

THE STATE OF EXTENSION AND RESEARCH IN ORNAMENTALS—FINAL THOUGHTS FROM THE PARK CITY WORKSHOP

The following summary is presented from the Park City, Utah workshop sponsored by Valent USA. I first reported on this meeting in July. This month I thought I would relate the areas of Extension and Research needs that were identified.

Extension scientists must continue to define their role in the future, since it has been changing over the past 10 years especially. There does seem to be a degree of resistance to change but we must change to survive. One of the things that has been happening is the advent of fee-based programs and technology. These are expected to offset loss of the traditional federal or state support. Applied research has always been part of extension in some states such as California. Some special schools (training) have been developed as a result of this research. Purdue has one on weeds and California has a diag-

nostic school and an aquatic school.

Loss of funds is forcing universities to better improve delivery of information. The traditional dog and pony show costs too much to do now. Distance education in pest management is in place at 7 campuses in Florida. Each site must meet a minimum fee to meet goals for costs or they don't go on line. They have also conducted training in "Improving your plant palette" through ALCA and provide certification as a landscaper.

Another example of alternative education is found at NC State. Extension workers have gone to grower's associations with paid workshops at meetings like the Southeast GH Conference. Profits are shared between the University and the grower organization.

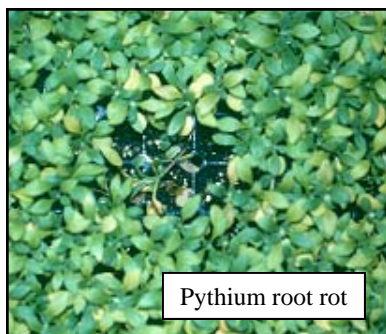
Funding is going to continue to change what is done and why.

These programs have been successful in many states. However, unless basic and applied research continues there won't be anything to extend.

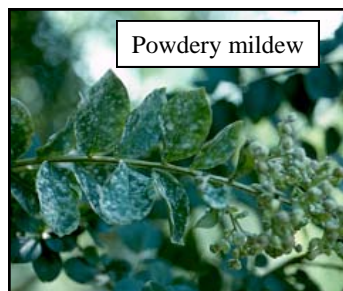
Major program areas reflect both current and long term goals. "Mission Research" that is goal-oriented has become more common. Cornell divides extension and research very distinctly as does Michigan State. Bridging the gap is not an easy proposition but since we have used up basic research from 20 years ago new work must be done.

There are no weed science departments in US so reaching a critical mass in terms of individuals cannot be achieved easily. Weed scientists must go across departments and sometimes universities to find partners. This can be very exciting and makes the likelihood of performing critical research higher.

WATCH OUT FOR THESE PROBLEMS AS FALL APPROACHES!



Pythium root rot



Powdery mildew

It is especially important now to watch out for over-watering since it is so easy to do when the weather fluctuates. Lower night temperatures also result in condensation on leaves and both powdery and downy mildews start to appear.



Erwinia blight

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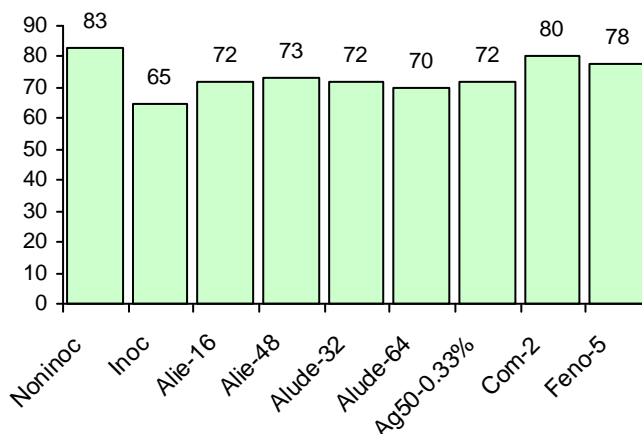
CONTROL OF ROOT DISEASES—PHYTOPHTHORA ROOT ROT ON VINCA

We have been trying to perform trials all summer on Phytophthora aerial blight on vinca to no avail. When we checked the root systems in the trials we did find that instead of aerial blight the fungus had caused root rot instead. Treatments were Aliette (16 or 48 oz/100 gal), Alude (phosphorous acid alternative to Aliette at 32 or 64 oz), Agri-Terra (0.33%), Compass O(2 oz), and fenomen (related chemical class to strobilurins at 5 oz).

