CHASE NEWS

Volume 7—Issue 12
December 2008

CHASE HORTICULTURAL RESEARCH, INC.

Xanthomonas Continues to Plague Growers

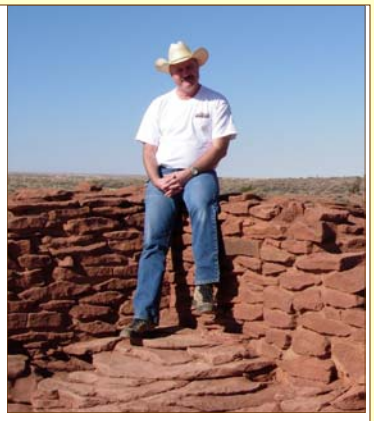
I started working on Xanthomonas diseases while I worked at the University of Florida in the 1980's and early 1990's. Once a plant pathologist starts to research an area it seems there is no end to the new plants that they find it on. I saw different strains of Xanthomonas on many foliage plants in Florida and also started seeing it on other crops like bedding plants.

This past year in our diagnostic lab, we found quite a few plants infected with Xanthomonas. I have included the month the sample was submitted. It used to be more common to find Xanthomonas on plants during that warmer seasons but in the past five years or so, they appear whenever the crop is grown. The fact that many of these plants are produced in greenhouses where the temperature is controlled is probably the reason the diseases are now year-round.

Plant	Month
Lavatera, Pepper, Prunus	February
Arbutus, Daphne, Delphinium, Geranium, Prunus, Ranunculus, Strelitzia, Vinca	March
Geranium, Heuchera	April
Lavender, Lobelia	May
Hydrangea, Pachira, Zinnia	June
Begonia, Dianthus, Nandina	July
Verbena	August
Ranunculus	September
Erysimum	October
Lavender	November

The majority of the plants listed in the table are well-known hosts of Xanthomonas. Most of them are attacked by separate pathovars (specialized strains) of *Xanthomonas campestris*. The plants that appear to be rarely affected by Xanthomonas fall into the perennial or woody category including Lavatera, Arbutus and Hydrangea.

Some Xanthomonas diseases start on infested seed including zinnia and ranunculus. We did find that one batch of zinnia seed was infected with a Xanthomonas that was a pathogen on zinnia. We are working with a post-planting seed drench to determine if it can be an effective means of controlling the disease when it is seed-borne. Other work in the same area will look at Alternaria.



As we all close out another year, I hope this next year brings some relief to all of us. We've all been hit in some way or another by the current economic conditions. I would like to thank each of you who support our business, and you all should know we value our relationship with you very highly. Next year we'll be back up and running on January 2nd.

For those of you who missed the diagnostic special (10 samples for $750), it will be available until the end of January. This is our way of giving some relief back to our customers and saying thank you for your diagnostic business. Next year, we hope to continue working with you along with making new business opportunities. From all of us at **Chase Horticultural Research**, we would like to wish everyone a safe, warm holiday season.

Mike Zemke

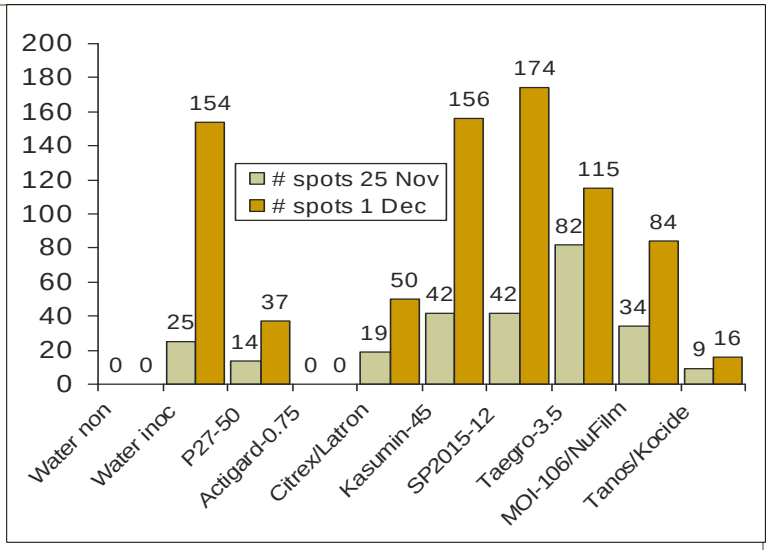
The diagnostic lab will be closed from December 22 through January 1. Reports will be made through December 24th but new samples will not be processed until January 2nd.

Inside this issue:

New Bactericides Researched by IR-4

The IR-4 program has designated certain Phytophthora, downy mildews and bacterial diseases as current topics for their funding. Their goal is to supplement research on minor crops like ornamentals. This allows more products to be registered as well as improve labels on ornamental products like fungicides.

