



WINTER WOES—GRAY MOLD AND DOWNY MILDEW

What's so special about winter that makes Botrytis and downy mildew fungi so much of a problem this time of year? Both Botrytis and the downy mildew fungi grow best when conditions are cool (60-70F) and moist (mainly from high humidity). Downy mildew fungi, like Peronospora, are most active when the humidity is high, but do not really like being rained on constantly.

Botrytis, on the other hand, will simply wait out the excessive wet and sporulate in any window of slightly drier conditions. Botrytis seems to be a problem in most of the country during the winter unless you live in an area where you cannot grow plants without a high quality greenhouse.

In the northeast, conditions outside can be so bad that use of heat in the greenhouse lowers the relative humidity below the level that favors Botrytis. Using a variety of fungicides will be very effective in these conditions since the fungus is not doing well in the first place. California especially has a very mild coastal climate which allows ornamental producers to use the great outdoors as their greenhouse. The plants are happy but so is Botrytis. We have to use the best fungicides to control the pathogen year round.

On the West Coast (California, Washington and Oregon), downy mildew is a year round concern. For the rest of the country, winter has been the most likely time to encounter and engage the downy mildews in a fungicide fight. Over the past five years, we have started seeing some downy mildew fungi, like the one that attacks Salvia, during the spring, fall and occasionally the summer months. These fungi appear to be adapting to our production conditions quickly.

A Gallery of Botrytis Blight



In the same five to ten years, we have seen many new fungicides developed for use against one or the other of these winter pathogens. Medallion (fludioxinil) was developed in the early 1990's and does a very good to excellent job on Botrytis. Decree (fenhexamid) came into the picture more recently and also targets Botrytis. Most recently, we saw the introduction of Stature (dimethomorph and mancozeb). It is an excellent downy mildew fungicide.

On the following pages I have presented the most current research on both Botrytis control and downy mildew control. You will note a number of experimental compounds that are in development. Some are legal for use on other crops while a few are farther back in the development process.

While it may be frustrating to read about something that is not available at least you can have hope for the future.

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CONTROL OF BOTRYTIS BLIGHT ON GERANIUMS

A few weeks ago we completed our first Botrytis trials of the season. Our target was geraniums. We had quite a number available for some ongoing Pythium work and decided to use many of them in the two Botrytis trials reported here.

The first trial (bottom-left) was conducted with plants showing moderate signs of Botrytis infection. We made sure all of the plants looked about the same and put out a single application of some of the best fungicides for Botrytis prevention. The best control was found on plants treated with 2 oz/100 gal of Medallion. A single spray of Decree at 16 oz was not effective while Chipco 26GT at 1.5 quarts resulted in a 50% reduction of disease. Finally, Daconil Ultrex (1.4 lb/100 gal) only reduced disease about 30%. This test indicates that a single application of Medallion was most effective.

The other trial was conducted with geraniums that were apparently healthy. They were from the same batch of plants used in the first trial so they were infected but not showing symptoms. This trial was conducted with three sprays on a 7 day interval including some experimental products.

The first product (A) is similar to hydrogen peroxide and only the highest rate affected Botrytis development. The second product is Endorse (Endor). This fungicide

is currently labeled for use on turf by Cleary Chemical. It performed well when used at the 1.1 or 2.2 lb/100 gal rates. The third product is Spectro 90 WDG (also from Cleary). Spectro has chlorothalonil and is known to be effective on Botrytis. In this trial, control was not very high. The next product is Chipco 26GT (1.5 quart/100 gal). This is another fungicide known for Botrytis control since it contains iprodione. It is interesting that it did not perform well in this trial either. The final experimental compound is in yet another group of chemicals. The good news is that this one appears to do pretty well against Botrytis.

Despite the relatively poor showing of some of the industry standards I still have to rank the best Botrytis compounds as shown in the table below.

