

CHASE NEWS

Chase Horticultural Research, Inc.

Volume 8—Issue 5 (May)

Update on My Travels in Early May

I spent most of the first week of May on the East coast and started with a visit to Conrad Fafard, Inc. in Anderson, South Carolina. As many times as I attended the Southeast Greenhouse Conference (held a short distance away in Greenville, NC) I had never visited their plant. I have known Dr. Hugh Poole (Director of Technical Services) since the early 1980's when we both worked in Florida. I had a great time seeing how Fafard makes potting media and was really interested since we have been using it for the past few years. Meeting with the technical experts there was also very enlightening and I was able to get a good picture of how Fafard handles customer service and runs their diagnostic lab. Fafard has a state of the art diagnostic lab for tissue, water and potting media that handles ___ samples a year. Thanks again to Hugh and the entire technical support team for a great visit!

Later in the week, I visited some greenhouses in the southern states and saw a wide variety of crops and problems. I am always interested to see what the new crops are and if they have any problems. The week before, I had spent a day in Oregon and it is surprising how often the same plants with the same problems appear all over the US. Botrytis is still out there causing a lot of problems with serious losses to crops especially during the final phases. Unfortunately, the disease really is worst when



Botrytis on finished geranium

the crop is finishing. Unfortunately, this geranium crop is really finished. The only thing to do about this crop is to throw it out. Effective control must start with timely fungicide applications (before the canopy closes) as well as spacing to reduce relative humidity in the canopy. Check your crops often to avoid nasty surprises.



The Fafard Company—left to right (Robert Steinkamp-FL), Dr. Jamie Gibson (R and D Director), me, Michael Tilley (TX) and Hugh Poole.

CONTENTS

WOODY ORNAMENTAL FOCUS (Cercospora leaf spot control on Crape myrtle, Kaolin particle film and <i>Gynaikothrips</i> galling and Galls on Rose Roots)	2
PERENNIAL PLANTS PAGE (Black death on Hellebores , Control of day-ly rust with some newer fungicides, Myrothecium leaf spot on Salvia in propagation)	3
NEW FROM OUR DIAGNOSTIC LAB	4
RESEARCH HIGHLIGHTS (ZEBA improved plant quality, Safety of some newer fungicides on <i>Oxalis regnelli</i>)	5
MORE RESEARCH HIGHLIGHTS (Preventing black root rot with seed treatment, Rhizopus blight control, Cercospora leaf spot on Dendrobium)	6

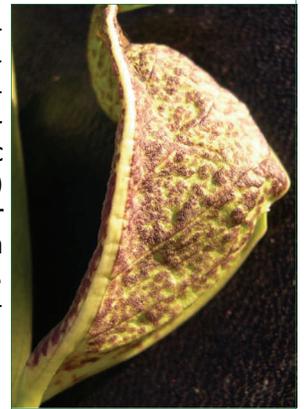
CERCOSPORA LEAF SPOT CONTROL ON CRAPE MYRTLE—Hagan and Akridge (Auburn University) performed a field trial in 2007 for control of naturally occurring *Cercospora* leaf spot on Crape myrtle

Treatment	Rate/100 gal	Disease severity
Un-treated control	—	6.5
Instrata 3.61 SE	16 oz	5.0
Instrata 3.61 SE	22 oz	5.0
Instrata 3.61 SE	33 oz	3.5
Banner MAXX	8 oz	5.3
Daconil Ultrex	1.4 lb	6.0
Medallion 50W	2 oz	5.8
Eagle 40W	8 oz	3.3
Heritage 50W	4 oz	3.5
3336 4.5 F	20 oz	4.0

'Wonderful White'. Plants were sprayed a total of five times on a 14 day interval. Products, rates and results are shown in the table to the left. Disease was rated from 1 (none) to 12 (100% leaves diseased and prematurely shed) and was moderate to severe (6.5 = about 50% leaves diseased) in this trial. Best control was achieved with Eagle, Heritage or the highest rate of Instrata which had light to moderate spotting with minimal premature defoliation. Instrata is a turfgrass fungicide (it is NOT labeled for ornamental use) from Syngenta that combines the active ingredients of Medallion, Daconil and Banner MAXX. The other fungicides did not give significant control of this disease in this trial. The complete report is published in Plant Management Network 3:OT027.

For other information on fungicides for *Cercospora* see page 6 of this issue of **Chase News**.

