



## YELLOW TUFT OR DOWNY MILDEW OF TURFGRASSES

Yellow tuft, or downy mildew, is caused by the water mold fungus *Sclerophthora macrospora*. The disease occurs on most cultivated turfgrass species, cereals, and many weedy grasses (e.g., crabgrass), but seldom causes extensive losses, except on turfs maintained at shorter mowing heights (<1"), such as golf greens. Downy mildew is usually associated with seedling or immature turfs grown on poorly drained and/or heavily watered areas. The disease may so weaken creeping bentgrass that additional stress, such as excessive traffic, drought, or extreme cold or heat, will kill infected plants.



Figure 1. Yellow tuft: (Left) small yellow patches in a bluegrass lawn; (right) close-up of infected plants showing excessively tillered yellow shoots with shallow roots (courtesy Dr. Noel Jackson).

### SYMPTOMS

Early symptoms of yellow tuft include the appearance of small clumps of slightly stunted, light green or yellow grass plants which have slightly thickened or wider leaf blades and exacerbated leaf growth. When the disease is severe, small yellow patches, 1/4 to 5 inches in diameter, can be found in the turf (yellow tuft). Patches on bluegrasses and fescues are usually larger than those found on bentgrasses and ryegrasses. Each patch contains dense clusters or bunches of stunted, excessively tillered yellow shoots with shallow roots (Figure 1). Plants in these patches are easily pulled from the turf as their roots are few and stunted. Infected plants commonly die from a combination of heat and drought stress, winter desiccation, or attacks by secondary fungi, such as those that cause leaf smuts and "Helminthosporium" diseases. Yellow tuft-affected turf appears unsightly, spotted or mottled, with an uneven surface. During cool, wet periods a white downy growth (sporangiophores bearing lemon-shaped sporangia; see Figure 5) may appear on the leaves and leaf sheaths. Symptoms of yellow tuft or downy mildew are most prominent during late spring and fall, appearing first in poorly drained areas.

---

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

If left unmowed, the heads of infected turfgrass plants assume abnormal shapes, similar to those associated with phenoxy herbicide injury (Figure 2).

## DISEASE CYCLE

The *Sclerophthora* fungus overseasons as mycelium and thick-walled oospores in living and dead leaves, stems, and crowns (Figure 3). In cool, wet weather, from late spring into autumn, the fungus produces stalklike fruiting structures (sporangiophores) that protrude from the stomates on both leaf surfaces and on leaf sheaths (Figure 4). Pearly white, lemon-shaped sporangia form on the tips of the sporangiophores. The sporangia (Figure 5) remain turgid only as long as the leaf surface is wet; on dry leaves they quickly collapse and appear as a dirty white residue.

When the turf is wet, microscopic sporangia release many spores (zoospores) that actively swim in search of susceptible turf. The zoospores attach themselves to leaf surfaces and encyst 1 to 24 hours after being released. Later, the cysts infect young meristems of healthy plants. Young tissues are quite susceptible while mature leaves usually resist infection. Numerous round oospores are produced in infected leaves (Figure 3) and can be seen with a microscope. The oospores may germinate in the presence of moisture to produce a sporangium and continue the disease cycle.

Oospores can persist for several months or more in well-drained soils. A dormant period of at least 8 weeks is required after oospore formation before germination can occur in the presence of moisture. The sporangia and oospores can be disseminated in splashing or flowing water, on all types of turfgrass equipment, shoes, and in infected sod, sprigs, and plugs. It should be noted that the fungus grows best under conditions that promote optimal growth of its grass host.

## CONTROL

### A Cultural Controls

1. When preparing a seedbed be sure that adequate surface and subsurface drainage is available so excess water will drain quickly. Avoid overwatering. If possible, remove excess water from grass surfaces following heavy rains.
2. Fill in low spots where water may stand.



Figure 2. Heads of K-31 tall fescue distorted by the downy mildew fungus, *Sclerophthora macrospora* (courtesy Dr. J.L. Dale).

