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CHASE NEWS

CHASE RESEARCH GARDENS, INC.

SAF Pest Management Fungicide Survey

In November, SAF sent out a brief survey concerning pest control to all its members. The major questions were what growers felt the key pests were and how they controlled them. About 45 people responded by sending in their comments.

One of the most important goals of the survey was identifying problem areas where pests are poorly controlled with any of the methods available. The respondents rated these pests for their difficulty to control and then what products or control methods they used for each. Only 33 surveys were used for this information as the others were incomplete, from outside the US or otherwise could not be used. I have made tables for the pests in each group as the growers reported their frequency and difficulty of control. Additional tables show the products listed as most effective for each disease as well as a final table in each set for the products used the most overall. This gives us an idea of which products the growers felt worked on each pest group.

The least commonly reported disease problems were black root rot (*Thielaviopsis*) and Cylindrocladium. This is probably due to the relatively small host range for these two fungal pathogens. The most common diseases were Botrytis, powdery mildew and Pythium, as one might expect. All of these pathogens have very broad host ranges and affect nearly all types of ornamentals from cut flowers to bedding plants to woody ornamentals. The diseases judged most difficult to control were bacteria, downy mildew and Pythium.

While bacteria are very difficult to control even under ideal conditions, both downy mildew and Pythium are relatively easy to prevent. This indicates that growers do not routinely engage in preventative programs for these diseases. The least difficult diseases to control were Alternaria and other leaf spots, Cylindrocladium (I don't understand this!), and Thielaviopsis. I think the last two were judged easy to control since few growers encounter them. There are really no great choices (chemically) for black root rot control and even the best products for Cylindrocladium do not give excellent results. The most frequent bactericide/fungicide listing for each disease type is given in the first table on the next page.

There are many other fungicides used for Alternaria than those listed below. I would agree with those chosen as the best broad spectrum products available. The choice for bacterial disease control was an overwhelming endorsement of Phyton 27. Very few growers reported using other copper products. Likewise, the fungicides reported for Botrytis match rankings I have come to after years of research trials and growers visits.

Botrytis Blight—a difficult and common disease.

Table 1. Top Diseases and Control Difficulty.

Pest Category	Common	Difficulty of control
Alternaria and other leaf spots	Moderate	Low
Bacteria	Moderate	High
Botrytis	High	High-moderate
Cylindrocladium	Low-moderate	Low
Downy mildew	Moderate	High
Phytophthora	Moderate	High-moderate
Powdery mildew	High	Moderate
Pythium	High	High
Rhizoctonia	Moderate-high	Moderate
Rust	Low	Moderate
Thielaviopsis (Black root rot)	Very low	Low

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Table 2. Top listings for control of specific diseases on ornamentals.

Pathogen	First listing	Second listing	Third listing
Alternaria	Daconil, Heritage, Medallion	Compass	Spectro, Zyban
Bacteria	Phyton	Camelot	ZeroTol
Botrytis	Decree	Chipco 26GT, 26019	Daconil
Cylindrocladium	Medallion, Cleary 3336	Terraguard	
Downy mildew	Aliette	Heritage	Dithane
Phytophthora	Subdue Maxx	Aliette	
Powdery mildew	Systhane	Compass	Pipron
Pythium	Subdue Maxx	Aliette	Truban
Rhizoctonia	Medallion	Cleary 3336	Terraclor
Rust	Systhane	Heritage	Banner Maxx, Strike
Thielaviopsis	Cleary 3336	Medallion, Terraguard	

Interestingly enough, there were some ineffective choices listed for downy mildew and Phytophthora control although the most commonly used products are very effective for these diseases.

I also checked for products with the most use overall for any disease. Subdue Maxx was one of the products with the most reported uses probably due to the prevalence of Pythium and Phytophthora as well as the relatively low cost of application. Aliette is also used quite a bit for much the same reasons.

