

CHASE NEWS

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CHASE RESEARCH GARDENS, INC.

Top Diseases—Chase Diagnostics 2006

We have been running our diagnostic lab for the past few years with more and more samples as time goes on. It has been interesting for me to see the trends in types of samples as well as type of diseases we are encountering. The majority still come from the West Coast greenhouses and nurseries but we have been seeing an increase in landscape based samples as well as those from out of state.

Roses led the list in sheer number of samples submitted at 34. Rhododendron and azalea were next at 25, geranium and cyclamen each had 12 and lavender and phlox each had 10. There was a total of nearly 800 samples and the remaining 700 samples were divided among a long list of ornamentals with 4-9 submitted. The table to the right summarizes some of our results on herbaceous ornamentals including bedding plants, foliage plants and flowering perennials. I have included a few pictures of these diseases on the bottom of page 3.

Some plants consistently show the same pathogens such as Xanthomonas leaf spot on *Erysimum* (wallflower). We usually find this pathogen on a single cultivar 'Bowles Mauve' indicating it may be more susceptible than other wallflowers. If we receive a sample of *Dianthus*, it most often has *Fusarium* while samples of pansy with leaf spot yield a wide variety of fungi.

Next month I will present the summary for the woody ornamentals.

alstroemeria	Fusarium, Pythium, non-pathogenic
anigozantes	Botrytis, bacteria, Myrothecium
anthurium	Non-pathogenic
aster	Fusarium/INSV, Alternaria
calla lily	Erwinia
celosia	Pythium
coleus	Bacteria, Downy mildew
cyclamen	anthracnose, Fusarium, non-pathogenic
dianthus	Fusarium
erysimum	Xanthomonas
geranium	Botrytis, Xanthomonas
gladiolus	Fusarium
hedera	Pythium
hydrangea	Xanthomonas
iris	Fusarium
lamium	Downy mildew, Pseudomonas
lavender	bacteria
lily	Pythium, Fusarium
matthiola	Fusarium
molucella	Cercospora
nemesia	Bacteria
osteospermum	Bacteria
pansy	Fungal leaf spots
petunia	Phytophthora, Alternaria, anthracnose
phlox	Xanthomonas, fungal leaf spots, Fusarium
phormium	Fusarium, Phytophthora, anthracnose
poinsettia	Non-pathogenic
ranunculus	Xanthomonas
salvia	Pseudomonas, Corynespora, Botrytis
snapdragon	Pythium/Pseudomonas
spathiphyllum	Non-pathogenic, anthracnose
verbena	bacteria
zinnia	Xanthomonas

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Controlling Cyclamen Anthracnose Caused by *Cryptocline*



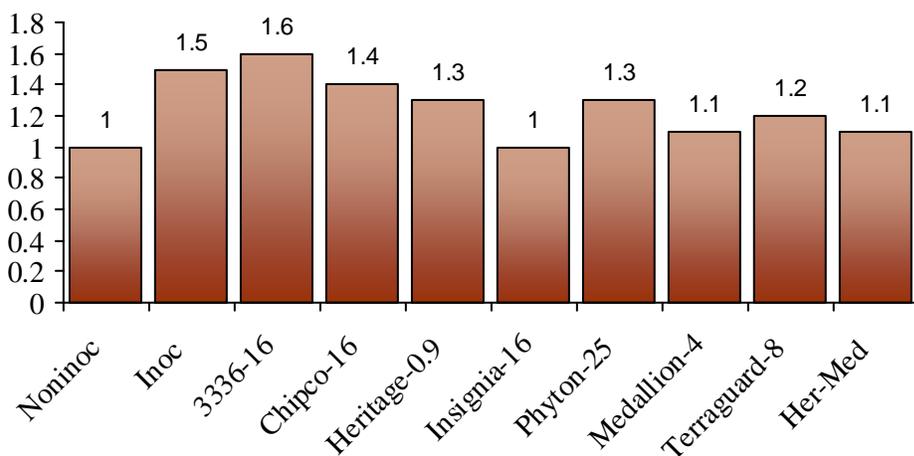
Corm rot caused by *Cryptocline* anthracnose

