



This bulletin from the Cooperative Extension Plant Health Clinic (Plant Disease Clinic) is an electronic update about diseases and other problems observed in our lab each month. Input from everybody interested in plants is welcome and appreciated.



The Plant Health Clinic now has a Facebook page:

<https://www.facebook.com/UAEXPlantHealthClinic/?pnref=story>

The following newsletter is a special edition of disease articles compiled by the graduate students of Plant Pathology's "Diseases of Economic Field Crops."

Powdery Mildew of Dogwoods

By Kathryn Haydon

Powdery mildew is a common disease afflicting many dogwood species (genus *Cornus*) that appears at the end of May to the beginning of June. Two fungal species, *Erysiphe pulchra* or *Phyllactinia guttata*, are known to cause powdery mildew of dogwoods, especially when moderate temperatures and frequent rainfall favor infection. The disease itself is easily identified by the presence of white fungal colonies on leaf surfaces. Infection can result in aesthetically undesirable symptoms, such as foliar yellowing or reddish-to-purple discoloration, and leaves that curl upward or develop scorched borders. Overall plant growth and health is not critically compromised. If powdery mildew is a persistent, undesirable problem, replacing susceptible trees with highly resistant varieties, such as 'Jean's Appalachian Snow,' 'Appalachian Joy,' and 'Karen's Appalachian Blush,' can provide a long-term solution. Pruning susceptible trees to provide ample airflow can prevent or limit powdery mildew growth. Infected leaves harbor powdery mildew through the winter, so fallen leaves should be collected and destroyed. If immediate control of powdery mildew is desired, fungicides such as Fertilome Broad Spectrum

Lawn and Garden Fungicide, (chlorothalonil), or Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide, (chlorothalonil) or Ortho Maxx Garden Disease Control, (chlorothalonil), or Ortho Disease B Gon Garden Fungicide, (chlorothalonil), or Garden Tech Daconil Fungicide, (chlorothalonil), or Bonide Fung-onil Multipurpose Fungicide, (chlorothalonil), or Spectracide Immunox Plus, (myclobutanil & permethrin), or Bonide Rose Rx Systemic Drench, (tebuconazole), or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs, (tebuconazole), or Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer, (tebuconazole & imidacloprid), or Fertilome 2-N-1 Systemic Fungicide, (tebuconazole & imidacloprid), or Bonide Infuse Systemic for Turf and Ornamentals, (thiophanate-methyl), or Ortho Rose and Flower Insect and Disease Control, (triticiconazole & acetamiprid) are options for homeowners. Follow label for timing and repeat applications.

Dogwood Powdery Mildew- *Erysiphe pulchra*



Micah Doubletree, former University of Arkansas Plant Pathology Graduate Student



Blackberry Anthracnose

By Maxwell Vonkreuzhof

Blackberries are susceptible to a fungal disease known as Anthracnose, caused by *Elsinoe veneta*. Anthracnose, can effect a large array of ornamental crops as well as edible crops. When talking about Anthracnose regarding blackberries, it can occur on the canes, petioles, leaves, flower buds and even the fruit. Lesions that are purple-red in color appear on the canes; generally, these spots are canoe shaped. With age, these spots will become gray and appear sunken, and if multiple lesions merge, they can become large enough to girdle the cane and cause tip dieback. Lesions may also cause cracking of the stem tissue. Leaves will display small purple lesions, and as the season continues, the center of the lesions will turn white and may fall out. This will cause a "shot hole" appearance in the leaves. If an infection of a leaf is severe enough, it may cause leaf drop. Optimal conditions for this disease are warm and moist conditions, which are generally caused by extended periods of rain or overhead irrigation use during the warmer months. This disease is primarily spread by spores from old diseased canes that have over wintered, and are spread by water splashing onto first year primocanes. To control this disease, avoid excessive nitrogen applications, overhead irrigation, and thin plants regularly to promote air circulation and sunlight penetration and be sure to remove any dead/diseased canes as this disease over winters. A dormant spray of Sulforix, followed by fungicides applied during the growing season are effective. Begin sprays when new growth is 6 inches. Captan, Pristine, and Switch are labeled for anthracnose on blackberry.

