THE UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURAL & ENVIRONMENTAL SCIENCES

Extension Plant Pathology Update

February 2013

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Plant Disease Clinic Report

By Ansuya Jogi and Jean Williams-Woodward

On a monthly basis, we will be providing clinic summaries for both commercial and homeowner samples submitted to the plant disease clinics in Athens and Tifton. The summaries are organized by crop and will help you know what plant problems we have been seeing in the clinics. There will also be a section on projecting what you might see next month based upon the previous year clinic submissions. We hope you find this section helpful! See Table 2 for diagnoses made in the clinics a year ago in February 2012.

Since sample submissions are lower at this time of the year, this report contains what we've seen from December 2012 through January 2013. Another report will be available beginning around March 1 for February.

Table 1: Plant disease clinic sample diagnoses made from Dec 2012 through Jan 2013

Host Plant	Sample Diagnosis	
	Commercial Sample	Homeowner Sample
Arborvitae		Abiotic disorder
Bermudagrass	Pink Snow Mold; Fusarium Patch, [*Monographella (Microdochium) nivalis (nivale) nivalis*] *Bipolaris* sp./spp.	
Blueberry	Abiotic disorder	
Boxwood	Volutella Blight and Stem Canker (*Volutella buxi)*	Cultural/Environmental Problem; Abiotic disorder
Broccoli	Physiological Responses, Abiotic disorder	
Cabbage	Sclerotinia Rot (*Sclerotinia sclerotiorum)* Black Rot (*Xanthomonas campestris)*	
Carrot	Not Pathogen; Secondary Agents	
Centipede grass		*Gaeumannomyces graminis* *Rhizoctonia* sp./spp. Abiotic disorder
Collard	Black Rot (*Xanthomonas campestris)*	

Cryptomeria		Abiotic disorder
Cuphea	Broad Mite (*Polyphagotarsonemus latus)*	
Euphorbia	Two-spotted Spider Mite (*Tetranychus urticae)*	
Fescue Turfgrass		Cultural/Environmental Problem, Abiotic disorder
Hydrangea		Environmental Stress; Problem, Abiotic disorder
Knockout rose	No Pathogen Found	
Leyland Cypress		Abiotic disorder
Ligustrum	No Pathogen Found	
Mustard greens		Leaf spot *(Pseudocercosporella capsellae)*
Onion	Herbicide Injury; Exposure, Abiotic disorder	
Pansy	Black Root Rot (*Thielaviopsis basicola)* *Rhizoctonia* Root and Crown Rot	Powdery Mildew (*Oidium* sp.)
Poinsetta	*Pythium* Root and/or Crown Rot	
Prunus	No Pathogen Found	
Rhaphiolepis (Indian Hawthorn)	Root Girdling, Abiotic disorder *Cercospora* Leaf Spot (*Cercospora* sp.)	
Sod - Sports Field	Environmental Stresses *Drechslera* sp./spp.	
St. Augustine grass	Insect Damage, Unidentified Insect Root Decline of Warm Season Grasses, (*Gaeumannomyces graminis var. graminis*) *Rhizoctonia* sp./spp. Fairy Ring, Various fungi	
Strawberry	*Phytophthora cactorum* *Phytophthora* sp./spp. *Colletotrichum* sp./spp. Unknown, General	
Tall Fescue	Insect Damage, Unidentified Insect *Pythium* Root and/or Crown Rot Fairy Ring, Various fungi	
Wheat	No Pathogen Found Cultural/Environmental Problem, Abiotic disorder	

