

Fairy Rings

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Fairy Rings (fungi – *Agaricus* spp., *Marasmius oreades*)

Host Grass: Hybrid Bermuda(*Cynodon dactylon*), Common Bermuda, Bentgrass(*Agrostis palustris*), Centipede Grass, St. Augustine Grass(*Stenotaphrum secundatum*), Zoysiagrass(*Zoysia japonica*)

Cause and Symptoms: Fairy rings appear in any lawn, golf course or other turf areas during spring and summer months. Nearly 60 different species of basidiomycete fungi have been implicated in fairy ring occurrence.

Fairy rings are a common problem on newly established golf greens that contain a high level of organic matter. Fairy rings are either dark green or brown. Brown rings develop when fungal mycelium forms a hydrophobic layer. This layer prevents water from reaching turfgrass roots, resulting in drought stress. Turfgrass next to the ring may be dark green because of nitrogen released from organic matter on which the fungus is feeding.

On highly maintained grasses, such as those used on lawns, golf courses, and athletic fields, fairy rings can cause severe symptoms of wilting or plant death in rings or arcs that range 10 to 30 cm wide, but mostly are from 4.5 to 9 m in diameter.

Fairy rings are caused by basidiomycotous fungi belonging to the family *Lycoperdaceae*: *Arachnion album*, *Bovista dermoxantha*, or *Vascellum curtisii*. This family of fungi is saprophytic and can survive on decaying plant material.

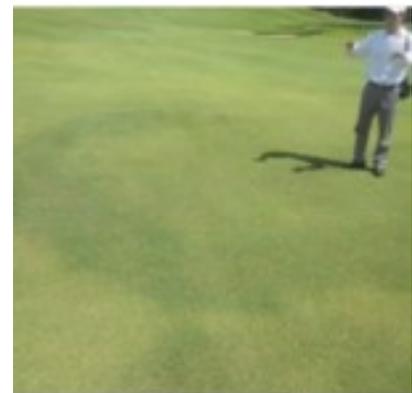
Under the classification system of Shantz and Piemesel, fairy ring types of the severe, necrotic nature are referred to as Type I, fairy rings that only exhibit stimulated grass growth are referred to as Type II, and rings of basidiocarps are referred to as type III. There are certainly varying degrees of each fairy ring type; so, the classification of a specific type of ring may be semi ambiguous. Additionally, types can change rapidly as mushrooms can appear overnight.

Fairy rings are additionally termed superficial when the fungi primarily reside in the upper thatch layer. Fungi associated with superficial fairy rings have been implicated as causal agents of localized dry spots on golf course. When lawns or golf courses are put in and organic matter is moved, many times fungal spores are too.

The fungus is also capable of releasing spores to the wind. As mycelia advances in the soil, it releases digestive enzymes.



Symptom of Fairy ring



type I fairy ring

These digestive enzymes release nutrients, particularly nitrogen into the soil. This excess of nutrients is what stimulates growth of type II rings. The fungus advances in diameter of about 30cm a year.

Control and Management: Mushrooms may or may not develop after a period of heavy rainfall or irrigation. Vertical mowing and topdressing to reduce thatch and removal of tree stumps and roots reduce the organic matter on which the fungus feeds. Fertilization may mask dark green fairy rings by stimulating growth in the rest of the turf. Aeration and drenching the soil with a wetting agent will minimize development of the zone of brown or dead grass in the area of dense mycelial growth.

Fairy rings are difficult to control with fungicides since soil in the infected area is almost impervious to water. Sporadic success has achieved by aerating and drenching with fungicide (See the section **Chemical Controls for Turfgrass Diseases**). Pesticide control has been shown to be unreliable due to difficulty penetrating the mycelium layer. Some success been achieved by aerating the soil and drenching the infected area with fungicide. Core aeration with the rotation of multiple fungicides, mixed with an wetting agent has shown the best results.

Preventive application is also recommended in areas with a history of infection. Masking the symptoms of fairy rings is most effective. Aerating and drenching the soil with a wetting agent will help prevent the development of the zone of brown or dead grass in the area of dense mycelial growth. Keeping the fertility level of the turf high will also help to mask the appearance of the ring of stimulated, or dark green growth. Also, regular mowing removes the mushrooms, the other symptom of the fairy ring disease. For more detailed disease management plan consult your friendly neighborhood plant pathologist.

- vertical mowing and topdressing to reduce thatch and removal of tree stumps and roots
- aeration and drenching the soil with a wetting agent
- core aeration with the rotation of multiple fungicides
- keeping the fertility level of the turf high

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type 2 fairy ring



aerification machine