Blackberry Anthracnose- *Elsinoe veneta*



Max Vonkreuzhof, University of Arkansas Plant Pathology Graduate Student

Blackberry Anthracnose- *Elsinoe veneta*



Sherri Sanders, University of Arkansas Cooperative Extension



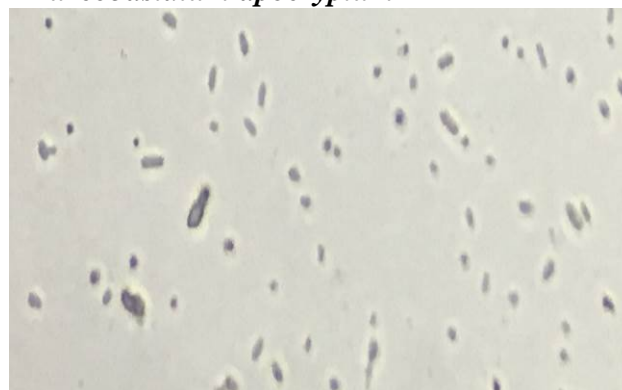
Blackberry Anthracnose- *Elsinoe veneta*



Sherrie Smith, University of Arkansas Cooperative Extension

fungicides including Propiconazole, Thiophanate methyl, copper fungicides, Mancozeb, and Chlorothalonil. The first application should be made at or just before bud break to protect new growth from infection in the spring. If there are prolonged periods of wetness, additional applications may be necessary.

Maple Anthracnose Spores- *Aureobasidium apocryptum*



Cullen Shaffer, University of Arkansas Plant Pathology
Graduate Student

Anthracnose of Maple

By Cullen Shaffer

Anthracnose of maple is a fungal disease caused by several fungi including *Colletotrichum* spp. (syn. *Glomerella* spp.) and most often *Aureobasidium apocryptum*. Anthracnose symptoms vary by host and by pathogen, but irregularly shaped, spots or blotches that occur along the veins or edges of the leaf characterize the disease. The fungi overwinter in fallen leaves and emerges in the spring when spores are produced in the spring and spread by wind and rain. The fungi also can hide out in infected twigs and buds. Leaves should be destroyed to eliminate fungal reservoirs. Infected twigs should also be pruned. Anthracnose will only cause minor damage to maple. Anthracnose can cause the trees to drop their leaves and it is not worth spraying pesticides unless this defoliation has occurred several years in a row. Hire a professional arborist to spray the entire tree with

Maple Anthracnose - *Aureobasidium apocryptum*



Cullen Shaffer, University of Arkansas Plant Pathology
Graduate Student



Turfgrass

By Christian Anderson

A large, area of dying turf is often found to be caused by the fungus, *Rhizoctonia solani*; a disease commonly referred to as Large Patch. Large Patch is a serious disease that is active in the spring and fall. Excessive amounts of water, excessive amounts of nitrogen, and a soil pH of 6.0-7.5 predispose turf to Large Patch. The grower may notice a large, brown patch that is beginning to thin as the fungus kills the grass. The circular patch may range in size from half of a foot to a few feet in diameter. There may also be an orange halo appear on the outer part of the brown spot. The sheaths of the grass may have reddish, brown lesions on the lower part. The roots also may begin to rot along with other parts of the plant that may make it easier to detach the brown grass in comparison to the unaffected patch of grass.

Maintaining good lawn care is essential to preventing large patch disease. Good lawn care techniques are mowing the lawn routinely; removing clippings to prevent the fungus from spreading, good drainage, and limiting thatch build up on the lawn. Soil test every two years for pH and nutritional profile of the soil. Homeowners may use Spectracide Immunox Fungus Plus Insect Control for Lawns, or Scott's lawn Fungus Control, or Bonide Infuse Systemic Disease Control lawn and Landscape. Follow label for rates, timing, and repeat applications. Commercial applicators may use Heritage 50 WG, or Prostar 70 WP or Eagle 40 WSP, or Trinity, or Bayleton 50 WSP.

