

CHASE NEWS

Chase Horticultural Research, Inc.

Volume 8—Issue 4 (April)

SAF Pest Management Conference—2009 Entomology

One of the most interesting talks in entomology was presented by Dr. Lance Osborne (University of Florida) on using banker plants to control insects. Banker plants or open rearing systems work well in some circumstances when biological control agents are being used. The movement to biological control agents can be difficult when more than one pest is encountered. Establishing an area of plants to promote and maintain development of parasites and predators is an excellent way to reduce the need for frequent introductions. The steps Lance listed for preparing the foundation for biological control are given below:

1. Establish a scouting program.
2. Prepare a detailed list of all potential pests and methods for their management.
3. Prepare a list of chemicals safe to use on the crop.
4. Prepare a subset of these chemicals that are relatively safe to the beneficials you intend to use (see side effects at www.biobest.be/ or www.koppert.nl/Side_effects.html).
5. Find a reliable source for the beneficials and other materials needed.

The benefits of banker plants are that they can provide natural enemies that are not commercially available, commercial beneficials can be evaluated, the probability of becoming established is increased, the beneficials are more economical and reliable and pesticides may be applied to the crop while maintaining a population of beneficials that are not exposed.

For more information on this concept and Dr. Osborne's trial results you can contact him at LSOSBORN@UFL.EDU.

Jim Bethke, University of California Farm Advisor, San Diego County (with Oetting and Byrne) presented an overview of the neonicotinoids. They are all systemic and typically used to control sucking insects like aphids, whiteflies and mealybugs.

These products include Celero (clothianidin), Flagship (thiamethoxam), Marathon (imidacloprid), Safari (dinotefuran) and Tristar (acetamiprid). All of these products are labeled for both spray and drench applications with the exception of Tristar (spray only). Some of the more critical features of neonicotinoids listed by Jim in closing were:

1. Neonicotinoids are upwardly systemic when applied to potting media or soil and are translaminar when applied as sprays.
2. Neonicotinoids can be effectively used as sprays and drenches.
3. The type of potting medium can affect efficacy when used as a drench.
4. Resistance to neonicotinoids must be managed carefully.
5. Applying two lower rate doses of a neonicotinoid may be more effective than a single higher rate dose.

For more information on neonicotinoids you can contact Jim Bethke at bethke@ucr.edu.

CONTENTS

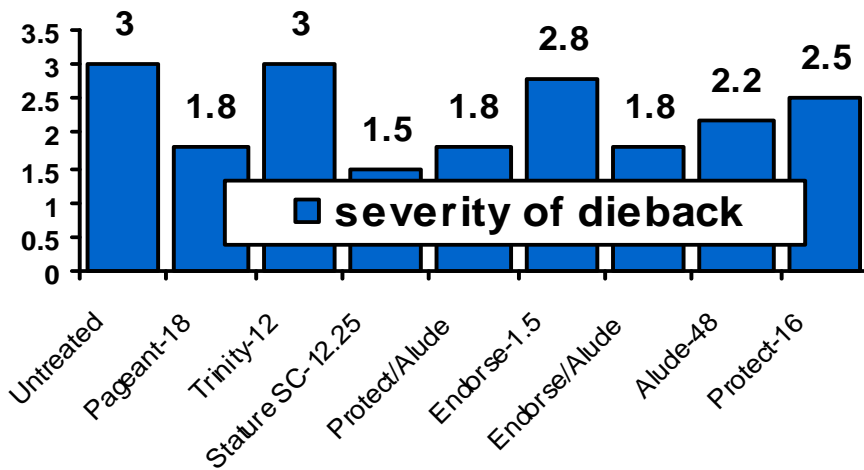
WOODY ORNAMENTAL FOCUS (UPDATE ON ROSE DOWNY MILDEW AND ANTHRACNOSE ON WOODIES AND PERENNIALS)	2
PERENNIAL PLANTS PAGE (EXPERIMENTAL BACTERICIDES AND PSEUDOMONAS BLIGHT ON LAVENDER)	3
NEW FROM OUR DIAGNOSTIC LAB AND DISINFESTING WITH XEROTON-3	4
RESEARCH HIGHLIGHTS (PREVENTION OF MYROTHECIUM PETIOLE ROT AND LEAF SPOT ON PANSY, ZEBBA REDUCES MOSS GROWTH)	5
PRODUCTS IN REVIEW—CYGNUS	6

UPDATE ON ROSE DOWNY MILDEW

Gary Osteen and I were out looking at a downy mildew trial we performed late last fall a couple of weeks ago. We reported back in December on the ability of a variety of fungicides to control downy mildew once it had started. At that time, the treatments that had the greatest efficacy were with Pageant and Stature SC. Since the beginning of December no treatments have been applied and the plants are growing again after over-wintering. We rated these roses for new downy mildew symptoms and also for dieback due to the downy mildew damage to canes over the winter. We found that the presence of new downy mildew lesions was not affected by the discontinued treatments as one would expect after three months. Dieback was rated as follows: 1 (none), 2 (slight), 3 (moderate), 4 (severe) and 5 (dead plant). The image shows a level of 3 (right).