We started testing some new bactericide products with out first trial on Xanthomonas leaf spot on Geranium. On 21 October, 2008 *Pelargonium x hortorum* (zonal geranium) 'Patriot Bright Red' rooted cuttings were planted in 4 inch pots containing Fafard Mix 2. The plants were fertilized with 1/2 tsp. Osmocote Plus 15-9-12 (3 month) the same day. The test was conducted in a heated greenhouse with poly and shade cloth covering the top and sides. Plants were treated twice before inoculation and once afterward



on a weekly interval. Plants were inoculated with a culture of *Xanthomonas campestris* pv. *pelargonii* mixed with sterilized water and 0.01M MgSO4 buffer. The plants were placed under mist conditions on 11 November, 2008. The inoculum was sprayed onto the wet plants on 12 November, 2008 and the plants were placed into plastic bags (high humidity) for 48 hours. The trial stayed under mist until concluded. Treatments were: noninoculated control, inoculated control, Phyton 27 (50 oz/100 gal), Actigard 50WG (0.75 oz/100 gal), Citrex and Latron B (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).

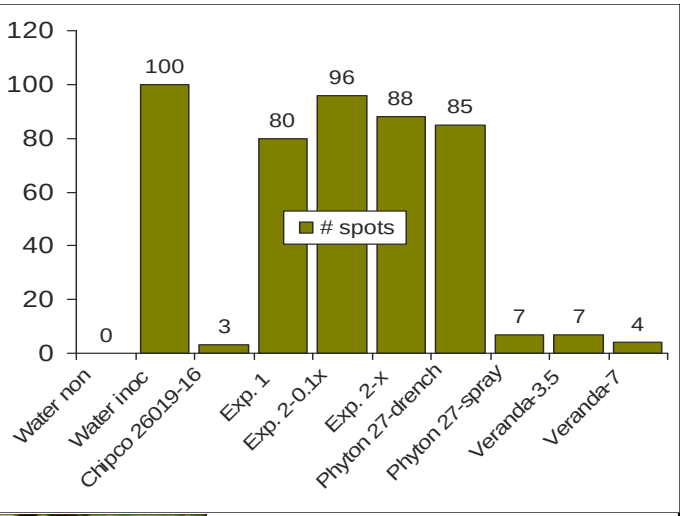
Three weeks after inoculation, the lowest numbers of spots were found on the noninoculated controls and plants treated with Actigard, the combination of Tanos and Kocide and Phyton 27. Clearly the copper products worked well and although Actigard is severely phytotoxic to geranium at the rate tested, it was 100% effective. The Citrex provided about 67% reduction in number of spots and the MOI-106 was also somewhat effective at 50% reduction in spots. The products that did not work at all in this trial included Kasumin, SP-2015 and Taegro. Final plant height was lowest for the plants treated with Actigard and SP-2015. The other plants appeared to be stunted somewhat if they were badly infected with Xanthomonas leaf spot. Top grade was significantly reduced by the presence of Xanthomonas and also by direct phytotoxicity of the Actigard. The only plants that appeared close to the noninoculated controls in top grade were those receiving the combination of Tanos and Kocide.

We wil be repeating this trial on lavender with a different Xanthomonas in early February.

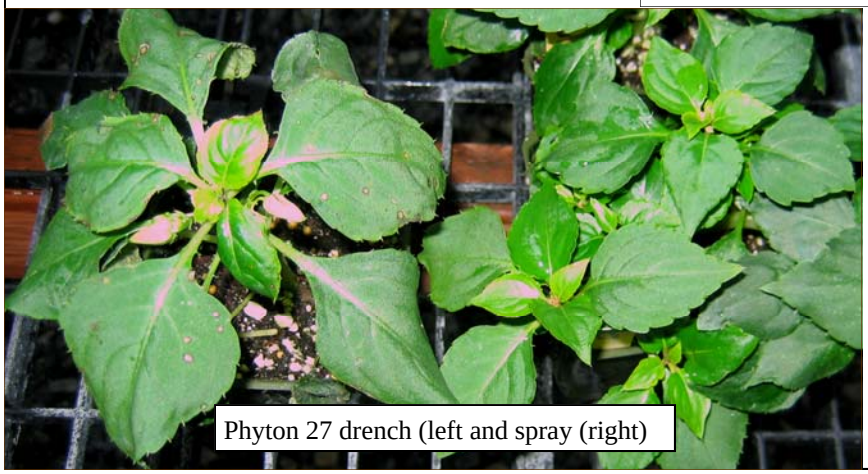
Product	Active ingredient(s)	Manufacturer	Registered on ornamentals
Phyton 27	Copper pentahydrate	Phyton Corporation	Yes
Actigard 50WG	Acibenzolar	Syngenta	No
Citrex	Citrus extraction	Citrex	No
Kasumin	kasugamycin	Arysta	No
SP2015	proprietary	SePRO	No
Taegro	*Bacillus subtilis* var. *amyloliquefaciens*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

Alternaria Leaf Spot Prevention on Impatiens

One of the test systems we often use is Alternaria leaf spot on impatiens. We started the most recent trial using rooted cuttings planted in 3.5 inch pots containing Fafard Mix 2. The plants were fertilized with 1/2 tsp. Osmocote Plus 15-9-12 (3 month) the same day. The test was conducted in a heated greenhouse with poly and shade cloth covering the top and sides. Plants were treated twice before inoculation and once afterward on a weekly interval. Plants were inoculated with a spore suspension of *Alternaria alternate* and plants were placed under mist conditions on 24 November, 2008. Treatments were: noninoculated control, inoculated control, Chipco 26019 (16 oz/100 gal), several experimental products, Phyton 27 (20 oz/100 gal) used as a drench OR a spray and two rates of Veranda (3.5 and 7 oz/100 gal).



