

Recognizing and Coping with Diseases of Perennials

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Damping-off and Root Rots

When they are in their most vulnerable germination or seedling stages, perennials are subject to attack by over 30 species of fungi. Good seed quality and optimum germination temperatures are important for reducing attacks by weak pathogens. *Rhizoctonia* may act as an agent of damping off and also as a stem rot on older plants, attacking at the soil line. Similarly, *Pythium* species may either rot germinating seeds or cause rot in older plants. For protection against a wide range of soil organisms, Banrot (a combination of etridiazole and thiophanate-methyl) or a tank mix combination of either metalaxyl (Subdue) or mefenoxam (Subdue Maxx) with a thiophanate methyl (3336, Fungo, Domain) or with iprodine (Chipco 26019), PCNB (Terraclor, Defend) or fludioxonil (Medallion) will be helpful. Of the combinations mentioned, those with mefenoxam (or metalaxyl) plus thiophanate-methyl are the most broadly labeled for use on all ornamentals. Other products are labeled for use on some, but not all, perennials. Certain plants such as rosemary, lavender and poppies are relatively prone to root rot because they are especially stressed by being grown in a poorly drained mix. Group plants with similar water requirements together to minimize root rot problems. Avoid over fertilization.

Leaf Spots

Leaf spot diseases are usually not very disfiguring on perennials. One notable exception is the anthracnose caused by a *Colletotrichum* sp. on lupine. This disease affects both young plug seedlings and mature plants, and spreads very aggressively with splashing water. The symptoms include both round, brown leaf spots (approx. 1/4" diam.) and leaf wilt (caused by infection just at the junction of the leaf and petiole).

Minimizing the duration of leaf wetness is important for reducing the impact of this disease. When infection is detected in seed flats, the diseased plants should be rogued out and the remainder treated. In our trials in 1998, a new strobilurin fungicide, kresoxim methyl (Cygnus) from BASF, gave the best protection against lupine anthracnose. Some cultivars of bergenia are susceptible to another anthracnose disease which causes numerous purple spots and pronounced distortion of the foliage. The broadly-labeled thiophanate-methyl fungicides (3336, Domain, Fungo) should provide some protection against many anthracnose and leaf spot diseases on perennials. Other leaf diseases such as *Septoria* leaf spot on phlox and white smut on gaillardia should be encountered relatively rarely. Downey mildew may be a problem on veronica in the spring, causing leaf spots and distortion.

Botrytis

Botrytis leaf spots are damaging to peony, hosta and Asiatic lilies, in particular. Spotting on hostas occurs very early in the growing season; leaves produced during warm growing conditions are apparently not as susceptible. Lilies are susceptible to *Botrytis elliptica* throughout the growing season. The disease is brought on by long periods of wetness that aid spore germination and infection. Careful watering practices are important for Botrytis management. Fungicides for Botrytis include iprodine (Chipco 26019); thiophanate-methyl (3336, Domain, Fungo, Zyban); mancozeb (Diathane T/O, Protect T/O, Zyban); copper (Kocide 2000 T/N/O, Phytan 27); chlorothalonil (Daconil); fludioxonil (Medallion); and chlorothalonil + thiophanate-methyl (Spectro). A new SePro product, Decree, has a greenhouse label. Check fungicide labels to determine

which host plants may be treated.

Crown Rot

A crown rot caused by *Sclerotium rolfsii* can cause yellowing, wilting and collapse of a wide range of perennials. The problem has been seen on hostas most often. The distinctive signs of the disease are perfectly round, tan sclerotia that bear a striking resemblance to mustard seeds. These appear near the soil surface on the dieing plant tissue. It is most important to recognize the signs of this disease so that the affected plants aren't used for propagation. Chemical control for *Sclerotium* is difficult, and the fungus can easily linger in the soil between crops (within sclerotia). The fungicides PCNB (Terraclor, Defend) and Medallion are registered for use against this disease on some perennial species. A new fungicide from Scotts, a 70WSP formulation of flutolanil called Contrast, should be available soon for control of *Sclerotium rolfsii* on ornamentals.

