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Extension Plant Pathology Update

March 2013

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Plant Disease Clinic Report for February 2013

By Ansuya Jogi and Jean Williams-Woodward

The following tables consist of the commercial and homeowner samples submitted to the plant disease clinics in Athens and Tifton for February 2013 (Table 1) and one year ago in March 2012 (Table 2). Sample numbers were still low in February, but this will soon change! Much of the symptoms we saw on samples were due to environmental stress/injury. However, root and crown diseases caused by *Phytophthora*, *Thielaviopsis basicola*, and *Rhizoctonia* continue to be identified. Also, with the cooler, humid, wet weather, the fungus, *Botrytis*, will continue to cause problems in the field and in greenhouses, particularly on freeze damaged tissues. Looking ahead through March, based upon samples diagnosed a year ago, we will likely see an increase in turf samples and problems, as well as rust and *Sclerotinia* diseases starting to show up. I would suspect too that downy mildew diseases will also become prevalent on some crops, particularly on ornamentals in nurseries.

Table 1: Plant disease clinic sample diagnoses made in February 2013

Host Plant	Sample Diagnosis	
	Commercial Sample	Homeowner Sample
Arabica Coffee	Anthracnose (*Colletotrichum* sp.)	
Bermudagrass	Fairy Ring, Various fungi Large Patch (*Rhizoctonia solani*)	
Boxwood	Cultural/Environmental Problem, Abiotic disorder Volutella Blight; Canker (*Volutella buxi*)	Cultural/Environmental Problem, Abiotic disorder
Blueberry	Phytophthora Crown, Root and/or Stem Rot (*Phytophthora* sp.) Environmental Stress; Problem, Abiotic disorder Unknown Abiotic Disorder	
Cabbage	Not Pathogen; Saprophyte, Secondary Agents; Saprophytes; Unspecified	
Geranium	Abiotic disorder, Environmental stress	
Japanese Spurge (*Pachysandra*)	Leaf and stem blight (*Volutella pacysandrae*) Phytophthora stem and root rot (*Phytophthora* sp.)	

Loropetalum	Salt Damage, Abiotic disorder	
Onion	Botrytis Blight (*Botrytis* sp.) Botrytis rot (*Botrytis allii*) Stemphylium Leaf Spot (*Stemphylium* sp.)	
Pecan	Unknown Agent	
Pepper	Abiotic disorder	
Pondberry (*Lindera*)	Sooty Mold, Unidentified Fungus	
Rhododendron	Oedema (Edema), Abiotic disorder	
Rye Grass	No Pathogen Found Cultural/Environmental Problem, Abiotic disorder	
Squash	Abiotic disorder	
Strawberry	Boron Toxicity, Abiotic disorder	
Tobacco	Black Root Rot (*Thielaviopsis basicola*)	
Tomato		Rust Mites, Order Acari
Unidentified Host (think it is oak)	Wood Rot Fungus (*Inonotus* sp./spp.)	
Watermelon	Gummy Stem Blight, [*Didymella bryonae* (ana. *Phoma cucurbitacearum*)] Fusarium Wilt (*Fusarium oxysporum*)	
Wheat	Powdery Mildew (*Erysiphe* sp./spp.) Insects, Class Insecta No Pathogen Found Cultural/Environmental Problem, Abiotic disorder	

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

Host Plant	Sample Diagnosis	
	Commercial Sample	**Homeowner Sample**
Azalea	No Pathogen Found	No Pathogen Found
Bentgrass	Anthracnose (*Colletotrichum cereale*)	
Bermudagrass	Rhizoctonia Stem and Root Rot (*Rhizoctonia* sp.) Root Decline of Warm Season Grasses, *Gaeumannomyces graminis* var. *graminis* Fairy Ring, Various fungi Large Patch (*Rhizoctonia solani*) Pink Snow Mold; Fusarium Patch, [*Monographella* (*Microdochium*) *nivalis* (*nivale*) *nivalis*] Bipolaris Leaf Spot (*Cochliobolus setariae*) Melting Out (*Drechslera* sp./spp.) Environmental Stress; Problem, Abiotic disorder	
Blackberry	Cane and Leaf Rust (*Kuehneola* sp./spp.)	

