36. Powdery Mildews

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Hosts

Powdery mildews, caused by fungi in the family Erysiphaceae, affect many hardwood species, especially oaks, sycamore, yellow-poplar, hickory, black walnut, elm, cottonwood, maple, and buckeye.

Distribution

Powdery mildews occur throughout the United States wherever the host species grow.

Damage

Damage is usually minimal, but powdery mildews can influence the quality of the seedling. Heavy foliage infection results in partial defoliation, reduction in photosynthetic ability of leaves, and less vigorous seedlings.

Diagnosis

In the early spring and summer, look for white, powdery growth usually on the upper leaf surface (fig. 36-1). This growth, which consists of white superficial mycelium and hyaline, one-celled conidia produced in chains, is the principal diagnostic feature identifying the disease.

In late summer or fall, small brown or black cleistothecia (fig. 36-2), the sexual state of these fungi, are produced on the leaf surface. These are visible with a 10 x hand lens. The cleistothecia have characteristic appendages, which may be straight, flexuous, branched, or hooked, and which, along with the number of asci developed in the cleistothecia, form the basis for generic separation. Cleistothecia of some species of powdery mildews mature, and produce spores in the fall they were formed; those of other species mature the following spring.

Figure 36-1—Leaves of water oaks infested by a powdery mildew fungus.

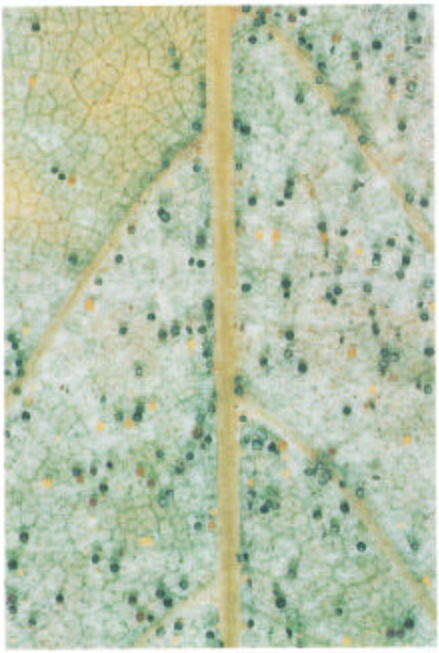

Figure 36-2—Small black cleistothecia of a powdery mildew fungus on leaf surface.

Biology

The fungi overwinter as mature or immature cleistothecia on fallen leaves. In the spring, the wind currents carry the ascospores to new leaves. Following infection, large numbers of conidia are produced on the superficial mycelium. These spores are windborne and are responsible for rapid buildup of the disease.

The powdery mildew fungi are obligate parasites and cannot be grown on standard laboratory culture media.

Control

Cultural—Schedule irrigation in the morning to allow the foliage to dry before the end of the day. All residual plant material that may be sources of inoculum should be plowed under after the crop is harvested.

Chemical—The fungicides maneb and zineb are registered and currently recommended for powdery mildew control. Lime-sulfur and wettable sulfur fungicides will also give adequate control.

Selected References

Boyce, J.S. 1961. Foliage diseases of hardwoods. In: Forest pathology. New York: McGraw-Hill Book Co.: 129-152.

Davis, W.C.; Wright, E.; Hartley, C. 1942. Diseases of forest tree nursery stock. For. Publ. 9. Washington, DC: Civilian Conservation Corps. 79 p.