UNIVERSITY OF ILLINOIS EXTENSION
College of Agricultural, Consumer and Environmental Sciences

report on
PLANT
DISEASE

RPD No. 406
1995

DEPARTMENT OF CROP SCIENCES
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

POWDERY MILDEW OF TURFGRASSES

Powdery mildew is caused by the fungus *Erysiphe graminis*, which attacks a wide range of grasses including cereals. The disease occurs most commonly on Kentucky bluegrass, bermudagrass, redtop, fine-leaved fescues, and zoysiagrasses. A number of highly specialized physiologic races of the fungus are known. Many of these races are restricted to specific species of turfgrass or to certain cultivars within a species. The races that attack cereals do not attack bluegrasses and other turfgrass.

Figure 1. Powdery mildew on Kentucky bluegrass leaves.

Powdery mildew has become an increasingly important disease of 'Baron', 'Cheri', Fyl-king', 'Kenblue', 'Merion', 'South Dakota Certified', 'Windsor', and other Kentucky bluegrasses in recent years. High-nitrogen fertilizers cause a dense growth of grass that creates an ideal environment for the mildew fungus. Resistance to powdery mildew is known to exist in several cultivars of Kentucky bluegrass, bermudagrass, and in several species of bluegrass and fescues.

The disease is much more severe where air circulation is reduced and the grass is growing in shaded areas (on north and east sides of buildings, under dense trees and shrubs). It attacks chiefly in the spring, late summer, and autumn when days are mild and cloudy and nights are cool and damp. Because the fungus significantly reduces the growth of leaves, roots, and rhizomes, powdery mildew is an important cause of the deterioration of bluegrass and zoysiagrass lawns in shaded areas. A severe attack may weaken and kill the plants, especially in crowded, newly planted areas. The surviving plants are more susceptible to winterkill, drought, and attack by other disease-causing organisms.

Symptoms

Powdery mildew appears first as small, superficial patches of white to light gray, dusty growth (mycelium) on the leaves and leaf sheaths (Figure 1). These patches enlarge rapidly and merge, becoming more dense. The lower leaves are often completely covered. The leaf tissue under the mildew yellows soon after infection and later turns tan or brown. Heavily infected leaves gradually dry up and die. In severe outbreaks, large areas of turf appear dull white as if dusted with flour or lime.

For further information concerning Turfgrass problems, contact Nancy R. Pataky, Extension Specialist and Director of the Plant Clinic, Department of Crop Sciences, University of Illinois at Urbana-Champaign.

Disease Cycle

Powdery mildew fungi live chiefly on the outer surface of the host plant. They obtain food and water by means of small, branched, rootlike organs (haustoria) that penetrate the grass leaf or sheath and enter the surface layer or epidermal cells (Figure 2). The mildew appears powdery because it produces tremendous numbers of microscopic chains of spores (conidia). During cool (55° to 70°F; 13° to 21°C), humid cloudy weather, spores are continuously produced for 7 to 14 days until the host tissue dies. The conidia are easily carried by air currents to other grass plants in the same or neighboring turf areas, where they produce new infections and start the cycle once again. The conidia are capable of germinating and producing infections within 2 hours after landing on a leaf. New conidia are produced within a week after infection occurs.

As the fungus matures, the grayish white powdery growth forms dense mycelial mats. Occasionally, speck-sized, black, fungus-fruiting bodies (cleistothecia) develop in the mycelial mats during autumn. These bodies are especially evident on dead grass leaves. Sexual or overwintering spores (ascospores) are sometimes produced in the cleistothecia. Cleistothecia, however, are not common in turfgrasses. The powdery mildew fungus survives the winter as cleistothecia on dead plant tissues and as mycelial mats on living grass plants. The ascospores and/or conidia are released in early spring and produce the initial infections.

