



ON THE ROAD AGAIN

Every other year, Valent brings together plant pathologists, entomologists, weed scientists and horticulturists for a retreat to discuss the state of pest control in the ornamental industry. This year it was held in Jacksonhole Wyoming and the first thing we did was discuss our interests and what was going on in our respective corners of the country.

Plant Pathology

Dr. Mike Benson, from North Carolina State is working on genetic diversity of *Phytophthora cinnamomi* (the cause of Phytophthora root rot on azalea and many other woody crops). He specializes in *Phytophthora* and *Rhizoctonia* and is especially interested in biological control of these pathogens.

Ms. Margery Daughtrey with Cornell University works on a wide range of disease but is currently involved in downy mildew and black root rot and well as *Phytophthora*.

Dr. Dave Norman from University of Florida has been working on *Ralstonia* over the past few years. His lab is one of the only labs in the country cleared to work on the quarantined biotype of this bacterial pathogen.

Dr. Jean Williams-Woodward works for the University of Georgia. Jean has been working very heavily in Ramorum blight detection in Georgia. She also works on control of daylily rust, Leyland Cypress needle blight and told us about a new disease of *Ajuga*—Phoma root rot.

Horticulture

Mr. Steve Tjosvold works for the University of California. Steve has completed many studies on the host range and fungicide control of Ramorum blight. His newest work is on mealybug control on roses, thrips control and liverwort control.

Dr. Hannah Mathers works for The Ohio State University primarily in nursery weed control. Hannah and her grad students are working in surveying needs of the Spanish labor force, the effects of DNA herbicides on over-wintering stock, treated mulches and tree liner production.

Dr. Jim Barrett works for the University of Florida and specializes in PGR application methods and rates on most ornamentals as well as and new varieties.

Dr. Joyce Latimer works on PGRs on perennials (especially the new

testing liner dips and drenches as newly emerging application methods.

Weed Science

Dr. Charles Gilliam works for Auburn University. He is currently Dept. Chairman. Charles is especially interested in creation of alternate substrates for the nursery industry and mentioned the increase in liverworts in the SE.

Dr. James Altland works for Oregon State University. He is working on *Epilobium*, liverwort and spurge control. You can find a nice article from James in the most recent NMPRO issue.

Dr. Andy Senesac attended from Cornell. Andy works on everything from landscape, field and container crops in ornamentals as well as other areas. He mentioned increased movement of new weeds species from the south causing problems as annual weeds in the NE.

Dr. Jeff Derr works for the University of Georgia on bittercress, spurge, groundsel and yellow nutsedge. He also mentioned movement of weeds with woody ornamental liners.

Entomology

Mr. Dan Gilrein works at Cornell University on landscape, greenhouse and most other crops for insect control. Dan has been working on Oriental beetle and grubs in field and container ornamentals.

Dr. Ron Oetting has been working on new product evaluations for the University of Georgia including whiteflies, thrips and mealybugs.

Dr. Ray Cloyd is working on tank mixes for insect control at the University of Illinois with emphasis on Western flower thrips, leafminers, and emerald ash borer.

Mr. Jim Bethke works insect control and resistance issues for the University of California. Jim is working on the Q biotype of silverleaf whitefly.

Dr. Pete Schultz works at Virginia Tech on nursery and landscape crops. He is working on improved pheromone traps for dogwood borers and Asian ambrosia beetle.

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Leaf Spot Control Update—*Alternaria* and *Cercospora*

We have been busy in the past few months doing a variety of new trials for leaf spot control. I report on several of these trials in this issue of *Chase News*.

The first trial we performed was prevention of *Alternaria* leaf spot on *Zinnia elegans* 'Profusion Orange'. The fungicides included three phosphonates: Mimik (experimental product) at 32 oz/100 gal, Fosphite at 32 oz/100 gal and Aliette at 16 oz/100 gal. We also trialed four strobilurins: BAS500 (pyraclostrobin from BASF) at 4 oz/100gal, Heritage at 1 oz/100 gal, Compass O at 2 oz/100 gal and Cygnus at 3.2 oz/100 gal. The fungicides were applied three times on a ten-day interval.

