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## **ANTHRACNOSE DISEASES OF TREES**

Anthracnose diseases occur on important shade and ornamental tree species throughout Connecticut every year. However, the prevalence and severity of disease can vary with each season, site, and species. Anthracnose diseases are common on ash (*Fraxinus*), maple (*Acer*), oak (*Quercus*), and sycamore (*Platanus*). These diseases are most noticeable on trees in the landscape, but they also occur on trees growing in natural woodlots and forests. The degree to which each tree or species is affected by disease is influenced by genetic factors, microclimate, and predisposition by other stresses (e.g., site, drought, excess water, winter injury).

The term “anthracnose” refers to diseases caused by fungi that produce conidia in structures called acervuli (Deuteromycotina, Coleomycetes). These fungi can infect leaves, flowers, fruit, and stem tissues. Infections are usually initiated in spring when new growth is emerging but they can occur throughout the entire season when the weather is favorable. Environmental conditions that are most favorable for disease development include periods of extended cool, moist or wet weather.

Symptoms of anthracnose diseases range from minor, cosmetic spotting of leaves to

blighting of leaves and tender shoots and to dieback of twigs and branches. Symptoms also vary with the individual host and the causal fungus. Although symptoms of anthracnose are most obvious from mid spring to early summer, additional cycles of infection can result in damage that is visible later in the growing season. As leaves and shoots mature and approach full-size, they become relatively resistant to infection.

Anthracnose diseases are generally considered aesthetic or nuisance problems. However, when infections are heavy, they can result in disconcerting levels of premature leaf drop and defoliation. Anthracnose diseases can also disfigure trees when infected twigs and branches die. This is more common after several successive years of disease. Most trees which have dropped leaves prematurely usually produce new shoots and leaves by mid-summer. Trees which are otherwise healthy can fortunately withstand several years of defoliation without long-term implications for tree health.

### **ASH ANTHRACNOSE:**

**Causal Agents:** *Gnomoniella fraxini*  
(*Discula fraxinea*)

**Hosts:** *Fraxinus* (black and white ash; green ash is fairly resistant)

**Symptoms:** Symptoms develop on newly expanding shoots and leaves in spring. Tender shoots are blighted and killed during cool wet weather. Infections on developing leaves first appear as water-soaked, irregular areas. These develop into brown, somewhat papery lesions (Figure 1).



Figure 1. Symptoms of ash anthracnose. Note angular, necrotic lesions on leaflets that distort the overall appearance of the leaf.

When infections are moderate, only portions of each leaflet are affected. This can give the leaf a distorted appearance but leaves usually remain attached to the tree. When infections are heavy, entire leaves will turn brown and drop prematurely. Branches which have dropped their leaves usually produce new shoots and leaves by mid-summer.

#### **MAPLE ANTHRACNOSE:**

**Causal Agents:** *Discula* sp., *Kabatella apocrypta*

**Hosts:** *Acer* (Japanese, Norway, sycamore, red or swamp, silver, and sugar maple).

**Symptoms:** Narrow, purple to brown streaks develop along the veins of leaves of Norway maples whereas large, brown patches develop between the veins on sugar maple leaves. Symptoms on Japanese maples appear as light tan, papery areas at leaf margins. Although symptoms vary with

the type of maple, symptoms which are common to most maples are the large, irregular dead areas on the leaves. These are often V-shaped or delineated or defined by the veins. These areas can be tan and paper-thin. When infection is severe, the fungus enters the petiole and causes entire leaves to appear blighted, browned, and shriveled. These symptoms are often confused with drought and heat stress since they are very similar. Samaras can also develop necrotic or dead spots and drop. Significant leaf drop can occur in late spring but trees usually re-foliate by mid-summer.

#### **SYCAMORE ANTHRACNOSE:**

**Causal Agents:** *Apiognomonia veneta* (*Discula platani*)

**Hosts:** *Platanus* (sycamore, London plane)

**Symptoms:** Sycamore anthracnose often occurs in three phases, each of which can result in different types of symptoms. The three phases are twig and branch cankers, shoot blight, and leaf blight. Weather patterns usually influence the severity of each phase. In the first phase, the presence of the fungus in twigs and buds over the winter results in cankers and bud death when the trees are dormant. During the shoot blight phase, new shoots are rapidly killed by the fungus as they expand (Figure 2). This symptom is particularly noticeable during or just after cool, wet periods in spring. These first two phases can be confused with frost damage.

