

### Foliage Disease of Hardwood

There are many diseases of the foliage of hardwoods caused by parasitic fungi, which may also extend their activities to the flowers, fruits, and young twigs. Some hardwoods are attacked by foliage diseases year after year without suffering apparent injury. Leaf diseases are mainly important when defoliation results or when an attack is so heavy.

#### Tar Spots of Maple

Tar spot is a disease of maple leaves caused by fungi

**Pathogen:** *Rhytisma acerinum*

#### Symptoms and Signs

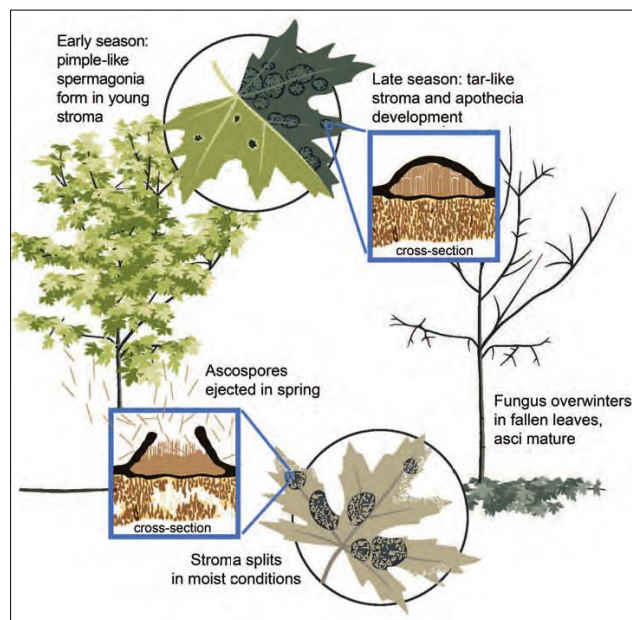
- 1-Yellow blotches form on the leaves in late spring
- 2-By mid-summer these have developed into large (up to 15mm across), slightly raised, shiny, black spots with a narrow yellow margin
- 3-Heavily infected leaves may fall slightly early
- 4-Tiny fruiting bodies develop during winter on disease-affected fallen leaves at the base of the tree



Fig the symptoms of tar spot

## Disease cycle

The fungi that cause tar spots overwinter on infected leaves that fall to the ground. The following spring, just as new leaves are unfolding, the fungal tissue in the leaves on the ground ripens. The surfaces of the spots split and minute, needle-like spores escape. The spores are carried about by wind and if they land on new leaves of a susceptible host they may germinate, penetrate the leaf tissue, and start a new disease cycle.



The disease cycle of tar spot caused by *Rhytisma* spp.

## Leaf Blister of Oak

Oak leaf blister caused by the fungus *Taphrina caerulescens* is a common disease affecting many species of oaks.

**Pathogen:** *Taphrina caerulescens*

**Hosts:** Most species of oak (*Quercus* spp.)

## Symptoms

- 1-Symptoms appear in early summer as yellow, blisterlike, circular, raised areas.
- 2-The blisters are scattered over the upper leaf surface with corresponding grey

depressions on the lower surface.

3-They turn from yellow to reddish brown with pale yellow margins, then become dull brown with age.

4-Several blisters may merge and cause the leaves to curl.



Fig the symptom of Leaf Blister of Oak

### **Disease cycle**

*Taphrina* fungi overwinter as dormant spores in bud scales and bark crevices. These spores germinate in spring during cool, rainy periods and infect young leaves and fruit. The spores are produced on infected tissues and later spread by wind and rain but do not cause additional infections during the same growing season. Instead, surviving spores remain dormant until favourable weather occurs the next spring. As a result, *Taphrina* diseases have only one cycle of infection per year.

### **Powdery Mildew**

Powdery mildew is a common disease that attacks all kinds of trees. A white powdery substance on the leaf surface comes from millions of tiny fungal spores, which are spread in air currents to cause new infections

The fungus spreads through wind, water splashes and contact between infected and healthy plants.

## Hosts

Powdery mildews have a very large host range that includes many woody and herbaceous plants. Some of the trees commonly infected with powdery mildews are apple, ash, boxwood, catalpa, cherry, Eucalypt, elm, honey locust, chestnut, maple, oak, pear, plum, rose, walnut, and willow.

**Pathogen; *Erysiphe* spp.**

## Symptoms of Powdery mildew disease

- 1-White patches of fungal growth develop on the lower surface of the leaf
- 2-Leaf edges curl upwards, exposing the white, powdery fungal growth
- 3-Tiny, round, black fungal structures (cleistothecia) may also be present on the underside of the leaves



**Fig Symptoms and signs of Powdery mildew disease**

## Disease Cycle

Powdery mildews are caused by many species of fungi in six genera, *Erysiphe*, *Microsphaera*, *Phyllactinia*, *Podosphaera*, *Sphaerotheca*, and *Uncinula*. The pathogens overwinter in the black specks, which are fruiting bodies, or as vegetative mycelium in buds and twigs

In the spring, spores are released from the fruiting bodies and are blown or splashed onto the foliage of susceptible trees. The pathogen penetrates the leaf

epidermis and inserts into the spongy mesophyll or the palisade cell a specialized absorbing organ, called a haustorium. The fungus does not grow further into the leaf but obtains its nutrition from the leaf through the haustoria. This structure does not kill the cell and the fungus can only live as long as the penetrated cell remains alive. As the fungus grows extensively on the leaf surface the leaf appears gray-white. Soon after the fungus extends over the leaf surface it begins to produce long chains of spores. These secondary spores, sometimes called "summer spores," create new infections during the late spring and throughout the summer.

The best growth of the pathogen occurs during warm, damp, or wet weather. The fruiting bodies mature on the dead leaves during the winter.

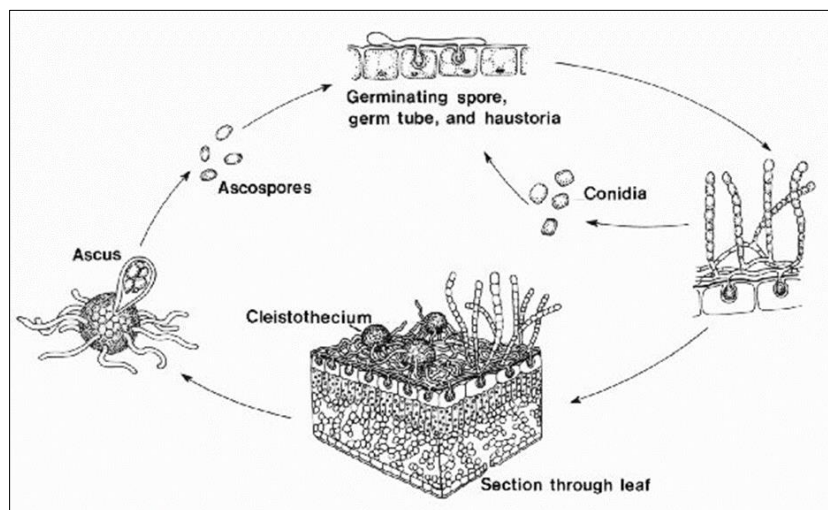


Fig The disease cycle is caused by a powdery mildew fungus

**Control:**

- 1-In the nursery and greenhouse powdery mildew is often controlled with fungicides.
- 2-They are applied at 1- or 2-week intervals after symptoms are observed, depending on the severity of the problem.
- 3- Destroying fallen leaves may help by limiting the potential inoculum.