



Fairy Rings In Lawns

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Early Superstitions About Fairy Ring

“Fairy ring,” a common turf disease is identified as large dead rings or arch of grass in lawns. The term “fairy ring” had its beginnings in myths and superstitions. Early herbalists and botanists could not explain the origins of the rings. The Irish and Germans thought for centuries they were caused by leprechauns and witches dancing in circles. In Scotland, if farmers tilled an area containing fairy rings, it was believed that “bizarre days and weary nights will last to his dying day.” Like the many early myths and superstitions, today’s fairy rings are considered a curse rather than good fortune.

Fairy Ring Turf Disease

Fairy ring survives in the organic debris in the soil or in the thatch layer, the area of dead roots and shoots found just above the soil line. Damage can be seen in turf as a band of unsightly large arcs or circles of dead grass (Fig. 1).



Figure 1. Dead rings of turf. (Photo courtesy of Bill Carlos)

How Fairy Ring Begins

Over 50 species of the ring fungi have been identified. The most common type of fairy ring is the genus and species *Marasmius oreades*. While the rings can develop in well-maintained lawns, they are often found in lawns that are underwatered and underfertilized.

The fungal rings begin at a central point and grow outward at a rate of 1 foot to 2 feet per year. Often rings will grow right out of a small lawn.

It is not known if fairy ring spreads by white, hair-like fungal masses known as fungal mycelium, and/or by spores produced by mushrooms (Fig. 2).



Figure 2. Fairy ring showing white fungal hairs. (Photo courtesy of Bill Carlos)

The fungus survives by decomposing organic matter, such as dead roots and shoots and other wood debris. It can also grow deep into the soil, forming a dense thread-like network of white mycelium. The mycelium can penetrate to a depth of 10 inches to 20 inches in loose soil although pathologists report finding fungal masses as deep as 4 feet. However in clay soil, the mycelial growth may be limited to the top 1 inch to 2 inches of soil (Fig. 2).

Types of Fairy Ring

There are three types of fairy ring. Type I reveal zones of dead grass with no mushrooms and may exhibit two rings (Fig. 3).



Figure 3. Fairy ring (Type I). (Photo courtesy of the American Phytopathological Society)

The dead or dry zone of Type I is the result of insufficient moisture. The network of mycelium, which is water-repellant (hydrophobic), grows through the pores of the soil, preventing water from reaching the plants' roots. As a result, the roots dry out, die, killing the grass. The hydrophobic tendency of the mycelium may last for 12 months to 18 months in arid and semiarid regions.

Type II ring exhibits a single circle of stimulated lush green grass with no evidence of mushrooms or dead turf (Fig. 4).



Figure 4. Fairy ring (Type II). Photo courtesy of the American Phytopathological Society.

The flourishing dark ring of turf is caused by nitrogen released by the fungus as it decomposes the organic matter in the soil. The dark vivid green is more pronounced in nitrogen-deficient turf. This condition is often seen in the spring, prior to regular fertilization.

Type III fairy ring shows only mushrooms with no visible effects on the grass (Fig. 5). The rings of mushrooms can range in size from several inches to several feet in diameter.



Figure 5. Fairy ring (Type III). A small circle of mushrooms without a distinct appearance of damage to the lawn. (Photo courtesy of Shouhua Wang, Ph.D.)

Appearance of Mushrooms

Because fungal spores are present in the soil and in the air, they will grow when weather conditions are favorable. Several types of mushrooms may appear for a short period of time in the spring and after a good rain, but may or may not be the fairy ring fungus.

Caution: Because many species fairy ring may produce mushrooms, don't eat them unless you are an expert at identifying them. They may be toxic to humans and especially toxic to small children and pets. Remove them by hand-picking or mowing as soon as they appear.

Management

Chemical Treatments

Limited success has been achieved by treating fairy ring with chemical fungicides and wetting agents, (chemicals used to break the surface tension of the soil and allow for water adsorption) on residential and commercial sites due to inconsistent soil textures and compacted soils. When these conditions occur, the fungicide (Flutolanil for residential sites and Azoxystrobin for commercial sites) cannot penetrate the soil deep enough to

completely kill the fungi. The rings may be suppressed by drenching the infected soil with a fungicide. However, symptoms may reappear when treatments are discontinued.

Golf course superintendents have reported controlling the rings on golf greens using a fungicide labeled for the disease. Because golf greens are constructed with a uniform soil, the fungicide can penetrate evenly and deeply where the fungus grows.

Cultural Methods: Drilling

Inconsistent success has been reported by drilling $\frac{3}{4}$ inch to 1-1/2-inch diameter holes, 18 inches to 24 inches deep, in front of and inside the ring and filling the holes with water and a wetting agent.

Drenching, Injecting and Aerifying

Soaking the soil with water 18 inches to 24 inches on either side of the ring and maintaining moist conditions for four weeks to six weeks has produced some success. Injecting water using a tree root feeder inside and outside of the ring has also revealed some control. Core aerating inside and outside the ring and applying water combined with a wetting agent is another treatment. Both methods suppress the fungus but do not eliminate it.

The goal of using any of these treatments is to keep the area moist to stimulate microorganism populations that are destructive or parasitic to the fairy ring fungus. However, all three methods suggested, drenching, injecting and aerifying, reduce the water-repellent nature of the fairy ring mycelium to produce a healthy and vigorous lawn.

Soil Mixing and Tilling

In established turf, soil mixing and rototilling has proven to be effective in controlling the fungus. Turf should be removed from the site and the soil tilled or cultivated repeatedly in different directions. Simply digging or plowing the soil is not adequate. After tilling, the area should be thoroughly soaked with water to encourage microbial activity to increase the decay of fungus. Keeping the soil bare after tilling for a month or two, or for an entire growing season if possible, can arrest or eliminate many fairy ring fungi. After that time, the soil can be prepared for seeding, which is the preferred method compared to planting with sod. The sod may carry the pathogen and may reintroduce the disease to the area.

Other Treatments

Other treatments include removing infected turf and soil. While total removal of infected soil is usually not warranted because of the time and expense, visual relief can be achieved by masking. This is a method of applying fertilizer over the entire area at the appropriate rate and time. The surrounding lawn will respond by greening-up and hiding the unsightly drought-effected or nutrient-deficient ring.

Preventative Measures

- Don't allow the lawn to dry out during the growing season. Fairy ring prefers to grow in dry soil.
- Water deeply and thoroughly at the first sign of fairy ring.
- Apply water evenly throughout the area during the growing season to a depth of 6 inches to 8 inches. Check

sprinkler nozzles for 100-percent overlap to prevent dry spots.

- Apply manufacturers' recommended fertilizer rates. Higher applications of nitrogen fertilizer will encourage thatch buildup where fairy ring thrives.
- Remove waste lumber, stumps, and other wood products prior to planting a new lawn. Burying these materials will promote fungal growth.
- Aerify lawns in March, April or May or in early fall in September or early October.

For additional information, call your local University of Nevada Cooperative Extension office.

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