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IN THIS ISSUE

- About Fairy Rings and Their Management
- Turfgrass Culture Under Tree Shade
- Another Insecticide Bites the Dust
- The Effects of Drought on Weed Control with Postemergence Herbicides
- Research Summary: Polystand Composition Succession of Cool-Season Turfgrass Communities
- JB Comments: Spring Turfgrass Cultural Strategies
- Ask Dr. Beard

About Fairy Rings and Their Management

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Fairy rings are commonly found in turf and pastures and may be caused by any one of 50 or more species of fungi. Fairy rings have been observed in areas where soil pH has ranged from 5.1–7.9. It is likely that fairy rings will occur under any soil condition that will support turfgrass growth. Nearly all of the commonly cultivated turfgrasses are known to be affected by fairy ring fungi. Fairy ring fungi belong to a group known as the basidiomycetes or “mushroom fungi.” These fungi can cause the formation of rings or arcs of dead or unthrifty turf, or rings of dark-green, luxuriantly growing grass. Fairy ring fungi primarily colonize thatch and organic matter in soil and generally do not directly attack turfgrass plants, however, some are weakly parasitic. **Fairy rings are classified into three types according to their effects on turf:**

Type 1: those that kill or badly damage plants; **Type 2:** those that stimulate grass, causing the formation of rings or arcs of dark-green turf; and **Type 3:** those that do not stimulate grass and cause no damage, but produce mushrooms or puffballs in rings.

The most destructive rings are of the Type 1 variety. Type 1 rings are very common, especially in lawns and golf courses situated on sites that previously had been pastures or woodlands. **Type 1 rings initially appear as circles or arcs of dark-green grass, but the dead zone generally does not appear until summer.** The most common fungi known to cause Type 1 fairy rings include *Agaricus* spp., *Calvata* spp., *Chlorophyllum* sp., *Clitocybe* spp., *Marasmius oreades*, *Lycoperdon* spp., *Scleroderma* sp., and *Tricholoma* spp. The fruiting body of most species is a typical mushroom with a cap and stem. The underside of the mushroom cap is composed of gills, upon which spores are produced. *Calvata* spp. and *Lycoperdon* spp. produce puffballs, which initially are white, fleshy, and egg-shaped. Puffballs turn brown as they age, and when they crack or are crushed they release large numbers of spores. The importance of spores in the spread of fairy ring fungi is unknown.

Type 1 rings are distinguished by three distinct zones: an inner lush zone where the grass is darker green and grows luxuriantly; a middle zone where the grass may be wilted or dead; and an outer zone in which the grass is stimulated and/or darker green. The distance from the inside of the inner zone to the outside of the outer zone may range from a few inches (3–6 cm) to 4 feet (1.2 m) wide. The darker green, stimulated zones are the result of the breakdown of organic matter, which releases nitrogen and results in more vigorous leaf growth. The outer green zone is caused by the breakdown of thatch and organic matter by the fairy ring fungus, which liberates nitrogen. The inner green zone develops in response to the release of nitrogen as bacteria degrade aging or dead mycelium of the fairy ring fungus produced in previous years. Mushrooms or puffballs generally are produced at the junction of the bare and outer green zone. Rings, how-

Continued on page 2