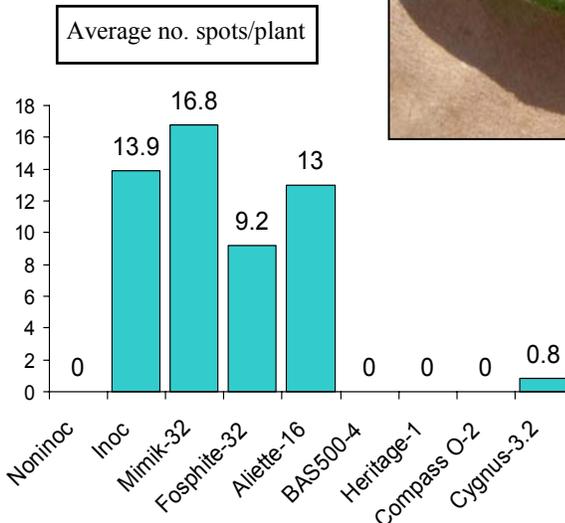
The number of leaf spots per plant was recorded at the end of the trial and the mean number of spots per treatment are shown in the graph to the right.

None of the phosphonates provided any control of *Alternaria* leaf spot on these zinnias. In contrast, the stro-

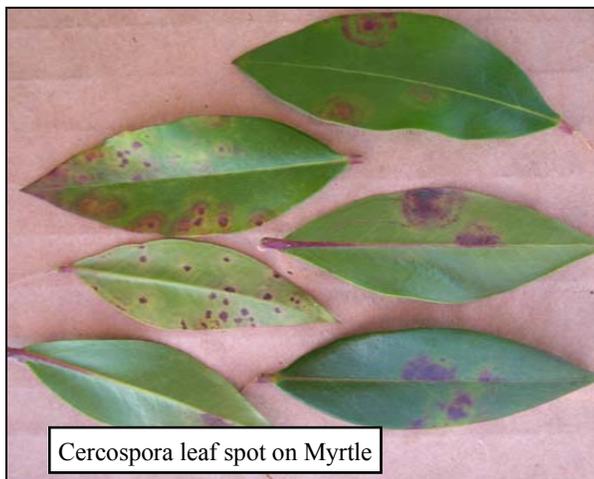
bilurins provided excellent prevention of the disease. Only the Cygnus failed to give 100% control with a few spots present. We are currently performing a second trial on this disease with some experimental products as well as many that are routinely used for *Alternaria* leaf spot prevention.



Alternaria leaf spot on Zinnia



We have had mixed results with strobilurins on *Alternaria* leaf spots. In most cases, they provide excellent control but occasionally, control is only mediocre. Clearly, in this case, all four of these fungicides provided excellent control. Remember to alternate products to avoid resistance development. Other effective products include Chipco 26019, Daconil and Medallion.



Cercospora leaf spot on Myrtle

Cercospora leaf spot control on Myrtle

Treatment	Rate/100 gal.	Disease severity
Water - Non-inoculated	-----	0.0 a
Water - Inoculated	-----	138.3 b
CGA 64250/Chlorothalonil	16 oz	0.0 a
Medallion	2 oz	65.9 b
Heritage	2 oz	0.0 a
Eagle (Systhane)	4 oz	13.2 a
Cleary's 3336	8 oz	0.0 a
Daconil Ultrex	22.4 oz	0.0 a
Compass O	2 oz	0.0 a
BAS500 (Insignia)	4 oz	0.0 a
Protect T&O	16 oz	0.0 a
Banner MAXX	4 oz	9.9 a

