



Culture and Disease Of Peonies

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BUD BLIGHTS



Botrytis Blight. This disease may occur wherever peonies are grown. It is sometimes very destructive in wet seasons and may ruin entire plantings, or spoil the flowers after they are picked. It affects stems, buds, and leaves, beginning in the spring as the shoots emerge. Infected stems show a brown discolored area at the base extending from one to several inches above and below the ground line. The discoloration may be superficial, with healthy tissue beneath, or may extend through the stem developing into a rot that girdles and blights the shoots. The affected parts may

become overgrown with a grayish brown felt-like coating of fungus spores. Rain and insects, especially ants, spread these spores to the lower buds, where they germinate in the sugary exudate and penetrate the bud tissue causing them to die and turn brown. Buds attacked at an early stage dry up. In the larger buds brown necrotic areas develop on the surface or inside; often the stalk below the bud is rotted off. Some buds are partly open before they are killed. Fully open flowers may be attacked, with resulting one-sided development and rotting of the inner petals. The flower blight may occur after picking, if the flowers are wet when placed in cold storage. When the diseased petals drop, they may adhere to the leaves causing blight lesions to develop. These appear as irregular necrotic spots of a light tan color with a darker margin. This form of the disease appears in midsummer. If the weather stays dry, it is of little consequence, but in wet seasons it may damage the foliage severely. Under such conditions also the stem rot may spread into the crown and upper part of the root and result in a crown rot, but ordinarily the fungus merely may hibernate there without producing evident decay.

The different phases of this disease may be all caused by one fungus *Botrytis paeoniae*, although a different species is generally considered responsible for the disease symptoms that develop in late summer. The fungus lives over winter in the form of small, black, pimple-like resting bodies, called sclerotia, which are formed on dead foliage and stems. When the diseased plant parts decay, the sclerotia pass into the soil and thus serve as a source of infection of the young shoots during their emergence the following spring. The presence of a mulch, manure, or of litter around the crown during the period of early shoot development promoted the infection of stems from soil-borne sclerotia, even though such materials are themselves not a source of disease.

Peony varieties differ in reaction to *Botrytis* blight, some apparently possess resistance. Among the better known varieties that are more or less resistant to this disease are Asa Gray, Baroness Schroeder, Festiva Maxima, Gypsy, Lady Alexandra Duff, La'll'ulipe, Sarah Bernhardt and Venus. Spraying peonies

with bordeaux mixture, as practiced for the control of Botrytis blight of lilies, is considered objectionable because of the staining of the foliage. In those commercial plantings where the sale of roots is a more important object than the ornamental effect, the use of bordeaux mixture (4-4-50) may afford a considerable degree of control, provided spraying is begun very early and the new shoots are kept thoroughly coated with spray from the time they emerge until flower buds appear. In the home garden the more dilute 2-2-50 bordeaux mixture (1 pound of copper sulfate, 1-1/4 pounds of hydrated lime, 25 gallons of water) may be used with only slight staining of the foliage.

The most effective control measures are the careful removal of diseased parts as they appear and the eradication of badly diseased plants. In fall, peonies should be cut to the ground and the debris burned. Stems may be cut below the soil, as low as possible without injuring the crowns, and all debris carefully collected. In spring, stems with discolored bases should be cut out as soon as discovered, the cut being made an inch or two below the ground level. The first infected buds or leaves should also be picked off and burned.

Phytophthora Blight. This disease resembles the Botrytis blight in its effects on the flower buds, but the affected tissues are darker brown and the adjacent leaves and the stem for several inches below the bud are often involved. As the diseased parts dry they turn nearly black and develop a tough leathery texture. There is also a crown and shoot infection phase. The disease is more virulent than the Botrytis blight, affected shoots wilting completely or dying at the tips. The crown may be invaded and decomposed. Fortunately, the disease occurs less commonly than Botrytis blight and becomes only seriously destructive in persistent wet weather. Spraying during the period of early shoot growth with 5-5-50 bordeaux mixture (1 pound of copper sulfate and 1-1/4 pounds of hydrated lime in 10 gallons of water) gives effective control, but subsequent applications up to the time the flower buds appear may be required in wet seasons notwithstanding the objection because of staining the foliage with spray.

ROOT DISEASES



Crown Rot: Peonies are subject to several root diseases, of which the most frequent are crown rot and root knot, or root gall. Growers have generally believed that crown rot is due to contact with manure, excessive depth of planting or defective drainage; but these factors are also the ones that promote fungus infection. At present, it definitely cannot be said whether the cultural conditions or fungus parasites are of primary importance. It is well known that Botrytis, which causes the stem disease, may over-winter in the crown and is possibly also the cause of one form of crown rot. The crown rot caused by Phytophthora also has been mentioned. In other cases, not only the crown but the fleshy roots may be attacked with necrotic areas appearing on the principal roots. These are of variable size, usually circular in outline, dry in texture, and centered about a branch rootlet. This disease, apparently associated with the soil-inhabiting fungus Rhizoctonia, is fostered by the excessive use of manure as a mulch or the manure contacting the roots.