Table 2: Plant disease samples diagnoses from A YEAR AGO – February 2012

Host Plant	Sample Diagnosis	
	Commercial Sample	Homeowner Sample
Acalypha (Copperleaf)	No Pathogen Found, No Pathogen Found	
Annual Ryegrass	Environmental Stress; Abiotic disorder	
Azalea	*Pythium* Root and/or Crown Rot	
Bentgrass	No Pathogen Found, No Pathogen Found	
Bermudagrass	Pink Snow Mold; Fusarium Patch, [*Monographella (Microdochium) nivalis (nivale) nivalis*] *Rhizoctonia* Crown and Root Rot, *(Rhizoctonia solani)* Fairy Ring, Various fungi	
Blackberry	Cane Blotch, *Cephaleuros* sp./spp.	
Blueberry	Environmental Stress; Problem, Abiotic disorder Unknown, General	
Boxwood	*Phytophthora* Crown, Root and/or Stem Rot, *Phytophthora* sp./spp. *Verticillium* Dieback, *Verticillium* sp./spp. Cultural/Environmental Problem, Abiotic disorder	
Cabbage	Abiotic disorder	
Camellia	Freeze; Frost; Cold Damage, Abiotic disorder	Cultural/Environmental Problem, Abiotic disorder
Carrot	*Sclerotinia* Rot (*Sclerotinia sclerotiorum*)	
Clover	*Sclerotinia* Stem/ Crown or Root Rot, (*Sclerotinia trifoliorum*)	
Cryptomeria		Environmental Stress; Abiotic
Cucumber	Anthracnose; *Colletotrichum* Leaf Spot, (*Colletotrichum* sp./spp.)	
Leyland cypress	Poor Root Development, Abiotic disorder	
Geranium	Saprophytic Fungus, *Chromelosporium* sp.	
Ilex crenata		Cultural/Environmental Problem, Abiotic disorder
Kumquat		Environmental Stress; Problem, Abiotic disorder
Ligustrum japonicum		Leaf Spot (*Pseudocercospora* sp.) Cultural/Environmental Problem, Abiotic disorder
Mango	Cultural/Environmental Problem, Abiotic disorder	

Olive	Abiotic disorder Freeze; Frost; Cold Damage, Abiotic disorder	
Pansy	*Phytophthora* Crown, Root and/or Stem Rot	*Pythium* Root and/or Crown
St. Augustinegrass	Root Decline of Warm Season Grasses, (*Gaeumannomyces graminis var. graminis)*	
Stevia	*Rhizoctonia* Stem Rot (*Rhizoctonia* sp.)	
Strawberry	Pythiaceous Root Rot, Family *Pythiaceae*	
Tobacco	*Rhizoctonia* Root and Crown Rot	
Viburnum	*Armillaria* Root Rot/ Mushroom Rot, [*Armillaria (Clitocybe) tabescens*]	
Viola	*Phytophthora* Crown, Root and/or Stem Rot	

Update: Extension Plant Pathology

Changes in the Extension Plant Pathology web pages

For those who don't know, we have a new clinic diagnostician, Ms. Ansuya Jogi , in the Athens plant disease clinic**.** Ansuya (a.k.a. Su) started in August 2012 and has been a great asset to the plant disease clinic. Su is a graduate from our department , receiving her M.S. in Plant Pathology under the direction of Dr. Scott Gold. She will also be updating our web pages, so there will be changes and additions coming shortly.

The Extension Plant Pathology web page can be found at: http://plantpath.caes.uga.edu/extension/index.html

Within this page, you will find links to:

- **Plant Disease Clinics** where you can find:
  - ✓ PDF sample submission forms to give clients to fill out
  - ✓ directions on how to submit a sample
  - ✓ addresses for where to send a sample
  - ✓ information on nematode sample submission
  - ✓ annual disease clinic reports

- **Plant Disease Library** where a wealth of information is available on:
  - ✓ Microscope use and making slides for viewing
  - ✓ fungal identification, including a simple key
  - ✓ nematode species information, and
  - ✓ disease identification and management on various crops including field crops, fruits, nuts, vegetables, flowers, trees, shrubs and turf

Update: Greenhouse/Nursery Ornamentals

Heuchera Rust has been seen

By Jean Williams-Woodward

Heuchera, also known as coral bells, are becoming a popular perennial plant for shaded areas. Already this year, I have been contacted by growers concerning a rust disease, caused by the fungus *Puccinia heucherae*. This rust pathogen will only infect *Heuchera* and *Saxifraga* (some common names are strawberry begonia and strawberry geranium). The disease can be fairly common on *Heuchera*. Growers have reported it on only one cultivar within their houses suggesting that the source of the infection may be infected liners. Since ornamental production is very specialized, many growers obtain their liners from the same producers. This means that other growers in the state may see this disease as well. Growers should carefully inspect all incoming plants for symptoms of rust infection.