While the difference between inoculated and noninoculated controls looks small, it was significant. Aliette and Alude gave some control at both rates tested to the same degree. Agri-Terra was equally effective but Compass O and fenomen were excellent at controlling Phytophthora root rot on vinca in this trial.

It is interesting that the strobilurin Compass O and related chemical, fenomen, were superior at controlling this root rot. Based on previous experience, I would have selected Aliette as the best treatment for this disease. Wrong again!

Healthy root were estimated on a percentage basis.

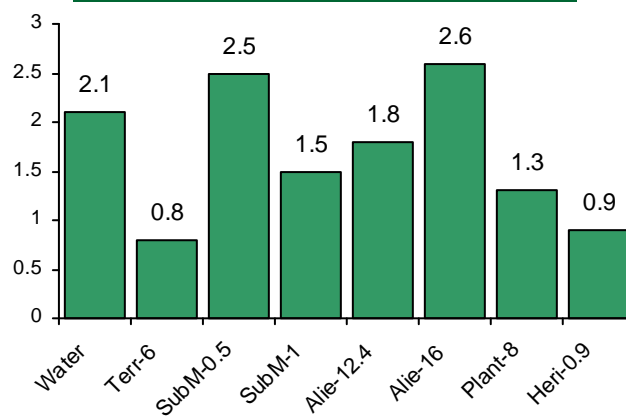


PYTHIUM ROOT ROT CONTROL ON ZAMIA CULCAS

Zamia culcas is a tropical foliage plant that is gaining popularity in both California and Florida. Propagation through rooting of leaf cuttings is sometimes troubled with Pythium root rot. We did a trial with the most effective fungicides last winter. Fungicides were applied as soil drenches on a monthly schedule. Zamia culcas with infected root systems were used so the trial was therapeutic in nature. Treatments were Terrazole (6 oz/100 gal), Subdue Maxx (0.5 or 1 oz), Aliette 80WDG (12.4 or 16 oz), PlantShield (8 oz) and Heritage (0.9 oz). Some of the rates were lower than I have found effective in our trials but we used them since they were the highest labeled rates for these products.

The graph to the right shows the number of good roots per plant. Most healthy roots were found on the Subdue Maxx used at 0.5 oz and the Aliette at 16 oz. Unfortunately, the fungicides appeared to cause root damage since most of them had poorer roots than the water treated control. This may be a case where cultural control can solve the problem since chemical control clearly is not beneficial.

The number of good roots per plant is shown.

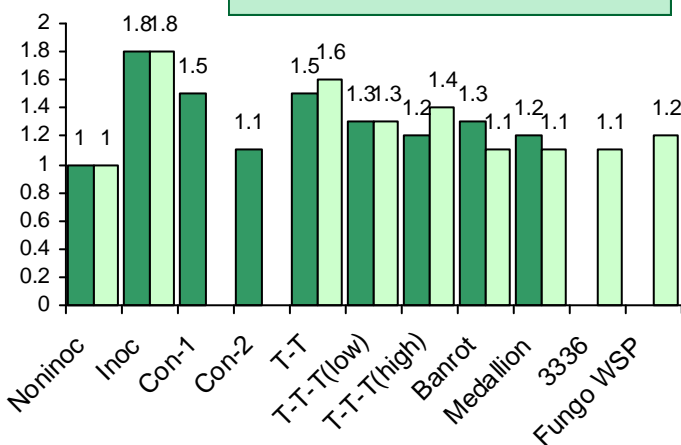


RHIZOCTONIA STEM ROT CONTROL ON VINCA

We performed two trials this summer with Rhizoctonia stem rot on vinca. The severity of disease was similar (and low) in both trials (Trial 1 is shown in dark-green bars and Trial 2 in light-green bars). One application was made to vincas before inoculation and one or more afterward on a 14-day interval. The treatments were: Con (Contrast at 1 or 2 oz/100 gal), T-T (Terraguard [4 oz] combined with Terrazole [3.4 oz]), T-T-T(low) (Terraguard [1 oz], Terrazole [3.4 oz], and Terraclor [4 oz]), T-T-T(high) (Terraguard [2 oz], Terrazole [3.4 oz], and Terraclor [4 oz]), Banrot (8 oz/100 gal), Medallion (1 oz/100 gal), 3336 (16 oz/100 gal), and Fungo WSP (16 oz).

Contrast was effective at 2 oz but only marginally so at 1 oz. None of the combination treatments did a very good job in either trial. The rate of Terraguard was too low to be beneficial and the rate of Terraclor was marginal as well. Only the T-T-T at the high Terraguard rate gave moderate control. Banrot and Medallion as well as both thiophanate methyl products (3336 and Fungo WSP) gave very good control in both trials.