With the excessive rainfall that California had this past winter and spring, quite a few new or at least previously unknown leaf diseases appeared. We tested a new *Cercospora* leaf spot on myrtle used for cut foliage. Specific fungicides and rates tested are given in the table to the right. We applied products four times on a 14 day interval. The table lists the average number of spots per plant. Most of the fungicides gave 100% prevention including Heritage, Cleary's 3336, Daconil Ultrex, Compass O, BAS500 and Protect T&O. The only fungicides that did not provide 100% prevention

were Medallion, Systhane and Banner MAXX. I was surprised with the failure of Medallion since although it reduced the number of spots

by 50% it was not significantly better than the inoculated controls. The two sterol inhibitors, Systhane (Eagle) and Banner MAXX gave control equal to the non-inoculated controls but a few spots did develop.

The combination of CGA 64250 and Chlorothalonil is under development at Syngenta and once labeled will allow for management of resistance since its components belong to different chemical classes. The strobilurins (Heritage, BAS500 and Compass O) were 100% effective.

Two of the best products are two of the oldest products—Daconil and Protect. New is not always better.

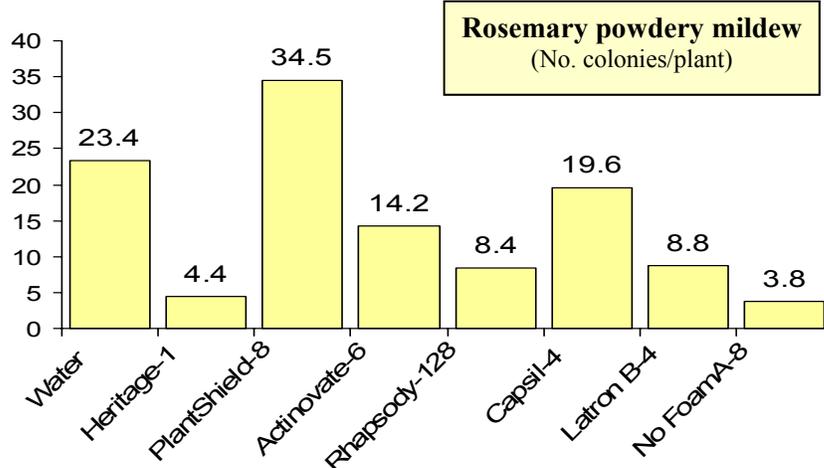
Rust and Powdery Mildew Eradication

Eradication of powdery mildew or rust can be a serious problem. We tested eradication of powdery mildew on rosemary earlier this year and had another opportunity a couple of months ago. The first trial evaluated strobilurins and phosphonates but this time we looked at three biological control agents and three wetting agents. The rosemary plants were produced from cuttings during the winter and developed an impressive case of powdery mildew in the process. We applied the products on a weekly interval four times and rated them weekly for number of powdery mildew colonies per plant.

The biological control products were PlantShield at 8 oz/100 gal (*Trichoderma harzianum* normally used for soil-borne fungal diseases), Actinovate at 6 oz/100 gal (a *Streptomyces* sp. normally used for soil-borne fungal pathogens) and Rhapsody at 1% (*Bacillus subtilis* normally used for foliar diseases, especially powdery mildew). The wetting agents were Capsil at 4 oz/100 gal (organosilicate), Latron B 1956 at 4 oz/100 gal (nonionic) and No Foam-A at 8 oz/100 gal. We used Heritage at 1 oz/100 gal as our industry standard for this trial.

Results after four applications showed the best control with No Foam-A and Heritage. Rhapsody and Latron B 1956 were also very effective. Actinovate also gave some control but Capsil and PlantShield failed to give significant control in this trial.

These results indicate that the “softer” products like biological controls or wetting agents can provide eradication of powdery mildew equal to an industry standard (Heritage in this case).