If symptoms are mild, they may go unnoticed for quite a while. Symptoms appear as raised reddish bumps on the upper leaf surface. Directly beneath the raised areas, orange rust pustules can be seen. This rust completes its entire lifecycle on *Heuchera*. Rust spores are easily spread from plant to plant by air movement. Removal of infected foliage can slow the spread of the disease. High humidity and moderate temperatures favor disease development. Reducing humidity by increasing air movement can help reduce disease development. Fungicides are integral for controlling this disease. Prior to cutting back infected plants, spray other heuchera with a fungicide such as Strike (triademefon), Systhane or Eagle (myclobutanil), Contrast or ProStar (flutolanil), a strobilurin such as Heritage (azoxystrobin), Compass (trifloxystrobin) or Insignia (pyraclostrobin) to protect them from infection. After cutting infected plants back, regularly spray plants using a fungicide rotation of Strike, Systhane or Contrast with a strobilurin at 14-day intervals. Under severe disease pressure and favorable conditions (overcast, high humidity, excess plant moisture) within the greenhouse, shorter (weekly) intervals may be needed.

As I am writing this, it has been cool, rainy and overcast for days. This is perfect weather for numerous diseases within greenhouses, particularly Botrytis blight, powdery mildew, and downy mildew. Plants should be scouted for the first sign of disease as these diseases can be explosive within greenhouses.

For more information contact Jean Williams-Woodward at jwoodwar@uga.edu or 706-542-9140.

Update: Wheat

Wheat Foliar Disease Update

By Alfredo Martinez

For Agents located in wheat-producing counties there are several foliar diseases to watch for:

Powdery Mildew: Powdery mildew (*Blumeria graminis* – syn. *Erysiphe graminis*) infections on wheat fields have been reported and confirmed recently across the state. Weather has been conducive for the disease. Powdery mildew tends to diminish as temperatures consistently reach above 75°F and RH falls below 85%. If powdery mildew progresses up the plant and is found in upper leaves (flag leaf minus 2), you might consider a fungicide application. Refer to page 11 of the 2012-13 Wheat Production Guide for responses of wheat cultivars to powdery mildew. A complete list of wheat fungicides, rates and specific remarks and precautions can be found on page 59. Always read label for fungicide applications restrictions.

http://www.caes.uga.edu/commodities/fieldcrops/gagrains/documents/2012_13WheatProductionGuideComplete.pdf or on page 480 of the 2013 Georgia Pest Management Handbook.

For more information on powdery mildew go to http://plantpath.caes.uga.edu/extension/plants/fieldcrops/WheatPowderyMildew.html

Stripe/yellow rust of wheat. Stripe rust has not been reported in the state. However, favorable conditions for the development of this disease have been observed in the state for the last couple of weeks. Additionally, heavy and early (earliest on record) infections of stripe rust have been found in Texas, Louisiana and Arkansas. Therefore field scouting and monitoring should be implemented at this time. If stripe rust is present in your field this warrants a fungicide application. Refer to the 2012-13 Wheat Production Guide and/or the 2013 Georgia Pest Management Handbook for fungicide selection. More information on Identification and control of stripe rust can be found at http://www.caes.uga.edu/Publications/pubDetail.cfm?pk_id=7814&pg=dl&ak=Plant%20Pathology

REMINDER: Small Grain Disease Physical Samples go to Athens

All small grains disease physical samples should be sent to the Plant Disease Clinic in Athens. For proper address and sample preparation check http://plantpath.caes.uga.edu/extension/clinic.html