Severity of dieback caused by downy mildew is affected by early season fungicide treatments



We did see, however that the early treatments did prevent dieback to a degree on these plants. The best plants were those treated originally with Pageant (18 oz/100 gal), Stature SC (12.25 oz/100 gal) and the combination of Protect (16 oz/100 gal) and Alude (48 oz/100 gal) and Endorse (1.5 lb/100 gal) and Alude (48 oz/100 gal). The two combination treatments performed better than the three products (in the combinations) when used alone. It is clear from this experiment, that spraying plants for downy mildew control even early in their production cycle can lead to real benefits in reducing damage during over-wintering.

ANTHRACNOSE ON WOODIES AND PERENNIALS

There are a variety of anthracnose fungi that commonly cause leaf spot, blight and dieback on woody and perennial ornamentals. This month we had a real influx of anthracnose caused by *Phylloticta* (sometimes called *Phoma*). Starting at right and moving clockwise—*Penstemon*, *Heteromeles*, *Asarum* and *Garrya*. Note that all of these spots have concentric rings (target spot), are roughly round, start on edges and in centers and are different sizes. They also rarely have yellow or reddish borders and sometimes have the fruiting bodies in the centers of the spots (black specks).



EXPERIMENTAL BACTERICIDES AND PSEUDOMONAS BLIGHT ON LAVENDER

The IR-4 program has designated bacterial diseases as current topics for their funding in 2008 and 2009. We reported on efficacy of some new bactericides for control of *Xanthomonas* on geranium in December of 2008 and this month we include a trial performed on *Pseudomonas* blight on lavender. We started testing with rooted cuttings of *Lavandula heterophylla* in mid-January. Before we could start the trial it was apparent that the cuttings were already infected with *Pseudomonas* sp. The test was conducted in a heated greenhouse with poly and shade cloth covering the top and sides. Plants were treated four times on a weekly interval starting on 26 January. Treatments were: noninoculated control, inoculated control, Phyton 27 (50 oz/100 gal),

Actigard 50WG (0.75 oz/100 gal), Citrex and Latron B 1956 (1.5 ml/L and 4 oz respectively, with the pH adjusted to 5), Kasumin (45 oz/100 gal), SP2015 (12 oz/100 gal), Taegro (3.5 oz alternated drench and spray), MOI-106 and Nu-Film P (1% and 0.02%), and Tanos and Kocide 3000 (8 oz and 32 oz/100 gal). Sources of each product are listed in the table at the bottom of the page. Note that only Phyton 27 and Taegro are currently labeled for ornamental use.

Two weeks after the first application, only plants sprayed with Kasumin had more spots than the controls. This was due to phytotoxicity which could easily be confused with bacterial leaf spot. By the end of the trial, the lowest numbers of spots were found on the plants treated with the combination of Tanos and Kocide. Apparently, none of the other treatments were able to affect development of this *Pseudomonas* leaf spot since it was present before applications started. Results of this trial indicate the difficulty faced by lavender growers in both obtaining healthy lavender starts and in possible treatment of infected cuttings. Watch for a new IR-4 trial on *Erwinia* soft rot later this summer.

Efficacy of IR-4 Trial Bactericides on *Pseudomonas* blight on Lavender

Treatment	Rate/100 gal.	Disease 2-10-09	Disease 2-23-09
Water noninoculated	-----	2.6 a	1.9 b
Water inoculated	-----	2.4 a	2.3 b
Phyton 27	50 oz	3.8 a	3.2 b
Actigard 50WG	0.75 oz	4.7 a	3.9 b
Citrex and Latron B 1956	1.5 ml/Lt and 4 oz	3.8 a	3.3 b
Kasumin	45 oz	13.6 b	20.3 c
SP-2015	12 oz	2.8 a	3.5 b
Taegro	3.5 oz	2.0 a	1.7 b
MOI-106 and Nu-Film P	1% and 0.02%	2.1 a	2.4 b
Tanos and Kocide 3000	8 oz and 32 oz	1.9 a	1.3 a