We started a trial in the summer to test efficacy of some fungicides in prevention of one of the anthracnose diseases on cyclamen. We used ‘Sierra Scarlet’ plugs established in 3.5 inch pots containing Sunshine No. 1. Plants were top-dressed with the recommended rates of Osmocote Plus 15-9-12. After a single fungicide drench, we inoculated the plants by adding spores of *Cryptocline cyclamenis* to the potting medium around the plants and watering in lightly to distribute the spores. Plants were drenched a total of eight times on a 10-day interval.

We waited impatiently for symptoms to develop but not much happened and in January we finally gave up and checked out the roots and corms for symptoms. The

top grades were unaffected by any treatment, although plants treated with either Phyton 27 (25 oz/100 gal) and Medallion (4 oz/100gal) were the best at the end of the trial.

The corms were mainly white with little discoloration but we did see a slight trend (graph below). The best corms were found in plants receiving Insignia (16 oz/100 gal) and Medallion alone (4 oz/100 gal) or in combination with Heritage (0.9 and 4 oz, respectively/100 gal). These differences were slight and not statistically significant. We plan to do this trial again on a different cultivar that is hopefully more sensitive to this anthracnose pathogen. To that end, we will be testing as many cyclamen cultivars as we can obtain for sensitivity to *C. cyclamenis* this spring.



Severity of corm discoloration was graded from 1 (none-white) to 5 (black). Very few corms showed any discoloration. Treatments were applied as drenches and rates are given in oz/100 gal.

Fungicides Can Help Control Botrytis Cutting Rot During Propagation

Controlling losses due to Botrytis blight during propagation can be a real challenge. The use of overhead misting can be critical to successful rooting but it also promotes Botrytis as well as other opportunistic pathogens. In a recent trial on roses we tested a variety of fungicides applied the day the cuttings were stuck and once again at 10 days. We often inoculate plants with pathogens but this time we let nature take its course. Botrytis was quick to oblige us and we did find that it moved into the cuttings. The num-

Treatment	oz/100 gal	% Control
Decree	16	30
Heritage	4	45
Compass O	4	53
Insignia	10	42
Daconil Ultrex	22.4	0
Medallion	4	32

ber of cuttings per pot (5 were used) with Botrytis was recorded about 4 weeks after sticking. This was right about the same time that the roots were initiating on those cuttings that were not rotted. The table (left) shows a summary of the test.

The best control was achieved with Compass O although both Heritage and Insignia gave similar levels of control. The real surprise was that Daconil Ultrex failed to give any control. None of the control was impressive but it was significantly better than doing nothing at all.

Phytophthora species isolated from Minnesota Woody Ornamentals

In January of 2007, Schwingle, Smith and Blanchette reported on a 2-year study (Plant Disease 91:97-102). The purpose of their work was to determine the species of Phytophthora isolated from woody ornamentals in 15 Minnesota nurseries. The table to the right summarizes a portion of the data collected. I have presented the most common woody ornamentals with the specific species of Phytophthora found in infected tissue (dieback-stem, leaf-spots and marginal necrosis, canker-wood and root-rot). The numbers in parentheses are the number of isolates for that combination.

The most frequently affected plant was Rhododendron as one would expect from a study that grew from the SOD—Ramorum Blight research initiative. In this case, *P. citricola* was most often isolated but several other species were also found. Cankers, dieback and leaf spots were all common on Rhododendron. *Syringa* was the only other plant with a number of Phytophthora isolations. Both leaf spot and dieback were caused by *P. citricola* and *P. citrophthora*.

One important finding was that *P. ramorum* was absent from these nurseries between 2002 and 2005. In addition, several new species of *Phytophthora* were found affecting Minnesota ornamentals that were not previously known and Phytophthora diseases appear to be more important than recognized. Hopefully, this will lead to research on disease prevention and control.