Update: Turfgrass

Diseases to watch for in Turf

By Alfredo Martinez

Large Patch (*Rhizoctonia solani*). Early infections of *Rhizoctonia solani* (Large patch) on quasi-dormant warm season grasses (Bermudagrass greens and centipede lawns) have been observed in the southern part of the state. For identification ad control of turfgrass diseases go to http://www.caes.uga.edu/Publications/pubDetail.cfm?pk_id=7149&pg=dl&ak=Plant%20Pathology

Yellow patch (*Rhizoctonia cerealis*). Sporadic infections of *R. cerealis* (yellow patch) have been observed in ryegrass over-seeded bermudagrass yards. The disease is rare in the state but it thrives in extended periods of wet, cloudy weather. It is a cool-temperature disease (50 to 65°F). Disease development is significantly suppressed at temperatures lower than 45°F and greater than 75°F. Avoid excessive nitrogen fertilization in the fall or when the disease is present. Thatch management is essential for disease control. Maintain thatch at less than 0.5 inch. There are several fungicides that can be used to control the disease, however in the state, yellow patch usually does not warrant a fungicide application.

If you need additional information on small grains and/or turfgrass diseases, please contact Dr. Alfredo Martinez at 770-228-7375 or amartine@uga.edu. Postal address is 1109 Experiment Street, Griffin GA 30223

Update: Blueberries

Mummy Berry Apothecial Development and Potential for Disease Development following Freeze damage

By Phil Brannen

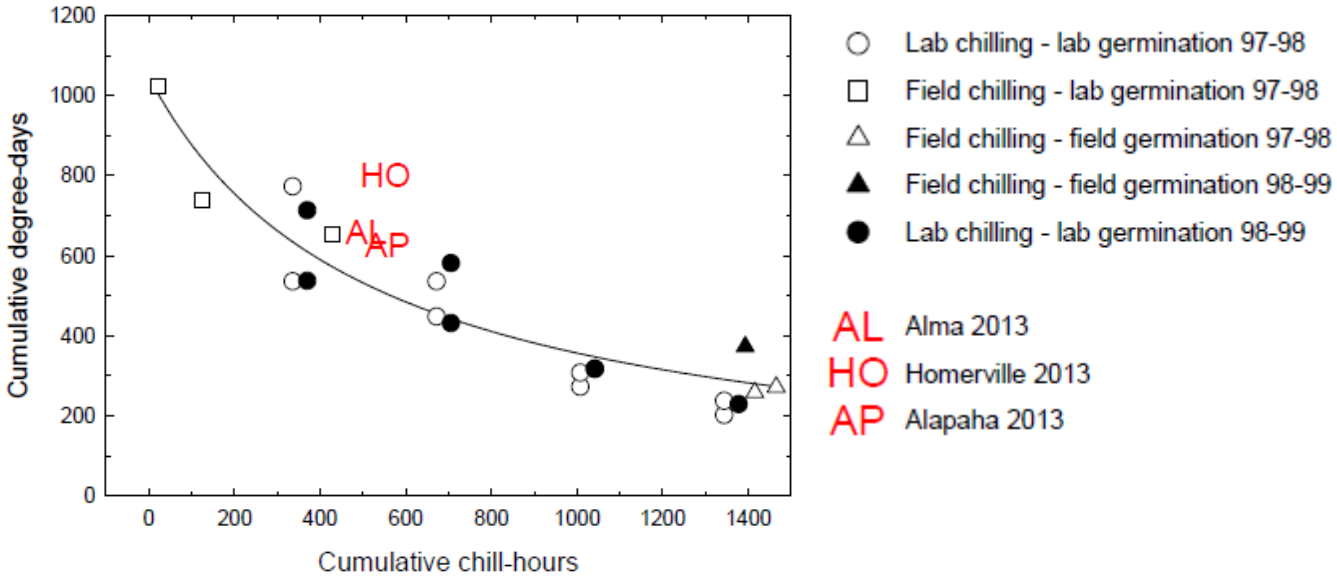
The following information applies to our major commercial blueberry production region in the southern part of the state, but other parts of the state will soon progress into a timeframe in which mummy berry disease could be an issue. This information is especially timely in light of the freezes over the last two nights, so please share with your commercial blueberry producers as soon as practically possible. Based