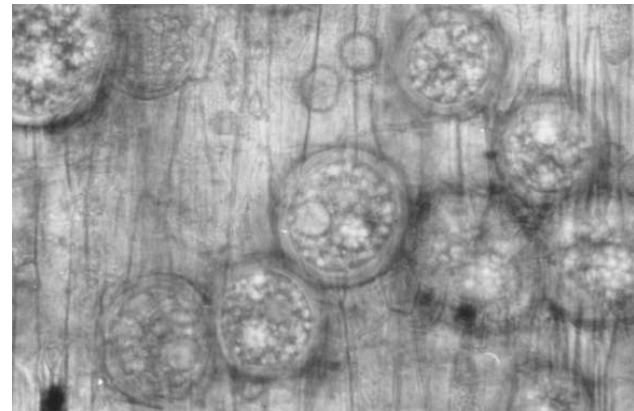


Figure 3. Thick-walled oospores of *Sclerophthora macrospora* in infected bentgrass tissue (courtesy Dr. Noel Jackson).

3. Buy **only** top-quality certified sod, sprigs, plugs, or pathogen-free seed from a reputable dealer.
4. Mow only when the grass is dry.
5. Manage the turf in a manner that promotes active, but not lush growth.
6. Fertilize (supply nitrogen, potash, and phosphorus) according to local recommendations and soil tests. During periods of hot weather, avoid overstimulation with fertilizer, especially one containing a high content of water-soluble nitrogen.
7. Remove excess thatch in spring and/or fall. Thatch should be kept at less than 1/2 inch on lawn-type turf; 1/8 inch or less on closely mowed turf.
8. Follow suggested insect and weed control programs.
9. Kentucky bluegrass and creeping bentgrass cultivars are not known to differ in their resistance to yellow tuft or downy mildew.

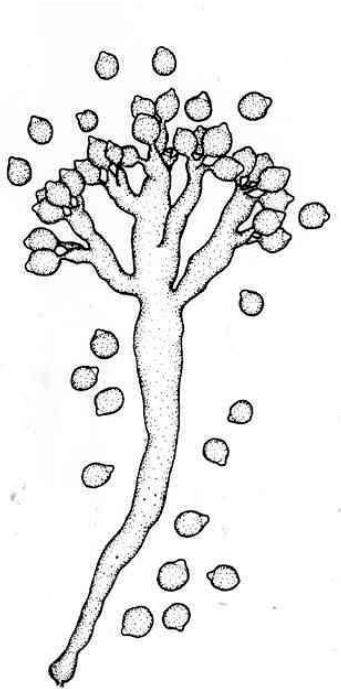


Figure 4. Stalklike, branched sporangiophore of *Sclerophthora macrospora* bearing sporangia (drawing by L. Gray).

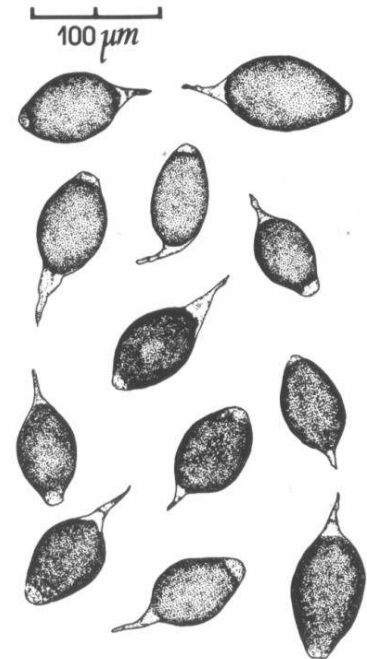


Figure 5. Lemon-shaped sporangia of *Sclerophthora macrospora* from Kentucky bluegrass, as seen under a microscope (drawing by L. Gray).

## B. Chemical Control

1. Preventive fungicides effective against species of **Pythium** have shown limited success in controlling yellow turf or downy mildew. The fungicide metalaxyl (sold as Subdue) must be applied **before** infection occurs since **infected plants cannot be cured**. Carefully follow all directions and precautions as printed on the container label. Spring applications of metalaxyl are most effective for control of yellow tuft.