It was interesting to see how much Heritage is used. This is partially due to the broad spectrum of activity for the fungicide as well as (perhaps) marketing prowess. It is a relatively expensive product to use but can be exceptionally effective on some tough diseases (Fusarium and Cylindrocladium). It also gives good control of many common diseases such as fungal leaf spots, Rhizoctonia and powdery mildew and rust.

Medallion also has high reported usage despite the fact that it does not control many of the most common diseases such as Pythium, Phytophthora, rust and powdery mildew. The benefits of Medallion for Botrytis and Sclerotinia, many fungal leaf spots, black root rot and of course Rhizoctonia make its use very common.

Most of the products in the first column are effective as tank mix partners for broad spectrum root disease control which does much to explain their high use.

Products in the moderate use range include some very broad-spectrum chemicals such as copper (Phyton 27) and Compass but also some more restricted fungicides such as Decree (Botrytis mainly).

The lowest reported uses encompass a number of older compounds such as mancozeb (Dithane), Banrot, Truban and Terraclor. These products remain integral parts of many disease prevention programs throughout the country and indeed worldwide. Mike and I are going to Australia to help launch two new products for Scotts - Banrot and Zyban. It is important to remember that new is not always better. Rotations between new products like Heritage and older standards like Banrot might be the best way to go.

These results were merely the tip of the iceberg. I present the information here for reference only since the survey was hardly definitive.

Table 3. Commonly used Fungicides for Disease Control on Ornamentals

High use	Moderate use	Some use
Subdue Maxx	Phyton 27	Dithane
Heritage	Daconil	Terraguard
Aliette	Decree	Banrot
3336	Systhane	Spectro
Medallion	Compass	Truban
Chipco 26GT/26019		Terraclor

Powdery mildew is one of the most common diseases reported by commercial growers

METHYL BROMIDE ALTERNATIVES UPDATE—SAN DIEGO

Over the past two years, we have been helping out with some methyl bromide alternative trials for cut flower production. The trials (started in October last year) were run by Dr. Clyde Elmore, weed scientist at UC Davis. This month we are updating three that are set-up in Carlsbad, California at the Flower Fields. Ranunculus were rated for weed control, possible crop damage and disease expression.

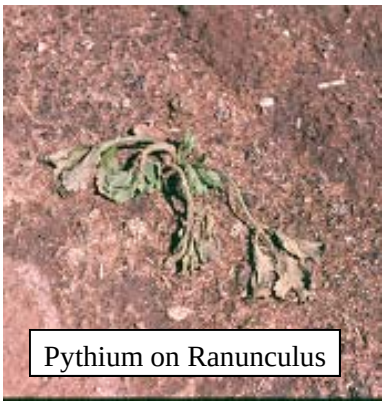
In the first trial, both Basamid and Vapam were tested with various Telone-based products. Basamid treatments were incorporated and then rolled with C-35, Telone and chloropicrin shank injected. All plots were tarped. The plant vigor on March 18 was very good for all treatments except the tarped-only control. On April 4, the number of white flowers on each plant was counted. This year's flower color is red while last year's color was white. The break-through of last year's white flowers occurred only in the control plantings. All fumigant treatments effectively stopped this from happening. The few white flowers in these plots were found on the shoulders of the beds and in the ends of the rows where the amount of product was apparently low.

The second trial is evaluating Midas in a 50-50 combination with chloropicrin. Treatments were shank applied and tarped. Two rates were compared to a methyl bromide/chloropicrin standard at 350 lbs/acre and an untreated control. Plant vigor and the degree of flowering (evaluated on 4-4) were about the same for the three fumigation treatments and were significantly better than the control. All fumigant treatments were also effective in killing last year's white flower seed compared to the control. Those that did grow were on row ends where the fumigant concentration was too low.

