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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.

Oak

Galls are tumor-like growths on the stems, petioles or leaves of a plant. The irregular growths are caused by the reaction between plant hormones and growth regulating chemicals produced by some insects or mites. The insect deposits her eggs into the plant tissue which causes a minor swelling. When the eggs hatch, the larvae secrete chemicals that stimulate abnormal cell growth. These galls provide food and protection for the growing insect or mite. At maturity the insect bores a hole and emerges. Usually damage to the plant is minor and control measures are not warranted. Some twig galls can cause stunting and twig dieback. Where control is necessary an insecticide or miticide must be applied at bud swell before the galls form. Galls may be pruned out and destroyed if the tree is not too large and heavily infected to make this impractical. Galls come in a variety of shapes and sizes. Over 600 species of North American gall wasps occur. It is not unusual to find galls from 20-30 species of wasps on a single tree. These tiny wasps are members of the Cynipidae family of wasps. We received a sample of oak this week that had numerous twig galls formed by gall wasps.



Old galls

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Gall wasp

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New galls on oak

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Oak apple gall



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Hickory

The Hickory bark beetle is one of the most serious hickory pests in the United States. The adult is a short, black stubby looking beetle 1/5 inch long. The underside rear-end is concave and has spines. The larvae or white-cream colored about the same size as the adults. Symptoms are dead and dying leaves and twigs, and trees with red-tinged foliage. Short, vertical egg galleries with radiating larval galleries beneath the bark are good indicators of damage. There are usually two generations each year in the southern United States. In early summer the adults appear and feed at the bases of leaf petioles and twigs. They then attack the bark, laying 20-60 eggs in egg galleries beneath the bark. Cultural control practices include felling infested trees over large areas and destroying the bark during winter months or storing infested logs in ponds. Insecticides containing pyrethroids can also be used. Bark beetles often attack trees already weakened by stress or disease.



J.R. Baker & S.B. Bambara, North Carolina State University,
www.forestryimages.org

Camellia

Camellias are lovely shrubs grown for their lustrous evergreen foliage and beautiful flowers. They do best in neutral to acidic soils in light shade, blooming from late fall to spring, depending on species. Camellias grow very slowly. Although an old camellia may reach 25 feet high or more, most are considered mature at 10 foot high. They require well-drained soil rich in organic matter. They are not very drought tolerant. Care should be taken to ensure enough water throughout the year,

including winter months when rainfall is less than one inch a week. Camellias do best when sheltered from full sun and drying winds. Leaves often will get sunburned when planted in full sun, or against a west or south facing wall. Recently a sample arrived at the clinic with large leaf spots. The fungi infecting the leaves were *Pestalotia*, a species that is often found on dying and dead tissue. On Camellia the fungus is sometimes found where leaves are damaged by sunscald. The problem should be temporary in places where too much sun is present where deciduous trees have not leaved out that normally provide shade. Planting sites for camellias should be chosen carefully to prevent sunscald.



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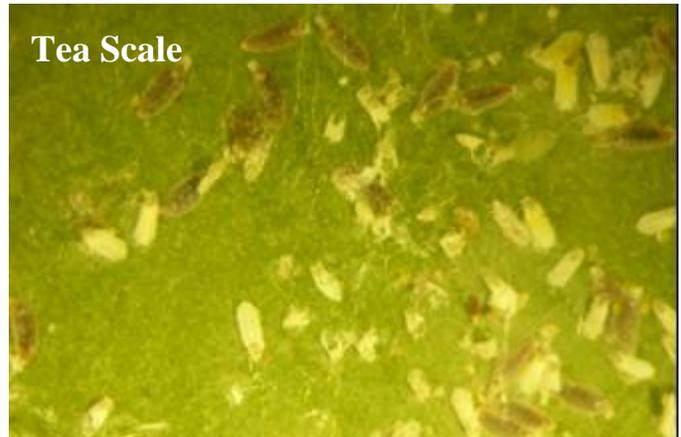


Camellia sunscald and leafspot

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Another common problem on camellia is scale. Several species attack camellia. The most common is tea scale, *Fiorinia theae*. The introduction of ornamental camellias from Asia into the United States is thought to be responsible for introducing the pest. It also attacks tea, holly, citrus, dogwood, bottlebrush, kumquat, mango, and olive. Symptoms include yellowing of the upper leaf surface, leaf drop, twig dieback, and occasionally death. Hand picking infected leaves is effective if there are only a few leaves involved. The best time to spray is in the spring after blooming with fine horticultural oil. Spray two applications, 10 days apart. Insecticides such as Malathion and seven will kill crawlers, but have the disadvantage of killing beneficial insects as well. Healthy plants attract fewer insects, so the key is to make sure your camellias are planted in the right location with adequate water and nutrients.