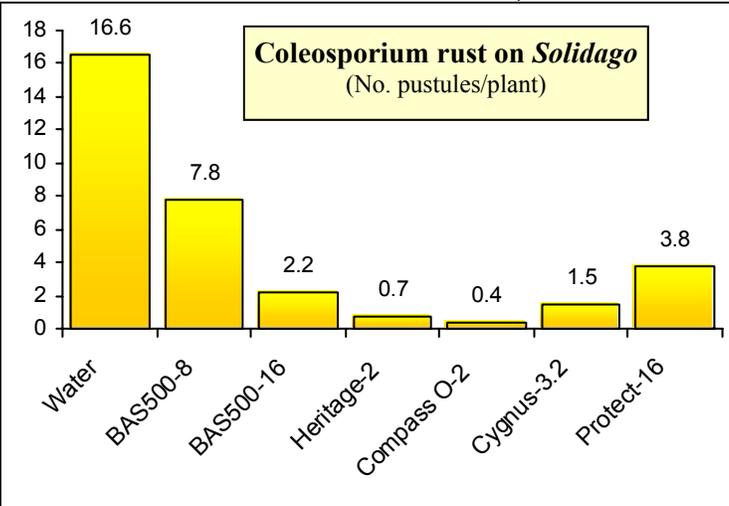


Rust products grouped by chemical class	Powdery mildew products grouped by chemical class
Compass O, Cygnus, Heritage	Compass O, Cygnus, Heritage
Banner MAXX, Systhane (Eagle), Strike, Terraguard	Banner MAXX, Systhane (Eagle), Rubigan, Strike, Terraguard
Dithane, Protect T&O, Fore	Latron B 1956, Capsil, No Foam-A, Silwet
	Camelot, Phyton 27

In late March, we received a shipment of rooted *Solidago* (*Solidaster*) cuttings that had a small but noticeable infection of *Coleosporium* rust. These cuttings had been destined for the cut flower trade but were rejected when the rust was detected. When we started the trial, there were no more than 2-3 pustules per plant and many showed no obvious infection at all. During the trial, they did develop additional rust. We applied fungicides three times on a 14-day interval. The products included the four strobilurins as well as the broad-spectrum protectant, Protect T&O (used at 16 oz/100 gal). The strobilurins included were: BAS500 (8 or 16 oz/100 gal), Heritage (2 oz/100 gal), Compass O (2 oz/100 gal) and Cygnus (3.2 oz/100 gal).

Optimal control was found with Compass O and Heritage with Cygnus and the 16 oz rate of BAS500 as effective (statistically). The 8 oz rate of BAS500 was only 50% effective. The protectant mancozeb (Protect) gave very good control as well. Previous work has indicated mancozeb is most effective in a truly preventative mode and not as good in a curative manner as strobilurins like Heritage.

The fungi causing both rust and powdery mildew make huge numbers of spores and can become resistant to fungicides if they are not rotated. Check the table above for products that give very good to excellent control of powdery mildew or rust.

