

CHASE NEWS

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CHASE HORTICULTURAL
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Some Recent Disease Sightings From Our Lab

I thought you might be interested in seeing images of some typical samples of winter-time diseases. Some of the samples have been one of a kind such as the rust disease on the Artemesia (A). The characteristic brown pustules of Puccinia rust were evident on the leaf undersides but not the tops. Be sure to turn leaves over when you examine your crops.

Others like the Botrytis on lavender (B) are common for this time of year and we have seen a series come into the lab. The typical symptom is death of a portion of the stems. Sometimes the gray-brown spores of the fungus are present but not always. We see this on rosemary too. We have some left in a greenhouse with high light that were quite healthy. Unfortunately, I had them moved into another greenhouse with LOW light and they started to show Botrytis blight. It started on old flowers and moved right into the stems. The difference in light level affected the relative humidity just enough to favor diseases.

Another disease to watch for right now is downy mildew. The image to the right on rose shows what stem infections can look like (C).

Another disease that has appeared is Diplodia leaf spot on Pittosporum (D). We have received tree samples in the past three weeks. The disease is apparently a winter disease since we have not seen this before when the plants are actively growing.

Finally, we have been seeing some Colletotrichum (anthracnose) on tropical plants. The Spathiphyllum (E) shows some of the tiny black fruiting bodies typical of this pathogen.

Remember to send samples of problems you do not readily recognize to a lab to confirm cause and therefore the best control strategy.



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Powdery Mildew Control on Rose

Part of our diagnostic service is recommending a control strategy for samples we receive. One of the most important questions is how long to I have to keep spraying to maintain disease control? As a result of a teleconference I participated in last summer on Clevis, we started testing the longevity of some fungicides used to control of common diseases.

One of the first trials we performed was on 'Nearly Wild Pink' rose infected with a low level of powdery mildew (*Sphaerotheca pannosa*). The products included were: Clevis (a combination of myclobutanil and mancozeb) at 1 or 2 lb/100 gal (the labeled rate of 2 lbs/100 gal), Eagle 40W (myclobutanil) at 4 oz/100 gal, Protect T&O (mancozeb) at 16 oz/100 gal, Insignia (pyraclostrobin) at 8 oz/100 gal alone and in combination with Sync (an adjuvant), Sync at 16 oz/100 gal and Actinovate (*Streptomyces* biocontrol) at 6 oz/100 gal.

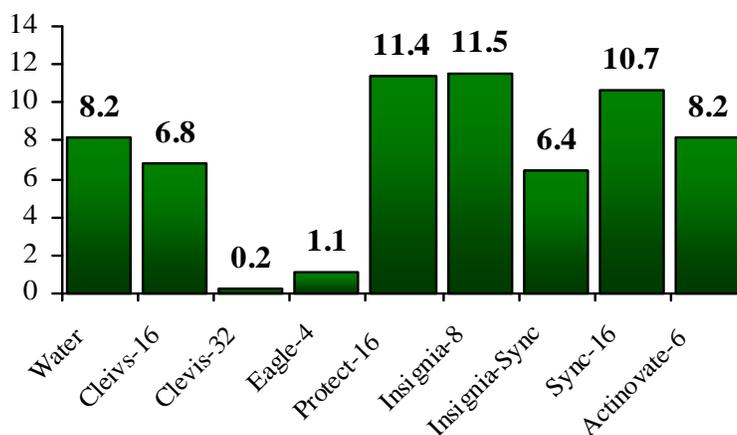
Plants were sprayed three times to drip (7, 12 and 20 November, 2007). Plants were placed in a large mass after the final spray to allow easy movement of powdery mildew conidia between plants. Then we just waited to see what happened. Our first rating of powder mildew (colonies per plant) was made on 3 December and this continued every week until 11 January. The graph below shows the data we collected on the last rating date.

The best long term prevention of powdery mildew in this trial was achieved with Clevis at 32 oz/100 gal and Eagle at 4 oz/100 gal. Protect T&O, Insignia alone, Sync alone and Actinovate did not stop the powdery mildew from recolonizing the roses. The addition of Sync to Insignia did perform better than either product alone. I believe this shows improved coverage and perhaps maintenance of product on the leaf surface afforded by the adjuvant. We are in the process of completing a similar trial on gerber daisy powdery mildew and should be reporting on those results next month in Chase News.

The second trial we completed in January on rose powdery mildew was performed to test some new active ingredients for their ability to eradicate disease. In this case, we allowed a moderate infection of powdery mildew to develop before we starting fungicide applications. Another set of 'Nearly Wild Pink' were used. In this test, plants were sprayed on 27 November, 11 and 18 December and 2 and 9 January. The treatments that were not covered in a secrecy agreement were: Eagle 40WP (4 oz/100 gal), Heritage (azoxystrobin at 4 oz/100 gal), Banner MAXX (propiconazole at 4 oz/100 gal), Trinity (triticonazole—not registered for ornamentals at this time—at 4 oz/100 gal) and Compass O (trifloxystrobin at 4 oz/100 gal). The number of powdery mildew colonies per plant was recorded five times during the trial.