Large patch- *Rhizoctonia solani*



Michelle Moberly, University of Arkansas Cooperative Extension

Rose slug- Tenthredinidae Family

By Aurora Manley

Adult sawflies lay their eggs on rose plants and the larvae feed on rose foliage. Three species which cause the most damage to roses include bristly rose slugs (*Cladius difformis*), curled rose sawfly (*Allantus cinctus*), and the European rose slug (*Endelomyia aethiops*). Only the European rose slug larvae, *Endelomyia aethiops*, leave a leaf skeleton behind after eating the leaf surface around the veins without biting through the leaf.

Identification

Sawfly larvae are light green with orange heads, which allows them to blend in with the leaf surface. Unlike caterpillars, sawfly larvae have five or more pairs of fleshy legs (prolegs) following the first three pairs of legs. These larvae can be 19mm in length or less and found several weeks after adult sawflies lay their eggs in early spring and only have one generation per year unlike the other two species.

Control

If European rose slugs are suspected, first check both the upper and lower leaf surfaces to confirm their presence. When larval infestation is light, the infested leaves should be removed and destroyed. Forcefully spraying water onto infested plant leaves can knock the larvae off and kill them, but this is effective if both the upper and lower surfaces are sprayed. Natural sawfly enemies can keep them controlled provided pesticides are not overused. Some very effective chemicals include insecticidal soaps, carbaryl, malathion, permethrin, and cyfluthrin. However, these should only be applied when larvae are physically present and the directions need to be followed. **Bacillus thuringiensis serotype israelensis (Bti)** is a safe and effective control when applied per label.



Roseslug- *Endelomyia aethiops*



Aurora Manley, University of Arkansas Plant Pathology
Graduate Student

Roseslug- *Endelomyia aethiops*



Aurora Manley, University of Arkansas Plant Pathology
Graduate Student

Rose Downy Mildew

By Wagner C. Fagundes

Downy mildew of roses is caused by the pathogen *Peronospora sparsa*. In favorable conditions during cool weather (50 – 60°F) and high humidity (> 85%), downy mildew can pose severe risks, destroying a greenhouse of roses or a landscape planting in relatively short period of time. In temperatures that are not optimal for pathogen growth, spores may survive and be viable on fallen leaves for as long as a month. However, when temperatures increase over 90°F, for a 24-hour period all active spores are killed. Although *P. sparsa* looks like a fungal pathogen, this organism is a member of the Oomycota clade - same clade of that pathogen responsible for the great potato famine in Ireland by the end of 19th century (*Phytophthora infestans*). As other downy mildew pathogens, *P. sparsa* is an obligate parasite, which means these organisms need to have living tissues to complete their life cycle. The symptoms of downy mildew are frequently confused with those of rose blackspot, leading to an incorrect treatment. Generally, downy mildew starts with chlorotic (yellow) angular lesions (spots) on the upper leaf surface, which quickly become black/brown colored with reddish margins. When the spots occur close to leaf veins, they follow it - easily differentiating from the blackspot disease, which the spots cross the veins. In drier environmental conditions, these lesions may develop necrotic centers. Defoliation also occurs from top to bottom of the bush, even before leaf symptoms become apparent. All old rose debris should be collected and destroyed. For prevention, plant spacing and good airflow between plants are important to keep the humidity at low percentages. Moreover, plants should be watered at a time of day that will enable fastest possible drying of leaves and stems. Fungicide applications are necessary on roses with a history of Downy mildew. Homeowners may use **Bonide Mancozeb Flowable with Zinc Concentrate**. Commercial growers should rotate Mancozeb with Heritage or Compass. Note that although Knockout roses are extremely resistant to Black spot, they are not resistant to Downy Mildew.