KAOLIN PARTICLE FILM AND GYNAIKOTHRIPS GALLING— While I primarily concentrate on disease information in **Chase News**, I sometimes find an interesting article on insect control. Held, Wheeler and Boyd reported on the efficacy of kaolin to prevent galling by this thrips (sometimes called Cuan Laurel thrips) on *Ficus benjamina*. The feeding causes the midvein of the leaf to fold creating the characteristic appearance. These researchers evaluated azadirachtin (Azatin XL), bifenthrin (Talstar) or kaolin (Surround WP) to prevent galling in both greenhouse and field trials. Their results showed that azadirachtin did not significantly prevent galling while both kaolin and bifenthrin reduced galling by at least 74% compared to the non-treated controls. Under landscape conditions, weekly treatments with kaolin were needed. For the complete report see Plant Health Progress doi:10.1094/PHP-2009-0407-02-RS.



GALLS ON ROSE ROOTS—WHICH ONE IS AGROBACTERIUM?



It is not always easy to tell what the cause of a particular symptom might be. We received two samples of rose roots in the past few months with galls. In one case, the galls were found to be caused by *Agrobacterium tumefaciens* while in the other we really don't know what was the cause. We isolate bacteria and the run bioassays using carrot disks. If the bacterium really is *Agrobacterium tumefaciens* it can produce tiny galls on the carrot disks in about 2 weeks. Some labs use tomato seedlings but carrots have worked well for us. Can you tell by looking at the galls which picture shows the crown gall roots? If you still aren't sure—check the texture of the gall. The crown galls are very rough and have a corky texture. The other galls were very smooth. The photo on the right is the real crown gall.



BLACK DEATH ON HELLEBORES—I first saw this disease a few years ago on a sample submitted to our diagnostic lab. It was already known to be caused by a virus but the actual description has just recently been made in the US. Black death was reported in Europe and the United Kingdom in the early 1990's. The most recent work was done by Eastwell et al. from Washington State. *Helleborus orientalis* and hybrids of *Helleborus x hybridus* are most commonly affected by this Carlavirus with the formal name of Helleborus Net Necrosis Virus (HeNNV). There are several other viruses found in this plant genus including Hellebore Mosaic Virus (HeMV) and Cucumber Mosaic Virus (CMV). For a full report see—Plant Disease 93:332-338.



CONTROL OF DAYLILY RUST WITH SOME NEWER FUNGICIDES—Daylily rust started a number of years ago and rapidly spread throughout the US. Fungicide work on this serious disease continues as new products enter the ornamental market or labels are expanded. Buck and Youmans at the University of Georgia performed a trial in 2007 on Insignia (pyraclostrobin), Pageant (pyraclostrobin and boscalid) and Trinity (triticonazole—not labeled for ornamental use at this time). Fungicides were applied at different times before inoculation to determine their residual longevity (21, 14 or 7 days or 2 hours before). Disease was severe in this trial but Insignia (4 or 10 oz/100 gal) and Pageant (6 or 18.5 oz/100 gal) provided excellent control at all application times before inoculation (up to 21 days before). In contrast, Trinity showed significant development of rust except when it was applied the day of inoculation. This work shows that either Insignia or Pageant could be effective in a preventative fungicide program with up to a 21 day interval. See Plant Disease Management Reports 3:OT017 for a complete report.



MYROTHECIUM LEAF SPOT ON SALVIA IN PROPAGATION

We have been seeing more *Myrothecium* problems during propagation of some of our herbaceous perennials such as *Salvia*. We decided to do a trial on *Salvia nemorosa* 'Sensation Rose' and the cuttings were kindly donated by McGregor Plant Sales. We stuck the un-rooted cuttings (five per 4 inch pot) into Fafard Mix 2 on 13 March. They were placed under plastic boxes with intermittent mist throughout the trial period. We then treated them with a weekly fungicide spray starting on 20 March a total of four times. Plants were inoculated with a spore suspension of *Myrothecium roridum* on 23 March. We rated the quality of the cuttings, degree of rooting and presence of *Myrothecium* leaf spot on 24 April. There was no stem rot in this trial.

The table to the right shows the effects of the fungicides on *Myrothecium* leaf spot. We saw excellent control with the strobilurins including Heritage (azoxystrobin), Compass O (trifloxystrobin), Insignia (pyraclostrobin), Disarm C (fluoxastrobin and chlorothalonil) and Pageant (pyraclostrobin and boscalid). Medallion (fludioxinil) also provided excellent control but did reduce rooting significantly. The two products with polyoxorim D (Veranda O and Endorse) also provided significant control but at a lower level than those previously mentioned. The only product that failed to give significant control in this trial was Phyton 27 (copper pentahydrate). Overall, best cutting growth was seen on the cuttings treated with Endorse.

