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CHASE RESEARCH GARDENS, INC.

CHASE NEWS

Stem Rots All Look Alike

I am frequently asked to diagnose a disease by a verbal description. This is a challenge that I have faced with usually ill humor for the past 25 years. And after so many attempts I am still unable to perform this feat.

Sometimes leaf spots can be diagnosed by sight including certain virus diseases and fungal leaf diseases like rust, powdery mildew and downy mildew. Sometimes the fungi that cause crown or stem rots also produce fruiting bodies like sclerotia that aide in their identification. Root diseases ALWAYS must be identified by means other than visual symptoms including culturing and rapid detection kits.

Not only do I prefer to see a real sample (or pictures), I usually resort to the old fashioned method of culturing the pathogen since this is the only way I can tell the difference between such diverse fungi as *Fusarium, Sclerotinia, Sclerotium rolfsii, Botrytis, Myrothecium, Pythium, Rhizoctonia, Cylindrocladium* and *Phytophthora*. It also allows me to determine if the pathogen is alive—a real issue when deciding whether or not to treat with a fungicide or discard damaged plants.

The pictures to the right show a small sampling of some very typical stem rot on ornamentals. These three samples were processed in our lab in the last 10 days. Not one of these samples produced any fruiting bodies at the time it was received so we had to culture the pathogen to tell the real cause. You can see from the symptoms that these three fungi resulted in a non-descript stem rot. Consider using a diagnostic lab next time you are confronted with stem rot and save some money on use of the wrong fungicide.

Sclerotinia stem rot on *Delphinium*

Pythium root and stem rot on *Gaillardia*

Fusarium crown rot on *Phormium*

Inside this issue:

Update on Controlling Fusarium Stem Rot on Holiday Cacti

We first reported a trial on Fusarium stem rot on holiday cacti (*Schlumbergera truncata*) last August and have recently completed a second trial. In the summer trial, none of the fungicides tested provided any significant control of this Fusarium. Results were more promising in the May trial.

Treatments were applied to liners (three stem sections/liner) twice as a sprench on a 14-day interval. Plants were inoculated with *F. oxysporum* spores one week after the first fungicide application.

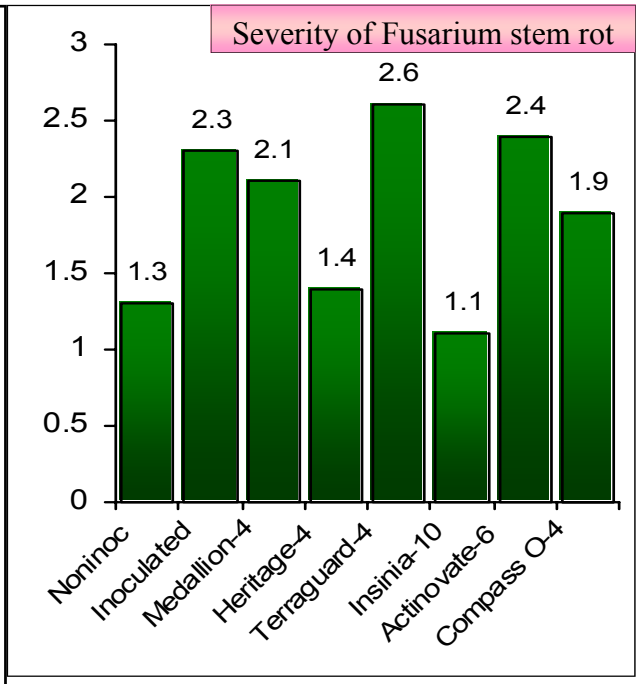
Disease was slow to progress during this cool spring. We saw the first signs of stem rot about 18 days after inoculation and recorded our final observations about 30 days after inoculation.

Some growers have reported cladophyll (stem segments) drop when some fungicides are applied

All of the fungicides we tested in this trial were safe on this cultivar ('Golden Dancer').

Optimal disease control was seen with Insignia closely followed by Heritage. The active ingredient rate was the same since Heritage is 50% active and Insignia is 20% active. A rating of 1 means no disease. The other strobilurin, Compass O failed to give statistically significant control in this trial. Although we usually see good control of Fusarium diseases with both Medallion and Terraguard they failed in this trial on holiday cactus stem rot.

We may consider another trial on this crop during the heat of summer with some modifications of our infection process which seems too severe. In both trials, we have wounded the cladophylls to mimic handling injuries. Next time, we will include fungicides from the first two trials without wounding.



Fungicide rates follow the product name and are given in oz/100 gal. The disease was rated using the following scale: 1 (none, healthy), 2 (slight), 3 (moderate), 4 (severe) and 5 (plant dead).

Botrytis Blight on Lisianthus—Wegulo (University of Nebraska)

Dr. Stephen Wegulo performed a series of trials on Lisianthus for control of Botrytis while he worked at the University of California at Riverside. Stephen evaluated both cultivar resistance and fungicide control and published the results in the spring issue of CORF News 10(1)1, 3.

