



## RED SPOT, LEAF BLOTCH, OR MEASLES OF PEONIES

Red spot disease—also known as measles, leaf blotch, and stem spot—of peonies (*Paeonia* spp) is caused by the fungus *Cladosporium paeoniae*. Red spot is likely to be a problem in large plantings and commercial nurseries where plants are grown closely together and the old tops are not destroyed in late autumn or early spring. Ordinarily, the disease does not cause reduced plant vigor, premature leaf fall, or dieback of stems. Red spot can, however, seriously disfigure plants and thus destroy their value as ornamentals or their use as cut flowers. If proper sanitary measures are taken, red spot usually does not become severe enough to be of significant economic importance.

Herbaceous peonies vary greatly in their degree of susceptibility. In general, weak-stemmed varieties, including most reds, and all medium or dwarf growers are susceptible. Vigorous, thick-stemmed varieties are little affected. The older, more susceptible varieties of peonies have largely disappeared from commercial production.

### SYMPTOMS

The disease affects all aboveground parts of the peony: leaves, stems, flower parts, and seed pods. Shortly before the peony blooms, small, circular, red or purple spots (“measles”) appear on the upper surface of the young leaves. Later, the spots appear on the lower surface. The undersides of infected leaves soon turn a dull, chestnut-brown, whereas the upper surfaces appear a glossy dark purple (Figure 1).

These distinct spots (lesions) are about 1/2 to 1 millimeter (1/25th of an inch) in diameter. Early in the season they remain almost static in size, only reaching a diameter of about 2 to 3 millimeters (1/8 inch). This relative stasis is due to the slow growth of the fungus and the natural resistance of the young leaf tissues. As the host tissue



Figure 1. Dark reddish purple blotches appear on peony leaves in mid-to-late summer.



Figure 2. Red spot or leaf blotch has destroyed the ornamental value of the susceptible peony plant in the center. More resistant peonies to the left and right are less seriously affected.

For further information contact Nancy R. Pataky, Extension Specialist and Director of the Plant Clinic, Department of Crop Sciences, University of Illinois at Urbana-Champaign.

mature and become less resistant, the lesions become active, enlarge rapidly, and may merge to form large, irregular blotches (Figure 3).

Many leaf spots originate on or near the veins. Those spots on the main veins are larger and more elongate than the lesions on interveinal areas. The mature leaf blotch phase, which occurs late in the growing season, is usually of little consequence, although it is unsightly and does create an overwintering site for the causal fungus (Figure 2). The density of the spots is greater near the leaf margins, especially at the tip, and some distortion may occur as growth continues. (Spots on the flower buds, floral bracts, petals, and seed pods resemble those on the leaves).

Stem and petiole lesions usually appear several days after the appearance of the leaf spots and enlarge even more slowly than the spots. On young green stems, infection is first apparent as short, reddish brown streaks with slightly diffuse margins (Figure 4). At first, the streaks are flat. As growth continues, the lesions on the stems near the soil line become somewhat sunken or pitted, tend to merge, and darken. On the upper parts of the stems, the lesions are fewer in number, usually do not merge, and become slightly raised instead of sunken.



Figure 3. Leaf blotch on lower surface of peony leaf. (IL Natural History Survey photo)



Figure 4. The "measles" stage of red spot or leaf blotch of peony. (IL Natural History Survey photo)

Usually the outer leaves are the first to become spotted because they, more than the inner foliage, are exposed to splattering rain drops, the primary disseminating agent of the fungal spores (conidia). The bushiness of the plant helps to protect the inner stems and leaves from infection. It is not uncommon to find more lesions at the bases of branches and petioles where old, diseased leaves and petals may have lodged and provided sources of infection.

Lesions on both the leaves and stems are essentially superficial; the fungal growth does not extend deeper than the cuticle of the leaf or the first one or two layers of cells below the epidermis on the stem. Unless droughty conditions prevail, neither the infected leaves nor the

stems are killed. Plant vigor is not reduced, even though stems may be completely girdled by lesions as the season progresses.

Spots on all plant parts remain purplish or brownish red throughout the season without differentiation into a lighter center and darker margin. The reddish color of the spots persists even in stems that have died and turned brown.

## DISEASE CYCLE

The *Cladosporium* fungus overwinters as dormant mycelium in the old stems. During warm (14° to 22°C or 57° to 71°F), wet, spring weather the mycelium resumes active growth and produces large numbers of

dark green spores (conidia) that are disseminated by splashing rain. The conidia germinate to produce slender radiating hyphae that grow over the surface of the leaf or are partly to totally embedded in the cuticle. Contaminated soil in the area of infected stems is a possible secondary source of infection.

## **CONTROL**

1. In fall or early spring, before the new shoot growth appears, cut back all old tops to ground level. Rake, remove, and destroy (burn, discard with the trash, or bury in an area away from peony beds) all peony leaves, stems, and other debris.
2. In the spring, just before the shoots break through to the soil surface, spray the soil around the plants with one of the fungicides listed in the table. Use one gallon of spray to cover 200 square feet. Make sure you soak the soil surface area, stem stubs, and any other peony debris that may remain.
3. When starting new plantings, purchase disease-free peony roots, free of all old debris, from a reputable nursery. Isolate these plants as far as possible from old, previously infected peony beds.
4. In addition to the control measures outlined above, apply one of the fungicides suggested in the table to the developing stems and foliage. Thoroughly spray all aboveground parts of each peony plant, including both surfaces of the leaves. Start when new shoot growth is two to four inches tall in the spring and continue until the flowers begin to open. This spray schedule will also control Botrytis blight, bud blast, and shoot blight.

Spraying is more efficient than dusting. Sprays are required at weekly intervals to keep the foliage adequately covered. If the period is unusually rainy and warm (above 16°C or 60°F), the spray intervals need to be shortened to five days; if dry, lengthened up to ten days. The fungicide must be present on the leaves, stems, and other susceptible parts prior to rainfall. If possible, sprays should be applied before it rains to provide maximum protection of the foliage and stems from spores that are distributed by splashing water. In general, one gallon of spray mix will cover 10 to 20 peony plants. Spray to the point of runoff (plants begin to drip).

When spraying hard-to-wet stems and foliage, add a small amount of a household detergent (about 1/2 teaspoonful per gallon) or use a commercial spreader-sticker (surfactant) if your preparation does not already contain a surfactant. Follow the directions on the container label.

Recommended products are listed in the Illinois Homeowners' Guide to Pest Management available at your nearest Extension office. This manual is revised annually.