On April 22, we rated Pythium severity and found that the disease was moderate in the control plot. Both Midas/chloropicrin (300 lbs) and methyl bromide/chloropicrin (350 lbs) had little if any disease apparent. However, the higher rate of Midas/chloropicrin showed slight disease or at least what appears to be disease. It is possible that the wilting and yellowing typical of Pythium are due to some other factor in this treatment.

The final trial at this site was drip applied. On April 4, the degree of disease of each plot was rated using the following scale: 1 = none, 2 = few plants with wilting or stunting, 3 = up to 25% plants dead and/or showing wilting and stunting, 4 = 26-50% plants showing wilting and stunting or dead and missing, 5 = over 75% of plants in plots missing or showing wilting and stunting. All drip applied products reduced severity of Pythium significantly compared to the control. Chloropicrin (300 lbs) and both Inline treatments (150 and 300 lbs) showed no signs of Pythium at this rating. The 150 lb chloropicrin rate and the Midas/chloropicrin treatments had very few diseased plants. Sodium azide had an overall rating of about 2 (slight disease) that was mainly affected by a single replicate with higher than average disease expression (for that treatment). This may have been due to differences in application efficiency, soil conditions or even distribution of the naturally occurring Pythium inoculum. Vapam was less effective than other treatments at this rating.

All drip applied products reduced the number of white flowers that grew from last year's crop. In many treatments, the white flowers were on bed shoulders indicating that the products had not reached the entire bed as applied. Fewer white flowers occurred in Midas/pic, Vapam and chloropicrin at 300 lbs.



Pythium on Ranunculus

Typical view of control plot from the first trial is shown above with missing and dying plants.

A methyl bromide/chloropicrin plot is shown below with full stands and vigorous plants.

Drip trial results for the past month on April 4.

Treatment	Rate/acre	Disease	No. white flowers
Vapam	325 gal	2.5 c	7 a
Midas/chloropicrin	350 lbs	1.6 ab	10 a
Chloropicrin	150 lbs	1.2 a	20 a
Chloropicrin	300 lbs	1.0 a	15 a
Sodium azide	100 lbs	2.1 bc	33 a
Inline	150 gal	1.0 a	22 a
Inline	300 gal	1.0 a	35 a
Water	—	3.7 d	243 b

Disease was rated from 1 (healthy) to 5 (dead). Numbers in the same column with the same letter were not statistically different from each other.

CHASE RESEARCH GARDENS, INC.

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

Mt. Aukum, CA 95656-0529

Phone/FAX (530)620-1624

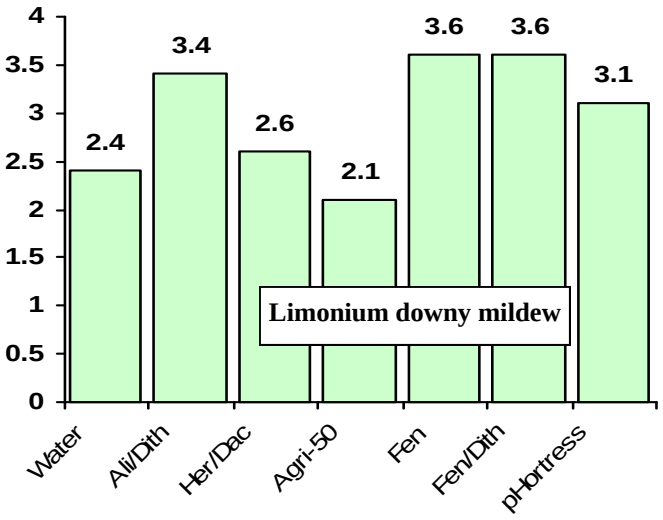
mtaukum@directcon.net

POTPOURRI OF RECENT TRIAL RESULTS

We have started doing some trials in San Diego County at Mellano and Company (cut foliage and flower producers). This is made possible by Buzz Uber, a private crop inspector. The first trial was conducted on Limonium (statice) with downy mildew. The disease is very hard to control and impacts flower production dramatically by destroying leaf tissue.