Blueberry	Hemlock-Blueberry Rust (*Thekopsora minima*) Canker, Dieback; Leaf Blight (*Fusicoccum* sp.) Freeze; Frost; Cold Damage, Abiotic disorder Abiotic disorder	
Boxwood	Phytophthora Crown, Root and/or Stem Rot (*Phytophthora* sp.) Pythium Root and/or Crown Rot (*Pythium* sp.) Cultural/Environmental Problem, Abiotic disorder Insufficient Sample, Identification Analysis No Pathogen Found	Crown and Root Rot, *Phytophthora* sp. Insect Damage, Unidentified Insect Chemical Injury, Abiotic disorder Cultural/Environmental Problem, Abiotic disorder Environmental Stress; Problem, Abiotic disorder
Cabbage	Unknown, General	Unknown Abiotic Disorder
Camellia		Unknown Abiotic Disorder
Cantaloupe	Gummy Stem Blight [*Didymella bryonae* (ana. *Phoma cucurbitacearum*)]	
Carrot	Unknown, General	
Centipede	Large Patch (*Rhizoctonia solani*) Root Decline of Warm Season Grasses, (*Gaeumannomyces graminis* var. *graminis*) Fairy Ring, Various fungi Decline; Dieback, Abiotic disorder Environmental Stress; Problem, Abiotic disorder Cultural/Environmental Problem, Abiotic disorder No Pathogen Found	Rhizoctonia Blight, *Rhizoctonia solani* Cultural/Environmental Problem, Abiotic disorder
Cherry		Wound Canker, Abiotic disorder
Cryptomeria		Cultural/Environmental Problem, Abiotic disorder
Fescue		No Pathogen Found
Geranium	No Pathogen Found	
Holly	No Pathogen Found	
Juniper	No Pathogen Found	
Leucothoe		Environmental Stress; Problem, Abiotic disorder
Leyland Cypress		Environmental Stress; Problem, Abiotic disorder
Ligustrum	Thrips, Thrips sp./spp.	
Lilac		White Peach Scale (*Pseudaulacaspis pentagona)*
Loquat	Anthracnose; Colletotrichum Leaf Spot, (*Colletotrichum* sp./spp.)	
Magnolia		Sooty Mold, Unidentified Fungus
Oats	No Pathogen Found	
Pansy		Unknown, General Environmental Stress; Problem, Abiotic disorder
Pea	Rhizoctonia Root; Crown Rot, (*Rhizoctonia* sp.)	

Potato	Herbicide Injury; Exposure, Abiotic disorder	
Rhododendron		Insect Damage, Unidentified Insect
Squash	Phytophthora Crown, Root and/or Stem Rot, (*Phytophthora* sp./spp.)	
St Augstinegrass	Root Decline of Warm Season Grasses, (*Gaeumannomyces graminis* var. *graminis*) No Pathogen Found	
Strawberry	Phomopsis Leaf Blight, (*Phomopsis obscurans*) Pythiaceous Root Rot, Family Pythiaceae Phytophthora Crown, Root and/or Stem Rot, (*Phytophthora* sp./spp.) Rhizoctonia Root Rot (*Rhizoctonia* sp./spp.)	
Tobacco	Black Root Rot, (*Thielaviopsis basicola*) Pythium Damping Off, (Pythium sp./spp.) Sclerotinia Rot, (*Sclerotinia sclerotiorum*) Collar Rot, (*Sclerotinia* sp./spp.) No Pathogen Found	
Turnip		White Leaf Spot; Gray Stem, [*Mycosphaerella* (ana. *Pseudocercosporella capsellae*)]
Viburnum	No Pathogen Found	
Watermelon	Gummy Stem Blight, [*Didymella bryonae* (ana. *Phoma cucurbitacearum*)] Fusarium Wilt, (*Fusarium oxysporum*) No Pathogen Found Abiotic disorder	
Wheat	Rhizoctonia Root; Crown Rot (*Rhizoctonia* sp.) Pythium Root and/or Crown Rot (*Pythium* sp.) Powdery Mildew (*Erysiphe* sp.) No Pathogen Found Not Pathogen; Saprophyte, Secondary Agents; Saprophytes; Unspecif.	
Zoysia	No Pathogen Found Insufficient Sample, Identification Analysis	Environmental Stress; Problem, Abiotic disorder

Update: Extension Plant Pathology

Clarification on where to send samples and who to contact

As a reminder, all **small grains** disease physical samples should be sent to the Plant Disease Clinic **in Athens**.

And, **Dr. Alfredo Martinez** handles **commercial** turf questions, sample diagnosis and management recommendations. **Homeowner** turf questions, sample diagnosis and management recommendations are handled by **Dr. Elizabeth Little**. Please direct your home landscape turf questions to Elizabeth at elittle@uga.edu or 706-542-4774.

