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Arkansas Plant Health Clinic Newsletter

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Watermelon

Several viruses affect melons. Watermelon mosaic virus (WMV) affects cucurbits, peas, vetch, clover, and alfalfa, among others. It is found wherever cucurbits are grown. Symptoms vary according to species, cultivar, and environmental conditions. Plants may be stunted. Leaves may be malformed, mottled green and yellow and blistered. Rugose leaves and vein banding may also occur. Fruits can be misshapen, dwarfed, mottled, or spotted. WMV overwinters mostly in wild legumes and is spread to cultivated cucurbits by more than 20 aphid species. There is no evidence it is seedborne. Aphid management and the use of resistant cultivars are the recommended control measures.

Watermelon Mosaic Virus (WMV)-Potyvirus

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Sandcherry

The Purple Leaf Sandcherry is one of our most decorative larger shrubs. It is a relatively slow growing upright plant that is usually grown as a shrub, but it can be pruned up to give it the appearance of a small tree. These ornamental varieties are valuable for their white or pink flowers, which are cup-shaped with 5 petals. They are usually followed by ovoid fruits. Grow in any moist, well-drained, moderately fertile soil in full sun.

These attractive ornamental members of the Prunus family are susceptible to the same diseases that other members of the cherry and plum family get. One unsightly disease is bacterial leaf spot caused by *Pseudomonas pruni*. Bacterial spot is more common and more severe where trees are grown on light sandy soils and the environment is humid and warm during the growing season. Symptoms start as angular, grayish, water-soaked lesions, 1-3mm in diameter. Lesions can occur on leaves, twigs, and fruit. As lesions age and enlarge their centers become purple and necrotic. Often the center of the lesion drops out giving a shot hole appearance. Spring and summer twig cankers result from infections the previous fall. Spring cankers develop on twigs of the previous summer's growth. Spring cankers appear as slightly raised blister like areas apparent at the time of leaf emergence. Summer cankers are formed on the new green shoots and are visible by late spring or early summer. Both spring and summer cankers are commonly referred to as black tip. Planting resistant cultivars, avoiding overhead irrigation, and cleaning up all fallen leaves and twigs are

important in controlling bacterial spot. Fixed copper fungicides applied at leaf drop in the fall and early in the spring are helpful. Healthy shrubs are less likely to be severely impacted by disease, so keep your Sandcherries properly watered and fertilized. They are prone to borer damage, so borer control is important to the overall health of the plant.

Sandcherry Bacterial Spot-
Pseudomonas pruni

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

A somewhat similar looking disease of Prunus is **Cherry leaf spot** caused by *Blumeriella jaapi*. This can be a serious disease, causing extensive defoliation, yield reduction, and overall weakening of the trees. Small purple spots appear on the leaves 3-6mm in diameter. White spore masses develop on the under surfaces of the leaves after heavy dews or rains. In severe cases trees may become nearly defoliated as affected leaves turn yellow and fall prematurely. Fallen leaves should be rakes up and destroyed to reduce inoculum the following season. Fungicides applied starting just after bloom and continued throughout the season give good protection. Myclobutanil, chlorothalonil, and Captan are recommended fungicides. See MP 154 for a complete list.

Cherry Leaf Spot- *Blumeriella jaapi*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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Russian Laurel

The Russian Laurel, *Prunus laurocerasus*, cultivar Schipkaensis, also known as the Cherry Laurel, or English Laurel is a hardy, compact, spreading evergreen shrub with highly fragrant pure white flower spikes in late spring followed by purple-black fruit. It has narrow, glossy green leaves year-round making it an ideal choice for a showy hedge or accent. Other benefits are it's tolerance to salt spray and shade. The Russian laurel grows to 4-6 ft. tall x 6-8 ft. wide. Recently a sample of Russian laurel came into the clinic with a severe case of Seiridium canker. As we've discussed in past newsletters, Seiridium canker can cause significant disease on may evergreen species. It is especially lethal in Leyland cypress. The severity of this disease is increased by stress, particularly drought stress. Symptoms include elongated sunken cankers on branches and twigs. These areas often weep copious amounts of sap. Death to an entire branch ensues when the branch is girdled by the canker. There are no effective chemical controls for Seiridium canker. Diseased branches should be pruned below the canker and destroyed. Stressful conditions should be avoided by a proper water and fertilization regime. Remember that evergreens need watered during the winter months if we have a dry winter.