Sources of Products used in IR-4 Trials

Product	Active ingredient(s)	Manufacturer	Registered on ornamentals
Phyton 27	Copper pentahydrate	Phyton Corporation	Yes
Actigard 50WG	Acibenzolar	Syngenta	No
Citrex	Citrus extraction	Citrex	No
Kasumin	kasugamycin	Arysta	No
SP2015	proprietary	SePRO	No
Taegro	<i>Bacillus subtilis</i> var. <i>amy-loliquefaciens</i>	Novozymes	Yes
MOI-106	proprietary	Marrone Organic Innovations	No
Tanos and Kocide 3000	Famoxadone/cymoxanil and cupric hydroxide	DuPont	No



Phyllosticta leaf spot on Shasta daisy (above) and cold damage on Magnolia (below)



These past few weeks we have had a variety of problems that were not obviously a disease or an environmental stress at first glance. I include a few examples here.

We did find that *Phyllosticta* (anthracnose) has become a concern on cold damaged Shasta daisy in California. We had some samples that were cold damage (magnolia from Florida) and sunburn (Heuchera from Texas). We also have seen a very large number of tulip samples in the past few months. This month we saw a sample of blue mold (*Penicillium*) which can start on infected bulbs. We also saw a case of *Phytophthora* which totally disintegrated the bulb right at the flowering stage.

Remember that as the seasons change the plants cannot always keep up. You have to be especially careful not to stress them with too much water or too much light.



Sunburn on Heuchera (above) and blue mold on a tulip bulb (below)



DISINFESTING WITH XEROTON-3

We have been working with a relatively new disinfectant from Phytton Corporation called Xeroton-3 (X-3). This month we are reporting some lab tests that evaluated the ability of X-3 to kill three plants pathogens—*Fusarium oxysporum* fsp. *cyclaminis* (Foxy), *Erwinia carotovora* (Ec) and *Xanthomonas campestris* pv. *pelargonii* (Xcp). We used labeled rates of X-3 and exposed the pathogens for either 5 or 30 minutes. The results are presented in the table below. Both rates of X-3 were highly effective in killing cells of the bacterium Xcp and spores of the fungus Foxy

when exposed for either 5 or 30 minutes. In contrast, the best control of Ec was seen when it was exposed for 30 minutes at the higher rate. It is good to know that the labeled rates of X-3 can be very effective in killing at least the three plant pathogens we tested.

Treatment (concentration)	Exposure time	% mortality for <i>Erwinia carotovora</i>	% mortality for <i>Xanthomonas campestris</i> pv. <i>pelargonii</i>	% mortality for <i>Fusarium oxysporum</i> fsp. <i>cyclaminis</i>
Xeroton-3 (25 oz/1000 gal)	5 min	0%	100%	100%
Xeroton-3 (51 oz/1000 gal)	5 min	32%	100%	100%
Xeroton-3 (25 oz/1000gal)	30 min	58%	>99%	100%
Xeroton-3 (51 oz/1000 gal)	30 min	>99%	100%	100%

PREVENTION OF MYROTHECIUM PETIOLE ROT AND LEAF SPOT ON PANSY.

Myrothecium causes leaf spots and petiole rot on pansy. The disease was first described over 100 years ago and has resurfaced occasionally over the past ten years. We started a trial recently using *Viola x wittrockiana* 'Majestic Giant Yellow' plugs established in 3.5 inch pots containing Fafard Mix 2B on 13 January, 2009. Plants were top-dressed with Osmocote Plus 15-9-12. The trial was started about 2 weeks later. Plants were sprayed three times on a 14 day interval. The treatments included a number of newly developed products as well as several industry standards. The rates are shown in the table to the right. Plants were inoculated with *Myrothecium roridum* spores on 9 February, 2009.

Treatment	Rate/ 100 gal	# dead leaves/plant 2-27-09	# dead leaves/plant 3-9-09
Water Noninoculated	-----	0.2 a	0.0 a
Water Inoculated	-----	1.8 b	2.3 c
Disarm C	4 oz	0.3 a	0.7 ab
Veranda O	3.5 oz	0.5 a	1.5 bc
Endorse	1.5 lb	0.2 a	0.3 ab
Cygnus	6.4 oz	0.8 a	1.2 ab
Insignia	4 oz	0.5 a	0.8 ab
Pageant	12 oz	0.2 a	0.2 a
Heritage	2 oz	0.6 a	0.7 ab
Compass O	2 oz	0.3 a	0.3 ab

We rated top grade, plant height and residue in addition to disease severity. Cygnus and Insignia treated plants had slight but significant residue with Pageant significantly higher but still in the slight range. None of the other treatments resulted in significant residue. The top grade and height were not significantly affected by treatment in this trial. At the first disease rating, all treatments were significantly better than the inoculated controls. Only the Veranda O treatment failed to give significant control of the disease in this trial. Cygnus and Insignia treated plants had slight but significant residue with Pageant significantly higher but still in the slight range. Remember that numbers in the same column followed by the same letter are not statistically different. None of the other treatments resulted in significant residue.

