

# CHASE NEWS

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## IR-4 Survey of Ornamental Growers

Historically, the emphasis for IR-4 funding was phytotoxicity testing performed to a large degree by University and ARS scientists. A few years ago, a change was made to give pesticide companies more efficacy data at the same time as targeting key and critical issues for ornamental growers. A special questionnaire was sent out (mainly via the internet) to growers, researchers and indeed all interested segments of the ornamental industry. The aim was to identify the diseases critically requiring fungicide research. Separate questionnaires were sent for insects and mites and weeds. Last November, I related some of the results of an IR-4 survey of ornamental growers. There were 325 responses last year and 486 responses this year. The responses were mainly from growers with greenhouses and nurseries that grew bedding plants, ornamental grasses, potted plants, shrubs and trees. About 30% of the responses came from three states: Ohio, Oregon and Texas.

The top pests were mites and spider mites followed by aphids, thrips and scales/mealy bugs. Whiteflies were a distant fifth. The most commonly cited weeds were all broadleaf including bittercress, spurge, oxalis and nut-sedge with liverworts in fifth place.

The top disease concerns changed from *Phytophthora* which was the single greatest problem for growers throughout the US in the 2006 questionnaire. The most serious problems identified in this year were powdery mildew and leaf spots (including anthracnose). *Phytophthora* dropped to the third position followed by crown and root rot and finally *Botrytis*. The table summarizes the top diseases, pests and weeds by region of the US. It is clear that growers have more trouble

controlling powdery mildew than any other disease group. Since there are huge number of very effective products in all types of categories (biological, green, traditional) I wonder why this is so. I do admit to failing to control rose powdery mildew in a couple of trials and of course application cost may be the main issue.

Next week, the IR-4 meeting is once again being held, this

time in Cherry Hill, New Jersey. The disease focus has been on *Phytophthora* (and *Pythium* to some degree) for the past few years. One of the purposes of the meeting is to determine the focus for the 2008 funding year. The results on the fungicides (both registered and experimental) for *Phytophthora* control have been very good to excellent while the results for the few *Pythium* trials that were completed were marginal. The products that are currently registered appear to do a better job of controlling *Pythium* root rot than those under development. I am hoping to see crown rots and/or anthracnose emerge as targets for testing this year. I will report the results of the deliberations in Chase News next month.

### Survey results of the top diseases, pests and weeds for four regions in the US.

North Central	North East	South	West
<b>Diseases</b>			
Powdery mildew	Powdery mildew	Leaf spots/anthracnose	<i>Phytophthora</i>
<i>Botrytis</i>	Leaf spots/anthracnose	Powdery mildew	Powdery mildew
<b>Pests</b>			
Mites/spider mites	Aphids	Scale/mealybugs	Mites/spider mites
Thrips	Mites/spider mites	Mites/spider mites	Aphids
<b>Weeds</b>			
Oxalis	Oxalis	Spurge	Liverwort
Thistle	Bittercress	Bittercress	Bittercress

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### Anthracnose on *Dracaena sanderiana*

In 2002, I became aware of a disease on *Dracaena sanderiana* (Lucky Bamboo) that was causing quite a stir at ports of entry throughout the US and Canada. The pathogen appeared to be anthracnose (*Colletotrichum gloeosporioides* had been identified previously). Since that time, a group of mycologists at APHIS and the ARS in Beltsville, MD (Farr, Aime, Rossman and Palm) have studied the species of *Colletotrichum* from members of the Agave family (contains dracaenas and phormiums too). They determined that the *Colletotrichum* from these Lucky Bamboo originating in China is a distinct and new species—*C. dracaenophilum*. Their evaluations included molecular testing of a wide range of isolates held in culture collections throughout the world as well as the newly described *C. dracaenophilum* from *D. sanderiana*.

Some of the anthracnose diseases of other members of the Agavaceae have been known for many years (1899 for Phormium and 1905 for Agave). The description of this new species on Lucky Bamboo indicates the value of our modern molecular techniques. For a complete report see: Mycological Research 110(2006):1395-1408.