on the best information we can derive from the literature at large, cold-damaged, exposed tissue (leaf and early bloom development) is more susceptible to mummy berry blighting, such as we observed in 2010 in many locations (90% losses in some cases). The blighting aspect of the disease basically wipes out whole bloom clusters, and this is not to be confused with the more controlled formation of mummies which occurs much later. Botrytis can also occur on damaged tissue, especially if wet, warming conditions follow – such as are predicted for later this week. The bottom line is that the early application of fungicidal materials that have both Botrytis and mummy berry activity are required (i.e. Pristine or DMIs (Orbit, Tilt, Quash, Indar, and generics) + Captan or CaptEvate). Pristine is generally my product of choice for the first application, since it would have activity on mummy berry/Botrytis, and it would have the potential to reduce potential Botrytosphaeria canker infections (also a potential on freeze-damaged stem tissue) as well.

Harald Scherm has generated current mummy berry information from a model he previously developed and tested. Based on his assessment, assuming that moisture is not limiting in southern Georgia, we should be in the early stages of apothecium (mummy berry) development and initial infections of exposed green tissue or early bloom tissue as these emerge – especially rabbiteyes but we can't exclude southern highbush either. I am not that familiar with recent rainfall patterns throughout the blueberry belt, but if rain has recently occurred or will be occurring, mummy generation may coincide pretty well with the initial bud germination and push (again, minimally exposed leaf [green tip] or flower tissue can be infected). Please see attached and below for Harald's explanation of the information he generated. Also, please let your producers know that there is a danger of mummy berry infection, especially if moisture is sufficient.

Harald Scherm writes: Below is the output of the mummy berry model for three locations, Alma, Homerville, and Alapaha, as of 2/17/2013. As you recall, the model is based on the balance of chilling and heating, assuming that moisture is sufficient for germination of mummies (which likely was the case this year).

The line on the graph indicates the time to 25% mummy germination (not apothecium formation) based on lab and field data collected in the late 1990s. The data points for the three locations (in red) are above this line, indicating that germinated mummies may be present. Although apothecia will be lagging a little behind, this indicates that protection may be necessary if susceptible tissues (green tips or open flowers) are available. Furthermore, the below-freezing temperatures during the past couple of days may also have rendered earlier flower bud stages (stage 5) susceptible to infection.



Freeze Damage and *Botrytis/Botryosphaeria* Potential

By Phil Brannen

The following information is of value to commercial blueberry producers in the southern part of the state or anywhere that blueberries are in bloom. We just had two nights of cold temperatures (<25 F) in most parts of our blueberry belt. Where cold-damaged blooms/shoots are observed, *Botrytis* might be a real issue, since damaged blossoms and buds will provide infection courts for the spores. In addition, it has been warm enough prior to the recent cold events that *Botrytis* development and sporulation may be more prevalent than normal for this time of year. One more point, the optimum temperature for infection of *Botrytis* is 59-68F, but the optimum for spore germination is actually 68F and above. That means we will have perfect temperatures for infection within the next day or two, as temperatures around 70F should be optimal for Botrytis; weather predictions for Alma and Homerville are indicating that highs will be ~70F by Friday. Rainfall is currently predicted, and if heavy and prolonged dews (or overhead irrigation) are associated with the warm temperatures, we may have *Botrytis* development.

