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DIVISION OF AGRICULTURE
Cooperative Extension Service

Sherrie Smith
Rick Cartwright

Department of Plant Pathology

PLANT HEALTH CLINIC NEWS

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.

Blueberry

Anthracnose fruit rot caused by *Colletotrichum gloeosporioides* is another name for ripe rot of blueberries. Losses in North America are estimated to be from 3-5%, but can be much higher depending on cultivar and environmental conditions. Symptoms begin as a blighting of the flowers. Infected fruit often remains symptomless until maturity. At that time the blossom end of the fruit softens and becomes slightly sunken, and masses of salmon-colored conidia are exuded from acervuli on the fruit. Control of ripe rot is best achieved with fungicide applications at 7-10 day intervals beginning at full bloom. Captan is listed for homeowners. Elevate and Switch are two fungicides listed for commercial growers.

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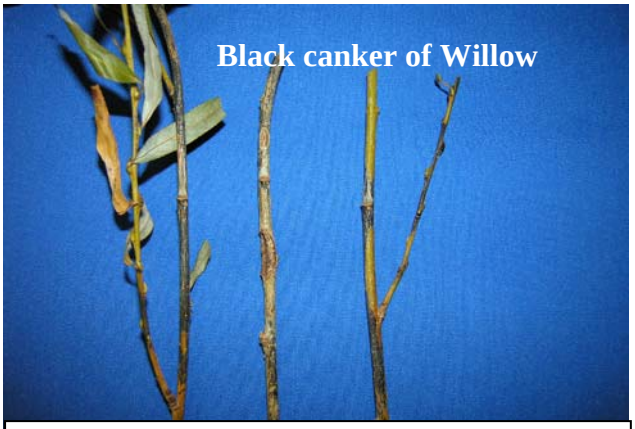
Willow

Rapid branch dieback, blackened stems, and blighting of shoots and leaves are symptoms of two diseases often found together on willow. The diseases are black stem canker caused by *Glomerella miyabeana* and willow scab caused by *Venturia saliciperda*. Willow scab attacks current year leaves in the spring, rapidly killing them. Olive green velvety spore masses develop along the veins and in spots on the underside of leaves. Small shoots are killed when the fungus grows into the petioles. Black canker usually infects leaves and twigs later in the season than scab. The cankers most often appear at the nodes underlying petioles. Leaf blades that become infected turn black near the base. Leaves will shrivel and drop prematurely. Control consists of pruning out diseased twigs, raking up fallen twigs and leaves, and avoiding overhead irrigation to prevent splashing spores to uninfected tissue. Avoiding stress by keeping willows properly watered is important in reducing the incidence and severity of both these diseases. Maneb and captan have been used as chemical controls, but the large size of willows make this impractical for most homeowners.



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Daylily

Daylily rust caused by *Puccinia hemerocallidis* can be a serious disease of daylily. Although it rarely outright kills the plant, it disfigures and weakens it. It was first identified in the United States in 2000 and now has been found in 30 states. Normally the spores are spread by wind, but here in the states the disease is mostly spread by infected nursery plants. Newly purchased plants should be carefully checked for signs of disease. Symptoms on susceptible cultivars are raised pustules with a yellow to orange powder of spores. The leaves

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and scapes become yellowed, then necrotic. Infected leaves eventually shrivel up. Resistant varieties may only get a few flecks instead of pustules. Management consists of immediately bagging affected foliage to prevent spread of the spores, cutting it to the ground and destroying the clippings. Fungicides such as myclobutanil and propiconazole are listed for daylily rust.

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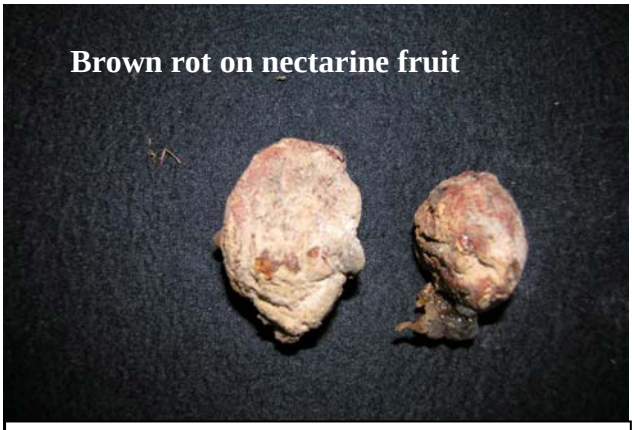
Nectarines and Peaches