Powdery Mildew

Powdery mildew is a common enemy of many popular perennials, including phlox, monarda, helianthus, and aster. It is becoming common on sedum, where it causes scabby spots. Overcrowding will increase humidity around plants and intensify the problem. Avoiding highly susceptible cultivars (choosing *Phlox paniculata* 'David' over 'Mt. Fuji', for example will simplify disease management. Recently the Chicago Botanic Garden identified 10 monarda cultivars resistant to powdery mildew: 'Blue Wreath', 'Colrain Red', 'Falls of Hill's Creek', 'Gardenview Scarlet', 'Marshall's Delight', 'Ohio Glow', 'Raspberry Wine', 'Rose Queen', 'Rosy-Purple', and 'Violet Queen'. Tests at the University of Vermont also identified 'Marshall's Delight' as a cul-

tivar consistently low in powdery mildew susceptibility—but we have found this cultivar to be highly susceptible to rust in Long Island. A number of fungicides, including Banner, Heritage, Strike, Systhane, Terraguard, Dithane T/O, Protect T/O and horticultural spray oil (Sunspray Ultrafine) may be used to reduce powdery mildew. Scout for the first appearance of the disease and then treat regularly if it is necessary to maintain the plants' appearance before sales. A bicarbonate fungicide called 'First Step' should be available soon.

Viruses

Viruses are not uncommon in perennials, but growers may not be aware of them. Ajuga, for example, may show mild mosaic or bright yellow ringspots when affected by cucumber mosaic virus (CMV), a virus commonly found in weeds and vectored by aphids. Another common aphid-borne virus, alfalfa mosaic, often appears in *Physostegia*, causing bronze flecking of leaves. The thrip-borne viruses, impatiens necrotic spot (INSV) and tomato spotted wilt (TSWV) may also be found in perennials—primulas, hostas and dahlias are among the most frequently seen with symptoms of one of these viruses (including ring spots, mosaic, or leaf distortion). Weed and insect (thrips and aphids, especially) management are part of the overall strategy for keeping viruses away from perennials. Most importantly, be alert to virus-like symptoms so that you do not propagate from virus infected stock. (For further information and illustrations of virus diseases on perennials, see the article by Steve Nameth and Rob Fisher in the August, 1999 issue of Greenhouse Product News).

Nematodes

Foliar nematodes are becoming increasingly common on a wider range of perennials. Host, aquilegia, heuchera, anemone, bergenia and many other plants will show variously-shaped patches of brown tissue in infested leaves. Inspect incoming stock to detect nematode infestations before introducing plants to your growing area. Avoid excessive periods of leaf wet-

ness or overly close plant spacing that would facilitate spread of the nematodes. Discard contaminated stock, and relocate the stock area (if possible) away from any area where the soil is known to be contaminated with nematodes. Root-knot nematodes, which cause swellings on the roots, in some cases have little effect and in other cases severely stunt perennials. Learn what the symptoms look like, and avoid propagating from root-knot contaminated material, even if the plants in question appear to be growing vigorously.

Please note: Mention of specific products is for information purposes only, and is not intended as an endorsement. Consult product labels for registered uses.

For further details on fungicides as well as descriptions and illustrations of diseases, see the Cornell University Bulletin IB#207, *Herbaceous Perennials: Diseases and Insect Pests* by M. Daughtrey & M. Semel, available from Cornell University Resource Center, 7 Cornell Business and Technology Park, Ithaca, NY 14850 for \$9.25 (the fall 1998 update of chemical pesticide insert included with the bulletin is also available separately, for \$6.00). The Cornell University online catalog address is <http://www.cce.cornell.edu/publications/catalog.html>. See also the illustrated books *Pests and Diseases of Herbaceous Perennials* by S. Gill, D. Clement and E. Dutky and *Diseases of Annuals and Perennials, A Ball Guide* by A.R. Chase, M. Daughtrey and G. Simone (both from Ball Publishing, toll free #1-888-888-0013).