Suppression of Rose powdery mildew with fungicides—test 1. Number powdery mildew colonies per plant on 11 January 2008 is given.



The best eradication in this trial was achieved with the sterol inhibitors Eagle (60%) and Banner MAXX (65%). Trinity (also a sterol inhibitor) did not do as well with only 36% control. The strobilurins fungicides Heritage and Compass O also gave relatively lower control with 10% and 29% control, respectively. When rose powdery mildew reaches a moderate severity it may not be possible to eradicate even with excellent fungicides used repeatedly. Treating early will save you money with less fungicide applications and overall far better control.

In general, sterol inhibitors fungicides like Eagle and Banner MAXX as well as strobilurins like Compass O, Insignia and Heritage are excellent choices for powdery mildew diseases on ornamentals. On rose, however, the strobilurins have not performed very well on ROSE powdery mildew. On roses, alternating a sterol inhibitor with a copper product or mancozeb may be more effective than the sterol inhibitor/strobilurin alternation that works so well on other crops.

Botrytis Control on Cyclamen and Pansy Flowers

Over the past two months Botrytis has been gaining ground in our research greenhouses. We save certain types of plants every fall in preparation for this event so we can do some work on new and established fungicides for control of the ubiquitous disease. We started a trial in the beginning of January with both pansy ‘XXL Purple’ and cyclamen ‘Concerto Rose Figaro’. The pansy trial was conducted in an unheated greenhouse that saw low temperatures in the low 30’s and the cyclamen trial was conducted in a greenhouse that was maintained at about 50 F.



The treatments in the two trials were identical and included: water, an experimental fungicide at three rates, Sporan (a mixture of essential oils) at 64 oz/100 gal, Palladium (a combination of fludioxinil and cyprodinil) at 4 oz/100 gal, Medallion (fludioxinil) at 4 oz/100 gal, a total release fungicide and Ultra Pure Oil at either 0.5% or 1%. The products were applied to drip on 7, 14, 21 and 28 January. We recorded phytotoxicity on the flowers, residue and severity of Botrytis in each trial. Botrytis on the Cyclamen was rated on a severity scale: 1 (none), 2 (slight), 3 (moderate) and 4 (severe). Botrytis on the pansy was recorded as the number of flowers per pot with sporulation.

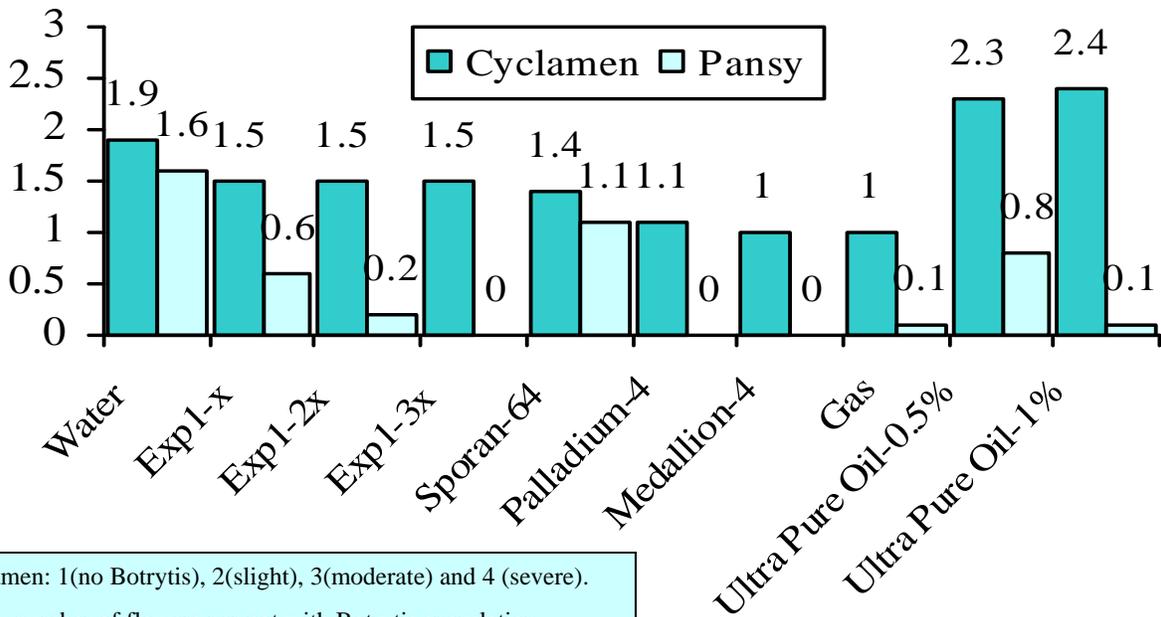
We saw slight to moderate flower damage with the Sporan that appeared as white blotches on both pansy and cyclamen. All other products were safe in this trial. The highest rate of the experimental fungicide and the Medallion



resulted in slight but significant residue. All other products left no more residue than the water sprayed controls.

