RESEARCH LABORATORY TECHNICAL REPORT

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Flowering Dogwood Disorders

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Flowering dogwood (*Cornus florida*) thrives in areas with morning sun and afternoon shade and well drained, slightly acid, organic soils. The shallow root system is sensitive to drought and competes poorly with turf grass for water and nutrients. For this reason, dogwood performs best when there is a layer of organic mulch beneath its branches. Mulch also protects the trunk from wounds inflicted by mowers and string trimmers; wounds that often lead to serious insect and disease problems. Nitrogen and manganese deficiencies are common on infertile soils, especially those that are alkaline or poorly drained. Dogwood is also prone to several serious pests that require proactive management to maintain plant health and appearance.

Discula Anthracnose

Discula anthracnose, a fungal disease, has been found infecting flowering dogwood over a wide area of eastern United States. It can be a killer of landscape dogwoods in shady, cool, and moist environments, particularly on trees weakened by drought or cold. Consecutive years of heavy infection usually result in severe dieback and tree death.

Symptoms

The disease first infects flower bracts and young leaves on the lower portion of the plant (Figure 1). Leaf veins may blacken and leaf margins scorch (Figure 2). Discula blights leaves and directly infects shoots and twigs causing cankers and branch dieback.

Blighted leaves are usually retained on twigs throughout the winter. Twig and branch dieback is most common in the lower part of the tree. As a result of twig blight, succulent epicormic sprouts proliferate on the lower trunk. These tender sprouts are prime candidates for infection the following spring. Infection then progresses into the main stem, and multiple cankers may finally kill the entire tree.

Figure 1: Anthracnose lesions on dogwood flower bracts. Photo by Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org

Figure 2: Anthracnose lesions on dogwood foliage

Control

Anthracnose management relies on protective fungicide treatments applied in the spring beginning at budbreak. Treatments are repeated every two weeks until the first flush of growth is mature and temperatures warm up. Typically, three treatments will provide the needed protection. In addition to fungicide treatments, pruning diseased twigs and shoots reduces inoculum. Fertilize based on results of soil testing. Avoid encouraging succulent growth on infected trees, and mulch and water to reduce moisture stress.

Spot Anthracnose

The fungus, *Elsinoe corni,* causes spot anthracnose. It is the most common disease of flowering dogwood. While by itself this disease is not life threatening to healthy trees, it can be a contributing factor to tree decline.

Symptoms

Spots on the foliage and flower bracts are small, 1/16 to 1/25 inch in diameter, circular to oval, with reddish-purple borders and tan centers (Figure 3). Heavily infected foliage and bracts are badly deformed. Spots on shoots and fruit are oval with purple margins. Spot anthracnose tends to be worse on trees in dense, crowded areas.

Figure 3: Spot anthracnose (Elsinoe corni). Photo by Mary Ann Hansen, Virginia Polytechnic Institute and State University, Bugwood.org

Control

Preventative fungicide treatments for Discula anthracnose will suppress spot anthracnose as well.

Powdery Mildew

Powdery mildew has rapidly developed into a major disease of dogwood. Once assumed to cause only cosmetic damage, research now shows that it is quite damaging to dogwood. This disease also makes dogwoods much more susceptible to drought injury. Powdery mildew is favored by warm temperatures and high humidity. Unlike most fungi, it does not need moisture on the leaves for the spores to germinate and infect. Late spring through early fall are the prime seasons for severe powdery mildew outbreaks. Trees located in sunny, exposed locations are just as susceptible to infection as those in the shade.

Symptoms

The disease gets its name from its powdery white appearance on the leaf surface (Figure 4). This symptom is most common on young, expanding foliage from the summer flush of growth. In addition to a powdery appearance, infected foliage may become twisted and distorted. More commonly, dogwood leaves display reddish-purple patches or flecking and may scorch on the margins.

Figure 4: Powdery mildew on dogwood leaf. Photo credit: Penn State Department of Plant Pathology & Environmental Microbiology Archives, Penn State University, Bugwood.org

Control

For powdery mildew suppression, begin treatment at budbreak, with additional treatments at monthly intervals. Monthly treatments typically give 90 percent control even under extreme disease pressure. Native dogwood shows a wide range of natural resistance to this disease. Variety selection is a key to having disease–free plants.

