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Anthracnose Fungus Symptoms and Treatment (*Apiognomonia* spp./*Colletotrichum* spp.)

Overview

Anthracnose is an extremely damaging pathogen that affects many high-value landscape trees in our area. Anthracnose is a foliar disease that causes leaf blotch that can eventually kill entire leaves and even pre-maturely defoliate trees. Anthracnose thrives in cool, high-humidity environments and can have outbreaks in spring and fall. Anthracnose affects hundreds of plant species worldwide, but there are five tree species groups in our area that are commonly and severely damaged: flowering dogwood, sycamore, maple, ash, and oak. This document will comprehensively explore anthracnose, including anthracnose fungus symptoms and treatment.

Life Cycle

In general, anthracnose fungal colonies overwinter on infected twigs or on ground debris from infected trees. In spring, spores are produced and are spread to susceptible hosts by wind, rain, and insects. Upon arrival onto vulnerable tissues (usually leaves), the spores penetrate and recolonize, leading to leaf spots, lesions, and areas of rot. Masses of spores are produced in infected tissues and given favorable weather conditions (cool and wet). This cycle repeats, leading to disease spread and increasing severity.

Symptoms

Dogwood Anthracnose

Flowering dogwoods are the most severely affected hosts of anthracnose in our area. Anthracnose symptoms include small, purple-rimmed leaf spots or large tan blotches that may enlarge and kill the entire leaf. Infected leaves may cling to stems after normal leaf fall, and twigs may die back several inches and possibly all the way to the main stem. Epicormic sprouts usually form up and down the main stem and on major branches of infected trees. Dogwood bracts (which we see as flower petals) may also become infected if rainy conditions prevail during flowering. Incidence of the disease depends on high relative humidity, cool weather, and the presence of a vulnerable host tree. Trees planted in greater light where foliage can dry quicker with adequate air movement are much more resistant to anthracnose.

Sycamore Anthracnose

Anthracnose in sycamore and London planetree is the most visible and dramatic expression of this disease group in our area. In sycamores in spring, there are three forms of anthracnose active and overlapping: perennial cankers, shoot blight, and leaf blight. During wet spring conditions, spores develop in infected tissues both on trees and on leaves shed the previous fall and reinfect new shoots and developing leaves, which wilt and die. In a severe anthracnose outbreak, this disease can kill 90% of new shoots and leaves on sycamores, resulting in trees that appear to have spontaneously died. However, anthracnose infection in sycamores is generally early enough in the

growing season that trees are able to produce a full second set of leaves that remain on the trees and uninfected until fall. Repeated severe infections over many years can lead to irregular branching, formation of witches-broom structures, and weaknesses in overall tree architecture.

Maple Anthracnose

Maple species are also highly susceptible to anthracnose, including red maple, sugar maple, silver maple, Japanese maple, and Norway maple. Under conducive conditions of wet weather at moderate temperatures, they may experience several cycles of infection annually. Spores are dispersed by splashing and running water, which start each cycle, more spores are produced in anthracnose lesions, and three types of foliar symptoms are induced by anthracnose on maples: 1) vein-associated lesions that extend secondarily into interveinal areas; 2) discrete necrotic spots; and 3) irregular spreading necrotic blotches and blight. On maples, anthracnose is usually a minor biological threat, but can have a severe aesthetic effect, especially on compact ornamental species such as Japanese maple. As with anthracnose in most species, severe infection can lead to defoliation.

Ash Anthracnose

Ash anthracnose is common wherever ash trees grow in the relatively cool regions of eastern North America, and common landscape hosts in our area include both white ash and green ash. The disease is characterized by blight of very young leaves and shoots or by irregular necrotic blotches on expanded leaflets. In years of prolonged wet spring weather with moderate temperatures, the leaf and shoot blight phases of anthracnose may kill almost the entire first flush of shoots on highly susceptible trees. Severe defoliation in several successive years may lead to dieback. However, the damage is usually minor, and defoliation is restricted to low branches. Ash

anthracnose symptoms arise in spring on succulent expanding shoots and leaves as water-soaked spots that may enlarge rapidly. In comparison with the devastation to the ash tree population nationwide brought on by emerald ash borer, ash anthracnose is rarely considered in management planning.

Oak Anthracnose

Oak species that are susceptible to anthracnose fungus include black, chestnut, northern red, pin, white, swamp white, and willow oak. On white oak, which is the most susceptible, symptoms include rapidly developing blight of leaves and shoots, large and irregular dead areas on distorted green leaves, and small necrotic spots on leaves that have reached mature size. During rainy weather in spring, leaf and shoot blight become prominent on low branches and then spread upward. Leaves approaching full size become quite resistant, which may account for the association of anthracnose fungus with only small necrotic spots on mature leaves. However, in severe cases of anthracnose, twig dieback and cankering both occur, leaving trees vulnerable to opportunistic wood borers and diseases like *Botryosphaeria*. As with other anthracnose species, frequent spring rainfall and moderate temperatures are conducive to outbreaks of oak anthracnose.

Management Strategies

For landscape ornamental trees, annual sanitation and fall clean-up are the first line of defense in management of anthracnose fungus symptoms and treatment. When trees have been infected and damaged, dead branches and twigs should be pruned out and destroyed or removed from the property. In addition, it is critical to rake and remove fallen leaves from beneath infected trees, since leaf litter is the primary reservoir for the next season's disease cycle.

On properties with a history of severe infections in feature trees or properties on which clean tree aesthetics are required, properly selected and timed fungicides can be effective in suppressing anthracnose. First fungicide treatment should be applied before bud burst, 2-4 weeks after first treatment (when flowers fall from dogwood), and again about 4 weeks following second treatment. This schedule is largely weather-dependent: when temperature in mid-April averages less than 55 degrees, anthracnose is expected to be severe in all hosts; between 55 and 60 degrees, projected disease severity decreases; and with mid-April average temperature above 60 degrees, disease spread and severity is negligible. Often, the most severe damage occurs on young trees and newly installed trees already experiencing transplant stress. Protection with fungicide is recommended for early-spring plantings of flowering dogwood, sycamore/planetree, maple, and oak.

In large trees (particularly sycamores), full canopy coverage of sprayed fungicides is not practical, but trees can be treated with systemic fungicide through injection at the root collar. Spring or fall injections can be effective to control the following infection period (spring injection for fall control, fall injection for spring control), and injections can provide up to three years of control.

The foundation of integrated pest management is a program of periodic inspections, during which all plants are assessed in terms of insect, disease, nutritional, and physiological health. After inspection, plants are treated as needed with the most advanced biological, chemical, and cultural management tools, and the findings of each visit are summarized and reported to you in writing. At Burkholder Plant Health Care, our approach is to put our training and experience to work for you, ensuring that your landscape gets the attention and tailored management that it deserves. For comprehensive and effective plant health care for your landscape, such as managing anthracnose fungus symptoms and treatment, trust Burkholder PHC.