Buzz applied a number of fungicides on a weekly interval (for a month) and we rated top grade about a month ago. The results show an excellent growth response on plants treated with a combination of Aliette (32 oz) and Dithane (16 oz), Fenamidone alone (7 oz) and with Dithane (16 oz) and somewhat less with pHortress (1 quart). Neither the combination of Heritage (2 oz) and Daconil Weather Stik (24 oz) nor Agri-50 at 33% was effective in this trial.

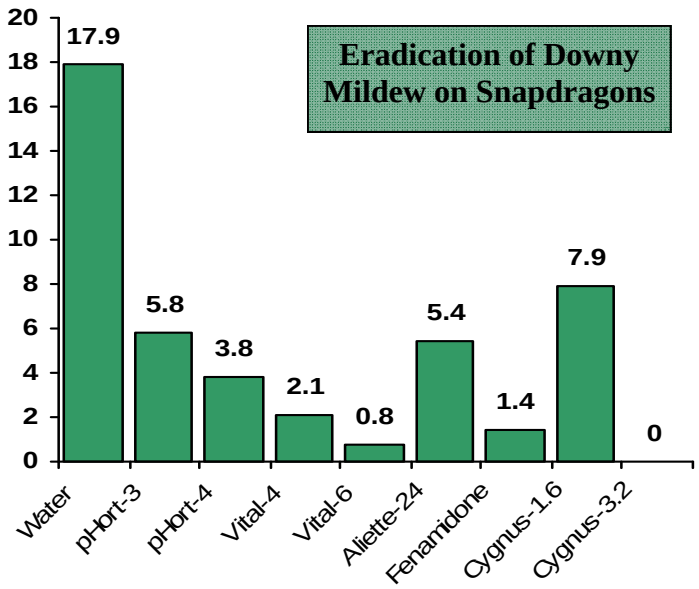
We have started another Limonium trial using higher rates of pHortress (see snapdragon results below) alone and in combination with Dithane, Soap Shield, Agri-50 at 0.25% (to reduce phytotoxicity potential) and Heritage alone at 1 oz (results next month).



One of the unforeseen benefits of visiting growers regularly is collecting diseased plants for fungicide trials. Last month I obtained some snapdragons that were infected with downy mildew but showed no sporulation. We quickly set up an eradication trial with a few products and were able to evaluate the benefits after just 2 weekly sprays.

Several of the products were in the phosphite category including pHortress and Vital. These were tested at 3 and 4 pints/100 gal and 4 and 6 pints/100 gal, respectively. We also included Aliette at 24 oz, Fenamidone (a strobilurin relative) at 7 oz and Cygnus (our first strobilurin from Scotts) at 1.6 and 3.2 oz.

Results showed that all fungicides were able to reduce development of downy mildew spores, although the best treatment was Cygnus at 3.2 oz/100 gal. We saw no phytotoxicity or even significant residue with this trial. Both pHortress (Western Farm Service) and Vital worked a little better at the higher rate tested and were as effective as Aliette. Fenamidone continues to look excellent for downy mildew, Phytophthora and Pythium control in our trials.



We started a trial on Botrytis blight on a Petunia crop about 2 months ago. Products included some new fungicides (Endorse from Cleary) and an experimental product (CX). We also tested Spectro at 1 and 2 lbs/100 gal and Heritage at 4 oz/100 gal. Fungicides were applied as sprays on a 10-day interval (four applications total).

Our results for disease (number leaves or flowers with Botrytis sporulation) are shown in the graph to the right. Plants were grown in 3.5 inch pots and had about 20 leaves and four flowers per pot. Best control was found with CX used at 16 oz/100 gal and Heritage. All of the other products gave some reduction in sporulation of Botrytis.

We also rated residue, plant height and phytotoxicity. Residue was slight for all treatments except for Spectro. In this case, residue reached a moderate level. Heritage caused significant stunting but no leaf burn. CX and Spectro each caused slight leaf burn but no stunting.