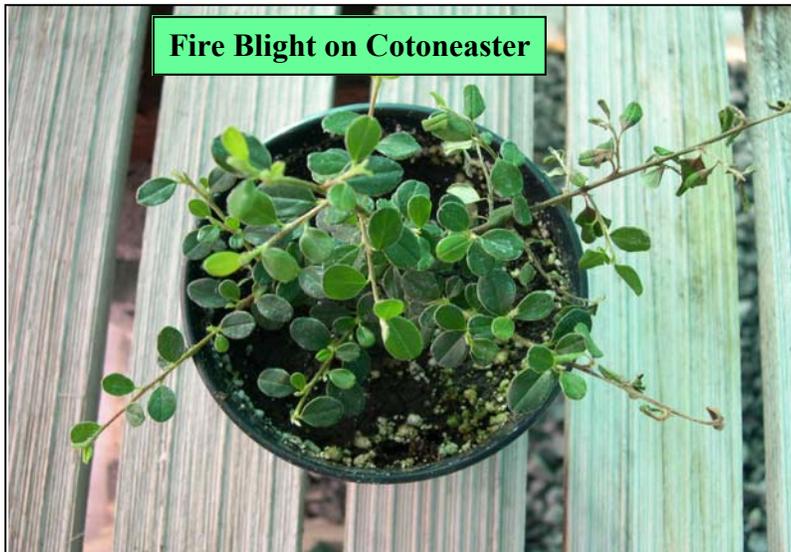
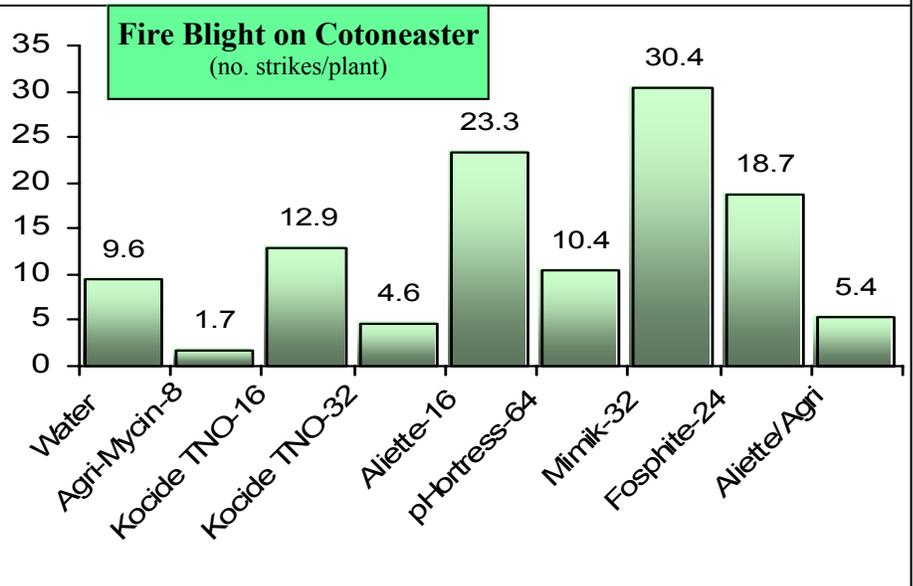


Fire Blight Control on Cotoneaster

Early last winter, I was asked to trial a biological control product for fire blight. I had not done such a trial before but succeeded in isolating the pathogen, *Erwinia amylovora*, from some *Photinia* and obtained Cotoneaster for the test plant. Since the rooted cuttings had stopped flowering by the time we were ready to do the trial we inoculate them by trimming the shoot tips and spraying with the bacterium. All plants were inoculated. Imagine my surprise when the test succeeded.

We included several types of products from phosphonates (Aliette at 16 oz/100 gal, pHortress at 64 oz, Mimik at 32 oz and Fosphite at 24 oz). We also used the antibiotic Agri-Mycin at 8 oz/100 gal and two rates of a copper product (Kocide TNO at 16 or 32 oz/100 gal). We even tested a tank mix of Aliette and Agri-Mycin (each at 8 oz/100 gal). Plants were sprayed four times on a weekly interval with inoculation after the second application.

The average number of strikes (dying branches) per plant was recorded four days after the final bactericide application. Some of the products actually increased disease severity compared to the inoculated controls. None of the phosphonates were effective with three of the four actually increasing disease compared to the water-sprayed control. The 1 lb rate of Kocide was not effective but the 2 lb rate did reduce disease. The best treatment in the trial was Agri-Mycin—the industry standard for the apple and pear market.



Watch for Fire Blight on:

- Arctostaphylos* (manzanita)
- Cotoneaster*
- Heteromeles* (toyon)
- Malus* (apple)
- Photinia* (Red-tip or Red-top)
- Pyracantha*
- Pyrus* (pear)
- Raphiolepis* (Indian Hawthorne-below)