Update: Home Gardens

Bloom Time is Brown Rot Time in Home Orchards

By Elizabeth Little

March is bloom time for many fruit trees but is also the time to think about pests that impact fruit production later in the season. Brown rot disease is caused by the fungus *Monilinia fructicola* and is the most important disease of stone fruits (peach, plum, cherry) in the eastern United States. Together with an insect pest called the plum cucurlio, brown rot often prevents the successful production of peaches, plums, and other stone fruits in the home orchard. Even though we are known as the Peach State, peaches need intensive management and can be a challenge for the home orchardist. Some plum varieties may bring more success although plums are also prone to brown rot. Cherries and apricots are not at all adapted to the climate in Georgia.

Brown rot on ripening fruit (above) and infected flower and twig (below) (images courtesy of Harald Scherm)

Management of brown rot starts with good orchard sanitation. Remove and destroy all old fruit from the tree and from the ground as soon as possible. The old fruit are a common source of the fungus for bloom infections. Prompt removal of any dropped immature fruit during the season will help with plum cucurlio management. Proper pruning removes old blighted wood and opens up the tree canopy for better air circulation. Placing the trees in an open site also increases air circulation and decreases the humid conditions necessary for fruit infections.

The fungus attacks the blooms and, later in the season, the ripening fruit. Reducing bloom infections reduces later fruit rot. Proper application of pesticides in the home setting may be difficult and if the grower wishes to apply fungicides only when most needed, the bloom and fruit ripening periods should be targeted. A bloom spray is important if brown rot has been a problem in the past. Coppers and lime-sulfur are organic choices but may burn the foliage after bloom. Captan is an old standby and works well, especially if good coverage can be achieved. Immunox (myclobutanil) is a systemic fungicide that may be more effective. However, repeated use of Immunox can decrease effectiveness, so this compound is best used when it is most needed, such as once during bloom, especially if weather is wet, and once again as a pre harvest spray. A few more repeat fungicide applications with Captan can be made at weekly intervals after bloom but are not as essential as the bloom spray. Pre harvest sprays (as the fruit is ripening) are also important for control of brown rot. Insecticidal sprays are often needed after bloom to manage the plum cucurlio. See the 2013 Homeowner Edition of the Georgia Pest Management Handbook for more information.

Update: Strawberries

Freeze injury to strawberries

By Phil Brannen

I received this photo of malformed strawberry fruit. This is most likely related to cold injury, but boron deficiency could also be involved. To rule out boron deficiency, producers should take tissue samples and send these to the soils lab for testing. In the book, Integrated Pest Management for Strawberries (University of California Agricultural and Natural Resources Publication 3351), the authors show a virtually identical cold-injury photo. They further indicate “Low temperatures during early fruit development can cause severe distortion that may be confused with lygus injury. Achenes in areas of the fruit that did not grow because of low-temperature injury are much smaller than achenes on parts of the fruit that did grow. This is also true of achenes on fruit distorted by boron deficiency, but in the case of boron deficiency, foliar symptoms would also be present too. When injury is caused by lygus bugs, achenes in affected areas are about the same size as achenes in the rest of the fruit.”

Please share this information with your strawberry producers, as we will likely see more of this injury symptom due to the recent freezes. Again, it would be wise to rule out nutrient deficiency as well, but this is most likely cold injury.

Update: Blueberries

Mummy Berry Management with Indar

By Phil Brannen

I sent the following out last fall through the blueberry Google group, but as we are truly entering the height of the rabbiteye bloom, it would be a good idea to review this information once more.

From numerous research trials, the utility of fenbuconazole (Indar), a DMI fungicide, for management of mummy berry is very clear. It is among our best labeled fungicides for management of mummy berry disease of blueberry. We have generally observed good to excellent mummy berry control when using Indar. However, recent research by Sara Thomas (Dr. Harald Scherm's lab) has indicated that fenbuconazole would need to be applied every five days to give full protection of blooms from mummy berry infections. The Indar label specifies: "For mummy berry and phomopsis twig blight, begin applications at early green tip and make subsequent applications at intervals of 8 to 14 days." Previously, triforine (Funginex; no longer registered) gave better curative and protective coverage, and we could still use additional products with better duration of activity than those currently on the market.

In a recent report, Sara indicated that "both fungicides [Indar and Funginex] provided excellent protection to flowers at anthesis [flower fully open and functional] during fungicide application. Fenbuconazole also protected flowers up to 2 days before and 2.5 days after anthesis, giving a 4.5-day protection window. In contrast, triforine was effective for 12.5 days, extending from 6 days before to 6.5 days after anthesis."

Based on this recent research, Indar should be applied with the "tightest" possible legal schedule of eight days between applications, and it should always be applied in combination with Captan to prevent rots. In addition, other fungicides with different modes of action should be alternated periodically with Indar + Captan for mummy berry resistance management. We do not have information on the protective/curative properties of the other DMI fungicides (Orbit and generics, Quash, etc.), but in the absence of this information, I would likewise use the shortest interval between applications for these as well.