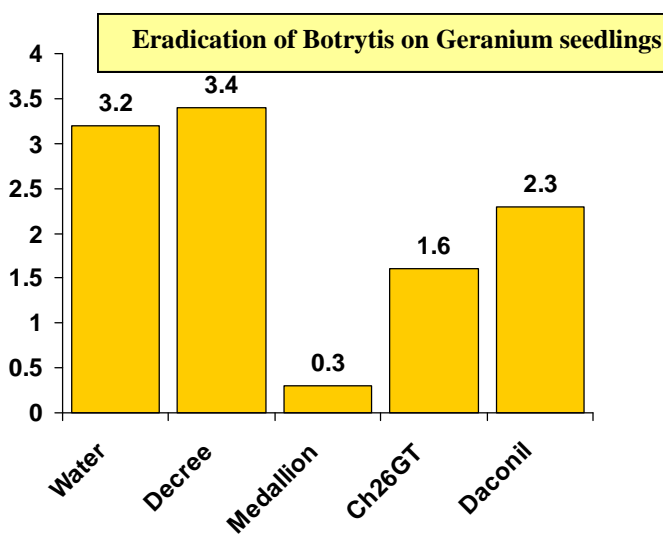
We will be testing both the "A" and "B" products as well as Endorse in other trials this year and hope to find more uses for these new products.

Geraniums express symptoms of Botrytis from flower blight, leaf spot, cutting rot and, in this case, the beginning of complete collapse from stem rot.

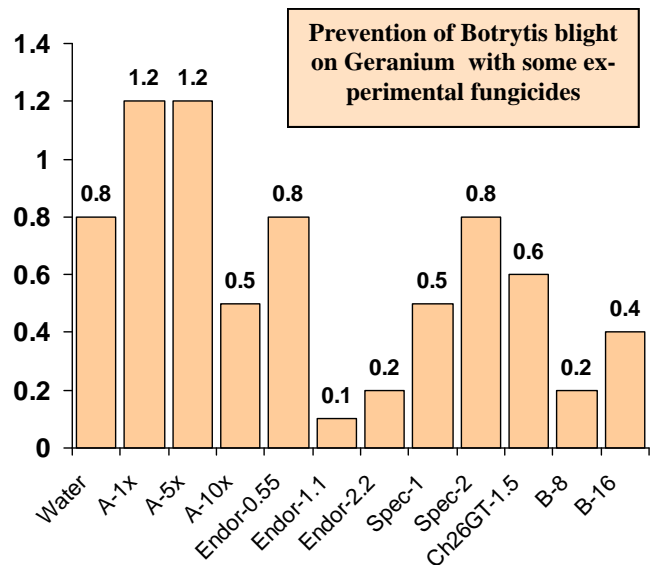


Check the next page for another trial with Endorse

Trade names	Active ingredient
Chipco 26GT, Sextant	iprodione
Daconil, PathGuard, Spectro and others	chlorothalonil
Decree	fenhexamid
Medallion	fludioxinil



The graph shows the average number of leaves/plant (above the bars) with active Botrytis after a single spray.



The graph shows the average number of leaves per plant (above the bar) with active Botrytis blight after three sprays.

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Pansy Downy Mildew

It started feeling like “downy weather” in November of last year when the first big storm hit us. We had some pansies (Crown Yellow) that showed downy mildew and decided to try an eradication trial with all of the strobilurin fungicides we could find (Compass, Cygnus, Heritage, and BAS500) as well as some industry standards like Aliette. The graph to the right shows the results of three weekly sprays with these products.

Best control was found with Aliette at 32 oz/100 gal, although 16 oz/100 gal was almost as good.

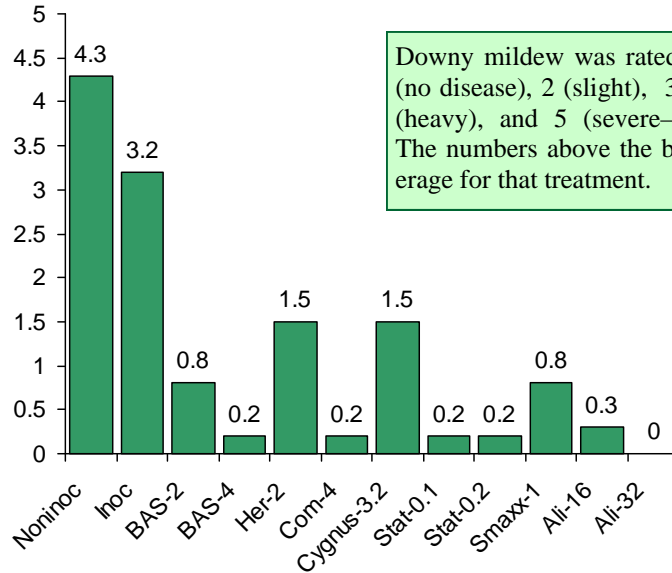
Our trials last year showed best eradication of this disease with Stature DM at 0.8 lb/100 gal (not labeled yet—only has dimethomorph). We had three rates (0.1, 0.2 and 0.4 lb/100 gal) and each gave an excellent response.