Treatment	Rate/ 100 gal.	# spots per pot
Noninoculated	-----	0.3 a
Inoculated	-----	3.6 c
Disarm C	4 oz	0.6 a
Cygnus	6.4 oz	0.2 a
Compass O	2 oz	0.2 a
Heritage	2 oz	0.0 a
Insignia	5 oz	0.4 a
Pageant	8 oz	0.6 a
Medallion	2 oz	0.4 a
Phyton 27	20 oz	3.3 c
Veranda O	7 oz	1.9 b
Endorse	1.5 lb	1.4 ab

Numbers in the column followed by the same letter were not statistically different using Student-Newman Kuels Method)

Downy mildew is HOT right now. It is appearing all over the US from Southern California to Oregon, North Carolina, New York and Texas. In the past few weeks it has been reported on phlox (A and B, below), rose, cabbage, alyssum (C, below), coleus and both annual and perennial salvias. Symptoms can be distortion of new growth, angular chlorosis or necrosis, leaf drop, sporulation on undersides that might be white (like alyssum) or purplish (salvia and phlox). Be on the alert for downy on coleus as well since as the weather warms up a little it tends to start showing up.



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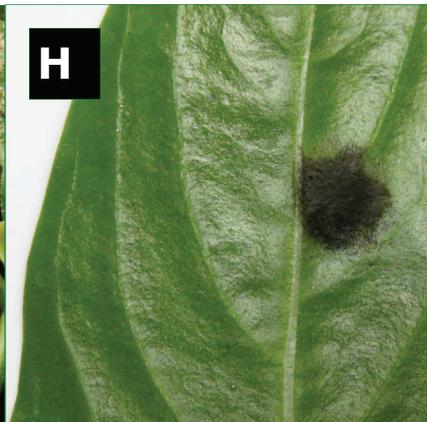
The other disease we have been seeing a lot is INSV. The most common host has been New Guinea Impatiens (D) but we have also seen it on *Lobelia valida* (E). But we have also seen bud mites reported on NGImps so don't jump to a conclusion. In one greenhouse the INSV moved (via thrips feeding) from



impatiens to some of the vegetables (F—cucumber seedling) produced in the same greenhouse. Watch for tan or black markings (ring spots or wavy lines) on leaves and stems.



One of the challenges of a diagnostic lab is to try to explain how something that looks like a disease might not be one. Last month we had samples of ivy geranium with edema (G), sooty mold on vinca (H—they do get *Alternaria* leaf spot—but this was superficial and not a disease) and nutrient or environmental problems on *Dianella* (I). None of these problems is due to a pathogen but they do mimic them.



ZEBA IMPROVED PLANT QUALITY ZEBA is a potting medium and soil amendment from Absorbent Technologies. It is primarily sold to improve fertility and water availability in soils and potting media. We performed tests over the winter on geranium, cyclamen and pansy. Plants were grown in 5 inch azalea pots containing Fafard Mix 2B. The plants were fertilized with Osmocote Plus 15-9-12 (8-9 month) incorporated at 5 oz/cubic foot the same day. The test was conducted in a heated greenhouse with poly and shade cloth covering the top and sides. The trial started on 21 November, 2008. ZEBA treatments were: 0.66 lb/cubic yard, 1.25 lb/cubic yard and 2.5 lb/cubic yard compared to un-amended medium. We started seeing differences after only 5-6 weeks in plant growth with best top grades in the ZEBA X (recommended rate treatment). We

Treatment	Rate per cubic yard	Top grade 12-19-08 Pansy	Top grade 1-2-09 Cyclamen	Top grade 1-16-09 Pansy	Top grade 1-30-09 Pansy
Fertilizer only	150g/cubic foot	3.3 ab	3.5 ab	3.3 a	3.3 a
ZEBA ½ X	0.66 lb	3.2 ab	3.2 a	3.4 ab	3.4 a
ZEBA X	1.25 lb	3.4 b	3.7 b	3.8 b	3.8 b
ZEBA 2X	2.50 lb	3.1 a	3.4 ab	3.6 ab	3.6 ab

recorded top grade, height and number of flowers for each crop every two weeks.

The table to the left shows some of the significant differences we saw. Top grade was rated on the following scale: 1 (dead), 2 (poor, unsalable), 3 (good, salable), 4 (very good, salable) and 5 (excellent, salable).



From left to right—No ZEBA, ZEBA-1/2x, ZEBA-x, and ZEBA-2x

All differences we saw showed best growth with the recommended rate of ZEBA. Pansies were especially responsive to the product but all three crops did show improvement in one or

more growth parameters at the recommended rate of ZEBA. We will be performing additional trials this summer with this interesting product.

