

Fairy Rings in Turfgrass

Megan Kennelly
 Plant Pathologist
 Department of Plant Pathology

Fairy rings are caused by dozens of different fungi, including mushrooms and puffballs. These fungi grow through the thatch and soil, consuming organic matter. They do not affect the turf directly, but they can alter the soil environment, making it unfavorable to turfgrass. Sometimes, a layer of white, fungal mycelium is visible in the soil or thatch below the ring.

Symptoms

Fairy rings develop as circles or arcs. They can range from a few inches to many feet across. There are three major types of fairy rings, as described in the photos below.

Why are they circles?

Fairy ring fungi start in the soil or thatch and grow outward, like a patch of mold growing as an expanding circle on a piece of rotten fruit or old bread. When two or more fairy rings meet, they do not grow together. This leads to a wavy pattern. Large fairy rings can expand several feet per year. The fungi accumulate nutrients as they grow through the soil, then when it is time to reproduce, they send up the mushrooms or puffballs to produce spores. So, every mushroom or puffball you see in the ring is all part of the same fairy ring organism. Although, not all mushrooms are from fairy ring fungi. There are many mushrooms that

grow on decaying wood or other materials, and they are not associated with fairy rings.

Conditions

Fairy rings tend to come and go. The mushrooms are most likely to appear after a rain. Type 2 rings sometime develop into Type 1 rings when the weather is hot and dry. Fairy ring fungi make the soil water-repellent (hydrophobic). This leads to locally dry conditions that are highly stressful for the turf. In addition, fairy rings can lead to accumulations of potentially toxic levels of ammonium. The low soil moisture can lead to a buildup of other salts. In putting greens, fairy rings are more common in sand-based greens and especially in newly constructed greens, but they can occur anywhere.

Management

Lawns and landscape

Fairy rings in taller-cut turf usually do not cause severe damage. If the mushrooms are a nuisance, they can be removed by mowing or raking. Some mushrooms are poisonous, so if children or pets are around removal is a good idea. If the green rings are a concern, a light application of nitrogen or iron could help mask the symptoms. Do not go over fertilize. Always keep in mind the best fertility



Type 1. Type 1 rings are the most serious, they lead to dead turf. Sometimes they have mushrooms or puffballs.



Type 2 (example 1). All Type 2 rings have a ring of dark green, stimulated growth. Some Type 2 rings have fungal structures (mushrooms or puffballs).



Type 2 (example 2). Some Type 2 rings do not have mushrooms, only a ring or arc of green, stimulated turf.

practices for the species of turf at the site. If the fairy ring becomes severe (Type 1), core aerification and watering can help move water to the hydrophobic areas around the roots. Affected areas can be physically removed by trenching out the affected areas, but this is time-consuming.

Golf courses

Cultural practices and fungicides can alleviate damage from fairy rings. Providing adequate water and fertilizer may prevent fairy rings, as fairy rings tend to be worse on “lean” turf. There are several fungicides labeled for fairy ring. See the table below. There are a couple of factors to remember:

1) *Water rates:* In recent fungicide studies, higher water application rates (for example, 4 gallons per 1,000 square feet) have performed better than lower water rates (2 gallons per 1,000 square feet). Always follow label instructions.



Type 3. Type 3 rings show no change in the growth of the turf. There is only a ring or arc of fungal structures.

- 2) *Surfactants:* In several recent studies, the use of a surfactant/wetting agent with the fungicide has significantly increased the performance of the fungicide. In fact, in some studies, a wetting agent alone has reduced symptoms. Always follow label instructions. The wetting agent Revolution at 6.0 fluid ounces per 1,000 square feet has been examined in several recent tests, and in many cases it increased the efficacy of the fungicide with which it was paired.
- 3) *Thatch:* In general, excessive thatch will hinder root growth, interfering with fungicides getting into the soil. So, manage thatch levels and organic matter.
- 4) *Fertility:* Fairy rings are more severe when turf is starved of nitrogen.
- 5) *Watering:* Hand watering (syringing) in damaged sites can help reduce turfgrass stress. A wetting agent may improve results.

Table 1. Fungicides Labeled for Fairy Ring

Active Ingredient	Fungicide Group	Efficacy Notes	Typical Interval (days)	Example Trade Names
azoxystrobin	Strobilurin/QoI	Good to excellent	28	Heritage
flutolanil	Carboximide	Good to excellent	21 to 28 preventative 30 curative	Prostar
hydrogen dioxide	Oxidizing agent	Limited data available	5 to 7	Zerotol
pyraclostrobin	Strobilurin/QoI	Good to excellent	28	Insignia
polyoxin D	Polyoxin	Good	7	Endorse ²
triadimefon	DMI ¹	Good to excellent	14 to 21	Bayleton ²
azoxystrobin + propiconazole	Strobilurin/QoI + DMI	Limited data available	28	Headway

¹DMI = sterol demethylation inhibitor
²Fairy ring is not listed on older labels of Bayleton or Endorse. These products did have a FIFRA Section 2ee recommendation. Newly revised, full Section 3 labels do include fairy ring.

Fungicides labeled for fairy rings

- Always check the label. It is the responsibility of the user to read, understand, and follow the label.
- Mention of a product does not imply endorsement, nor does lack of mention of a product imply non-endorsement.

References

Fungicide table modified with permission from *Chemical Control of Turfgrass Diseases 2008* by P. Vincelli and A.J. Powell, University of Kentucky

Compendium of Turfgrass Diseases, Third Edition. 2005. RW Smiley, PH Dernoeden, BB Clarke. APS Press

Treating fairy ring with fungicides, new soil surfactant. Golf Course Management, May 2007, pp 121-125. Fidanza MF, Wong FP, Martin B, McDonald S.

New insight on fairy ring. Golf Course Management March 2007 pp. 107-110. Fidanza MF

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned. Persons using such products assume responsibility for their use in accordance with current label directions of the manufacturer.

Publications from Kansas State University are available on the World Wide Web at: www.oznet.ksu.edu

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Megan Kennelly, *Fairy Rings in Turfgrass*, Kansas State University, December 2008.