Please feel free to share this information with your commercial blueberry producers.

Update: Greenhouse/Nursery Ornamentals

Downy mildew on Shrub Roses

By Jean Williams-Woodward

Cooler, wet weather this spring makes for ideal conditions for downy mildew disease development. Roses, particularly shrub roses such as Knock-Out® and Drift® roses within nurseries are very susceptible to downy mildew. Since propagation of Knock-Out and Drift roses is illegal, growers have or will be receiving their liners for finishing now. Downy mildew can be a systemic disease, and downy mildew sporulation has been seen off the roots of ornamental plants, including roses and Coreopsis (tickseed). Systemically infected plants carry the pathogen within the xylem. Plants systemically infected with downy mildew often show poor, off-color and distorted growth. Within nurseries with daily overhead irrigation and often within poly-covered houses for winter protection, downy mildew diseases can become epidemic causing leaf drop and leaf blighting. Downy mildew symptoms on rose include purplish, often angular, lesions along leaf veins and purplish-red stem lesions (see images). Leaf drop is also very common on infected plants.

A downy mildew management program developed by Mary Hausbeck (Michigan State University) and Margery Daughtrey (Cornell University) based on experimental data of Hausbeck (cucurbit and coleus downy mildew); Daughtrey (coleus and impatiens downy mildew); and Colleen Warfield, Ball Horticultural Company (impatiens downy mildew) is below. Although, the program was not developed specifically for rose downy mildew, it is applicable to all downy mildews on ornamentals. It contains two parts, a preventive program when downy mildew has not been found (yet) within the nursery and a management program when it is present and symptoms are evident. Notice that preventive fungicide applications are at two-week intervals using the lower labeled rates compared to management applications that are applied weekly and at the higher labeled rates.

Downy Mildew PREVENTIVE Program:

1. *First and last application:* Subdue MAXX (mefenoxam) (1.0 oz/100 gal) + Adorn (fluopicolide) (2.0 oz/100 gal) drench. Treat soon after plants are received unless propagator has treated just before shipment.

2. *Two weeks later:* A strobilurin (Compass O or Disarm O or Heritage or Insignia or Pageant) spray, using high label rate tank mixed with mancozeb (e.g. Protect T/O, Fore, or Dithane at 1-2 lb/100 gal)

3. *Two weeks later:* Segway (cyazofamid) (2.1 fl oz/100 gal) spray

4. *Two weeks later:* Stature SC (6.12 fl oz/100 gal) spray

5. *Repeat # 2, 3, 4 at two-week intervals, as needed.*

Last application, shortly before shipment: Subdue MAXX + Adorn drench, as in #1

Downy mildew MANAGEMENT Program:

1. *First and last application:* Subdue MAXX (1.0 oz/100 gal) + Adorn (2.0 oz/100 gal) drench. Treat soon after plants are received unless propagator has treated just before shipment.

2. *One week later:* A strobilurin (Compass O or Disarm O or Heritage or Insignia or Pageant) spray, using high label rate + mancozeb (e.g. Protect T/O, Fore, or Dithane at 1-2 lb/100 gal) as a tank mix

3. *One week later:* Segway (3.5 fl oz/100 gal) spray + mancozeb (as above)

4. *One week later:* Stature SC (12.25 fl oz/100 gal) + mancozeb spray (as above)

5. *Repeat # 2, 3, 4 at one-week intervals as needed.*

Last application, shortly before shipment: Subdue MAXX + Adorn as in #1

***Several notes about this program:**

- **FenStop** (fenamidone) is another strobilurin for use on downy mildew diseases; however, it is only labeled for use in greenhouses.
- **Adorn** (fluopicolide) is very good on downy mildew diseases, but it must be tank mixed with another downy mildew fungicide per label restrictions.
- Roses are not listed on the **Adorn** or the **Segway** (cyazofamid) product labels. If these products have not been used on roses within your nursery, then test them for possible phytotoxicity prior to using on entire crop.
- Downy mildew pathogens can develop **fungicide resistance**; therefore, rotation of products with different modes of action (i.e. different FRAC code numbers) is necessary.

Downy mildew sporulation on the backside of rose leaves
(Photo by Kari Whitley)

Who to contact in Extension Plant Pathology?

Alfredo Martinez, Extension Coordinator	Turfgrass (commercial, professional lawncare, sod, golf, sports fields); Small grains and non-legume forages	amartine@uga.edu	770-228-7375
Phil Brannen	commercial fruit	pbrannen@uga.edu	706-542-2685
Jason Brock	commercial pecans	jbrock@uga.edu	229-386-7495
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 turfgrass, 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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