

Plant Pathology Fact Sheet

Dogwood Powdery Mildew

by John Hartman

Dogwood (*Cornus florida*) continues to be a popular ornamental in Kentucky landscapes. Unfortunately, powdery mildew is one of several diseases that threaten the beauty of these native trees in home and commercial settings. This disease can also be troublesome in nurseries, especially on seedling trees. It is less of a problem in the forest environment. First noticed in the mid-1990s, powdery mildew has been active in Kentucky for over a decade.

SYMPTOMS AND SIGNS

The white powdery mycelium and spores of the fungus (signs) are often visible before symptoms become very obvious (FIGURE 1). Affected portions of leaves develop a mottled yellowing, turn light green, or turn yellow (FIGURE 2). Leaves frequently develop brownish patches (FIGURE 3). Often symptoms begin as barely distinguishable reddish-brown or purplish irregular blotches on leaves.

Later in the season, the tips and edges of infected leaves may be scorched, cupped, and drooped (FIGURE 4), with badly infected leaves falling prematurely. Throughout the season, the typical white powdery fungal mycelium and spores may develop abundantly on new growth, distorting and

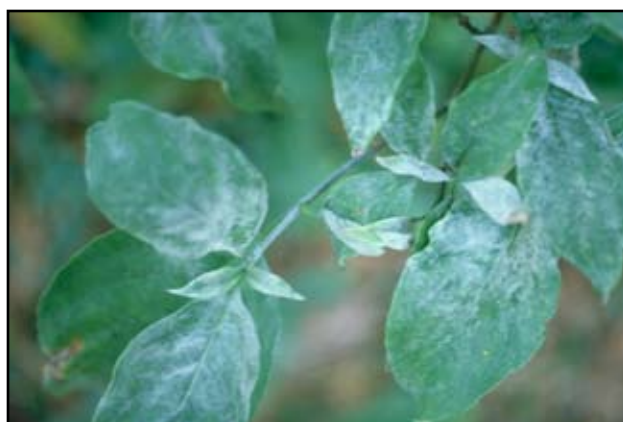


FIGURE 1. THE PRESENCE OF A WHITE POWDERY FUNGAL GROWTH IS THE DISTINGUISHING FEATURE OF THIS DISEASE.

curling these youngest leaves. This disease increases progressively from early June to early September. Severely affected trees may appear wilted and browned by late summer (FIGURE 5). Landscape dogwoods exposed to sunlight and dry soil conditions may be especially scorched.

CAUSE AND DISEASE DEVELOPMENT

Dogwood powdery mildew is mainly caused by the fungus *Erysiphe pulchra* (formerly *Microsphaera pulchra*). A related, but different fungus, *Phyllactinia guttata*, can also be found on diseased dogwoods in Kentucky. The white powdery growth observed for most of the season is the white mycelium and

chains of spores produced by the asexual *Oidium* stage. Late in the season, tiny dark specks may appear embedded in the mildew. These are the ascocarps (cleistothecia) of the sexual stage which aids the fungus in surviving through the winter.

Although wet conditions favor most landscape plant diseases, powdery mildew is an exception. These fungi require high humidity but are not dependent on wet leaves for infection and spread. Powdery mildews are obligate parasites, preferring fresh, succulent plant growth. Dogwood powdery mildew occurs in open landscapes as well as in heavily shaded areas.

EFFECT OF POWDERY MILDEW ON DOGWOODS

Although powdery mildew probably weakens trees, it does not appear to be lethal. We



FIGURE 2. INFECTED LEAVES OFTEN FADE OR TURN YELLOW IN SUMMER.

have observed that under high disease pressure, flower production is decreased the following year. Powdery mildew most likely reduces plant photosynthesis and increases water loss from leaves. In the long run, this could weaken trees making them more prone to dogwood borer or *Botryosphaeria*



FIGURE 3. DEAD BLOTCHES MAY APPEAR ON INFECTED LEAVES.



FIGURE 4. DROOPING, SCORCHING AND CUPPING OF LEAVES ARE COMMON SYMPTOMS.

canker. The long-term effects of powdery mildew disease development on tree health are not known. Most landscape dogwoods are grown from seedling sources, so the mildew susceptibility of individual dogwood trees in landscapes varies greatly.

DISEASE MANAGEMENT

Powdery mildew can be managed by using cultural practices, planting resistant dogwoods, and by using fungicides.

Cultural practices

Use good cultural practices, such as mulching over the root system and pruning out dead branches. Provide good air movement and light penetration by judicious pruning of nearby vegetation. Avoid cultural practices that stimulate succulent growth and, thus, encourage powdery mildew. These include applying nitrogen fertilizer, pruning heavily, and irrigating excessively.

Resistant varieties

Plant dogwood species and cultivars resistant to powdery mildew. Native dogwoods vary in their susceptibility to the disease – severely affected and lightly affected trees may appear in the same landscape.

Susceptible

All *Cornus florida*, seedling wild types (but individuals vary in susceptibility) and most *C. florida* cultivars.



FIGURE 5. BY FALL THE FOLIAGE OF INFECTED DOGWOODS MAY BE VERY UNHEALTHY ON SUSCEPTIBLE TREES.

Intermediate susceptibility

C. florida 'Cherokee Brave' and cultivars of the *C. florida* x *C. kousa* hybrids.

Resistant

Three new powdery mildew resistant *C. florida* cultivars have been developed by the Tennessee Agricultural Experiment Station and are now available in the nursery trade. They include 'Jean's Appalachian Snow', 'Karen's Appalachian Blush', and 'Kay's Appalachian Mist'. Also resistant: cultivars of *C. kousa*, oriental dogwood.

Immune

Cornelian cherry dogwood, *C. mas*.

Fungicides

Fungicide applications may be needed in the nursery and on valuable susceptible trees in the landscape. If fungicides are to be used, determine which trees are most susceptible so that applications are not made unnecessarily. Those trees most at risk for powdery mildew disease can then be considered for preventive fungicide applications (FIGURE 6).

Fungicide applications should begin by the end of May and continue every two or

three weeks until the beginning of August. Most fungicides are capable of stopping the progress of powdery mildew infections fairly quickly, but none will restore already discolored or damaged leaf tissues. Good control can be obtained with as few as four fungicide applications made three weeks apart. When using fungicides for powdery mildew management, be sure that dogwoods are listed on the label and carefully follow all label directions.

Effective fungicides include

- azoxystrobin (Heritage)
- fenarimol (Rubigan)
- myclobutanil (Eagle, Immunox)
- propiconazol (Banner Maxx)
- thiophanate-methyl (Cleary's 3336)
- triadimefon (Bayleton, Strike)

Fungicides requiring more frequent applications to be effective include

- neem oil (Triact)
- potassium bicarbonate (Bonide Remedy, FirstStep, Kaligreen)
- paraffinic oil (Sunspray UF Oil)



FIGURE 6. THE UNSPRAYED TREE (R) IS INFECTED WITH POWDERY MILDEW, WHILE THE SPRAYED TREE (L) APPEARS HEALTHY.

(Issued January 2008)