SAFETY OF SOME NEWER FUNGICIDES ON OXALIS REGNELLI

We just finished a trial on this ornamental with hopes of evaluating efficacy of two of the newer fungicides for Pythium root rot control. FenStop (fenamidone) and Segway (cyazofamid) were compared for growth benefits on Oxalis tubers infected with Pythium. We tested each product at three rates and applied them as drenches on a 21 day interval. We used Sunshine Mix 2 and top-dressed the rhizomes with Osmocote Plus 15-9-12. The first thing we recorded was the emergence date for each and every pot. By the end of the trial, after four drenches, we also evaluated the top and root quality. Unfortunately, we saw no Pythium but did find that FenStop was not safe on this crop. It caused a delay in emergence and reduced both root and top quality. The standards we used were Subdue MAXX which was very good on this crop and Terrazole CA. The Terra-

zazole CA caused a reduction in top grade but not in roots. The best products for this plant were Segway and Subdue MAXX which are in different MOA groupings so resistance management can be maintained. Remember to always test new products on your crops in your potting media. Many things can affect safety of a product and it is ultimately your responsibility to make sure what you apply is safe and effective under your conditions.

Treatment	Rate/ 100 gal	Top grade 5-7-09	Root grade 5-11-09
Water	-----	3.8 b	4.2 b
Subdue MAXX	1 oz	4.0 b	4.4 b
Segway	1.5 oz	4.0 b	4.4 b
Segway	2.25 oz	3.9 b	4.5 b
Segway	3 oz	3.9 b	4.3 b
FenStop	7 oz	3.1 a	3.1 a
FenStop	10.5 oz	3.0 a	2.9 a
FenStop	14 oz	3.0 a	2.9 a
Terrazole CA	6 oz	3.3 a	4.0 b

PREVENTING BLACK ROOT ROT WITH SEED TREATMENT—Sometimes research on non-ornamental crops is the best way to find out how to control and ornamental disease. I recently found an article on treating cotton seed with fungicides to prevent black root rot. Toksoz et al. tested several myclobutanil (Eagle, Systhane) and the systemic acquired resistance product Actigard (acibenzolar-S-methyl) for prevention of *Thielaviopsis basicola*. Their studies showed that both products did reduce root infection alone but were most effective when both were applied. Acibenzolar-S-methyl is not labeled for any use on ornamentals at this time although Syngenta continues to explore this possibility. In addition, myclobutanil is not labeled for seed treatment on ornamentals. Perhaps we can look forward to a seed treatment for such black root rot prone crops as pansy, vinca and salvia in the future. For a complete report see Plant Disease 93:354-362.



RHIZOPUS BLIGHT CONTROL— While Rhizopus blight (*Rhizopus stolonifer*) is not a common disease it is devastating when it occurs. We have seen problems off and on over the years on poinsettia, phlox and vinca especially. Research on poinsettia was done over 20 years ago but nothing has been published that I could find on this disease on an ornamental since then. Sweet potatoes also get Rhizopus during post-harvest tuber storage. Edmunds and Holmes published results of trials on postharvest soft rot with some newer fungicides compared to dichloran (Botran). The most effective control was seen with the combination product of pyraclostrobin and boscalid (sold as Pageant in ornamentals) or fludioxinil (sold as Medalion in ornamentals). Be sure to check labels for appropriate (LEGAL) use sites and rates on ornamentals. For a complete report see Plant Health Progress doi:10.1094/PHP-2009-0206-

01-RS.

CERCOSPORA LEAF SPOT ON DENDROBIUM—Orchids continue to grow in popularity throughout the world as they have moved into mainstream ornamental production. They are subject to a number of diseases including soft rot, viruses and leaf spots. McMillan et al. reported on efficacy of some newer fungicides for control of Cercospora leaf spot which is known to occur on many important orchid genera. Treatments were applied a total of three times on a 21 day interval and plants were naturally infected with *Cercospora dendrobii*. Disease was rated on a scale from 1 to 10 where 1 (no symptoms) and 10 (complete defoliation). Disease pressure in the trial was at the level of noticeable lesions with some defoliation on the untreated controls. As you can see from the table to the right, optimal control was achieved with either the 12 oz rate of Pageant (pyraclostrobin and boscalid) or the 8 oz rate of Insignia (pyraclostrobin).

Treatment	Rate/ 100 gal	Disease rating
Untreated control	---	4.5 d
Pageant	6 oz	1.4 a
Pageant	12 oz	0.4 e
Cleary's 3336 4F	6 oz	2.4 c
Heritage	4 oz	2.4 c
Insignia	4 oz	2.3 c
Insignia	8 oz	0.4 a
Pentathlon	32 oz	3.0 b

Numbers followed by the same letter were not statistically different.

For a more complete version of the study see: Proc. of the Florida State Hort. Soc. 121:353-355.

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