

## Anthracnose-A Fungal Disease of Shade Trees

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Anthracnose is a name for a group of diseases caused by several closely related fungi that attack many of our finest shade trees. It occurs most commonly and severely on sycamore, white oak, elm, dogwood, and maple. Other host plants that are usually only slightly affected include linden (basswood), tulip tree, hickory, birch, and walnut. Each species of anthracnose fungus attacks only a limited number of tree species. The fungus that causes sycamore anthracnose, for example, infects only sycamore and not other tree species. Other anthracnose-causing fungi have similar life cycles, but require slightly different moisture and temperature conditions for infection.

### 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 unusually cool, wet weather during bud break. Single attacks are seldom harmful to the tree, but yearly infections will cause reduced growth and may predispose the tree to other stresses. Damage may be in the form of:

- killing of buds, which stimulates the development of many short twigs or “witches’ brooms;” these may spoil the shape of the tree
- girdling and killing of small twigs, leaves, and branches up to an inch in diameter
- repeated early loss of leaves, which over several successive years weakens the tree and predisposes it to borer attack and winter injury
- premature leaf drop, which lessens the shade and ornamental value of the tree

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 (Fig. 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 (Fig. 2). Twigs may die as a result of canker formation.



Fig. 1. Blighting of leaf tissue caused by the sycamore anthracnose fungus. (Photo by E. Dutky-U. Md.)



Fig. 2. Twig canker caused by the sycamore anthracnose fungus. (Photo by E. Dutky-U. Md.)

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

- On oak, small scattered brown spots or large light brown blotches form along veins. The leaves look scorched.
- On maple, purplish brown areas form along the veins or larger, irregular, light to dark brown spots form along or between veins (Fig.3), extending to the leaf margin.

- On ash, large, irregular, light brown spots appear, most often along leaf margins (Fig. 4).

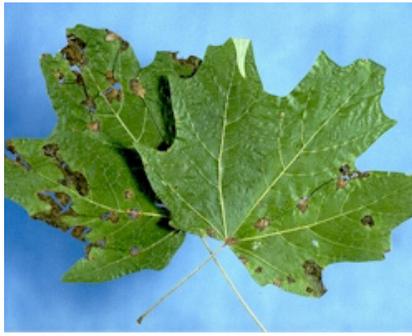


Fig. 3. Leaf symptoms of anthracnose on sugar maple.  
(Photo by M.A. Hansen)

- On linden, large brown areas with black margins appear, especially along main leaf veins. The areas are small to large and circular to elongate.

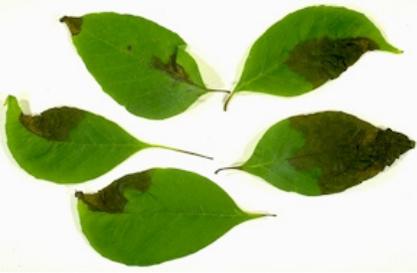


Fig. 4. Anthracnose on ash.  
(Photo by Virginia Tech Photo Lab)

- 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. Symptoms of spot anthracnose include tiny leaf and bract spots, about the size of a pinhead, with whitish centers and purplish borders. 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 culminate in death of the tree.

## Disease Cycle

Anthracnose fungi overwinter in infected leaves on the ground. Some 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. Long rainy periods help the fungus to spread rapidly.

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## Control

Disease control measures for different trees vary slightly because the period of infection is different depending on the fungal species involved. If fungicides are used, sprays must be applied on a preventative basis, beginning before infection takes place. Spraying large trees for many anthracnose diseases may be impractical and unnecessary, especially in dry springs. Sanitation is important in reducing the amount of fungal inoculum available for new infections. For large, high-value sycamore trees, injection with the fungicide, thiabendazole hypophosphite (e.g. Arbotech 20-S), on a 3-year basis is also an option (Fig 5).



Fig. 5. Two trees on right showing symptoms of sycamore anthracnose compared to tree injected with Arbotech 20-S fungicide on left.  
(Photo by R. J. Stipes)

For effective anthracnose control of most anthracnose diseases:

- Rake up and remove infected leaves in the fall. Leaves may be shredded and composted or burned.
- Prune out and burn or bury dead twigs and small branches. Prune to thin the crown. Thinning will improve air movement and promote faster drying of the leaves.
- If fertilizer is needed, fertilize in the fall about a month after the average date of the first frost or in early spring about a month before the date of the last frost to increase tree vigor.
- If chemical control is desired, spray with a fungicide containing mancozeb (e.g. Manzate 200, Dithane M-45) at budswell and twice again during leaf expansion (in most years, this would be at 10-14 day intervals). Follow label rates or refer to the current Virginia Pest Management Guide for Home Grounds and Animals (VCE Publication 456-018), <http://pubs.ext.vt.edu/456-018/>, for details on fungicide application. For information on the proper use of pesticides and fungicides, refer to any current VCE pest management guide.
- Because Discula anthracnose is often fatal to the tree, control of this anthracnose disease on dogwood is a special case and is described in VCE Publication 450-611, Foliar Diseases of Dogwood.