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—Howard Kaerwer, Director of Turf Research at Northrup King’s Research Center

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Howard Kaerwer and the Northrup King research team have devoted thirty years to developing new grasses and perfecting blends. The results are products such as Medalist 7 Brand, the rugged, dependable ryegrass blend that lets *you* control transition. And new grasses like Delray, with lower nitrogen requirements and better tillering than any other ryegrass on the market.

When Howard isn’t in the lab he’s on the links talking to superintendents, conducting field experiments and collecting new grass samples to bring back for testing.

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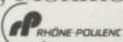


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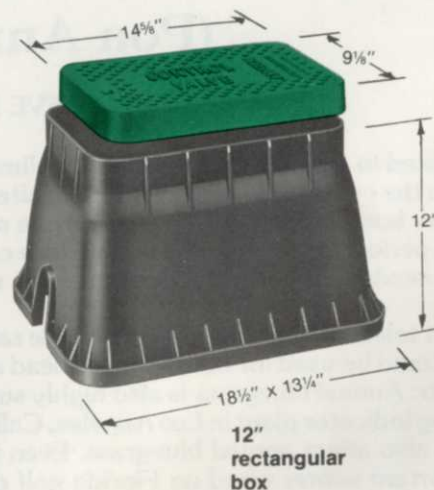
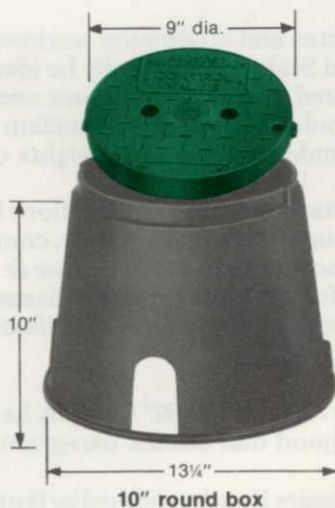


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## ANNUAL BLUEGRASS (*Poa Annua* L.)

By STEVE BATTEN

Annual bluegrass is adapted to a wide range of soils and climates and is common worldwide. So much so, that it can be cultured as a turfgrass in the cool humid regions of the United States. It can easily be identified among warm season or overseeded grasses by its boat-shaped leaf tip. A vigorous seed producer, a mature unmowed plant can produce 360 seeds over a four month period. Potentially the soil surface could contain up to 30 million seeds/acre. Annual bluegrass is capable of producing seeds on open pyramidal panicles under low mowing heights of  $\frac{1}{4}$  inch (6 cm).

Annual bluegrass will not tolerate high amounts of soluble salts or low pH. Observations by researchers suggested that acid-forming fertilizers could be used for control (seedhead suppression). However, control has been more successful with applications of sulfur. Annual bluegrass is also highly susceptible to smog (ozone & sulfur dioxide) damage. It has even been used as a smog indicator plant in Los Angeles, California. Most common diseases and insect pests that affect cool season turfgrasses also affect annual bluegrass. Even with all these susceptibilities, annual bluegrass is still the most economically important winter weed on Florida golf courses.

Declination of the root system at soil temperatures above 80 to 85° F (30-32° C) allow bermudagrass to gain the upper advantage in the spring. With a lack of heat tolerance, it is good that annual bluegrass is only seasonal in Florida. ■

(illustration from *Turf Management for Golf Courses*, Fall 1982, by James Beard, published by Burgess Publishing Co., Minneapolis, Minn., illustrated by Steve Batten)



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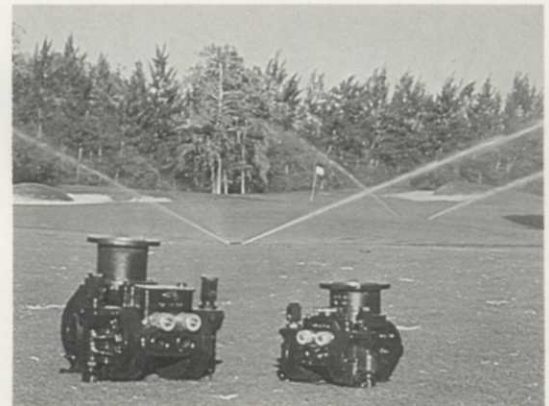
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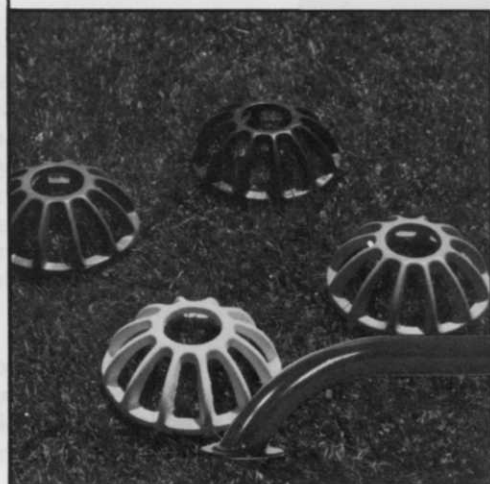
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# Watching Your Tees & Q's

