

Azalea Diseases

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Azaleas are durable, reliable shrubs for the mid-Atlantic landscape. However, sometimes problems appear. The first step in solving the problem is a correct diagnosis. This can involve some detective work.

Phytophthora ramorum, a New Disease

The fungus *Phytophthora ramorum* has been identified as the cause of foliar blight, shoot blight, and cankers on a wide variety of plants. A common name for the fungus is "Sudden Oak Death" or "SOD," based on the damage caused to oaks in coastal California forests. Other species of the *Phytophthora* fungus cause disease of azalea and rhododendron in nursery production and landscapes, and some produce foliar symptoms that can be confused with this new disease. You will need expert laboratory help to diagnose *P. ramorum*. Consult your local state department of agriculture for guidance in selecting samples for testing.

We plant pathologists would prefer to call this disease "Ramorum blight" rather than "SOD," but the press prefers to use SOD in stories about detections of the disease. This disease was observed on nursery plants (rhododendrons, viburnums, and some others) in Europe in 1993 and on oaks in California in 1995. The populations of the *P. ramorum* fungus in Europe and California differ. It is not clear if these populations represent separate introductions of the fungus from unknown points of origin. The disease has spread throughout the countries of the European Union on nursery stock. *P. ramorum* has now been found at 339 sites in England and Wales alone. It is being seen causing cankers on trees (oaks, beech) in parks and forests in England and Wales. In the United States the disease was restricted in distribution to the California coastal

forest ecosystem until recently. In 2003 the fungus got into several large wholesale nurseries in California. Camellias, viburnums, and lilacs potentially infected with *P. ramorum* were shipped to nurseries and directly to home gardeners in about 35 states during the period from March 2003 through June 2004.

P. ramorum causes damage by infecting foliage, shoots, and the trunks of some trees (oaks, beech). It has been detected on the roots of potted azaleas, but is not considered to cause root disease. The new *Phytophthora*, *P. ramorum*, causes leaf spot and shoot blight on azalea and rhododendron (see Photo 1). It has a very wide host range, which is very unusual for *Phytophthora*, since most species of *Phytophthora* studied have a narrow host range. *P. ramorum* usually does not kill the infected plant. Instead it produces leaf spots, small twig cankers, and blight of shoot tips. The fungus produces many microscopic spores on the infected foliage and blighted shoots. These spores can be carried on wind or splashing rain to lodge in the bark of oaks, infecting the main trunk, and eventually killing the oak. It usually takes several years to cause wilt and death except for very small seedling oaks. The symptoms seen on azalea are brown leaf spots and die-back of young shoots.

If you suspect that you may have azaleas showing odd leaf spot/shoot blight symptoms, and want them tested for *P. ramorum*, you should contact your local state department of agriculture. Only plants purchased during the March 2003-June 2004 period are considered at increased risk for this disease. Several laboratory tests are required to identify this fungus. It cannot be quickly identified through microscopic examination. [For the most current information on SOD in

Maryland, home gardeners should contact the Home and Garden Information Center (1-800-342-2507) or visit their Web site (www.agr.umd.edu/users/hgic).]

Flower Diseases

The major disease of azalea flowers is *Ovulinia* petal blight caused by the fungus *Ovulinia azaleae*. The first symptom seen following infection is a small tan spot. This spot enlarges to turn the entire petal into a slimy mass. The blighted petals may cling to the plant (and look messy) well into late June (see Photo 2). They weather off the plant, the over-wintering structure of the *Ovulinia* fungus (a lens-shaped dark sclerotium) falls to the ground (see Photo 3). The following spring these sclerotia produce little mushrooms (apothecia) that forcibly eject infective spores into the air.

Because the first infections each spring come from air-borne inoculum, even when you control all the *Ovulinia* on your property, you will probably see it again each year. This disease is easily prevented with one fungicide application. Apply a systemic fungicide (e.g., Strike, BannerMaxx, Heritage, Compass) to the plant when flower buds show color. The fungicide will enter the petal tissue and prevent infection for three to four weeks.

Root Diseases

The most important root disease in landscapes is *Phytophthora* root rot. Over a dozen species of the *Phytophthora* fungus attack azaleas and other ornamental shrubs and trees. The symptoms range from sudden death within the first few years after planting to a slower decline over three to five years. To diagnose, look for the dark chocolate brown discoloration in shoot cambium. In nursery

production this disease is prevented using cultural and chemical methods. Fungicides are routinely applied to prevent *Phytophthora* diseases in nursery production and to ensure that the plant reaches the consumer with a healthy vigorous root system.



Photo 1. *Phytophthora ramorum* on Rhododendron 'Nova Zembla'.
Photo by Nina Shishkoff

Phytophthora is a "water mold." Under wet conditions it produces many microscopic swimming spores called zoospores. These can seek out and infect plant roots, shoots, and foliage.

In the landscape we advise cultural methods to prevent losses from *Phytophthora*. Azaleas have a shallow, fibrous root system. Add organic amendments to the soil to increase organic matter content and to improve internal soil drainage characteristics. Your goal is a soil that retains moisture, but drains well and does not remain saturated for extended periods. Some azaleas are resistant to *Phytophthora* root rot. These resistant varieties should be used when re-planting a site where you have lost plants to *Phytophthora*.



