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106. Stay on top of *Pythium*. Hausbeck, M. *Greenhouse Management and Production* 30(12):41-43. 2010.

Stay on top of Pythium



By Mary Hausbeck

Pythium crown and root rot is a troubling disease for many growers and at times may seem unavoidable and tough to control. Pythium is a water mold and “nibbles” the feeding roots of plants, resulting in stunted growth and death. Root rot disease is favored by growing conditions that are too wet, such as when a growing medium does not drain quickly or when weather doesn’t allow rapid drying.

Pythium can be introduced into a greenhouse via plant plugs or other pre-finished plant material. This pathogen can also be a greenhouse resident that hibernates on dirty plant containers, benches, hoses and greenhouse walkways, ready to become activated by the right plant and weather conditions. Although Pythium can be a problem on many annuals and perennials, it seems to favor certain crops such as geraniums and poinsettias.

Limiting root rot

Sanitation is especially important in limiting root rot. First, use a pressure washer with soap and water. Treat cleaned surfaces with a disinfectant to remove any remaining unseen problems such as Pythium. Conditions that favor good plant growth and minimize stress make plants less vulnerable to attack by root rot pathogens.

Early detection critical

Root rot must be detected and identified early while fungicide drenches can be most effective. If Pythium has a significant head start, the root system of some plants will be too rotted and a fungicide drench won’t be able to rescue them. If timely fungicide drenches have been made using appropriate rates and root rot continues to be a problem, it is time to take a hard look at the products used.

If Subdue MAXX has been the only or primary fungicide used over the years for Pythium control, it is possible that the patho-

gen has become resistant and is no longer affected by this fungicide. To know for sure, however, the Pythium present in your greenhouse can be tested. Some diagnostic clinics offer this service. To avoid the development of resistance, rotate among the different active ingredients available among fungicide products.

Effective fungicides

The products proven to be especially effective in controlling Pythium root rot are those that have been around for a long time. For the most part, fungicides that control Pythium disease do not control Rhizoctonia and Thielaviopsis root rots.

A fungicide such as Banrot 40WP is a mixture of two different active ingredients and targets all three root rot pathogens. Banrot can be a good choice when you need



Adorn SC (treated plant shown) and Terrazole 35WP completely prevented plant death in a Michigan State University trial of fungicide effectiveness to control *Pythium ultimum* on geranium.

to make a treatment quickly and don't have time to determine which pathogen is the culprit.

If Pythium is diagnosed as the problem, fungicides that are specific for Pythium can be used. These include Sub-

due MAXX (also available as Mefenoxam 2), Banol, Truban and Terrazole. Some greenhouse growers who have struggled with Pythium problems have determined that Subdue MAXX does not control the disease and have had to rely on other

fungicides. If Pythium is sensitive to Subdue MAXX, then this fungicide will be effective in halting root rot. Pythium should be tested each year that root rot is a problem to determine whether Subdue MAXX can be part of an effective fungi-

Scouting Notes:

Duponchelia fovealis detected in 13 states

On May 18, 2010, the Canadian Food Inspection Agency notified Animal and Plant Health Inspection Service about an interception of *Duponchelia fovealis* larvae in a nursery shipment from San Diego County, Calif. Since this notification, APHIS has worked closely with the California Department of Food & Agriculture and San Diego County to survey the area of concern.

On July 16, APHIS confirmed the detection of *D. fovealis* at a greenhouse in Vista, Calif. Trace-forward information provided by the affected nursery resulted in the expansion of detection surveys in 26 counties within California. Although detection survey data confirm the presence of *D. fovealis* in 16 counties in California, APHIS has not received reports of damage caused by this pest.

During the months of September and October, APHIS and State Departments of Agriculture confirmed the presence of *D. fovealis* in portions of 12 additional states including: Alabama, Arizona, Colorado, Florida, Georgia, Mississippi, North Carolina, Oklahoma, Oregon, South Carolina, Texas and Washington.

