



Anthracnose-A Fungal Disease of Shade Trees

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Introduction

Anthracnose is a generic term for a disease that occurs on many ornamental and forest trees. A number of different fungi cause anthracnose on various hosts. It occurs most commonly and severely on sycamore, white oak, elm, dogwood, and maple. Other host plants that usually show only minor symptoms of anthracnose include linden (basswood), tulip tree, hickory, birch, and walnut. Anthracnose fungi may be host-specific, as in the case of sycamore anthracnose, which infects only sycamore and not other tree species. Anthracnose fungi have similar life cycles, but require slightly different moisture and temperature conditions for infection. Symptoms of anthracnose are most commonly observed in spring and early summer during cool, wet weather.

Symptoms

Anthracnose fungi may cause defoliation of most maple, oak, elm, walnut, birch, sycamore, and hickory species and, occasionally, of ash and linden trees. Damage of this type usually occurs after cool, wet weather during bud break. Single attacks are seldom harmful to the tree, but yearly infections leading to defoliation will cause reduced growth and may predispose the tree to other stresses, such as borer attack and winter injury. Damage may result in:

- dead buds, which stimulates the development of many short twigs or “witches’ brooms;” these may alter the shape of the tree
- girdling and killing of small twigs, leaves, and small diameter branches (i.e. up to an inch in diameter)
- premature leaf drop

Specific symptoms of anthracnose vary somewhat depending on the tree species infected:

- On sycamore, leaves and growing tips of the twigs may die as they emerge from the bud. This damage is often confused with late frost injury. Sudden browning and killing of single leaves or leaf clusters may occur as the leaves expand. The disease continues to develop later in the season, resulting in irregular brown to nearly black, dead areas between or along the main leaf veins and extending to the margin (figure 1). Infected leaves fall when the petiole is girdled or when several lesions enlarge and coalesce to form large, dead blotches. After defoliation from spring infections, the tree may appear bare except for tufts of leaves at branch tips. Regrowth appears by midsummer. Sunken cankers form on larger twigs during cooler weather in fall, winter, and spring. Twigs may die as a result of canker formation (figure 2).



Figure 1. Sycamore leaves with lesions along the leaf veins and blighted tissue extending to the leaf margin caused by the sycamore anthracnose fungus. (Photo by Nancy Gregory, University of Delaware, Bugwood.org)



Figure 2. Cankered areas on sycamore twigs caused by the sycamore anthracnose fungus. (Photo by Robert L. Anderson, USDA Forest Service, Bugwood.org).

When terminal twigs are killed, lateral twigs take over as leaders. Thus, repeated twig dieback results in the formation of crooked branches (figure 3).



Figure 3. Previous damage by the sycamore anthracnose fungus resulted in dead twigs and branches that show a crooked growth habit. (Photo by Joseph OBrien, USDA Forest Service, Bugwood.org).

- On oak, small scattered brown spots or large light brown blotches form along veins. Leaves may appear scorched. Twigs may also dieback. When infection occurs while leaves are expanding, leaves can be deformed (figure 4).



Figure 4. Red oak leaves that were infected by the anthracnose fungus when leaves were still young and expanding, which caused deformation of foliage. The small spots likely occurred later when the leaves were mature. (Photo by Elizabeth Bush, Virginia Tech)

- On maple, purplish brown areas form along the veins or larger, irregular, light to dark brown spots form along or between veins and eventually extend to leaf margins (figure 5).



Figure 5. Leaf symptoms of anthracnose on silver maple. (Photo by Mary Ann Hansen, Virginia Tech)

- On ash, large, irregular, light brown spots appear, most often along leaf veins and extending toward leaf margins (figure 6).



Figure 6. Anthracnose on ash. (Photo by Mary Ann Hansen, Virginia Tech)

- On linden, large brown areas with black margins appear, especially along main leaf veins. The areas are small to large and circular to elongate.
- On birch, small, irregular, circular, brown spots with dark brown margins are apparent.
- On hickory, large, irregular, reddish brown spots appear on the upper leaf surface and a dull brown area is apparent on the lower leaf surface.
- On walnut, irregular, circular, dark brown to black spots are visible on leaves.
- On dogwood, two different anthracnose diseases may occur: spot anthracnose and Discula anthracnose. Symptoms of spot anthracnose include tiny leaf and bract spots, about the size of a pinhead, with whitish centers and purplish borders. Spot anthracnose is a minor springtime disease on dogwood and does not pose a serious threat to the health of dogwood. Symptoms of Discula anthracnose (dogwood anthracnose) include irregular, small to large brown blotches with purplish borders on leaves and bracts, lower branch dieback, and trunk cankers that will kill the tree if a canker girdles the trunk.

Disease Cycle

Anthracnose fungi overwinter in infected leaves on the ground. Canker-causing anthracnose fungi, such as the sycamore anthracnose fungus, also overwinter in twigs on the ground or in cankered twigs that remain on the tree. Microscopic spores of most anthracnose fungi are produced in infected tissues during April and May. The spores are blown and splashed to the buds and young leaves and, with favorable moisture conditions, penetrate

and infect the swelling buds and unfolding leaves. Prolonged rainfall helps the fungus to spread rapidly.

Prevention and Management

Anthracnose diseases do not typically pose a serious threat to the health of a tree, so fungicide treatment is not usually recommended. However, there are general cultural management tactics to minimize anthracnose infections and severity on trees in the landscape. Tactics include raking and removing leaves and dead twigs to reduce fungal inoculum for future infections. Prune out and remove dead twigs and branches. Pruning to thin the crown of the tree will promote foliar drying, which will minimize infections. When planting trees, space adequately and avoid crowding to promote foliar drying. Promoting overall good health of trees in the landscape will also allow a tree to better withstand damage from anthracnose.

However, since “anthracnose” is a generic disease name for different fungal diseases, there are some anthracnose problems that may warrant fungicide treatment. For example, Discula anthracnose on dogwood may be lethal so fungicide treatment would be warranted. Also, in a situation where significant defoliation is occurring annually and a high-value tree is involved, fungicide treatment may be desirable. For effective management of anthracnose, fungicides must be applied preventatively and, for large trees, this typically will require hiring a professional pesticide applicator. Refer to the Home Grounds and Animals Pest Management Guide (VCE Publication 456-018), Home Ornamentals: Diseases of Landscape Trees for more information.

Diagnosing the Disease

The Virginia Tech Plant Disease Clinic can diagnose this disease and other plant diseases. Refer to the [Plant Disease Clinic website](https://bit.ly/VTplantclinic) (<https://bit.ly/VTplantclinic>) for the current diagnostic form, fees, and instructions on collecting an appropriate diagnostic sample and submitting samples to the Plant Disease Clinic.



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Produced by Virginia Cooperative Extension, Virginia Tech, 2024

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VT/0224/SPES-555P