Dogwood Borer

Dogwood borer (*Synanthedon scitula*) is the most serious insect pest of flowering dogwood. Landscape trees in the full sun are particularly attractive to the borer. Dogwood borer readily attacks trees that are declining from other stresses such as drought or disease. The adult, a clearwing moth (Figure 5), lays eggs on bark surfaces around wounds. Caterpillar feeding within the phloem girdles limbs and trunks.

Figure 5: Dogwood borer adult. Photo credit: James Solomon, USDA Forest service, Bugwood.org

Signs and Symptoms

The first obvious sign of attack is dark frass on the bark surface. The half-inch larvae will be found at the end of brown, frass-packed galleries within living bark. Dieback and adventitious shoots are symptoms of advanced damage. Old, declining trees may be repeatedly attacked year after year.

Control

Damaged trees can be protected by an insecticide treatment applied prior to the egg-laying period in June. Bark surfaces in and around wounds and old attack sites must be sprayed thoroughly. Prune out limbs that are heavily damaged by dieback, sun scald, or prior borer attack. Avoid injury and stress to trees through proper cultural practices.

Canker and Root Rot

Approximately thirty percent of the dogwood canker and root samples received at the Bartlett Tree Diagnostic Laboratories are confirmed positive for *Phytophthora* infection. When soils and roots remain saturated with water, the environment is right for spread of this fungus-like pathogen. Injuries at the root collar and buried root collar tissue can lead to bleeding trunk cankers.

Symptoms

Plants infected with *Phytophthora* have a general unhealthy appearance. Foliage will be small, chlorotic, drooping, and may scorch at the margins. Twig growth slows and crowns thin out. Decline may occur over a period of years beginning with death of twigs, progressing to dieback of major limbs, and finally to tree death.

Phytophthora trunk cankers are typically located near the ground. Bark falls away after death of the infected area and may show ridges of callus tissue. Dark liquid may be oozing from the margins of the canker where the pathogen is still active. The wood beneath the active area is dark reddish-brown and water-soaked.

Control

If soils are not excessively wet, *Phytophthora* is rarely a problem. Disease begins and advances when trees are overwatered or soil drainage worsens. New irrigation systems can often be identified as the source of overwatering. Trunk injury from lawnmowers or string trimmers can open trunks to infection as well. Piling soil up around the root collar may also lead to canker infection.

Newly planted trees decline from *Phytophthora* in heavy, poorly drained clay soils. Deep planting and overwatering increase disease incidence on marginal soils.

Fungicide treatments will reduce infection and improve tree health if the disease is not too advanced. Along with fungicide treatments, reduce irrigation, improve drainage patterns, plant in raised beds, and avoid trunk injury. In situations where suitable soil drainage cannot be obtained, install species that are more tolerant of wet soils.

Other Pest Problems

Other common pests of dogwood include leaf spot fungi, Armillaria root rot, dogwood twig borer, ambrosia beetle, aphids, whitefly, scale insects, and leaf-feeding caterpillars.

Disease Resistance in Dogwood

When purchasing dogwood trees, variety selection for disease susceptibility should be the primary consideration. Many fine varieties are available that offer both an impressive flower display and low disease incidence (Table 1). Remember that resistance does not mean complete freedom from disease and some disease symptoms should be expected in some years.

Table 1: Disease Resistant Varieties

Powdery Mildew	
C. florida	*C. kousa*
'Cherokee Brave'	'Big Apple'
'Cherokee Chief'	'China Girl'
'Dwarf White'	'Milky Way'
'Sweet Water Red'	'Milky Way Select'
	'Temple Jewel'
	x 'Celestial'
Spot Anthracnose	
C. florida	*C. kousa*
'Cherokee Sunset'	'Aurora'
'Cherokee Chief'	'Galaxy'
'Cherokee Brave'	'Milky Way'
'Double White'	'Milky Way Select'
'First Lady'	'National'
'Plena'	'Stellar Pink'
'Springtime'	
'Rubra Red'	
'Weaver's White'	
'Welch's Bay Beauty'	
Discula Anthracnose	
C. florida	*C. kousa* (most varieties)
'Appalachian Spring'	

Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.