

# Turfgrass Disease Profiles



## Fairy Ring

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**F**airy rings are caused by numerous types of soil-inhabiting fungi and occur in stands of all turfgrass species. The appearance of fairy rings on high maintenance golf greens, sports turf and manicured landscapes is often unacceptable, even though the symptoms are largely cosmetic and result in no lasting turf damage. Sometimes fairy ring activity kills turfgrass plants, and in those areas new growth is very difficult to re-establish. Finally, colonization of soils by fairy ring fungi may contribute to 'localized dry spot,' a condition that is a serious concern on golf greens.

### Fairy Ring Symptoms and Development

Fairy rings are dark green circular bands in turf (Figs. 1 and 2). They may be less than one foot to more than 100 feet in diameter. Sometimes they appear as arcs or incomplete circles (Fig. 3), and may result in bands of dead turf. The rings are more prevalent in dry soils, during dry months in summer and fall. After extended periods of precipitation, mushrooms (of all sorts) may be associated with some fairy rings (Fig. 4).

Rings develop as the fungi grow radially through soil and thatch, breaking down organic matter. The breakdown releases ammonium, which is further reduced by other microorganisms to nitrate. The nitrate stimulates growth ahead of the leading edge of the ring. Hence, the darker green rings of turf are actually the plant's response to nitrogen release in the soil.

The cause of turf death associated with fairy rings is not well understood. One theory holds that the extensive growth of the fungi in soil creates a 'hydrophobic soil condition.' Hydrophobic soils actually repel water



Figure 1



Figure 2



Figure 3

Gray Snow Mold

Pink Snow Mold

Leaf Spot/Melting Out

Red Thread

Dollar Spot

Brown Patch

Gray Leaf Spot

Anthracnose

Pythium Blight

Leaf Rust

Powdery Mildew

Slime Mold

**Fairy Ring**

Take All Patch

Summer Patch

Necrotic Ring Spot



and result in wilting and death of plants. Another possible cause involves lethal amounts of hydrogen cyanide released in soil as part of the normal metabolic processes of some fairy ring fungi. A third explanation supposes that some fairy ring fungi actually parasitize turfgrass roots. Regardless of the reason for death of affected turf, in all cases where such damage occurs, re-seeding and re-sodding are more difficult.

### Cultural Control

The simplest means of managing fairy rings is to use additional N fertilizer (spoon feed 0.1 – 0.25 lb. per 1,000 sq. ft.) in the areas where rings occur to mask the dark green bands. Another non-chemical method involves excavating soil in affected areas, replacing soil, and re-establishing the turf. The excavation option is obviously very expensive and only practiced on very high maintenance golf and sports turf.

### Fungicides and Fumigation

Flutolanil (Prostar) and strobilurin fungicides (Heritage and Compass) may be effective in suppressing fairy ring development under certain conditions where the fungicide is effectively applied to the soil. Foliar sprays with 2 – 4 gallons of water per 1,000 sq. ft. have yielded very inconsistent results. However, in some experiments, satisfactory results were achieved using a hydroject device to force a fungicide suspension 4 – 6 inches into the soil profile. Also, the timing of the fungicide application may significantly affect fungicide performance. It is likely that even the most generous application of fungicide with a hydroject device will result in only marginal control if target fungi are inactive and incapable of absorbing the toxic ingredient. Like turf problems involving other soil



Figure 4

fungi (e.g. summer patch and take all patch), most effective fungicide applications are those made when the causal agent is actively growing.

Fumigation of affected areas is another chemical option. However, the expense is near-prohibitive. Also, with the promise of new fungicide treatments and delivery systems, the fumigation option is even less attractive.

### Home Lawn Help

Homeowners who manage their own lawns should try to engage in peaceful coexistence with fairy rings. Although the rings will normally appear in the same place year after year, they may be barely visible and hardly a concern in some years. The best way to deal with the rings is to mask the dark green bands with small amounts of additional fertilizer and regular mowing. Investment in a spreader, small amounts of fertilizer, and a little more time in affected areas is much less expensive than excavation or chemical options, and will more consistently produce satisfactory results.