The most effective fungicides in this trial were Palladium and Medallion which had no disease in either trial (1=none for the cyclamen). The total release gas was also extremely effective in both trials with no disease on cyclamen (1) and very slight disease on the pansy (0.1).

Sporan was somewhat effective in both trials. The Ultra Pure Oil was not effective in the cyclamen trial but was very effective at the 1% rate in the pansy trial (0.1). Finally, the experimental fungicide was somewhat effective on the cyclamen but very effective at the higher rates in the pansy trial. Since flowers are especially sensitive more work is need on leaves to determine efficacy and safety of these products on plants without open flowers.



Cyclamen: 1(no Botrytis), 2(slight), 3(moderate) and 4 (severe).

Pansy: number of flowers per pot with Botrytis sporulation.

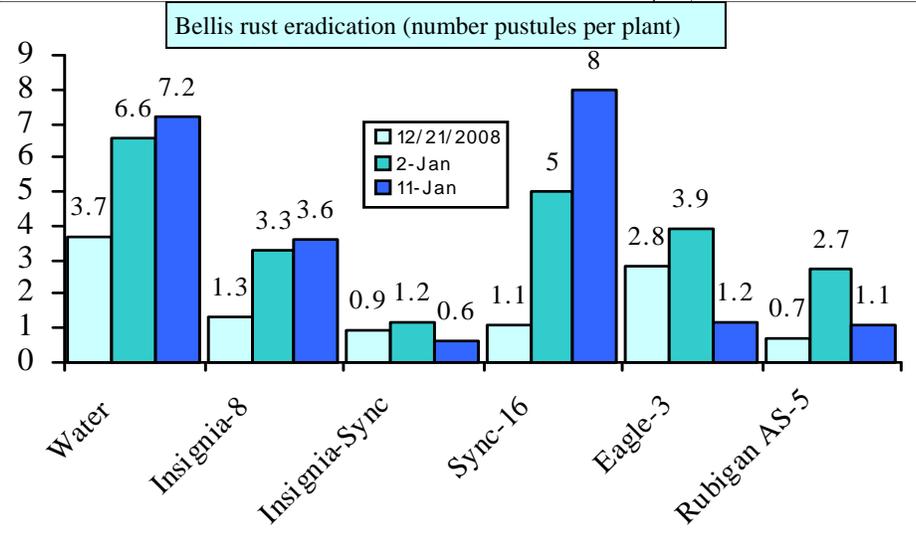
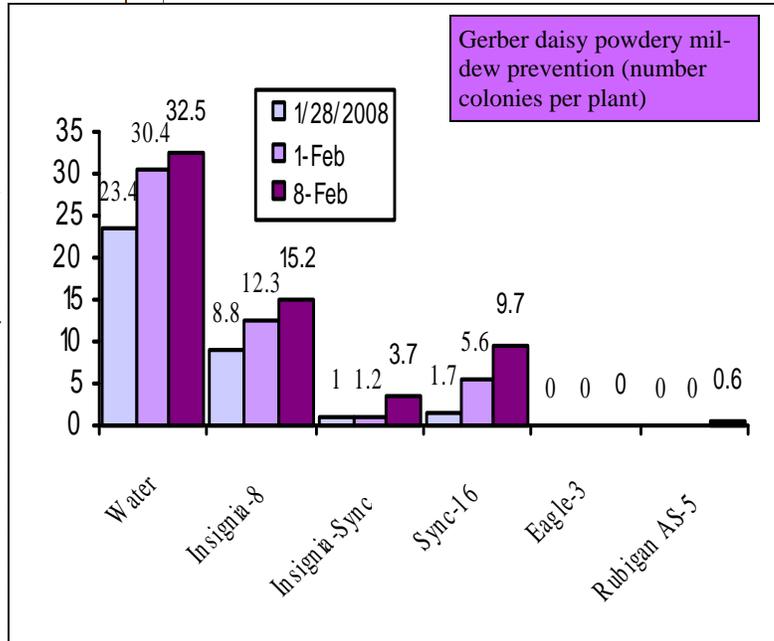
Improving Fungicide Efficacy with Wetting Agents

We are continuing our testing on the ability of various fungicides and wetting agents to improve longevity of disease control. In many cases, we prefer not to recommend that spraying continues indefinitely. We completed two trials recently using the same fungicides. In the first case, we tested their ability to eradicate rust on Bellis and in the second we tested them for prevention of powdery mildew on gerber daisy.

