Anthracnose Disease of Shade Trees

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Issued March 1994
4 pages

NebGuide

Published by Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln

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This NebGuide describes anthracnose diseases in sycamore, ash, oak, maple and walnut trees and offers suggestions for control.

Anthracnose diseases affect a wide variety of plants including many popular shade trees. Sycamore, ash, oak, maple, and walnut commonly exhibit symptoms each spring. Although the symptoms may appear serious, anthracnose diseases rarely kill trees. In most cases, healthy trees quickly recover from anthracnose infections with little damage to their long-term health.

Many different species of fungi cause anthracnose diseases. All cause some kind of leaf spot or leaf blight, and premature leaf drop commonly results from heavy infections. Some anthracnose diseases also cause twig dieback and shoot blight. Although symptoms observed on different tree species may be similar, the various anthracnose pathogens are host specific, meaning, for example, the fungus that causes anthracnose in sycamores does not infect and cause anthracnose in ash.

Weather plays an important role in promoting the development and spread of anthracnose. These diseases are generally more severe when the weather is cool and wet. Symptoms usually appear in the early spring and intensify in late spring and early summer if weather conditions remain favorable for fungal growth and dispersal.

Sycamore Anthracnose

Anthracnose is the most important disease of sycamores in Nebraska. It causes twig canker and dieback, leaf and shoot blight, and often substantial defoliation. The fungus that causes sycamore anthracnose, *Apiognomonia veneta*, overwinters in twigs on the tree and becomes active whenever temperatures permit its growth. Twig dieback occurs when a canker forms, enlarges, and girdles the twig

Figure 1. Twig dieback caused by sycamore anthracnose.

(Figure 1). Buds may become infected and killed. Trees with high twig and bud mortality produce only thin crowns by late spring *(Figure 2)*.

In early spring, small black fruiting bodies (pycnidia) are produced on dead one-year old twigs. These fruiting bodies release spores that infect expanding shoots and leaves. Infected shoots suddenly wilt and appear scorched. This shoot blight symptom is common following spring rains. Infected leaves develop tan to reddish brown lesions that typically center on and extend along the leaf veins *(Figure 3)*. Occasionally, this leaf blight symptom is confused with foliar browning caused by summer leaf scorch, which develops along the leaf margins and between the veins.

Ash Anthracnose

Ash anthracnose is a common but seldom serious problem on white and green ash in Nebraska. The disease is caused by the fungus *Apiognomonia errabunda*. Symptoms first appear as water-soaked spots on the expanding shoots and leaves. The spots enlarge and develop into brownish green to

Figure 2. Sycamore tree with thin crown caused by anthracnose-induced twig and bud mortality.

Figure 3. Shoot blight and leaf blight caused by sycamore anthracnose. Leaf blight lesions typically extend along the leaf veins.

brown lesions *(Figure 4)*. The lesions are often associated with leaf veins and margins. Growth of the infected tissue slows or stops as the rest of the leaf continues to expand. As a result, the leaf tissue around the lesion becomes twisted and wrinkled. Defoliation also may occur. Young shoots that become infected may suddenly wilt and shrivel, especially following a rain. This symptom is sometimes confused with spring freeze injury. The fungus can also grow from leaves into twigs and develop as a canker.

Oak Anthracnose

Oak anthracnose, caused by the fungus *Apiognomonia quercina*, attacks many species of oaks including bur, white, swamp white, English, pin, northern red, and chestnut oak. Susceptibility varies among species, with white and bur oaks usually the most severely affected.

Figure 4. Brownish green lesions and leaf deformation caused by ash anthracnose.

The first symptom seen in the spring is usually shoot blight, which can develop suddenly following rain. Young leaves and shoots appear brown and shriveled. Leaves that have already expanded may become cupped and distorted with large areas of dead tissues *(Figure 5)*. Small, brown fruiting bodies (acervuli) may become visible on the lower surface of the dead leaves on or near major veins. Some leaf drop may occur. Mature leaves are fairly resistant and infection causes only small necrotic spots. The fungus also infects twigs, producing cankers and causing twig dieback during the winter and early spring.

Figure 5. Leaf distortion caused by oak anthracnose lesions (photograph courtesy of Mark Gleason, Iowa State University).

Maple Anthracnose

Of the several fungal species causing maple anthracnose, the most prevalent one in Nebraska is *Kabatiella apocrypta*. Hosts include Norway, red, silver, and sugar maples and boxelder.

The symptoms caused by *K. apocrypta* appear following infection during cool, wet weather throughout the spring and summer. Infected young leaves and shoots may shrivel and turn black. On more mature leaves, red, brown, tan, or black

Figure 6. Leaf lesions and distortion caused by maple anthracnose.

lesions develop that may or may not be associated with leaf veins *(Figure 6)*. Leaves may become crinkled or otherwise deformed. Lesions often coalesce and kill large areas of leaf tissue. In severe cases defoliation may occur.