For the cultivar resistance trials, he tested different aspects of Botrytis blight, from stem lesions to leaf area affected. The table to the right shows his summary of overall resistance rankings for 12 common cultivars. The cultivars are listed from most resistant at the top to least resistant at the bottom. Choosing cultivars based on resistance to a single disease may not be the most effective way to produce cut flowers since most are affected by more than one disease and marketing the product remains the goal.

Most Resistant
Magic White
Echo Pink
Magic Champagne
Avila Ivory
Magic Rose
Balboa Yellow
Catalina Purple
Balboa Blue
Echo White
Echo Lavender
Avila Purple
Avila Blue Rim
Least Resistant

Dr. Wegulo also worked on fungicide control at a San Diego Nursery on 'Avila Purple'. The fungicides and rates he tested are shown in he table to the right. Each of the fungicides provided significant control of Botrytis (numbers in the column followed by the same letter were not significantly different using Fischer's least significant difference test at P=0.05). Several of the products were tested at lower than maximum labeled rates including Medallion, Decree and Heritage. Our trials on other ornamentals have shown that 4 oz rates of Medallion and Heritage as well as 16-24 oz rates of Decree perform better than the rates in this trial when conditions are severe.

Fungicide	Rate/ 100 gal	Disease Incidence
Untreated	——	14.7 b
Insignia	8 oz	7.0 a
Rhapsody	4 quarts	6.4 a
Rhapsody	6 quarts	2.3 a
Medallion	2 oz	5.4 a
Decree	12 oz	4.9 a
Heritage	2 oz	4.9 a
Fore	24 oz	3.1 a
Kaligreen	2.5 lbs	3.1 a
Daconil Ultrex	1.4 lbs	2.8 a

Dr. Wegulo stressed the benefits of using multiple methods of disease control including cultural, environmental, chemical and of course resistant cultivars whenever possible.

Sycamore Anthracnose—Our First Fungicide Trial

Sycamore anthracnose or blight is caused by *Discula platani* (aka *Gnomonia*). This disease, like all anthracnose diseases can be devastating when the late winter-spring rains coincide with leaf emergence and expansion. In the worst situations, the entire flush of leaves may be blighted resulting in their death. If the weather improves, the trees often put forth a new flush. However, years of this damage can lead to dieback, thin crowns and even death of severely affected trees.

In a landscape, spraying can be very challenging and must be timed accurately for best effect. One of the most effective fungicides has been propiconazole (Banner MAXX) applied once or twice as a foliar spray.

This year we performed a trial with some experimental formulations of tebuconazole (Lynx), a combination of triadimefon and trifloxystrobin (Armada), a combination of Lynx and Compass O and a Bayer Advanced formulation of tebuconazole—all compared to Banner MAXX.

We obtained bare-root *Platanus occidentalis* 'Bloodgood' trees in January and planted them in 15 gal pots. When their leaves started to emerge in late April we treated them twice on a 14 day interval (table to the right). They were inoculated one week after the first treatment.

Treatment	Rate/100 gal	Disease severity	Leaf size grade
Water	——	22.9 b	3.6 ab
Banner MAXX spray	8 oz	11.5 ab	3.0 a
Armada	6 oz	4.5 a	3.4 ab
Lynx spray	8 oz	5.5 a	3.9 b
Lynx and Compass O spray	8 and 1 oz	12.3 ab	3.6 ab
Lynx drench (once only)	0.06 oz applied in one gallon	8.8 ab	4.0 b
Tebuconazole (Bayer Advanced)	75 oz	19.2 ab	3.1 a

We saw symptoms of blight less than 7 days after inoculation. The ratings in the table were made 8 days after the second application. At that time, it was clear that the best treatments were Armada and the Lynx spray (based on number of blighted leaves/tree). Each of the other fungicides reduced disease severity somewhat but Armada and Lynx were the only two that were statistically significant. In addition, the leaf size was slightly affected by the fungicides, although none of them were significantly different than the water sprayed controls.

We look forward to performing more trials on tree diseases in the future and especially hope to expand our knowledge of the uses of Armada and Lynx in the ornamentals market.

Euonymus Anthracnose—Fungicides and Cultivars

Euonymus anthracnose is caused by *Colletotrichum gloeosporioides*. This disease was first described in 1980 and is common in the Southeast, Midwest and East.

A recent report by Schupbach-Ningen et al. was published in HortTechnology 16(2):211-215. These Oklahoma State University researchers tested efficacy of chlorothalonil (Echo 720), mancozeb (Fore) and trifloxystrobin (Compass) applied alone and in rotation on three cultivars of Euonymus. A 14 day interval was tested for Echo and Compass and a 7-day interval was tested for Fore. The cultivars tested were 'Emerald 'n Gold', 'Emerald Gaiety' and 'Emerald Surprise' and trials were performed in Oklahoma and Arkansas. The table to the right shows the summarized results.