Russian Laurel Canker-*Seiridium spp.*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Grapes

Grape Measles (Esca) is caused by nine species of fungi in the genus *Phaeoacremonium*. It is one of the earliest described diseases of grapes, found most

frequently in warm temperate zones. Symptoms may appear on the entire vine or just part of the vine. Foliar symptoms are the most frequently observed. Symptoms usually appear first on the leaves at the base of shoots and spread to the rest of the leaves. Leaves display small chlorotic interveinal spots that enlarge and dry out. This often causes premature dropping of leaves. Affected fruit may not mature properly or have pinprick black spots (measles) distributed in the epidermis. The most dramatic symptom is sudden death of all or part of the vine. This occurs because this is a vascular pathogen. In the wood a characteristic zone of brown necrosis forms around a central area of soft damaged wood. Vines with Esca characteristically exude dark gums from transversely sectioned vascular tissue. Control is difficult. Some benefit has been observed by dormant season applications of liquid lime sulfur to the main trunk of the vine. Avoiding injury to stem is critical as wounds allow entry sites for the pathogen. All newly purchased vines should be checked for vascular discoloration as infections are thought to be present in some nursery stock. Grape leaves showing these foliar symptoms without vascular discoloration are probably symptomatic of magnesium deficiency instead of Esca.

Grape Measles (Esca)-
***Phaeoacremonium* spp.**

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Grape Measles (Esca)-
***Phaeoacremonium* spp.**

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Pecan

Pecan anthracnose is caused by *Glomerella cingulata.* It can cause significant late season yield loss in certain cultivars when environmental conditions favor the disease. Symptoms develop during late summer on green fruit when wet periods occur. Shiny dark brown sunken lesions occur along the shuck suture or at wounds where clustered fruit are in contact. Lesions may eventually cover the entire fruit. After wet weather, masses of salmon-colored conidia can sometimes be observed on the lesions. The disease can cause ticktights where the shucks don't open at maturity, decreased kernel size, fruit abortion, and fruit rot. Control consists of a fungicide spray program beginning at bud break in the spring. Abound, Enable, Topsin, Orbit, and Pristine are all labeled for pecans in Arkansas. Immunox and products containing thiophanate-methyl are listed for homeowners. Proper sanitation is helpful in control efforts. All fallen nuts, leaves, and twigs should be raked up and destroyed. Prevent stressful conditions by proper watering practices. Pecans prefer deep, rich, river bottom type soils, and require about 80 gallons of water a day to produce good fruit.

Pecan Anthracnose sticktight symptoms- *Glomerella cingulata*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Root-Knot Control Planning Next Year's Garden – Now!

by Ronnie Bateman

Although it may seem remote to think in terms of next year's garden while this season is in full swing, nematode management in the garden is a season-long concern. Nematodes are soil-borne microscopic roundworms that infect the root systems of most common garden crops. The root-knot nematode is the most common nematode problem in gardens, but other nematode types may also be damaging in some sites. This article will focus on root-knot management, but the concepts also apply to other nematodes as well.

Where they are severe, nematodes can cause tremendous damage to the host crop. Nematode

populations increase in the soil throughout the growing season and can be extremely high in the late summer and fall. They also tend to over winter well, and a nematode problem in a site this year will more than likely be a problem next year if steps are not taken to manage the problem. Nematode control in vegetable gardens depends on a combination of management practices, many that can be initiated this year, to reduce the risk for future crops and to ensure that a productive garden will be possible in the future.

Before destruction of this year's garden, it would be good to make a map of the garden showing the location of the different crops. This will assist in pin-pointing areas of nematode infestation. Also keep a record of the crop varieties that were grown. This information can assist in future crop selections by indicating which varieties performed best under the conditions in your specific site. A quick way to determine where the nematode problems are is to dig up and inspect the roots of plants all over the garden for the presence of galls on the roots (Fig.1), or take a soil sample from the site for nematode assay. Soil samples should be taken in early fall. It is advisable to break the garden into blocks or at least quarters and sample each one. Collect enough soil for both a nematode assay and a soil nutrient assay. The sample(s) should be taken to the local county Extension office to be forwarded to the appropriate laboratory. There is a $10 cost-recovery fee charged for nematode assay. Fertilizer and lime analyses are done free of charge.