Perhaps the most pervasive and destructive disease of peaches and nectarines is brown rot caused by *Monilinia fructicola*. Symptoms include blossom and twig blight in the spring, and fruit rot of immature and mature fruit. Blossoms turn brown, often becoming gummy before being covered with a grayish to tan spore mass. Often the fungus enters the shoot where it causes a canker on which spores are also produced. They appear as brownish, sunken areas that are often covered with gum. The leaves on such shoots turn tan to brown and remain attached for several weeks. Brown rot on ripening fruit starts as small soft brown lesions. Under optimum conditions the entire fruit can be rotted within 48 hours of infection. Fruit with brown rot infections will sporulate profusely, shrivel, and become tough grayish-black mummies. These mummies may drop to the ground, where apothecia may develop and provide innoculum for next season. Good sanitation is very important for controlling this disease. All remaining fruit should be removed from the tree after the final harvest. All fallen fruit must be picked up and destroyed. Cankered stems should be pruned out. Keeping trees properly fertilized and watered reduces stress. Chemical controls beginning at pink bud stage and continuing all season give good results. Captan is listed for brown fruit rot.



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Cotoneaster

Cotoneaster with its bright red winter berries is a commonly planted shrub where winter interest and low maintenance is desired. There are over 200 species of cotoneaster, both deciduous and evergreen. Cotoneaster is bothered with few diseases or pests, but the clinic has received several samples heavily infested with Greedy scale insects. Scale insects have long piercing mouthparts with which to feed on plant sap. They feed on twigs, leaves, branches, and fruit. Severe infestations cause decline of plant health and even plant death. Greedy scale attacks cotoneaster as well as acacia, bay, boxwood, cactus, ceanothus, citrus, fruit trees, holly, laurel, magnolia, manzanita, palm, pepper tree, pittosporum, pyracantha, and redbud. Plants with significant populations of scale often appear water stressed. Leaves may turn yellow and drop. Twigs and limbs may die. Most armored scale such as greedy scale have several generations a year. The eggs are laid underneath the shell of the female. They hatch into tiny, usually yellow crawlers with legs. They settle down permanently after a few days and begin to grow their protective shell like cover. They are most vulnerable to control measures while in the crawling stage. Too many insecticides in the garden may actually promote explosions of scale insects as their natural

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predators are eliminated. Many species of lady beetle as well as parasitic wasps feed on scale and help to keep their numbers down. Where chemical control is required, well timed sprays of fine horticultural oil during the dormant season or when crawlers are active is usually enough to control scale. Insecticidal soaps and malathion are also listed for scale.

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Turf

Gray leaf spot caused by Pyricularia grisea can cause severe damage to turfgrass in the genera *Festuca*, *Cynodon*, *Eremochloa*, *Pennisetum*, and *Pasplaum*. Warm season grasses such as Bermuda, Zoysia, and St. Augustine; develop tiny brown lesions on leaves and stems that enlarge rapidly into round to oblong spots. Large spots may extend most of the way across the leaf, killing the leaf. The spots are tan to gray and have purple to brown borders. During humid weather the spots may be covered with grayish masses of conidia. Gray leaf spot is more severe in newly established turf than in mature stands, particularly where nitrogen fertility levels are moderate to high. The disease typically occurs in the summer, but epidemics may continue until heavy frost. Control practices that limit drought stress, extended periods of leaf wetness, excessive applications of nitrogen, and soil compaction help to reduce disease incidence and severity. Azoxystrobin, trifloxystrobin, propiconazole, thiophanate-methyl, chlorothalonil, and triadmefon are all listed for treatment of gray leaf spot.

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Nematodes in the Home Garden by Ronnie Bateman

While most gardeners in Arkansas are concerned about the summer heat, drought, insects, and diseases that can cause severe problems in their garden, quite often very little thought is given to a group of unseen parasites which can not only be damaging alone, but can also increase the severity of these other problems. A number of plant- parasitic nematodes are common in a typical Arkansas garden, but the root-knot nematode is by far the most wide spread, and has the widest host range.

The root-knot nematode can infect vegetables but is most severe on tomatoes, okra, beans, squash, peppers, carrots, cucumbers, cantaloupe and muskmelons, eggplant and watermelons. Although resistance to this nematode has been bred into newer varieties of some of these crops, older varieties, particularly heirloom varieties, are susceptible. Symptoms of root-knot nematode include: yellow foliage, stunted plants, in extreme cases plant death, and reduced yields. The most visible symptom, however, is the presence of galls on roots of infected plants (Figure 1).