We measured plants, rated top grade and counted spots after ten days. Plant height was not affected by treatment but Alternaria leaf spot did dramatically reduce top grade when it was severe. The lowest numbers of spots were found on the noninoculated controls and plants treated with Chipco 26019, Phyton 27 as a spray and both rates of Veranda. Veranda is under development with OHP and contains polyoxyrim as an active ingredient. None of the experimental products supplied any control. The comparison of application methods for Phyton 27 did show that a drench was not effective while a spray was very effective in controlling Alternaria leaf spot on Impatiens.



Phyton 27 drench (left and spray (right)

Wisconsin Fungicide Trials for Foliar Diseases of Shade Trees

I have been reviewing my literature files on woody ornamental diseases in an effort to find some fungicide recommendations for some foliar diseases of trees. There are very few current studies but I ran across an article that is 20 years old summarizing the diseases of shade trees in Wisconsin. The article is "Common Foliage Diseases of Shade Trees in Wisconsin" by G. L. Worf (Urban Phytonarian Series—A2509). There are some very nice color plates as well as life cycles and descriptions of diseases from anthracnose, and Septoria leaf spot to rust and leaf blister (*Taphrina*). I am presenting the summary table of fungicide trials conducted in WI. I have eliminated products that are no longer available.

Fungicide	Anthracnose on oak	Cylindrosporium leaf spot on ash	Phyllosticta leaf spot on maple	Septoria leaf spot on dogwood
Bayleton	Excellent	Excellent	Poor	
Chipco 26019			Poor	
Daconil	Good	Good to excellent	Excellent	Excellent
Rubigan		Excellent	Excellent	
Dithane		Fair	Excellent	Fair to excellent
Kocide	Good	Fair		Fair

Products in Review -Segway

We started working on Segway (also called cyazofamid and Ranman over the years) about 10 years ago. Segway is marketed by FMC Corporation and was recently labeled for use in California (it has been labeled in most of the US for a few years). The active ingredient is cyazofamid and it is related to fenamidone most closely and to the strobilurins (less closely). Due to the mode of action (MOA), however, it is in the same grouping as Fen-Stop (fenamidone) and the strobilurins (Compass O, Cygnus, Heritage and Insignia) (MOA 11). Be sure not to rotate products in the same MOA to avoid development of fungicide resistance.

disease	plant	rate	interval	effect
downy mildew	stock	2.1-3 oz	weekly	Excellent
downy mildew	rose	2.1-5 oz	7-10 day	Very good
Phytophthora aerial blight	annual vinca	0.75-6 oz	14 day	Excellent
Phytophthora root rot	spathiphyllum	0.75-6 oz	28 day	Very good
Phytophthora crown rot	African violet	0.75-6 oz	14 day	Some at higher rates
Phytophthora root rot	lavender	1.5-4.5 oz	once	Excellent
Phytophthora root rot	rosemary	1.5-6 oz	14 day	Very good at 3 oz
Pythium root rot	snapdragon	0.75-6 oz	14 day	Poor
Pythium root rot	lisianthus	0.75-6 oz	28 day	Very good at 0.75 oz
Pythium root rot	geranium	0.75-6 oz	28 day	Some at 6 oz
Pythium root rot	pansy	0.75-3 oz	28 day	Good at 3 oz
Pythium root rot	Asiatic lily	0.75-4 oz.5	28 day	Some at 3 or 4.5 oz
Pythium crown rot	wax begonia	6 oz	14 day	None
Pythium root rot	calla lily	0.75-3 oz	28 day	Some

The spectrum of activity is the same as fenamidone (downy mildew, Phytophthora and Pythium). We performed several trials on downy mildew on stock and rose and found it provided very good to excellent control when used at rates from 2.1 to 3 oz/100 gal on a 7-10 day interval.

For Phytophthora diseases we also saw very good to excellent control when the disease was expressed as an aerial blight (annual vinca) or a root rot (spathiphyllum, lavender and rosemary). Treatments were applied as drenches on a 14-28 day interval. However, the trial we performed on African violet with crown rot was started after infection occurred and results were not as good. As with most diseases, treating before an infection gives better results than trying to cure an active infection.

Results on Pythium were not as good. Treatment interval for most Pythium trials was longer with a 28 day interval most common. In these trials, the most effective rates were those at the higher end (3 to 6 oz). It is possible that applying a lower rate more often (14 days) might be more effective but testing would have to evaluate this under your conditions.

Downy mildew on rose (left) and Phytophthora aerial blight on vinca (right)

Contact Us:

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

Chase Horticultural Research, Inc.
Education for Horticulture