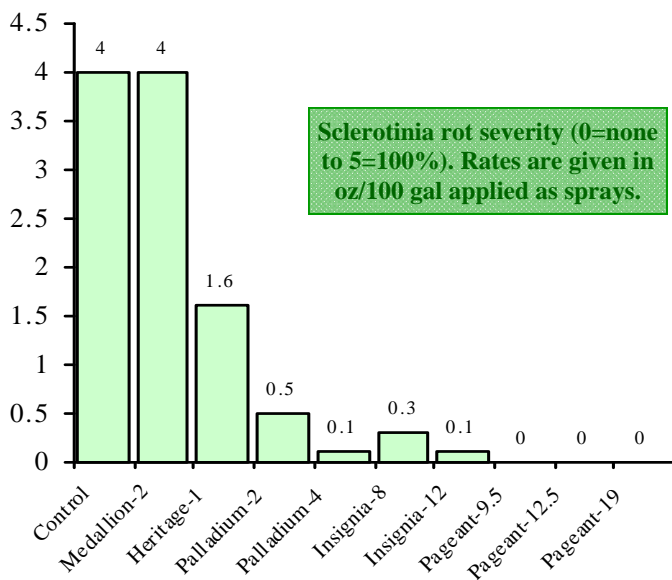


### Superphosphate Promotes Soft Rot in Callas

Gracia-Garza et al. reported on the effect of phosphorus on severity of soft rot (*Erwinia carotovora* subsp. *carotovora*) in a 2004 report. The researchers found that superphosphate incorporation into the potting medium resulted in significantly higher levels of soft rot on calla lilies. Phosphate in the nutrient solution, however did not affect soft rot severity. The presence of phosphorus with soft rot bacteria actually increase their production of the enzymes that breakdown the cells walls of the plants causing soft rot (polygalacturonase and pectate lyase). The authors suggested that supplying phosphate through nutrient solutions would reduce incidence of soft rot without creating phosphorus deficiency in the calla lilies. See: European Journal of Plant Pathology. 110:293-298 (2004).

### Control of Sclerotinia Rot of Stock

Wegulo and Counsell (University Nebraska) reported on a 2006 trial on controlling *Sclerotinia sclerotiorum* on *Matthiola incanae* (stock). Fungicides were applied as a spray on 5 and 15 September and plants were inoculated on 12 September. The graph to the right shows the disease severity rating (29 September) based on a scale from 1=no disease to 5=100% rot. Excellent control was achieved with Palladium (4 oz/100 gal), Insignia (12 oz/100 gal) and all three rates of Pageant (9.5, 12.5 and 19 oz/100 gal). Palladium is a combination product under development by Syngenta and Pageant is another combination under development from BASF. These products will be welcome additions for Sclerotinia control on ornamentals. A complete report is available: Plant Disease Management Reports 1:OT021 (2007).



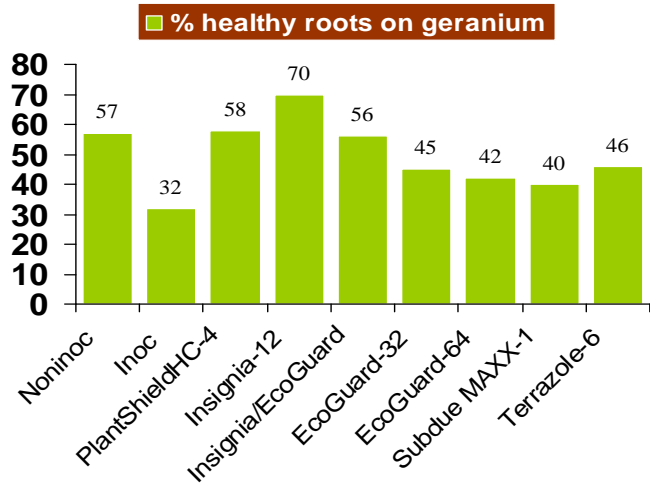
Wegulo and Breathnach tested some of the same fungicides for Botrytis control on rose (see picture below for Botrytis symptoms during propagation) and got excellent results with Palladium (2 or 4 oz/100 gal), Heritage (1 oz), Insignia (8 oz) and Medallion (2 oz) when applied three times on a 10-day interval. See: Plant Disease Management Reports 1:OT019 (2007).



## Pythium Root Rot Control on Geraniums and Poinsettias

This year we have been testing many fungicides as well as biological agents for control of root diseases including Pythium root rot. Our most recent trial was conducted using Pythium root rot on geranium. The *Pythium irregulare* isolate we used originally came from geranium and was found to be resistant to Subdue MAXX.

We started by planting the zonal geranium ('Pinto White') plugs into 3.5 inch pots containing Fafard Mix 2 and top-dressed with Osmocote Plus 15-9-12. Plants were treated with drenches on a 14-day interval a total of four times starting on 28 June and ending on 9 August. Drenches were applied at the rate of 1 pint per square foot (a little more than 1 oz/3.5 inch pot). Treatments included controls, PlantShield HC (4 oz/100 gal), Insignia (12 oz), a combination of Insignia (8 oz) and EcoGuard (32 oz), EcoGuard (32 or 64 oz), Subdue MAXX (1 oz) and Terrazole 35W (6 oz). EcoGuard is a biological product from Novozymes (Roots). Plants were rated for height, top grade, final fresh weight of tops and the percentage of healthy roots on 21 August 2007. The data for roots was the only data that was significantly affected by treatment and is shown in the graph below.



The best roots were found on the plants treated with Insignia at 12 oz. These were statistically the same as the noninoculated controls, the PlantShield HC and the Insignia and EcoGuard combination. The EcoGuard alone, Subdue MAXX and Terrazole treatments were only slightly better than the inoculated controls. This trial shows that both traditional fungicides and biological agents can give effective control of Pythium root rot on Geranium. The combination of Insignia and EcoGuard is further interesting since it would be a good tool for resistance management.