The strobilurins were tested at different rates to reflect previous research. BAS500 and Compass, each at 4 oz/100 gal. Cygnus (3.2 oz/100 gal) was good but not as good as Compass or the higher rate of BAS500. Heritage at 2 oz/100 gal gave control similar to Cygnus.

The final note on this test regards use of Subdue Maxx as a foliar spray. Although it can be very effective I must remind you - IT IS ILLEGAL!!!!

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Downy mildew was rated as follows: 1 (no disease), 2 (slight), 3 (moderate), 4 (heavy), and 5 (severe—plant dying). The numbers above the bars are the average for that treatment.

Controlling Alternaria leaf spot on Impatiens

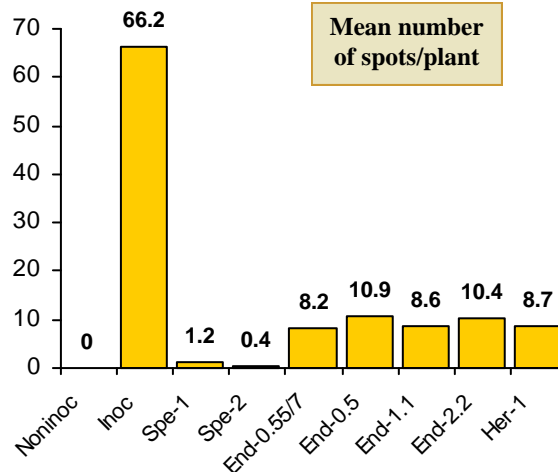
We have been testing an experimental fungicide from Cleary Chemical during the past year. In November 2002, we completed a trial on prevention of Alternaria leaf spot on Impatiens. Comparisons were made at three rates and two spray intervals with Spectro 90WDG (1 and 2 lb/100 gal) and Heritage (1 oz/100 gal). The graph to the right shows the response of the disease after two or three applications (most products were used on a 14-day interval).



While it is clear from this trial that all fungicides gave very good control of this disease, best control was found on those sprayed with Spectro at 1 or 2 lbs/100 gal. Endorse performed as well at 0.55 lb/100 gal on a weekly interval as it did on a 14 day interval at the same rate. Increasing the rates to 1.1 or 2.2

did not result in better disease control for this product.

Heritage gave about the same degree of control as the other products but Spectro was best in the trial. We have seen chlorothalonil (one of the ingredients in Spectro) give very good to excellent results in nearly all Alternaria leaf spot trials over the past 20 years. In contrast, strobilurins, like Heritage, give very good to excellent control in about 50% of the trials we have conducted. Under slight to moderate disease pressure, they may be good choices in a rotation program for Alternaria leaf spot. Under heavy disease pressure, a product with chlorothalonil is a better choice.



PRODUCTS IN REVIEW—MANCOZEB

Mancozeb products are among the oldest in our fungicide arsenal. They are very inexpensive to use, relatively safe and have a broad-spectrum of activity against foliar diseases. They are also so general in their effect on the fungi they are used against that resistance is very unlikely to develop. One of their most limitations is residue that can on some crops reduce salability of the crop. When mixed with a copper product they provide a very effective foliar disease product since nearly all fungal and bacterial pathogens can be controlled with this combination. The unfortunate residue that certain mixtures create is almost legendary in the southeast where leaf spots are rampant.