In the final leaf blight phase, newly expanding leaves are infected and killed as they emerge. Leaves are most susceptible during the first few weeks of growth. Symptoms include foliar lesions that extend along the veins and develop into large brown areas on the leaves. Infected trees have thin, sparse canopies as growth emerges in spring (Figure 3). Significant leaf drop can occur in early summer

although by mid-summer most trees will have re-foliated with a canopy of healthy leaves.



Figure 2. New leaves and shoots are infected with sycamore anthracnose as they emerge in spring.

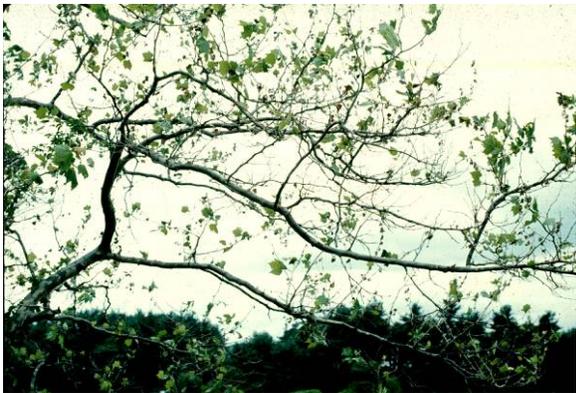


Figure 3. Sycamore infections can be recognized by the sparse canopy as the tree begins to grow in the spring.

#### **OAK ANTHRACNOSE:**

**Causal Agents:** *Apiognomonia quercina* (*Discula quercina*)

**Hosts:** *Quercus* (white, black, pin, burr, scarlet oak)

**Symptoms:** White oak is the most susceptible of all oak species. Although some twig and branch dieback can occur, the most common symptom appears as a blighting of newly expanding shoots and emerging leaves. Irregular, tan, papery necrotic spots develop on the leaves as they

develop and are often concentrated along the veins or at the margins of the leaves (Figure 4). When the spots are numerous, they coalesce and give the leaves a blighted appearance. Heavily infected leaves become distorted and often drop prematurely by early summer. However, trees usually re-foliate by mid-summer.



Figure 4. Irregular, necrotic lesions are concentrated along the veins of oak leaves infected with anthracnose.

#### **MANAGEMENT STRATEGIES FOR ANTHRACNOSE DISEASES:**

Managing anthracnose diseases is most successful using a multifaceted strategy. These diseases are often effectively controlled by following good sanitary and cultural practices and are rarely serious enough to warrant chemical control.

- Anthracnose fungi overwinter in cankers on twigs and branches and to some extent, on fallen leaves. Because these serve as important sources of overwintering inoculum, symptomatic tissues should be pruned, raked, and/or removed as completely as practical. This practice reduces the number of fungal spores available to infect emerging shoots and leaves in spring and during the growing season.

- Maintain overall tree vigor by following sound cultural practices. These include watering, fertilizing (as determined by a soil test), mulching, and pruning.
- Although anthracnose diseases are usually considered to be more aesthetic than life-threatening, there are situations where they can be serious and cause permanent damage or even tree death. Newly transplanted trees or trees weakened by environmental or site-related stress are particularly sensitive to several years of repeated defoliation. In such cases, chemical control can be beneficial. Among the fungicides registered for homeowner use in Connecticut are thiophanate methyl, chlorothalonil, copper sulfate pentahydrate, and mancozeb. Organic options for control include copper products, sulfur, *Bacillus subtilis* QST 713 strain (Serenade<sup>®</sup>), and potassium bicarbonate. The pesticide label will contain information on dosage rates, application intervals, and safety precautions. Since most anthracnose fungi infect in spring as the buds are swelling and new leaves and shoots are expanding, the first fungicide spray is applied at or just prior to budbreak. Two or three additional sprays are subsequently applied at intervals specified by the label for the particular fungicide being used. Additional applications may also be necessary under unusually wet or prolonged spring conditions. Once symptoms of anthracnose are visible on the leaves it is usually too late for effective chemical control.

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