by Steve Batten and Bud White  
United States Golf Association—Green Section  
Southeastern Region



## WHAT ARE THOSE YELLOW RINGS ON YOUR GREENS?

Did you ever have yellow rings mysteriously appear during the hot summer rainy season? When probing the soil, was the soil/organic matter layer near the surface brownish-red as opposed to dark brown outside the rings? Was the soil dry in the ring and application of wetting agents or fungicides have little effect? No, it's not a bacteria, but you might have had fairy ring.

To verify this, inspect the yellow ring for thumb nail size mushrooms. The mushrooms are small off-white puff ball types. This kind of fairy ring has been common this summer along the Florida East Coast from Miami to Cocoa Beach.

There are over 28 species of fungi which can cause fairy ring. Of course, most species in Florida do not kill the turfgrass, but some do when under the right cultural conditions. These conditions favor accumulation of thatch and soil organic matter, warmer summer temperature (above 85 degrees F daily highs), along with rain or excess irrigation.

Damage from fairy ring which kills the turfgrass results from fungi mycelium becoming so abundant in the soil, that penetration of water is inhibited and plants suffer from drought. Researchers have also suggested that some fairy ring fungi produce a soil toxin (hydrogen cyanide) that kills the grass roots.

Appearance of these rings which can number 20 or more per green usually starts in light yellow rings 10-30 inches (25-75 cm) in diameter. The turfgrass declines in several weeks, and dies after the ring has matured to its final size. Inside the ring is a band of dark green vigorously growing turfgrass which is the result of a natural nitrogen fertilization from microbial breakdown of soil humus. The advancing soil mycelium on the outer part of the ring can cause a similar plant nutrient uptake and appear as a lush green ring (see figure 1).

These two green rings surrounding the yellow turfgrass can make the rings most conspicuous, especially on low mowed bermudagrass greens. The fairy ring fungi which kills bermudagrass can also be found on tees, fairways, and roughs, but is of less economic importance.

## SUPPRESSION AND CONTROL OF FAIRY RING

Once the killing fairy ring has set up housekeeping on your greens, it can be very difficult to control. The best control is to work on cultural practices which will reduce soil organic matter. Aerification (coring) followed by a regularly scheduled spiking program can provide the oxygen necessary to speed up breakdown of thatch and dead root mass. Aerification also physically disrupts the fungi mycelium mass in the soil. Careful reduction in irrigation will prevent thatch build up and reduce water availability in the soil fungi.

Physical excavation is possible, but the labor is extremely expensive. Removal of the soil mycelium which can be as deep as the 12 inches (30 cm) of the greens soil mix can be tricky. Besides, there is no guarantee that the soil replacement is free of mycelium unless it is correctly fumigated.

Fumigation with methyl bromide or chloropicrin (teargas) can be successful at the time of green construction. Although this can be a drastic way to eliminate fairy ring fungi in an existing golf course green. Formaldehyde solutions (0.125-2 percent) have been investigated in New Zealand, Canada, and the United States, but with little success in fairy ring control due to the lack of complete soil sterilization.

Fungicides and soil wetting agents have been applied for control of fairy rings but also with little success. At present, there are no fungicides labeled in Florida for fairy ring.

Biological control of fairy ring has been suggested by researchers in Canada. This has been related to such phenomena as the less intense fairy ring fungi on the down hill side of slopes. A ground water intrapment in the center of the rings would encourage soil antagonistic fungi to reduce the fairy ring fungi. Similar observations have been made where two fairy rings cross and cancel each other, which could be due to fairy ring fungi being antagonistic to each other. In any event, soil microflora can have an effect on natural control.

Although literature on fairy ring has been cited in scientific papers from 1807 in Great Britain to 1982 from Japan, most references agree on cultural practice of the soil for control. So, if you get a case of the yellow rings on the greens, don't panic, just aerify, aerify, and aerify. ■