Disease was rated from 1 (none, healthy) to 5 (dead). These ratings were all slight.



ALTERNARIA LEAF BLIGHT ON LOBELIA AND ZINNIA

We have been struggling with Alternaria leaf spot trials all year for some reason. We finally set up a trial with zinnias, lobelias and impatiens in an effort to get at least one of them to develop disease. Well, the lobelias worked so here are the results.



The trial was started in July with weekly sprays of BAS500 (an unregistered strobilurin product), Chipco 26019 (iprodione) and Phyton

27 (copper pentahydrate). Plants were inoculated after the first spray and kept under mist to promote Alternaria leaf blight.

Two days after the final spray we rated leaf blight severity (1 = none, healthy), 2 (slight), 3 (moderate), 4 (severe) and 5 (dead). The table below shows the ratings. I include the zinnia flower blight ratings (same scale as above) to show that even when leaves can be protected from Alternaria, sometimes the flowers are just too susceptible and disease develops on them. This test indicates that BAS 500 will be a good product for Alternaria diseases if used at rates of 4 or 8 oz/100 gal. Phyton 27 gave some disease control, but Chipco 26019 was slightly better. Years of working with these fungicides indicated they would give very good to excellent control. Other strobilurins (Compass O and Heritage) have also been good for Alternaria leaf spot in our trials.

Treatment	Rate/100 gal	Lobelia leaf blight	Zinnia flower blight
Water-noninoculated	—	1.0 a	1.9 a
Water-inoculated	—	3.1 c	3.0 b
BAS500	4 oz	1.2 a	2.6 b
BAS500	8 oz	1.1 a	2.7 b
Chipco 26019	16 oz	1.6 ab	2.9 b
Phyton 27	25 oz	2.0 a	3.0 b

BOTRYTIS STEM ROT ON EXACUM

Under normal circumstances I might never have tried a Botrytis trial in the summer. I probably should not have tried this one but we ran into an experimental fungicide that needed some quick evaluation for Botrytis and I thought why not.

Exacum are notoriously sensitive to Botrytis stem rot. They can succumb anytime from plug production through finished product. The trial we conducted was done under really bad conditions for the plant and really good conditions for the Botrytis. The greenhouse was dark, wet and we actually stabbed the plants to get the disease going.

The trial was started in August with a spray directed to the stems of the plants. We inoculated by wounding the base of the stem and adding a small culture of Botrytis. Then we turned on the mist. The fungicides were sprayed twice on a 7 day interval.

We rated the severity of stem rot the day before the second fungicide spray and 6 days later. Stem rot severity was rated as follows (1 = none, healthy), 2 (slight), 3 (moderate), 4 (severe) and 5 (dead). The table to the right shows the ratings.

The experimental product not only failed to control Botrytis stem rot it actually made it worse. This demonstrates once again that you need to be careful when trying to control diseases like Botrytis since wounding the plant actually makes disease worse.



Botrytis stem rot on Exacum

Treatment	Rate/100 gal	Stem rot
Water-noninoculated	—	1.0 a
Water-inoculated	—	2.6 b
A1664	6.7 oz	4.6 c
A1664	13.3 oz	4.7 c
A1664	26.6 oz	2.9 b
Decree	16 oz	1.3 a

We did see very good control of the stem rot with Decree and no disease on the noninoculated controls. So even normally adverse weather conditions (heat), Botrytis can attack susceptible crops and Decree can protect them.

FROM THE TRADESHOW FLOOR—MIKE ZEMKE

I attended two new (to us anyway) tradeshow in the past month. The first was the **Perennial Plant Symposium** in Sacramento at the end of July. This show moves around the country. Last year it was held in Chicago and next year it will be in New York. Attendance this year was around 650 (last year was about 1500). As you can see the selection of the site and local chapter marketing are critical for good attendance. People from all over the country stopped by the booth and we have seen a lot of response to our pre-print special on our **Perennial Problems** card set. You can still order a set at \$5 discount until September 15.

The second new show for us was the Farwest Show in Portland, August 21-23. This show is huge and growing every year (trying to catch up to the Ohio show!). As newcomers, we were up in the small room behind registration instead of the main floor. This turned out to be a good spot since most people started here in their journey. I may try to move our booth to the main floor next year since traffic fluctuated in our location.