Do not drench plants with any mancozeb. Roots may be killed on many of the most common bedding,

foliage and flower crops. Woody ornamentals appear somewhat resistant to this damage but it is not a safe or effective use of mancozeb. The mancozeb products I am most familiar with include Dithane, Junction (mancozeb mixed with copper) and Protect. We have found good to very good control of Alternaria leaf spot, anthracnose (Colletotrichum), downy mildew and rust. In addition, control of poinsettia scab has been good to excellent.

We have never gotten good control of Myrothecium (Florida and California work) with any mancozeb product. Sometimes, we obtain control of Rhizoctonia but since the products should not be drenched or sprenched only aerial Rhizoctonia is a suitable target for mancozeb fungicides.

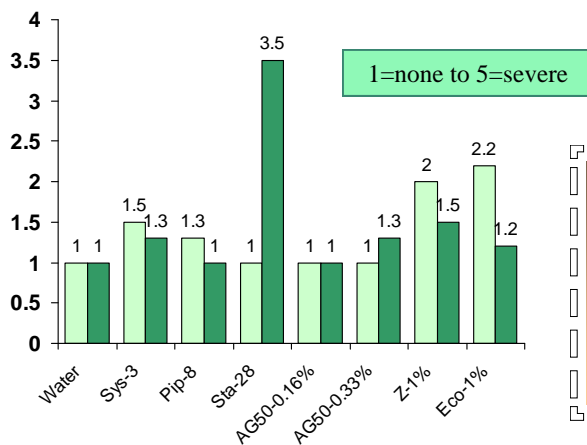
Powdery Mildew Trial on Gerber Daisies

Here is the only powdery mildew trial we were able to complete last year. Gerber daisies are usually a great host for this disease and can be sensitive to fungicides. In this trial, we sprayed small plants three times on a 7-day interval and then rated phytotoxicity and residue (chart below).

We saw slight speckling on plants sprayed with ZeroTol or EcoClean each at 1% (these products are similar chemically). None of the other fungicides damaged these Gerber daisies ('Semi-double Salmon') although Stature left a moderate residue that might affect salability of a pot crop.

Disease control was excellent with Systhane 40WP (3 oz/100 gal), Pipron (4 oz), Stature (28 oz), and AGRI-50 (0.16 or 0.33%). EcoClean gave very good control at 1% but ZeroTol provided only slight control.

This year we have a long lineup of products to trial for powdery mildew control—watch for results by summer.



FROM THE TRADESHOW FLOOR MIKE ZEMKE

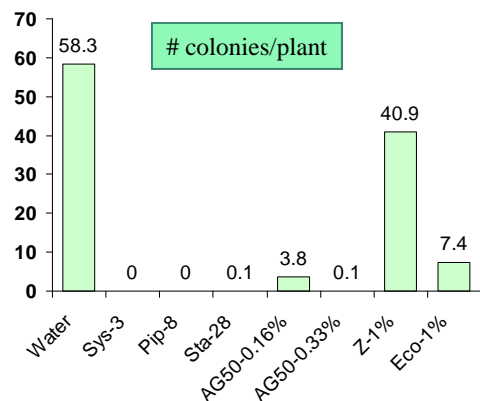
We just returned from TPIE (Tropical Plant Industry Exposition) in Ft. Lauderdale. This show features plants and services for the production of tropical plants, especially those we used to refer to as houseplants.

The show was good with a wide variety of interesting products, although it seemed to me and a few other exhibitors that attendance was down from last year. It's always nice meeting new people and trying to meet their needs. We were there for the entire week, and had the chance to get some consulting work in before the show started. We even met with our publishing advisor and have some exciting new products in the pipeline.

The weather was nice, but started to cool down towards the end of the week. It was a challenge to navigate Ft. Lauderdale but by the end of the week we were getting lost less often.

The next show we will attend is the SAF Pest Management conference in Orlando, February 25th-27th, so mark your calendars! It's a good conference to go to with most of the industry's pesticide suppliers attending.
Mike

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CHASE RESEARCH GARDENS, INC.

8031 Mt. Aukum Rd., Suite F, Box 529

Mt. Aukum, CA 95656-0529

Phone/FAX (530)620-1624

mtaukum@directcon.net