Plant	Phytophthora species				
	<i>cactorum</i>	<i>citricola</i>	<i>citrophthora</i>	<i>nicotianae</i>	other
<i>Acer</i>	Leaf (2)	Leaf (3)			Dieback (1)
<i>Hamamelis</i>		Dieback,	Leaf (1)		
<i>Lonicera</i>	Dieback (2)	Canker, dieback, root (3)			
<i>Magnolia</i>		Leaf (1)		Leaf (1)	
<i>Malus</i>	Wilt,				Leaf (2)
<i>Myrica</i>	Leaf (1)		Dieback (1)		
<i>Prunus</i>	Bleeding				
<i>Pyrus</i>	Leaf (1)	Leaf (1)			
<i>Quercus</i>		Leaf (1)			Leaf,
<i>Rhododendron</i>	Canker, dieback, leaf (5)	Canker, dieback, leaf (40)	Dieback, leaf (2)	Canker, leaf (2)	Leaf (1)
<i>Syringa</i>		Dieback, leaf (5)	Dieback, leaf (9)		
<i>Taxus</i>			Dieback (2)		Dieback (1)
<i>Viburnum</i>	Dieback	Leaf (1)			Leaf (1)

Highlights from Our Diagnostic Lab



← Cercospora leaf spot on Phlox



← Rhizoctonia stem canker on Celosia



Pseudomonas leaf spot on Coreopsis (above)



Botrytis leaf spot on Asiatic lily →



Xanthomonas leaf spot on Nemesia →

Preventative Control Works Best on Rose Downy Mildew

I have been growing roses in my yard for five years and until we had a winter with more than double our average rainfall I had never seen downy mildew or rust. That year all of the roses had a severe outbreak of these two diseases. It taught me that environment is the most critical factor in disease development. It is also true that when growers use pre-



Typical leaf symptoms of downy mildew

ventative methods (both cultural and chemical) no disease may develop. Tracing a disease outbreak to its source is a complicated affair.

With downy mildew it is critical to apply preventative controls from the beginning. A small amount of downy mildew can spread from last year's crop into the current season's crop very rapidly. When the environment is favorable fungicides must be applied to protect the new plants. Although downy mildew can be latent (present without any symptoms) on roses for long periods of time it is more effective to use the right fungicides from the start even when the bare-root roses are healthy. After performing efficacy trials for nearly 27 years, even under our highly controlled conditions, some diseases defy 100% control. In some cases, expecting a disease and preparing for it is the only way to control losses.

The first step in any disease control strategy is to identify a problem early. This means you must check your cuttings, seedlings and plugs when you receive them or when they are trans-

planted. If you wait until you see downy mildew symptoms you will surely be fighting an uphill battle for the entire crop cycle. If you are not sure what the problem is then by all means have it diagnosed by a competent lab. I have seen a lot of Botrytis and powdery mildew being treated as if they were downy mildew. The best fungicides for each disease differ so it is important to use a broad spectrum of products from the outset. The table below shows some of the most effective products for control of winter-spring rose diseases.

The products in each column are in different chemical classes so choosing two to rotate will help prevent resistance from developing. Apply products in combination on a weekly schedule. Using them more often can actually be counter-productive since it involves



This canker is caused by **downy mildew** –NOT Botrytis. Look for Botrytis spores on all cankers and dieback. The cankers also tend to be more gray whereas downy mildew can appear reddish and sunken.

Botrytis	Downy mildew	Powdery mildew
Decree	Heritage or Insignia	Compass O
Medallion	Stature DM	Eagle or Banner MAXX
Chipco 26109	Phosphonates (like Aliette)	Copper (like Camelot and Phytan 27)
Daconil Ultrex or Daconil WeatherStik		

applying water each time and Botrytis and downy mildew are each more severe when leaves are wet.

Did you know that when **downy mildew** starts on a rose but encounters adverse conditions like dry, warm weather or fungicides it can look like this? Be sure you check for symptoms of downy mildew every week during the winter and spring.