Walnut Anthracnose

Walnut anthracnose is common on black walnut in Nebraska in areas where the weather is often warm and humid. It is caused by the fungus *Gnomonia leptostyla*.

Symptoms of walnut anthracnose begin to appear in late spring on leaves that have reached full size. Small, brown, circular lesions, typically surrounded by yellow margins, develop first on the lower surface of the leaf and later appear on the upper surface *(Figure 7)*. Extensive leaf spotting causes yellowing, curling, and premature defoliation. Lesions appear also on the nut husks as dark sunken spots. Affected nuts may have reduced meat quality and may drop prematurely.

The severity of walnut anthracnose tends to increase as the summer progresses, especially if rainfall is frequent. However, the disease usually does not significantly affect tree growth since most of the year's growth is complete by the time the symptoms become severe.

Figure 7. Spotting, yellowing, and premature leaflet drop caused by walnut anthracnose.

Disease Development

Anthracnose fungi overwinter in twigs and small branches on the tree and in leaves on the ground. The fungi are active during periods of mild winter weather, forming cankers and causing twig dieback. In the spring, fruiting bodies form on the killed twigs and produce microscopic spores that are dispersed by rain splash and wind to the young expanding shoots and leaves. Spores are also produced from fruiting bodies that overwintered in the fallen leaves. Spores need extended periods of moisture and relatively cool temperatures to germinate and infect plant tissues. Therefore, anthracnose is usually more severe if the weather is cool and rainy in the spring and summer.

After the initial infection period in the spring, repeating cycles of the disease may occur throughout the summer when new fruiting bodies are produced on recently killed tissues. These fruiting bodies produce spores that reinfect leaf tissues when weather conditions are favorable. The progress of the disease slows during hot, dry weather.

Damage

Anthracnose diseases usually do not seriously affect the health of shade trees. A severe case of anthracnose may cause defoliation in the spring, but the tree usually recovers and produces a second crop of leaves later in the season. Severe defoliation year after year, however, may weaken the tree and increase its susceptibility to insects, other diseases, and stressful environmental conditions. In addition, branch structure may be affected by the disease. On sycamore and oaks, repeated twig dieback promotes the development of side shoots, resulting in bushy growth and angular branching. On trees used mainly for ornamental purposes, even a moderate level of anthracnose may cause unacceptable aesthetic damage.

Control

In most cases, control of anthracnose is unnecessary because the disease is usually not damaging to the long-term health of trees. When control is desired, various techniques can help reduce the severity of the disease.

Raking and destroying fallen leaves and twigs and pruning out dead branches on the tree will help reduce the overwintering population of anthracnose fungi. Pruning will also increase air circulation in the canopy, reducing the time that wet conditions, which favor fungal infection, are present on leaf surfaces. Healthy, vigorous trees are more likely to recover from a severe anthracnose attack than stressed trees. Trees should be well watered and fertilized if necessary.

When selecting trees to plant, species or cultivars that are less susceptible to anthracnose should be chosen. London planetree is much less susceptible to anthracnose than American sycamore. Northern red and pin oaks are usually less severely affected than white oak species, and green ash is relatively resistant compared to white ash. At planting time, trees should be spaced far enough apart to allow good air circulation when the trees are fully grown.

Chemical sprays to control anthracnose are rarely justified except when the disease occurs in stressed or recently transplanted trees, or when the disease causes repeated defoliations. Fungicides labeled for control of certain anthracnose diseases include chlorothalonil (Daconil 2787), thiophanate-methyl (Clearys 3336, Fungo 85), mancozeb (Dithane), lime-sulfur, Bordeaux mixture, and other copper fungicides (such as Tenn-Cop 5E). The first spray should be applied in the spring when buds begin to swell, followed by two to three additional sprays at 10- to 14-day intervals. For walnut anthracnose, the first application should be made when the leaves begin to unfold, followed by additional weekly sprays as needed, especially if rainy weather persists. Read label directions for more information on timing and application.

Another fungicide, thiabendazole (Arbotect), is labeled for systemic injection into tree trunks for the control of sycamore anthracnose. Injections should be made by a professional arborist in the late summer or fall before leaf drop for control of anthracnose infections the following spring. Although thiabendazole injections give good control, this treatment is not recommended for use on an every-year basis because of the trunk wounding caused by the application technique.

Note: Fungicide trade names have been used in this publication for convenience. No endorsement is implied, and no criticism against similar products not mentioned is intended. Always read and follow instructions on the pesticide label.

File under: PLANT DISEASES
B-10, Trees
Issued March 1994, 10,000

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Kenneth R. Bolen, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.