In the control of crown rot, the first essential is to provide a sanitary soil environment. It is preferable to plant in a new site with proper preparation of soil beforehand; but, if the same site is to be used again, a few shovelfuls of soil should be removed, and fresh soil from a site not previously exposed to contamination used for refilling. The crown bud should not be covered more than 2 or 3 inches except in very light soil. This process should, of course, be carried out only with dormant roots.

If one desires to save an infected plant, it should be dug up and the decayed areas cut out. The root should then be soaked in a suitable antiseptic solution, as corrosive sublimate 0.1 percent (112 ounce to 4 gallons of water) for 1 to 1-112 hours, after which the root can be divided for propagation, or planted in its entirety if not too large. Plants having deep areas of decay or badly crippled crown had best be discarded and burned.

Root Knot Or Root Gall: Peony roots are frequently infected by root knot nematodes (*Meloidogyne* spp.). The symptoms of root knot appear in the aerial parts of the plant as a general reduction of vigor. The presence of numerous short, thin stems with narrow, light green leaves and few or no flowers is a



more reliable indication of root knot. However, the disease is best identified by uncovering and examining a portion of the root system. If infected with nematodes, the smaller roots will have very conspicuous galls or knots ranging in size from just perceptible enlargements of the root to 114 inch or more in diameter. On the larger roots, the knots may be 112

inch in diameter. The form of the galls is irregular; they are usually, but not always, on one side of the root. These galls contain the adult female nematodes and the surrounding soil will be infested with nematodes in the immature stages (larvae). The nematodes can also infect a large variety of other plants including many kinds of ornamentals, vegetables, and weeds, but not most lawn grasses. This makes it very difficult to eliminate them from the small garden. Probably the best procedure is to dig up and destroy the infected peony plant, then sow grass on the spot for 2 or 3 years before again using it for any kind of ornamental. Peonies should be grown in another part of the garden. The alternative is to use chemicals to kill the nematodes in the soil.

An alternative to use of chemicals for providing clean soil in which to plant peonies is to select a site that has been in grass for several years or has been used for the growing of grain (oats, wheat, rye, barley, or corn).

Lemoine Disease: This unusual disease is subject of an ongoing research project, which has determined at least 3 viruses are responsible for its expression. Further information will be available in the near future. The name was originally derived from imported peony roots propagated by Lemoine of France, but the disease occurs on domestic peonies also, and nothing definite is known as to its origin. Affected

plants are barren and make very little growth, the shoots being weak and few in number. The roots show swellings in more or less regular serial order, the entire diameter of the root being enlarged. The swellings occur on both the large and small fleshy roots. Diseased storage roots show soft yellow spots when cut. It is best to avoid planting roots that show this condition, and to discard any plants that develop it. (updated 2.15.2019).

OTHER PEONY DISEASES



Stem Rots: A disease affecting the stems and the crown of peonies, and resembling those caused by *Botrytis* and *Phytophthora*, is caused by the fungus *Sclerotinia sclerotiorum*. It is found less frequently than the other two diseases, but it attacks fully grown plants somewhat more aggressively, sometimes killing several or all of the shoots. It can be distinguished from *Botrytis* and *Phytophthora*, which typically infect shoots at an earlier stage of growth and cause tip blight or bud blight, by its more destructive habit, by the occasional presence of a superficial white mold on

the surface of affected stems and leaves, and especially by the production of large black granular resting bodies (sclerotia) in the pith of the stem. The fungus is likely to be introduced with certain materials used for mulching, as garden litter and manure that has previously been used in hotbeds or greenhouses. Affected plants should be dug up and destroyed if badly affected, or pruned, disinfected and set in a new location if their value justifies this effort.

Still another soil-inhabiting fungus that persists from year-to-year by means of sclerotia may attack peonies, especially in regions having warm summers. This fungus, *Sclerotium rollsii*, may be recognized by the conspicuous white mold that forms in fanlike wefts on the surface of diseased plants and also permeates the soil, and by the numerous sclerotia, which are pale to dark brown, round, smooth or pitted, and about the size of mustard seed. Other garden perennials, especially delphiniums and violets, and many vegetable crops, are also attacked. The control is the same as described previously for *Sclerotinia* stem rot.

Wilt: Peonies may be attacked by the wilt fungus *Verticillium*. The same fungus attacks numerous other plants including maple trees, raspberry bushes, and various garden flowers. The parasite is internal, affecting



the water-conducting vessels inside the stem, thus causing the plant to wilt suddenly and die prematurely. Affected plants are doomed and should not be used for propagation. They should be dug out and burned. If the site is to be replanted with a peony, the soil also should be changed.