Photo 2. When the azalea petal blight fungus (*Ovulinia azaleae*) infects flowers, the petals become brown and slimy.
(Photo by Ethel Dutky)



Photo 3. The petal blight fungus forms these black lens-shaped structures called sclerotia in blighted petals. In early spring these sclerotia can produce mushrooms that forcibly eject microscopic spores into the air to cause the first infections of new flowers in the spring. (Photo by Ethel Dutky)

Cankers and Die-backs

When most of the plant looks fine but a section is blighted, there are several suspects. Tight growing azaleas (such as the 'Gumpo' varieties) are susceptible to *Rhizoctonia* web blight. The symptoms seen are browning of patches of foliage. Look closely for the fungal sign, the fine tan webbing of *Rhizoctonia solani* (see Photo 4). This fungus can also cause blight of cuttings during rooting. *Rhizoctonia* can infect foliage



Photo 4. The fungus *Rhizoctonia solani* can blight cuttings in the greenhouse. Note the tan web-like mycelium growing across the media. In the landscape, *Rhizoctonia* causes foliar and shoot blight in hot, humid summer weather. (Photo by Ethel Dutky)

and make a little inconspicuous spot. *Rhizoctonia* diseases thrive in warm, moist conditions. Fungicides may be applied to prevent *Rhizoctonia* web blight on highly susceptible varieties. **Resort to fungicides only when you know you have this in your planting.** Some effective fungicides include: Contrast, BannerMaxx, Systhane, Heritage, Compass, Medallion, Daconil Ultrex, and others.

A different picture can be seen when selected large branches die during the summer and fall. Look for evidence of canker (abnormal looking areas on the bark). Old azaleas often lose large stems from *Phomopsis* canker. In Dutky's lab she isolates to identify the fungus. The symptoms of *Phomopsis* are similar to *Botryosphaeria* canker, but the two fungi look different in culture. *Phomopsis* usually produces a pie-shaped wedge of brown discoloration in the shoot (see Photo 5).



Photo 5. Cankers caused by *Phomopsis* are common in old landscape azaleas. This pie-shaped wedge of discoloration seen when the wilting shoot is cut, is diagnostic for *Phomopsis* on azalea. (Photo by Ethel Dutky)

The control is the same for all shoot canker diseases. Prune out the dead shoots back to healthy wood. Try to identify and correct cultural problems (drought is the most common one that predisposes azaleas to cankers) and correct them to encourage vigorous growth.

Don't be fooled by borers. They make symptoms that look just like a canker, but if you look for it, you can find the holes—tunnels in the shoot and "sawdust" coming out when they are active. Dr. Mike Raupp explained how to deal with borers (see accompanying IPM article on page 61).

Shoot Galls

Azaleas and rhododendrons can be affected by the disorder called "Tissue Proliferation." These large galls on the crown were long thought to be caused by the crown gall bacterium, but are now known to be of abiotic origin. Some symptomatic plants perform well in the landscape,

but others are brittle at the galled area and fail to thrive. Some even snap off at the crown. Tissue proliferation galls can be distinguished from bacterial crown gall because they sometimes make little green shoots. This disorder appears to be most common in plants that originated from tissue culture.

Exobasidium Leaf and Petal Gall

This is a very conspicuous disease that is not damaging to the plants. It is seen on native azaleas in the woodland. Several species of the *Exobasidium* fungus can infect ericaceous plants. The galls on *Rhododendron periclymenoides* [formerly *R. nudiflorum*] are called "Pinkster apples" and are edible. This fungus can remain on the plant either as a systemic infection or as spores on bud scales. Infection requires moist conditions, and only young developing leaf or petal tissues are infected to form galls. These galls should be picked off before they develop the white bloom. This white material is composed of a layer of infective spores, and it is these spores that make next year's infections. We never advise chemical control for this disease. If you are offended by it, then hand-pick the galls promptly. Remove them from the landscape; don't just drop them on the ground (see photo 6).



Photo 6. Pick off the galls caused by *Exobasidium* fungus before they produce the glaucous white bloom on the surface.
(Photo by Ethel Dutky)

Powdery Mildew, Rusts, and Other Diseases on Foliage

Azalea foliage can be marred by a variety of leaf spot fungi. The two most conspicuous ones are the rusts

and the powdery mildews (see Photo 7). Other fungi may cause spotting and blight of azalea foliage (*Rhizoctonia*, *Colletotrichum*, *Cercospora*, *Phyllosticta*), but are seldom important in the landscape. However, we may find that more attention must be paid to leaf spots on azaleas and rhododendrons because of the possible introduction of the fungus *Phytophthora ramorum*.

A reference to help you diagnose Azalea Diseases:

Compendium of Rhododendron and Azalea Diseases. 1986. APS Press \$49.00. To order by phone 1-800-328-7560 or online at www.shopapspress.org.



Photo 7. This rust (fungus *Pucciniastrum myrtilli*) produces conspicuous symptoms and signs on the lower leaf surface of this deciduous azalea.

(Photo by Ethel Dutky)

Animal-Caused Damage

Finally, a few words about non-disease-related azalea damage.—White-tailed deer like to eat the shoots, leaves, and flower buds of azaleas in the winter. If deer have eaten all the flower buds in the winter, flower display will be reduced. Bird netting placed over the planting will protect from deer.

Another cause of decline, wilt, and death symptoms can be small rodents eating the roots during the winter. Look for holes and shallow tunnels around your azaleas. The best control for these pesky rodents (usually pine vole or meadow vole) is to adopt a nice cat. Visit your local animal shelter to find your new pet. If you don't like cats,

encourage snakes to reside in your garden. We don't think poison baits are a good idea in home landscapes, but may be used in field production.

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