ZEBA REDUCES MOSS GROWTH

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). It was even more interesting to see that the development of moss was highest in the un-amended pots (far left in image) and progressively lower in those pots with ZEBA. The pots shown are the cyclamen with tops removed to better show the moss growth. We are hoping to perform additional trials this summer with this interesting product.

Treatment	Rate ZEBA/ cubic yard	Moss severity Geranium	Moss severity Cyclamen	Moss severity Pansy
Fertilizer only	none	1.8 a	3.1 b	3.5 c
ZEBA ½X	0.66 lb	1.4 a	1.3 a	1.2 a
ZEBA X	1.25 lb	1.1 a	1.5 a	1.8 ab
ZEBA 2X	2.50 lb	1.3 a	1.2 a	2.0 b



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

Pathogen	Plant	Percent control	Application time and interval	Rate/100 gal
<i>Alternaria</i>	dusty miller	30%	4 times, 10 days	3.2 oz
<i>Alternaria</i>	zinnia	100%	3 times, 2 weeks	3.2 oz
<i>Cercospora</i>	pansy	100%	2 times, weekly	3.2 oz
<i>Coleosporium</i>	aster	85%	3 times, 2 weeks	3.2 oz
<i>Coleosporium</i>	bellis	95%	3 times, 10 days	3.2 oz
<i>Colletotrichum</i>	cyclamen	43%	3 times, weekly	6.4 oz
<i>Diplocarpon</i>	rose	70%	5 times, 2 weeks	6.4 oz
<i>Erysiphe</i>	gerbera	85%	4 times, weekly	1.6-3.2 oz
<i>Myrothecium</i>	pansy	48-75%	4 times, 2 weeks	3.2 oz
<i>Oidium</i>	rosemary	91%	3 times, weekly	3.2 oz
<i>Oidium</i>	salvia	100%	4 times, weekly	1.6 oz
<i>Peronospora</i>	pansy	30-64%	3 times, weekly	3.2 oz
<i>Peronospora</i>	rose	48%	2 times, 10 days	3.2 oz
<i>Peronospora</i>	snapdragon	100%	2 times, weekly	3.2 oz
<i>Phragmidium</i>	rose	70%	5 times, 2 weeks	6.4 oz
<i>Puccinia</i>	geranium	52%	2 times, 2 weeks	3.2 oz
<i>Sphaceloma</i>	poinsettia	90%	4 times, weekly	4 oz
<i>Sphaerotheca</i>	rose	70%	2 times, weekly	6.4 oz

Cygnus was the first strobilurin fungicide labeled for ornamental use with registration in the late 1990's by BASF Corporation. It was originally marketed primarily for powdery mildew but in fact works on quite a number of other foliar diseases including rust, downy mildew and leaf spots like *Alternaria* and black spot (rose). We ran most of the trials at 1.6 or 3.2 oz/100 gal but more recently have used 6.4 oz/100 gal in field rose work. The treatment interval was 7, 10 or 14 days.

We have performed several trials on different rust pathogens such as *Puccinia*, *Coleosporium* and *Phragmidium*. Cygnus showed good to excellent control of rust in all trials.

On leaf spots, Cygnus has resulted in some (dusty miller with *Alternaria*) to excellent control. *Myrothecium* can cause leaf spot or petiole rot on pansy and in two trials, Cygnus provided some to good control when used at 3.2 oz/100 gal every 14 days. *Colletotrichum* is also a leaf spot/petiole rot organism on cyclamen and once again, control of the petiole rot phase was now as good as for leaf spot.

Downy mildew is also a good target for Cygnus. Our trials included rose downy, pansy and snapdragon downy mildews. Eradication is usually less successful than prevention as is the case nearly all of the time with downy mildew on ornamentals. Control ranged from some (rose) to excellent on snapdragon.

Cygnus really shines on powdery mildew. We ran three powdery mildew trials on a variety of plants including Gerber daisy, *Salvia farinacea* and rosemary. The first two trials were preventive and the final trial was curative after some powdery mildew appeared on the rosemary cuttings. Most recently, we have seen moderate control of rose powdery mildew in a field trial. This is a very tough disease to control and this trial had moderate disease before we started.

So for those of you thinking about what to use Cygnus for after your powdery mildew problems are under control, consider the other foliar diseases listed above.

Contact Us:

www.chasehorticulturalresearch.com
or archase@chaseresearch.net.

Remember to
always follow the
label—it is the law!