Leaf Blotch And Measles: This disease, caused by the fungus *Cladosporium paeoniae*, is common after flowering. In warm seasons in particular, the measles phase of the disease may be severely disfiguring to susceptible varieties before the flowers open. Small red or reddish-brown spots appear on stems, leaves, and flowers. These remain small and pimple-like on the stems, but on the leaves some spots enlarge to form the blotch phase, characterized by purplish brown areas on the upper leaf surface and dull brown spots



beneath. As this fungus over-winters on infected peony tops, the cleanup program recommended for *Botrytis* blight is also important here. In large-scale peony culture, where this cleanup is attempted by mowing and raking the tops, enough stubs and fragments remain to insure infection in the following year. Research workers have found that Elgetol, * a proprietary dinitro-ortho-cresol compound, applied to the ground and to the refuse and tops in early spring before new shoots develop, at the rate of 1 gallon of a 1 percent spray solution to 200 square feet of land, materially reduced the amount of disease appearing that season in such commercial fields. Bordeaux mixture applied immediately after the flowering season is often recommended to reduce development of leaf blotch late in the season.

Other Leaf And Stem Spots: Several other fungi have been found to cause spots on the leaves or stems of peonies. *Septoria paeoniae* causes circular spots with grayish white centers and reddish brown borders on leaves and stems. Anthracnose caused by a species of *Gloesporium*, is marked by elongate reddish spots, becoming gray centered, sometimes zonate, and often puckering the leaf margins. Other leaf spots are caused by *Phyllosticta*, *Cercospora*, and *Alternaria*. In general, control measures advised for *Botrytis* blight are effective against these diseases. The fall cleanup program is important here also. Bordeaux sprays applied against *Phytophthora* blight and the leaf blotch disease are effective against these diseases as well.



Mosaic: Mosaic is a virus disease and is characterized by conspicuous yellowish blotches, rings or target patterns in leaves. Affected plants are not noticeably dwarfed or deformed. The disease seems to spread slowly, if at all. Although this is a mild disorder, propagation of diseased plants should be avoided.

Crown Elongation: In the disease called crown elongation, the crowns are more numerous than normal, elongate, and branched, but the roots seem to be normal. In spring, such plants develop many slender weak shoots which remain short with LEAF CURL OR CURLY LEAF: Another disorder called leaf curl or curly leaf is occasionally encountered. Plants are dwarfed with crowded, curled, and crinkled leaves, and set few or no flower buds. The roots appear to be normal. Affected plants do not recover even when transplanted. They are best discarded and burned.

Consult current sources, however, to determine what chemicals are legal for various purposes, as some of the chemicals mentioned are now withdrawn for environmental protection and safety reasons. See the agricultural extension service representative in your area for current chemical treatment recommendations, or, contact the extension horticultural department at your state university. Either of these sources will also advise you how to prepare samples of plant material and where to send them for assistance in diagnosing specific causal agents involved in diseased plants.

* The mention of trade products does not imply that they are recommended or endorsed by the Department of Agriculture over similar products of other companies.

ANIMAL AND INSECT PESTS

Moles and gophers seriously damage peony roots by making their runs around the plants and even under them, sometimes leaving them suspended in the void so created. Use one of several advertised remedies, or trap them.



While cattle seldom damage plants growing where they graze, yet if you plant a peony where a cow can reach it through a fence, she will eat it eventually. Take the necessary precautions to prevent this. Rabbits and hares will cut down the stems if given a chance.

Cut worms often cut down many stems before they harden. Poison them, being careful to cover the poison so birds will not be killed by eating it.

Thrips, small, almost invisible, insects that feed at the base of the petals, often destroy the blooms which start to open, turn brown and die. In some years, they are a serious menace. They are especially prevalent in the South and prevent many late bloomers from opening. Begin to spray when the buds are small. Spray twice again ten days apart. There are several sprays on the market that may be used. Always follow the printed directions.

Rose bugs occasionally eat the buds. Handpicking is the best remedy. Borers will sometimes enter a stem and cause it to break off. This happens too infrequently to worry about in most places.

Probably the most serious menace to peonies is the damage caused by the small eel worms called nemas. They feed on the small feeding roots and make nodules on them similar to legume sacs. Sometimes these nodules look like a lot of peas on the ends of the roots when dug. They prevent the plant from getting its needed nourishment. They are found in every section of the country, but are more prevalent in the South. Since over four hundred of our common plants are hosts to them, they are hard to deal with, even often impossible. They are invisible to the naked eye. They may be transported on the roots and in the soil. Treating infected roots with hot water at a temperature of from 119 to 121 F. will kill them, but the bath must be under agitated thermostatic control, practically impossible except under laboratory conditions-besides, it weakens the roots and makes them subject to disease attacks and does not make them resistant to future infestations. Never use a poison that kills them by being absorbed by the roots unless you are sure of its safety. It may be extremely dangerous to humans and animals.

Several chemicals are now available which are said to kill these worms with no danger to the plant. It would be wise to try them on one or two infected plants before using generally. Better ask your State Department of Agriculture about it. Roots planted in clay soils are less subject to attack than those planted in other soils. When you find a root infected, the best remedy is to destroy it. Never plant it where it will infect another plant.

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