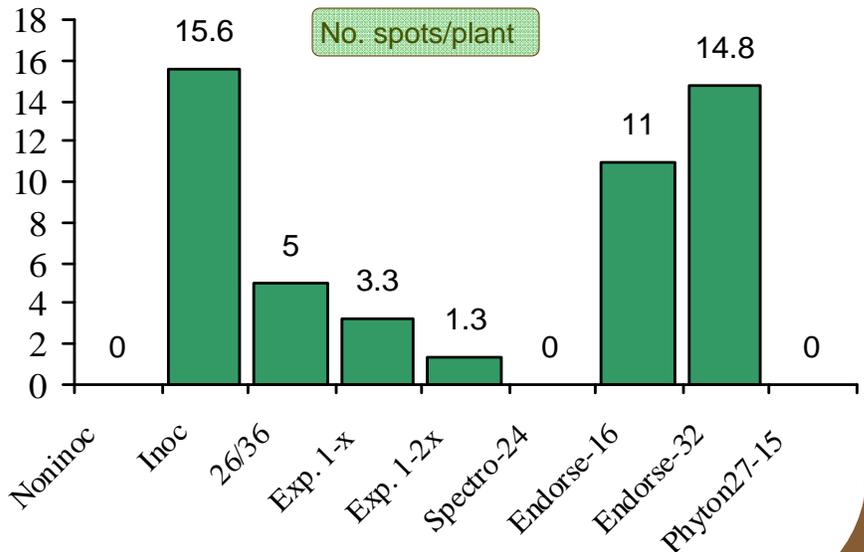
Colletotrichum. Our most recent trial on *Cyclamen* anthracnose (*Colletotrichum gloeosporioides*) is shown below. Some of the best targets for Endorse are *Alternaria* leaf spots, downy mildew and *Rhizoctonia*. Be sure to follow the label directions and start with the lower rate suggestion since residue can be significant if you apply the 2.2 lb/100 gal rate on many crops. I am looking forward to a full 50 state registration as soon as possible as well as label expansions.

| Pathogen | Plant | Rate/100 gal | Result |
|-----------------------|---|--------------|------------------------|
| <i>Alternaria</i> | Zinnia | 2.2 lbs | Excellent |
| <i>Botrytis</i> | Cyclamen, Geranium, Petunia, Poinsettia | 0.55-2.2 lbs | Some to very good |
| <i>Colletotrichum</i> | Cyclamen | 1-2 lbs | None |
| <i>Fusarium</i> | Cyclamen | 0.55-2.2 | Very good |
| <i>Myrothecium</i> | New Guinea Impatiens | 14 oz | None |
| <i>Peronospora</i> | Snapdragon | 0.55-2.2 lbs | Very good to excellent |
| <i>Rhizoctonia</i> | Zinnia | 1.1-2.2 lbs | Excellent |
| <i>Sclerotinia</i> | Petunia | 0.55-2.2 | None |



Rose downy mildew is one good target for Endorse Wettable Powder Turf Fungicide

We performed another *Cyclamen* anthracnose trial recently. This time we used 'Intermezzo Laser Mixed' and started applications on 26 February. The fungicides were applied four times on a weekly interval with the inoculation occurring 2 days after the second application. The number of spots per plant was recorded one week after the final fungicide application. We also rated number of open flowers and top grade finding that neither one was affected by treatment. 26/36 (a combo of 26019 and 3336) was used at 64 oz/100 gal with moderate results. An experimental product also gave moderate to very good results. Excellent control was seen with Spectro 90WDG (24 oz/100 gal) and Phytion 27 (15 oz/100 gal). In this trial, Endorse failed to give significant control of anthracnose.



Efficacy of Insignia Compared to Heritage

We have been testing strobilurins for the past 13 years with the first product tested kresoxim methyl (Cygnus). The most recent entry into the ornamental market is Insignia. It is labeled throughout the US with the exception of a few states including California. However, we are starting to hear one specific question. That is which fungicide is best for each disease?

We have done a large number of trials comparing four of the strobilurins in efficacy on a wide variety of pathogens. The table below shows some of the results for two of these fungicides when they were tested in the same trial. The first thing you must recognize is that the level of active ingredient (ai) in Heritage is 50% while the level of ai in Insignia is

only 20%. That means that if the two active ingredients were equal in efficacy it would take 2.5 times as much Insignia as Heritage to give the same amount of ai in an application. So to compare the fungicides I adjusted the rates to reflect this difference and then checked efficacy results. The middle column in the table reflects the results of these comparisons.

| Pathogen (disease) | Insignia compared to Heritage | Higher efficacy based on equal ai |
|-------------------------|--------------------------------|-----------------------------------|
| <i>Alternaria</i> | Same control at 2x | Equal |
| <i>Botrytis cinerea</i> | At little better control at 2x | Insignia |
| <i>Cercospora</i> | Same control at 2-4x | Equal |
| <i>Cercosporidium</i> | Same control at 4x | Heritage |
| <i>Coniothyrium</i> | Same control at 4x | Heritage |
| <i>Cylindrocladium</i> | Same control at 10x | Heritage |
| Downy mildew | Same control at 4x | Heritage |
| <i>Fusarium</i> | A little better control at 4x | Equal |
| <i>Mycocentrospora</i> | Better control at 2.5x | Insignia |
| <i>Myrothecium</i> | Better control at 12x | Heritage |
| <i>Phyllosticta</i> | Less control at 2 x | Heritage |
| <i>Phytophthora</i> | Same control at 10x | Heritage |
| Powdery mildew | Same control at 4x | Heritage |
| <i>Rhizoctonia</i> | Same control at 3-8x | Heritage |
| Rust | Less control up to 8x | Heritage |
| <i>Sclerotinia</i> | Less control at 2-4x | Heritage |
| <i>Sphaceloma</i> | Same control at same rate | Equal |

For example, our trials (and others) have shown that it takes twice as much Insignia as Heritage to give equal control. The final column reflects this by the conclusion that the two products are equal.

The next entry shows that Insignia gives a little better control than Heritage when used at twice the rate of Heritage. This leads me to conclude that Insignia is more effective than Heritage when used at the same rate for Botrytis.

Insignia and Heritage work about the same for *Alternaria* leaf spot, *Cercospora* leaf spot, *Fusarium* wilt and stem rot and scab (*Sphaceloma*). Insignia works a little better than Heritage for Botrytis blight and *Mycocentrospora* leaf spot. Heritage works a little better than Insignia for *Cercosporidium* canker, *Coniothyrium* canker, *Cylindrocladium* cutting rot (and root rot on *Spathiphyllum*), downy mildew, *Myrothecium* leaf spot, *Phyllosticta* (anthracnose), powdery mildew, *Rhizoctonia*, rust and *Sclerotinia* blight.

Be sure to check pricing to make a final conclusion. These products are overall very similar in efficacy.



Powdery mildew on crape myrtle (A), rust on Dianthus (B) and Botrytis on azalea (C) are all good targets for strobilurins like Heritage and Insignia.