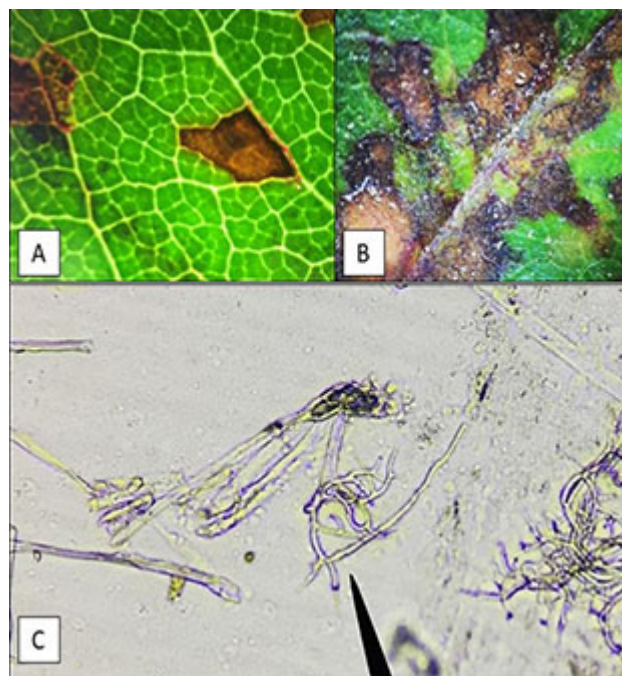


Rose Downy Mildew leaf lesions- *Peronospora sparsa*



Wagner C. Fagundes, University of Arkansas Plant Pathology Graduate Student

Rose Downy Mildew- (A) Brown angular lesions on upper leaf surface demonstrating the presence of reddish margins; (B) Presence of sporulation observed within the lesion; (C) Typical sporangiophores of *Peronospora sparsa* observed through 10X magnification



Wagner C. Fagundes, University of Arkansas Plant Pathology Graduate Student

Bacterial Spot of Stone Fruit

By Katherine Wilkinson

Bacterial Spot of Stone Fruit is caused by the pathogen *Xanthomonas arboricola* pv. *pruni* and infects stone fruit including peaches, apricots, nectarines and more. Early foliar disease symptoms include water soaked lesions. Later foliar symptoms of this disease include purple-brown necrotic lesions which are angular in shape due to the veins of the leaves rather than rounded and which can produce shot-holes on the leaves. Chlorosis or



Sherrie Smith



CLINIC NEWS

Issue 18, June 12, 2017

yellowing can also appear on foliage as well as browning. Stems can also develop cankers that can be several centimeters long. Infected leaves may fall prematurely from the tree, negatively affecting yield. Symptoms on fruit may include a mottled appearance, cracking and lesions. A bacterial ooze may also be present during wet weather.

Chemical treatment for this pathogen includes the application of copper-based bactericides or the antibiotic oxytetracycline, both of which are only effective before symptoms present; Removing infected twigs and diseased leaves can help reduce the spread of this disease. Adding windbreaks between groups of trees can prevent the spread of the bacteria as the pathogen can be spread by wind. It is important to remove weeds around trees to both improve air circulation and prevent the weeds as a reservoir for the bacteria. Proper irrigation methods, which prevent the splashing of bacteria onto uninfected trees, is important. The most effective method of control is planting resistant varieties. Biscoe, Blazing Star, Candor, Contender, Harrow Beauty, Harrow Diamond, PF1, PF12A, PF24-007, PF27A, Starfire, Blaze Prince, Desiree, Encore, Garnet Beauty, Gloria, Glowingstar, John Boy, Messina, PF5B, PF14 Jersey, PF24-007, PF19-007, PF28-007, Redkist, Redstar, Summer Serenade, Victoria, PF 11 Peach, PF9A-007, Goldnine, Vulcan, Venture, Vinegold, Virgil, Allgold, GoldJim, Manon, Saturn*, Scarlet Pearl, Southern Pearl have excellent or good resistance.

Peach Bacterial Leaf Spot- *Xanthomonas arboricola* pv. *pruni*



Katherine Wilkinson, University of Arkansas Plant Pathology Graduate Student

Peach Bacterial Fruit Rot- *Xanthomonas arboricola* pv. *pruni*



Russ parker, University of Arkansas Cooperative Extension