Our next show will be CAPCA (California Agricultural Production Consultants Assn.) will be in Reno from October 19-21 at the Nugget. See you there!
Mike

PREVENTING GERBER DAISY POWDERY MILDEW

One of the most common problems encountered in ornamental production is powdery mildew. The disease is caused by fungi such as *Oidium*, *Sphaerotheca* and *Erysiphe*. We work on different plants throughout the year but usually resort to Gerber daisy as the easiest to work with.

The first trial was conducted using 'Festival Dark Eye Yellow' gerbera plugs and a new product called Agri-50. We have been testing this product for a few years and found it to be effective for powdery mildew. The trial compared two rates of Agri-50 (1:333 and 1:450) to Compass O (1 oz/100 gal) applied on a 7, 14 or 21-day interval. Products were applied between 24 July and 22 August.

The table below (left) shows the disease (# PM spots) and top grade (8-27-03). Top grade was rated as follows: 1 (dead), 2 (poor, unsalable), 3 (moderate, salable), 4 (good salable), and 5 (excellent, salable). Plants were small at test initiation and few reached salable size when we ended the trial.



We saw some leaf deformity with Agri-50 at both rates when applied weekly. However, when applied every 14 or 21 days this did not occur. Disease was controlled very effectively with Agri-50 at either dilution when applied as far apart as 21 days. At the 21 day interval, powdery mildew had started to develop on the 1:450 dilution. The level of control with Agri-50 was comparable (or even a little better) to that achieved with Compass O when used at 1 oz/100 gal.

I have been hearing about efficacy of some wetting agents in controlling powdery mildew on a variety of crops over the past two years. The most commonly mentioned product is Latron B 1956. Since we had so many Gerber daisies of four cultivars we compared Latron B 1956, Silwet and Capsil to Compass O. All products were applied at 2 oz/100 gal, four times on a weekly interval.

Disease was again rated as the number of powdery mildew spots per plant (8-21-03). The response showed that Jaguar 'Apple Blossom' was most susceptible with 'Festival Light Eye Yellow' least susceptible. In each case, the wetting agents were effective in preventing powdery mildew development. Although Silwet caused slight damage on one cultivar, the wetting agents were as effective as Compass O.

This makes interpretation of powdery mildew trials that employ wetting agents in their sprays a little tricky. If the control treatment is actually untreated then a comparison to any product with one of these three wetting agents would not be fair. Only trials that compare wetting agents alone to fungicides mixed with wetting agents would be valid to judge the benefits of using the fungicide. I may continue to leave wetting agents out of our trials until we are sure the prod-

Treatment (interval)	Rate/100 gal	# PM Spots	Top Grade
Water	----	19.5 c	3.0 c
Agri-50 (21 day)	1:333	0.9 ab	2.7 c
Agri-50 (14 day)	1:333	0.0 a	2.9 c
Agri-50 (7 day)	1:333	0.2 a	2.4 a
Agri-50 (21 day)	1:450	2.4 ab	2.8 c
Agri-50 (14 day)	1:450	0.7 ab	2.9 c
Agri-50 (7 day)	1:450	0.0 a	2.5 b
Compass O (21 day)	1 oz	2.2 ab	3.0 c
Compass O (14 day)	1 oz	2.0 ab	2.9 c
Compass O (7 day)	1 oz	3.8 b	2.9 c

Treatment	Jaguar Apple	F. Dark Eye Y.	F. Dark Eye W.	F. Light Eye Y.
Water	7.0 b	3.2 c	2.4 b	1.7 b
Latron B 1956	1.4 a	0.5 a	0.6 a	0.1 a
Silwet	0.3 a	0.7 a	0.5 a	0.7 ab
Capsil	2.2 a	1.5 ab	0.4 a	0.3 ab
Compass O 50W	3.0 a	1.6 ab	0.7 a	0.9 ab

THANKS ESPECIALLY TO RAKER IN MICHIGAN FOR SUPPLYING US WITH ALL OF THE PLANTS USED IN THESE TWO TRIALS. SOMETIMES GETTING GOOD, HEALTHY PLANTS IS EASIER THAN OTHERS AND THEY CAME TO OUR RESCUE ON THIS WORK.

WE ALSO THANK SUNGRO HORTICULTURE FOR DONATING SUNSHINE NO. 1 POTTING MEDIA AND SCOTTS FOR OSMOCOTE PLUS AND MICROMAX. THESE SUPPLIERS MAKE OUR JOB EASIER.



CHASE RESEARCH GARDENS, INC.
 8031 MT. AUKUM RD., SUITE F, BOX 529
 MT. AUKUM, CA 95656-0529
 PHONE/FAX (530)620-1624
 MTAUKUM@DIRECTCON.NET