One of the most serious diseases of camellias is Camellia dieback and canker caused by *Glomerella cingulata*. Branch tips may die; leaves on cankered branches turn yellow and wilt. A close inspection reveals gray to tan lesions on the twigs and branches that develop into cankers. Tiny black fruiting bodies of the fungus may be seen with a hand lens. Treatment consists of pruning diseased twigs several inches below the canker and destroying. Use a solution of 10% bleach and water to dip pruning equipment into between cuts. Ornamental fungicides may be applied after rainy periods to help protect from infection which typically starts at fresh leaf scars.



Tea Scale

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Camellia canker with fruiting bodies

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Azalea

Azaleas are our most popular blooming shrub for the shade. There are literally thousands of cultivars to choose from, both evergreen and deciduous species. Azaleas have shallow roots, and prefer moist, well-drained soil with a pH between 4.5 and 6.0. They do best with protection from the hot afternoon sun. They cannot tolerate boggy soils. A common problem with Azaleas is Phytophthora root rot and Phytophthora dieback. These diseases thrive in wet soils. The first symptom of Phytophthora root rot caused by *Phytophthora cinnamoni* is wilted leaves. Azalea and



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Rhododendron leaves will curl inward and droop. Homeowners will often mistake the wilted appearance for drought and over water which makes the disease worse. Roots will appear rotted and have blackened areas on them. The xylem and phloem layers become discolored as the disease moves into the stem. Unfortunately, once wilt symptoms are observed the plant cannot be saved. Soil drenches of a product such as Monterey Aliette or Subdue Maxx have been used to suppress the disease, but most homeowners are better off pulling the plant up and destroying it. The soil should be replaced in that spot and drainage improved if necessary before replanting a Rhododendron or Azalea. Never buy an Azalea or Rhododendron that appears wilted with the hopes of reviving it with water. The disease is a major headache in nurseries and is often carried home by unwitting customers. Phytophthora dieback is thought to be a phase of the Phytophthora disease syndrome where inoculum gets splashed onto the foliage from infested soil. The species involved are different than the Phytophthora species commonly responsible for root rot. Characteristic symptoms develop on the current season's growth. Circular lesions form on young leaves within 1-2 days of infection, become water-soaked, and turn chocolate brown. Infected tissue expands, dries out and becomes brittle within 3-5 days. The infected leaves then curl inward and generally remain attached to the stem. Petiole infection may produce a diamond shaped stem canker. Frequent rainfall and sprinkler irrigation contribute to conditions favoring Phytophthora dieback. Excessive concentrations of nitrogen in the foliage also contribute to incidence of the disease. Mulching to prevent rain splash of soil and zoospores onto the foliage is an important cultural tool. Mancozeb is effective for preventing shoot infection, but only for 5-7 days if sprinkler irrigation is used. Fosetyl-Al, (Aliette), applied as a leaf drench prevents infection for about 14 days.

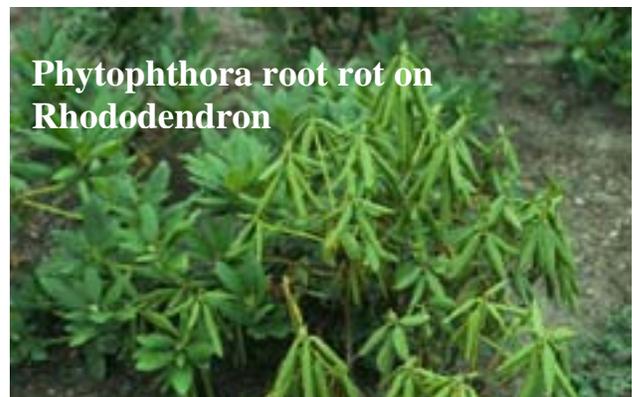
Iris

Iris are a perennial favorite in the garden. They tolerate a range of soils, come in a wide array of colors, and are usually carefree. They do best in well-drained soil in a sunny location. They will grow in the shade, but do not bloom well in more than half a day of shade. A common problem for Iris is leaf spot caused by fungal or bacterial pathogens. The symptoms are very similar.