Overall, 'Emerald Gaiety' was significantly more resistant to anthracnose than the other two cultivars. The best fungicide treatment was the alternation of Echo and Fore but all treatment regimes than incorporated Fore more effective than those that did not. Echo and Compass used alone or in combination were not significantly effective compared to the water sprayed controls.

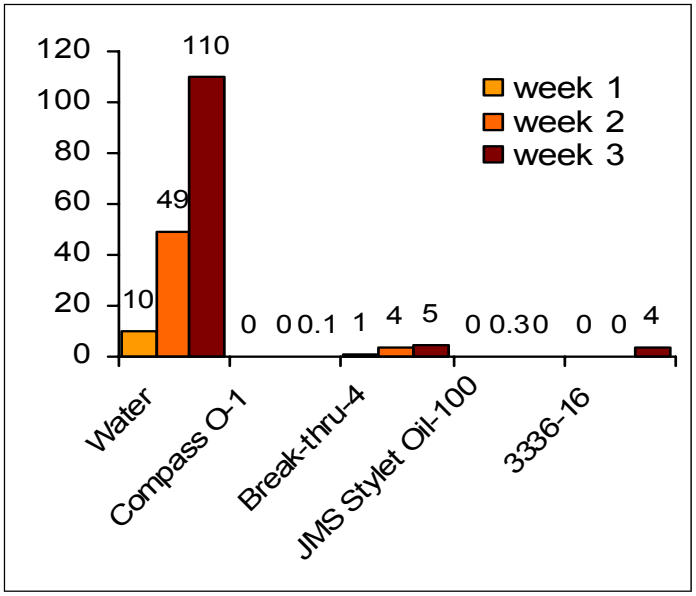
Since the products were not applied on the same interval, it is possible that the benefits of the Fore were simply due to the fact that it was applied more frequently.

Treatment	Disease rating
Echo 720	22.2
Fore	11.1
Compass	22.8
Echo/Fore	8.9
Echo/Compass	23.6
Fore/Compass	13.9
Echo/Compass/Fore	16.4
Water	36.1
Significance	15.4

Prevention of Scabiosa Powdery Mildew

We struggled all last year on powdery mildew trials on many different plants and had really disappointing results. This year we are having a lot better luck. The difference in the weather as well as the crops we are working on has made all of the difference in the world.

We are currently doing two trials on eradicating rose powdery mildew and just finished one trial on Scabiosa. We obtained rooted Scabiosa columbaria (pin cushion flower) 'Butterfly Blue' in late April and started spraying them on a weekly interval. After the first spray, we moved some large Scabiosa with powdery mildew into the same greenhouse to act as an inoculum source. The fungicides we tested included a few experimental products but have presented the data on the labeled products only. Products were applied three times and we rated the number of powdery mildew colonies per plant every week before the next spray. The graph shows this data including the final data taken one week after the third spray.



You can see that disease severity was very high by the second rating and continued to climb in the water sprayed control. We included Compass 0 (1 oz/100 gal) as our commercial standard and control was close to perfect. Actually, all products applied gave the same very high level of control including Break-thru wetting agent (4 oz/100 gal), JMS Stylet Oil (100 oz/100 gal) and 3336 flowable (1 pint/100 gal). The experimentals (two from Cleary Chemical and one from Agrium-Western Farm Service) also provided excellent control.

Look for more data next month on our rose powdery mildew trials as well as a summary of our powdery mildew trials for the past few years.

Controlling Bacterial Blight on Cornelian Cherry Dogwood

Mmbaga and Nnodu reported on work *Cornus mas* for control of *Pseudomonas syringae.* Cool temperatures of 20-24 (day) and 10-15 (night) were the most favorable for disease development. Wounding also increased infection even when conditions were not generally favorable (high temperature). A bactericide trial with Phyton 27, Camelot, Agri-Mycin 17, Kocide 101, Basicop and Bordeaux mixture was performed. Bactericides were applied all season on a 10-day interval in both 2004 and 2005. Disease appeared about 7 days after inoculation and was rated on the following scale: 1(1-10% foliage blighted), 2 (11-25%), 3(26-50%), 4(51-75%0 and 5(76-100%). The final ratings are shown below. Mean disease severity numbers followd by different letters are statistically different.

Best control was seen with Agri-Mycin and Phyton 27. The rate chosen for Phyton 27 seems very low since 3 oz/10 gal is a labeled rate but 3 oz/100 gal is very low. Possibly the rate is reported inaccurately. In the second trial under higher disease pressure, only Phyton 27 and Agri-Mycin provided significant control. For a full report see **HortScience 41(3):721-74.**

Treatment	Rate/ 100 gal	Disease severity
Untreated	——	3.2 c
Phyton 27	3 oz	1.2 a
Agri-Mycin 17	3 pints	1.0 a
Bordeaux mixture	16 oz	1.6 ab
Camelot	16 oz	1.8 ab
Basicop	2.5 lb	3.0 bc
Kocide 101	16 oz	3.2 c

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