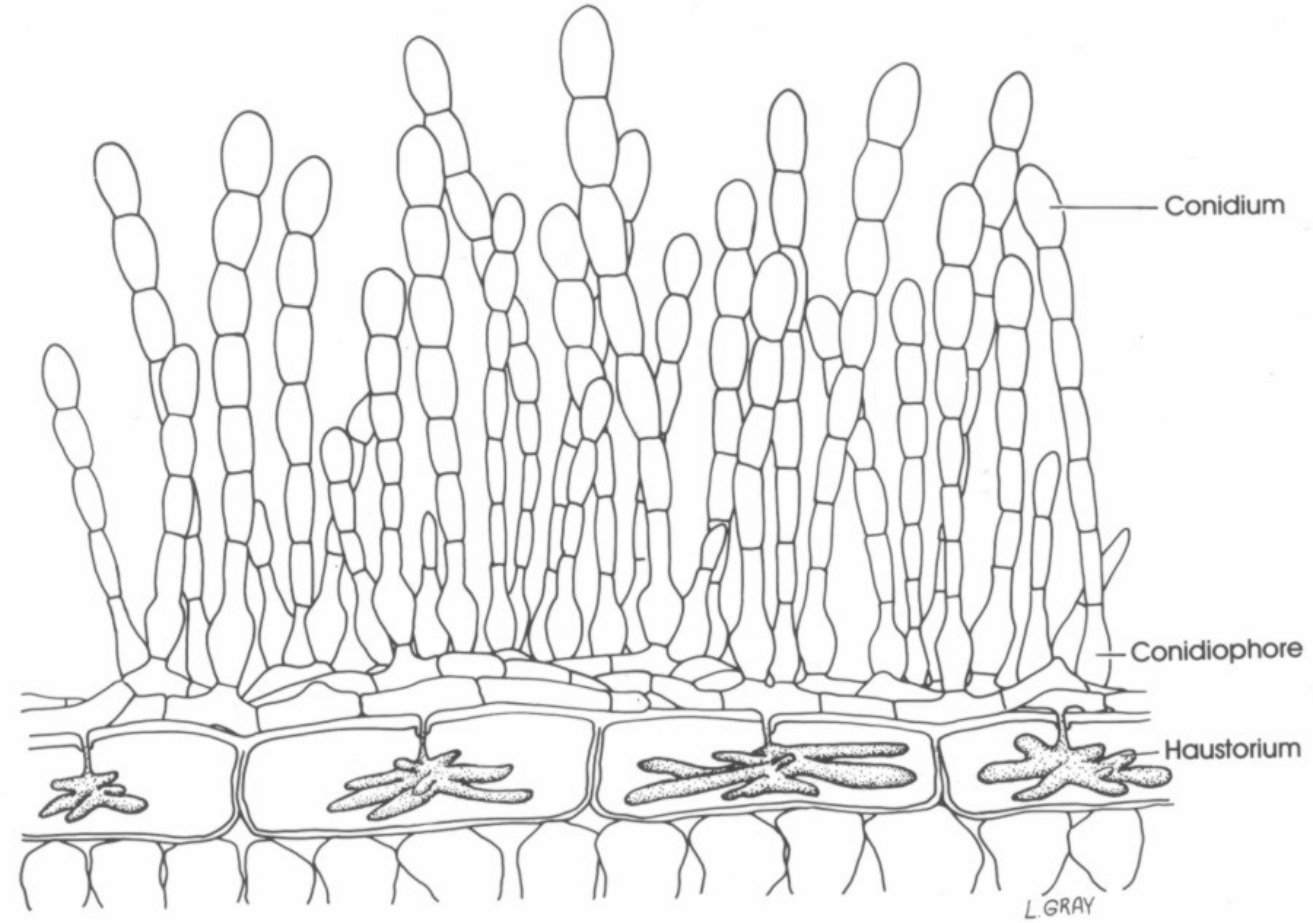

Figure 2. Diagram of powdery mildew fungus Erysiphe graminis. The fungus is on the surface of a leaf except for its feeding organs (haustoria), which invade the epidermal cells (drawing by Lenore Gray).

Control

1. Increase the penetration of light, movement of air, and drying of the grass surface by pruning or selectively removing dense trees and shrubs that shade or border turf areas. Space landscape plants properly to allow adequate movement of air and to avoid excessive shade. Certain shade-tolerant cultivars of Kentucky bluegrass, such as 'A-34' or 'Bensun', 'Dormie', 'Nugget', and 'Sydspot', the fine-leaves fescues and rough stalks bluegrass (*Poa trivialis*) do relatively well in shade-tolerant ground cover, such as Japanese spurge (*pachysandra*), myrtle or periwinkel (*Vinca*), English ivy, creeping mahonia, hosta, wild ginger, ribbon grass, and lily of the valley.

2. Keep the turf vigorous and growing steadily by fertilizing on the basis of a soil test and of local recommendations for the grass(es) grown. Recommendations will vary with the cultivar or blend grown and its use. Avoid overfeeding, especially with fertilizers containing large amounts of soluble nitrogen.

3. Water thoroughly (soil should be moist to a depth of 6 inches) during dry periods. Avoid frequent light sprinkling, especially in the late afternoon or evening.

4. Mow bluegrasses at the recommended height (1½ to 2 ½ inches). Mow frequently so that no more than one-third of the leaf surface is removed at any one time.

5. On high-value turfs, where powdery mildew consistently recurs, a fungicide program may be economically feasible. When powdery mildew is first evident in the spring or late summer, two or more applications of a fungicide at intervals of 7 to 21 days should keep the disease in check. For effective control of powdery mildew, spray 1,000 square feet uniformly with about 1 to 3 gallons of water containing a small amount of surfactant Always follow the manufacturer's directions. Thorough coverage of the grass leaves with each spray application is essential for good control. The suggested fungicides to control powdery mildew are given in Illinois Commercial Landscape & Turfgrass Pest Management Handbook or Illinois Homeowner's Guide to Pest Management. These publications can be found in your nearest Extension office or the Information Technology and Communication Services at the University of Illinois. Use lower fungicide rates in preventive programs, higher rates for curative programs.