Where freeze damage has occurred, I would recommend an immediate application of Pristine at the high rate. There are several excellent *Botrytis* materials on the market: Pristine, Switch, Elevate, and CaptEvate. Captan has *Botrytis* activity, but it is not as efficacious as these newer products. Pristine also provides mummy berry control, so as a botryticide and mummy berry and rot control, it might be the best choice for the first applications. Switch is also excellent, and *Botrytis* resistance is not likely with one of the components in this fungicide. Apply no more than two applications of Pristine before switching to another product with a different mode of action -- any of the others. If using Indar or Orbit or Quash for control of mummy berry, I would suggest that one use either Captan, or Captan + Elevate or CaptEvate (Captan + Elevate comix product) tank- mixed with the Indar or Orbit or Quash, depending on your risk assessment (Captan alone being the least efficacious relative *Botrytis* management).

If field conditions are wet, aerial applications may be necessary to apply fungicides in a timely fashion. As always, follow all label directions. I have not reviewed labels this morning, but as far as I know from reviewing the labels in the past, Pristine is the only material that controls the full spectrum of pathogens required and for which aerial application is allowed. Captan, CaptEvate and Elevate do not.

Also, there are always questions regarding the tremendous amount of bark/ground wetting that occurs with overhead freeze protection. I am hopeful that this will not increase root rot diseases substantially at this time, but the root zones are likely saturated. Ridomil application might be warranted, but there is no guarantee it would be needed. However, these products will not resurrect dead plants, so it is a judgment call as to whether one applies the product now or later as the plants start to push more. Sorry to be so vague, but we do not have good information on application of Ridomil in this timeframe. There may not be enough foliage for good uptake and activity of Aliette or other phosphonate-type products (ProPhyt or Agri-Fos or Kphite for example), but in 3-4 weeks (after bloom but with good new expanded leaf flush), I would consider foliar application of one of these materials to stave off root rots during the early spring; follow label directions and do not over-concentrate these materials in the final spray volume, as damage can occur with their use if label directions are not carefully observed.

Got Botrytis? If you do encounter *Botrytis*, Guido Schnabel (Clemson University) is willing to test these samples for resistance to our current fungicides. He has found that resistance is widespread in strawberries, so due to the fact that we have sprayed the same materials for years, this could be a problem for blueberry Botrytis populations as well. Samples would need to go directly go Guido Schnabel if we are to have this checked.

Who to contact?

Alfredo Martinez, Extension Coordinator	commercial turfgrass, sod farms and small grains	amartine@uga.edu	770-228-7375
Phil Brannen	commercial fruit	pbrannen@uga.edu	706-542-2685
Bob Kemerait	Row crops – corn, cotton, soybean, peanut	kemerait@uga.edu	229-386-3511
David Langston	commercial vegetables	dlangsto@uga.edu	229-386-7495
Elizabeth Little	home landscapes and gardens, small farm and organic production	elittle@uga.edu	706-542-4774
Jean Williams-Woodward	commercial ornamentals in greenhouses, nurseries, and landscapes, Christmas trees, forestry, urban forestry, wood rots	jwoodwar@uga.edu	706-540-9140
John Sherwood	Department Head	sherwood@uga.edu	706-542-1246

Clinic Sample Type	Contact Name & Number	Contact Address
Christmas trees, fruit, ornamentals, forestry, all homeowner samples, legume forages, mushrooms, turf and small grains, urban ornamental landscapes, wood rots	**Ansuya Jogi** Office Phone Clinic phone 706-542-9157 ansuya@uga.edu Fax (706) 542-4102	UGA - Plant Disease Clinic 2405 Miller Plant Sciences Bldg. Athens, GA 30602-7274
Tobacco, pecan, cotton, soybean, peanut, corn, kenaf, commercial vegetables	**Jason Brock** Phone: (229) 386-7495 jbrock@uga.edu Fax (229) 386-7415	Tifton Plant Disease Clinic Room 116 4604 Research Way Tifton, GA 31793
All samples for nematode analysis	**Ganpati Jagdale** Phone: (706) 542-9144 gbjagdal@uga.edu Fax (706) 542-5957	UGA - Plant Pathology Nematode Laboratory 2350 College Station Road Athens, GA 30602-4356

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