Detection of the root-knot nematode is relatively simple during the growing season. This can be done by carefully digging up a suspicious – looking plant, rinsing soil from the roots, and examining the roots for the

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presence of galls. While the root-knot is the most common problematic nematode in home gardens, there are a number of other nematodes that can cause damage to a much narrower band of crops. These nematodes can only be detected by nematode analysis. For a nematode analysis, the soil should be sampled and sent to the Arkansas Nematode Diagnostic Laboratory. This sampling is best done by using a soil sampling probe (Figures 2&3), to collect approximately ten cores of soil to a depth of 6 to 8 inches from the suspected area. Although soil probes are available for purchase, your county agent should be able to loan you one and provide any assistance needed. Samples should be taken from close enough to the root zone to insure that some of the feeder roots will be included in the sample. Insertion of the probe at an angle toward the plant (Figure 2), should insure that the probe will pass through at least a portion of the root zone. It is essential that the soil be taken from the root zone because that is where the nematodes are most abundant. The soil sample should be mixed well, placed in a plastic bag, sealed to avoid drying out the sample, and labeled for proper site identification. One pint of soil is sufficient for submission. Because nematodes are living organisms, a degree of care must be exercised in handling the sample after it is collected. Avoid allowing the sample in the plastic bag to stand in direct sunlight or to get excessively hot or cold. If it will be several hours or a day or two after collecting the sample before it can be sent to the county agent or to the diagnostic laboratory, store the sample in a cool room (air-conditioned). Be sure to seal the bag completely to prevent excessive drying of the soil. A nematode sample submission form (retrievable from the UACES website Form # AGRI – 483) should be filled out for each sample. A cost-recovery fee of $10 is charged for each sample that is assayed for nematodes.

Although a sampling probe is the best tool for soil sampling, a garden shovel, sharp-shooter shovel, or a hand trowel (Figure 3), can also be used if used properly. Since these tools are so much bigger than a soil probe, care must be taken to not get so close to the plant that it is destroyed and yet close enough to get soil from the plant's root zone. This can be done by digging a hole at a safe distance from the plant and then flaking off the back side of the hole until you begin to get a few feeder roots. The sample should be taken throughout the top 8 inches in this area. This procedure should be repeated in several sites in the garden, and the soil from all sites should be mixed, bagged, and labeled as previously described. Nematode samples can either be taken to the local county extension office for submission to the Arkansas Nematode Diagnostic Laboratory, or they may be sent directly to the laboratory at: Arkansas Nematode Diagnostic Laboratory, 262 Highway 174 N., Hope, AR. 71801.

If nematodes are determined to be a problem in a garden during the growing season, very little can be done to totally eliminate the possibility damage to the crop, but a few management practices may help insure that a level of production and quality in the garden is maintained. Prevention and (or) management prior to planting will be covered in a future article

Reduction of plant stress is the greatest key for insuring a harvest from the infested crop. Since nematodes damage the root system, the plant's ability to take in water and nutrients can be severely limited. Consequently, care should be taken to avoid the added stress of disease, insects, weeds, and drought. Watering the plants deeply and less often will encourage the development of a deep root system which will help reduce plant stress. Maintaining good soil tilth and an adequate nutrient level will also help maintain plant growth and production in the presence of nematode infection.

In certain instances, only a certain area or areas of the garden may have a severe nematode problem. If these areas can be identified, care should be taken to avoid contaminating the rest of the garden. When working in the garden with a hoe, shovel, tiller, etc., work in the non-infested sites first and then go to the contaminated areas. Disinfecting garden equipment, including reusable cages or stakes, with a 10% solution of household bleach after each use, can help reduce the risk of spreading the nematode mechanically. If furrow irrigating, don't allow water to flow through an infested area into a non-infested area. Although nothing can be done to reverse the effect of nematodes on plants in a garden within the season, good stress management and proper sanitation techniques should allow a respectable harvest in all but the most severe circumstances.

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For more information see CES fact sheet FSA 7529, Control Root-knot Nematodes in Your Vegetable Garden.

Figure 1. Root knot on tomato roots

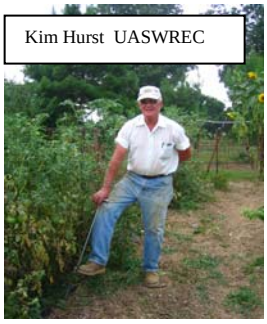

Figure 2. Proper angle for sampling

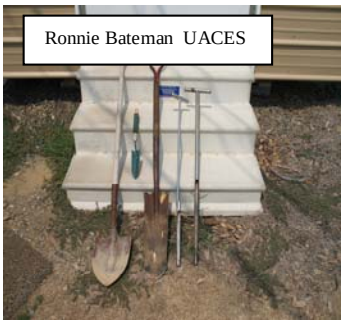

Figure 3. Sampling tools