The fungicides were Insignia (8 oz/100 gal), Insignia (same rate) combined with Sync (a wetting agent - at 176 oz/100 gal), Sync alone (16 oz/100 gal), Eagle 40W (3 oz/100 gal) and Rubigan AS (5 oz/100 gal).

For the Bellis trial we collected plants (six-pack size) that were moderately infected with rust (Coleosporium). The sprays were applied on 3 and 20 December and 4 January. Rust severity was rated before the first spray to make sure disease was uniform and then weekly until the final rating on 11 January. The graph below shows three of the ratings. As you can tell, rust severity increased for the water control and Sync alone. The increase was less dramatic for the Insignia alone and the addition of Sync was very effective in controlling the increase in Bellis rust. Eagle and Rubigan AS were very effective when used on the 7 day interval but less so when the 14 day interval that occurred over the holidays. In this case, eradication of rust was much more effective when Insignia was used in combination with the wetting agent Sync. This may be due to simple coverage or penetration issues but also may be due to the ability longevity. Note that on the first rating date, the disease was about the same for both treatments, while at the end of 14-day interim before the second rating, disease had increased on the Insignia alone considerably more than when Sync was added.

The second trial was run on gerber daisy that did not have any powdery mildew when the trial started. The inoculum was added by way of scattering infected plants throughout the experiment and allowing fans to move the spores. In this case, sprays were made on December 7th and again on January 4th. Powdery mildew started to appear on soe plants about 3 weeks after the final spray and the first rating was made on January 28th and continued for a total of



three weeks. Disease severity was recorded as the number of powdery mildew colonies per plant.

Insignia alone was somewhat effective in preventing powdery mildew but as with the rust, prevention was excellent when Sync was added. Sync alone was somewhat effective on powdery mildew but by 4 weeks after its application, powdery mildew was starting to increase on those plants. Eagle and Rubigan AS were also excellent at preventing powdery mildew on gerber daisy in this trial up to 4 weeks after their application.

We are doing a trial to test longevity of fungicides to control Botrytis blight and one on the most effective fungicides for Botrytis with and without a Capsil. In both trials, the plants were infected with Botrytis before the first fungicide application. Results—next month!

Products in Review—Chipco 26019

One of the best general fungicides I have worked with over the past 30 years has been Chipco 26019 (iprodone). I first worked with it at the University of Florida on foliage pant diseases like *Alternaria* (schefflera) and *Fusarium* (dracaenas) leaf spots, *Myrothecium* petiole rot (syngonium and spathiphyllum) and *Rhizoctonia* aerial blight (Boston fern, English ivy and pothos). In each disease, the fungicide gave very good control of these diseases. In most trials, we tested Chipco 26019 as a foliar spray at 16 oz/100 gal) with repeat applications on a 7-14 day interval.

Since starting our business in California we have tested this fungicide many times for *Botrytis* and *Sclerotinia* control on a wide range of flowering crops. Unlike some of the other fungicides for *Botrytis*, Chipco 26019, has been generally safe even on open flowers in our trials. We have seen it cause veinal chlorosis on petunias in our *Sclerotinia* trials.

A few years ago, when Chipco 26GT was being developed we tested both formulations for safety and efficacy. In our trials we generally saw that the WP formulation of Chipco 26019 was a little safer and a little more efficacious than the flowable formulation of Chipco 26GT.

This fungicide makes a good rotation partner for a wide range of foliar diseases and offers a distinct mode of action, affording resistance management in many cases. The rows in blue show cases where use of Chipco 26019 can provide excellent control.

Myrothecium on dieffenbachia, Botrytis on cyclamen and Sclerotinia on lobelia (left to right).



Alternaria leaf spot on Alstroemeria (left) and Fusarium crown rot on Dianthus (left plant in right image)

Disease	Plants Tested	Effect
Alternaria	Impatiens, lobelia, pansy, zinnia	Very good to excellent
Botrytis	Cyclamen, exacum, fuschia, geranium, gerber daisy, lisianthus, mum, pansy, petunia, poinsettia, primrose, ranunculus	Excellent
Cercospora	Moluccella	Some
Colletotrichum	Cyclamen	None
Coniothyrium	Rose	Very good
Fusarium	Cyclamen, holiday cacti, lisianthus	Very good
Gliocladium	Palm	Good
Myrothecium	Pansy	Very good
Rhizoctonia	Fern, impatiens, poinsettia, pothos	Good to excellent
Sclerotinia	Petunia, primula, stock	Some to excellent
Thielaviopsis	Vinca	None



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