Hausbeck and Harlan reported controlling Pythium root rot on poinsettia in Plant Disease Management Reports 1:OT013 (2007). The test evaluated efficacy of Subdue MAXX and Heritage alone and in combination for prevention of *Pythium ultimum* on 'Freedom Red'. Fungicides were applied as drenches on 13 January and 14 February and final plant height and health were recorded on 17 March. The disease pressure was severe in this trial.

### Control of Pythium root rot on Poinsettia

Treatment	Rate/100 gal	Plant health	Plant height (in)
Noninoculated control	—	1.0 a	6.0 c
Inoculated control	—	3.5 c	4.1 d
Subdue MAXX	0.5 oz	1.3 ab	7.4 a
Subdue MAXX	1.0 oz	1.0 a	7.1 ab
Heritage	0.45 oz	2.0 b	4.8 d
Heritage	0.9 oz	1.5 ab	6.1 bc
Heritage and SMAXX	0.45 and 0.5 oz	1.0 a	7.3 a
Heritage and SMAXX	0.9 and 1 oz	1.0 a	7.5 a
Truban 30WP	1 0 oz	1.2 a	6.9 abc

The tallest plants were any of those treated with Subdue MAXX (alone or in combination with Heritage). Plant height reflects severity of stunting due to Pythium root rot. The only treatment that did not result in significant control in this trial was the 0.45 oz rate of Heritage alone. This trial concurs with results of trials at Chase

Horticultural Research over the past five years or so on use of Heritage for Pythium root rot.

Hopefully, additions to the Heritage label for Pythium control will reflect the need to add another fungicide if the 0.45 oz rate is to be used.

## MSU Researchers Conduct Rose Downy Mildew Trials

Michigan State University researchers, Gevens, Harlan and Hausbeck have been conducting cooperative studies with Florida growers for the past 5 years or so. In 2006, they completed two studies on rose downy mildew. The fungicides were applied weekly 7 times (trial 1) or 3 times (trial 2). The average number of leaves with downy mildew sporulation were determined. I have summarized their data (see original reports in Plant Disease Management Reports 1:OT004 and OT005, 2007) in the table below. While all of the fungicides tested in both trials significantly reduced number of leaves with downy mildew sporulation, I have chosen to include only those that gave at least 60% control.



The first trial showed that combinations of mandipropamid (a new active ingredient from Syngenta) and Heritage or Subdue MAXX were most effective in preventing rose downy mildew. Mandipropamid has been very effective on Phytophthora as well but less effective on Pythium root rot. In this way it is similar to Stature DM by giving superior control of downy mildew and Phytophthora but not Pythium.

Pageant was also very effective. This combination of active ingredients from BASF is due to be registered in early 2008 and has a very broad range of activities. Finally, it was interesting that SP2015 (SePRO) showed very good downy mildew control. We have seen very good results with this active ingredient for bacterial leaf spots (*Pseudomonas* and *Xanthomonas*) and anthracnose on cyclamen.

The second trial evaluated a number of broad spectrum registered fungicides. The best control in this trial occurred when plants were treated with Daconil WeatherStik. Unfortunately, this treatment reportedly caused phytotoxicity and does have a moderate level of residue which will limit its

usefulness on some crops. Heritage, Stature DM and Junction also gave good control.

In our trials on rose downy mildew, we have found that

Trial 1—% Control of Rose Downy Mildew		
Fungicide	oz/100 gal	% control
Heritage and mandipropamid	1 and 8.2	87
Heritage and mandipropamid	1 and 2.05	78
Subdue MAXX and mandipropamid	1 and 4.1	76
Subdue MAXX and mandipropamid	1 and 8.2	75
Heritage and mandipropamid	1 and 4.1	72
Mandipropamid	8.2	70
Subdue MAXX	2	69
Pageant	18.5	66
SP2015	10	62
Pageant	12.5	62

Trial 2—% Control of Rose Downy Mildew		
Fungicide	oz/100 gal	% control
Daconil WeatherStik	16	83
Heritage	4	75
Stature DM	12.8	73
Junction	54	72
Pentathlon	25.6	65
Kocide 2000	32	60

some of the best control is achieved with FenStop (5 oz/100 gal) and Aliette (1-2 lbs/100 gal). FenStop is a new fungicide from OHP that works well on many downy mildews, Phytophthora and Pythium and is currently labeled for greenhouse use only. It is in a closely related group of fungicides to the strobilurins and you should not alternate FenStop with a strobilurin fungicide (such as Compass O, Cygnus, Heritage or Insignia) since cross resistance may occur. Our trials have also shown that using higher rates of Aliette (over 2 lbs/100 gal) is counter-productive, often resulting in increased downy mildew. Try 1 lb first, since it is often as effective as the 2 lb rate. As always read the labels to make sure you are not doing something illegal.