Phytophthora dieback

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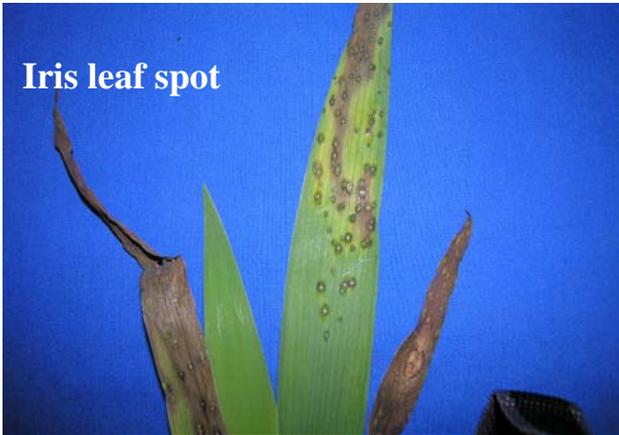
**Phytophthora root rot on
Rhododendron**

Credit: D.M. Benson & R.K. Jones/N.C. State University

One cause of leaf spot on Iris is the fungus *Didymellina macrospora* (*Heterosporium iridis*). It starts as small water soaked spots that rapidly enlarge to 1/2-inch- long spots with yellow margins whose centers turn gray as they age. Bacterial leaf spots look very similar, but bacteria may be observed streaming out of the lesions under microscopic examination. Both diseases commonly start at the top of the plant. Both diseases can weaken the rhizome over time when significant amounts of foliage are killed by the diseases. Cultural controls such as avoiding overhead irrigation and removing old leaves and infected leaves are generally enough to control these diseases. Fungicides can be helpful when cultural controls prove inadequate. Daconil will give good control of fungal leaf spots, while a copper based fungicide is best for bacterial leaf spot.



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Large Patch. Spectricide Immunox and Green Light Fung-Away Systemic fungicide are available for homeowners.



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Bermuda and Zoysia

It's time to spray **NOW** for *Rhizoctonia* patch diseases in the lawn. Patches in Bermuda grass occur usually in the spring as grass is breaking dormancy, or in the autumn as fall approaches. Irregular circular patches may be several feet or more in diameter. Sometimes a smoke colored halo may be observed early in the morning at the margins of the patch. Water soaked black to reddish brown lesions usually can be found on stolons and basal leaf sheaths. Affected shoots may be pulled easily from their points of attachment. In Zoysia, the patches occur a little later in the spring, two to eight weeks after green up, or in the autumn. Roots are discolored but not rotted. Patches can enlarge to more than 25 feet in diameter. Orange rings or patches up to 6 feet in diameter may appear. Sometimes symptoms slowly disappear during the growing season as surviving tillers start filling in the killed spots. Night irrigation and too much nitrogen increase both severity and incidence of patch diseases. Complete fertilizers with time release nitrogen should be used instead of quick release nitrogen. A soil test is useful to see where fertility levels are. Good drainage is essential for a healthy lawn. The turf should be de-thatched if thatch accumulates to more than 0.5" thick. De-thatching should be done while grass is actively growing. Fungicides may be applied once in the spring between March 15 and April 15, and again in the fall between September 20 and October 10. Heritage, Prostar, Eagle, and Bayleton are labeled for

Wheat

I want to remind readers that the clinic is involved in a Stripe rust race survey, and that we are also screening wheat for virus. It's always better for us to receive whole plants as opposed to just leaves. If you know the variety please include that information.

We are seeing some Downy mildew, (Crazy Top), in a few wheat samples. Plants are typically scattered in low spots or along standing water. Disease symptoms are yellowing, stunting, excessive tillering, warty leaves, and thickened leathery leaves (Photo), twisting leaves and heads. The causal organism for Downy mildew is *Sclerophthora macrospora*. The sporangia must have water to develop. There is no chemical control for Downy mildew. Water management and improving drainage are the keys to controlling the disease.



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Downy mildew of wheat

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