D. fovealis, which originated in southern Europe and North Africa, is considered to be a greenhouse pest. It is not very cold tolerant.

For more: California Department of Food & Agriculture, (916) 654-0466; www.cdffa.ca.gov; www.pestalert.org.



Adult male *Duponchelia fovealis* in pheromone trap in San Diego County.

Photo by Marc Epstein, California Department of Food & Agriculture

Chiquita's FreshRinse reduces microorganisms on produce

Chiquita Brands has introduced FreshRinse, a produce wash that reduces microorganisms on leafy greens and better maintains freshness. When compared to traditional chlorine sanitizers, FreshRinse has been found to be of superior microbial efficacy. Also with FreshRinse, fresh produce does not undergo the chlorine sanitation process and therefore better retains its natural color and aroma.

Commercial application of FreshRinse has been scientifically validated. It has worked under salad manufacturing conditions and yielded positive consumer experiences.

FreshRinse is acceptable for use on both conventional and organic produce. Its ingredients decompose to environmentally safe and friendly compounds that pose no harm to the environment.

For more: Chiquita Brands International Inc., (513) 784-8000; www.chiquitabrands.com.



By training greenhouse employees to scout for pests and diseases, plant losses and treatments could be minimized.

Train employees to scout for pests, diseases

How much more valuable would greenhouse employees be if they could identify potential pest or disease problems? Those workers who conduct routine tasks such as watering, spacing and pinching plants would be even more valued if they could also recognize a pest infestation or disease symptoms.

University of Connecticut extension horticulturist and greenhouse IPM specialist Leanne Pundt said one early pest or disease treatment or identifying a problem before disastrous consequences would more than pay for the training costs. Learning to recognize the basic pests, their various life cycles and their natural enemies is a valuable skill for all greenhouse employees. She said it would also be beneficial for more seasoned employees to receive occasional refresher training.

Pundt has prepared a new PowerPoint slide show that can be used to train employees. This extensive presentation includes pictures and descriptions to help identify some common insects and some beneficial insects on sticky cards.

For more: Leanne Pundt, University of Connecticut, (860) 626-6240; www.negreenhouseupdate.info.

cide program.

The problem with Pythium and fungicide resistance may also extend to Banol. Penn State University plant pathologist Gary Moorman has reported that some Pythium strains that are resistant to Subdue MAXX may also be resistant to Banol.

Truban and Terrazole are often used by growers when their particular Pythium is resistant to Subdue MAXX. Other growers successfully rotate either Truban or Terrazole with Subdue MAXX in a program to control root rot and delay potential problems with fungicide resistance. Since Truban and Terrazole have the same active ingredient, rotating between these fungicides is not typically recommended. Aliette, FenStop and Segway are tools for Pythium control that can be helpful if used early and if the disease is not severe. For the best control, the time between fungicide applications should not be stretched beyond the minimum interval listed on the label.

Avoiding resistance

One way to keep currently available fungicides working at their best is not to become wholly reliant on one fungicide. Fungicides should always be used in alternation, so that each application attacks the Pythium through a different mode of action.

It is critical to know the active ingredient of each fungicide and whether particular products should be alternated in a program. For instance, based on recent research, using Subdue MAXX in alternation with Banol probably isn't the best approach because of the potential of Pythium to develop resistance to both of these products. Since Banrot, Terrazole, and Truban all have the same active ingredient (etridiazole), alternating among these products is not recommended. 🌱

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ON THE COVER

Ty Strode, Agri-Starts director of marketing, expects container-grown edibles to become a major part of the company's tissue culture production. See page 10.

Photo by David Kuack

COVER STORY

10 Incredible edibles

Agri-Starts is known for propagating foliage, but the 26-year-old company found that edible plants provide an avenue for increased profits. Agri-Starts is supplying plugs for containerized edibles sold in garden centers.



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