Good sanitation practices will reduce the risk of spreading nematodes to non-infested areas. The main agent of nematode movement, both within the garden or into a garden for the first time, is the grower. Be extremely careful not to introduce new or additional nematodes into a site with infested equipment, topsoil, or infected transplants. If certain areas of the garden are infested and others are not, work in the non-contaminated areas before entering the areas of contamination. After working in root-knot infested soil, all tools and equipment that were used, including reusable stakes, cages, hoes, shovels, garden tractors, and tillers, should be disinfested with a 10% solution of household bleach after each use. Avoid walking across a wet, muddy garden and spreading the nematodes with muddy shoes.

There are a number of practices that can be utilized this season to reduce the population of nematodes in the garden. Immediately after production ends, dig up the roots of infested plants and remove them from the garden. These plants, particularly the root systems, should be put into plastic bags and sent to the landfill, or they can be composted to kill the nematodes, of burned. If infected roots are allowed to remain in the soil, the nematodes will continue to reproduce as long as the plant is alive. Continue to work the soil every 10-14 days or as often as needed to eliminate grass and weeds that could serve as hosts for the nematode. Spraying the site with a general herbicide will also kill the grasses and weeds, but occasional tilling will bring nematodes to the surface where the sun, heat, and wind can destroy them.

Care should be taken in the tillage process not to spread nematodes from an infested area to a non-infested area. If only one end of a row is infested, start on the end without infestation and work into the infested area last. If infestation is in the middle of the site, it would be safest to start on one end and till the soil until well into the infested area. Disinfect the equipment and then till from the other (clean) end. Till the remaining infested portion last. By always working from the non-infested areas into the areas of infestation, mechanical spreading should be kept to a minimum.

Fallowing a garden may pose a risk of erosion in many Arkansas gardens. If erosion is a concern, it would be advisable to plant a nematode resistant or

non-host cover crop in the fall. During late summer or early fall, a cover crop of root-knot resistant southern peas or certain varieties of marigolds (Tangerine, Petite Harmony, Petite Gold, Happy Days, Lemondrop, and French Dwarf Double) will lower nematode populations substantially but will die at first killing frost. Some good choices for a cover crop include mustard, rye, vetch (Cahaba white), turnips (if planted late and harvested early, <65 degrees F), and rapeseed (Humus, Jupiter, Dwarf Essex, Bridger, Cascade, Elena and Indore).

In late summer, another technique that can be used to reduce nematode populations is soil solarization. This technique involves tilling, irrigating to good planting moisture, and then covering the soil with clear plastic for six to eight weeks (Figure 2). The heat generated under the plastic will destroy a lot of nematodes in the upper six to eight inches of soil. The effectiveness of this approach can be improved by placing a soaker hose under the plastic so that the soil can be re-moistened every week or two. The plastic can either be removed so a cover crop can be planted, or it can be left in place all winter to prevent erosion and allow the soil to warm up quicker in the spring.

The addition of organic matter to the soil will generally improve overall performance of a site by increasing its' moisture-holding capacity and adding nutrients. Organic amendments also tend to increase the activity of various beneficial soil borne fungal antagonists of nematodes. Organic matter can be added in numerous forms including peat moss, animal manure, compost, or green manure crops. If compost is applied, make sure there are no partially decomposed roots from a root-knot infested plant in the material.

Rotation of crops within the garden is essential. Care should be taken to follow a susceptible crop one year with a resistant or non-hast crop or variety the next. A good practice would be to plant an area of the garden each year with root-knot resistant crops to provide space for the more root-knot sensitive crops the next year. For a partial listing of nematode resistant varieties see CES fact sheet FSA 7529, Control Root-Knot Nematodes in Your Vegetable Garden. Information is also generally available from seed companies on the resistance level of their varieties. Although most are susceptible to nematodes, early maturing crops (lettuce, onions, radishes, cabbage, etc.) can be generally grown in the more severely infested areas because they will be harvested and destroyed before the soil warms up enough for the root-knot to cause much damage. An ideal, although generally not practical, situation would be to rotate the entire garden site every 2 or 3 years. This will greatly lower the risk of a build-up in nematode population. If the garden can be relocated periodically, a soil sample should be taken from next year's potential site in the late summer or early fall to make sure nematodes are not already present.

None of the methods discussed in this article will eliminate the root-knot nematode, but they will help ensure that the home gardener can continue to produce a consistent and rewarding harvest.

Figure 1. Root-knot galling. Photo courtesy: Ronnie Bateman, UACES

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Figure 2. Soil solarization. Photo courtesy: Austin K. Hagan,
Auburn University

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.

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