



Solution Sheet

Mini Ring (Leaf and Sheath Spot)

The Problem

Mini ring is a fungal disease caused by *Rhizoctonia zeae* that attacks the crown and sheath of bermudagrass. The pathogen can be active spring, summer and fall. Damage can appear as bronze patches a few inches to a few feet in size, but symptoms vary. The disease can rapidly appear on slow-growing bermudagrass in the summer or on bermudagrass that is going into dormancy in the fall. Mini ring symptoms were first reported in the late 1990s on Tifdwarf golf greens in South Carolina and Florida.

Mini ring has been documented on all ultra dwarf bermudagrass varieties commonly used for golf greens, including TifEagle, Champion and MiniVerde. Low nitrogen fertility creates plant stress, and the effects can be pronounced on shallow-rooted ultra dwarf bermudagrasses. The disease has also been reported on Tifdwarf and Tifgreen, two older bermudagrass varieties once commonly used for golf greens.

What To Look For

The frog-eye mini ring symptoms are most commonly seen in the late summer through fall. The mini ring symptom may actually be a result of earlier damage during late spring or early summer. Fall symptoms on bermudagrass are worrisome to a golf course superintendent as they can last through the winter on semi-dormant or dormant greens. In the lab, *R. zeae* is distinguished from other *Rhizoctonia* species by having numerous very small sclerotia when cultured on agar media. Increasingly, molecular methods are being used to help identify *R. zeae*.

The Solution

Cultural practices can be used to improve bermudagrass plant health and reduce risk of mini ring.

Cultural practices to minimize mini ring include adequate nitrogen fertilization, especially spoon-feeding with urea since ammonium nitrate can enhance symptoms; promote rooting through summer aerification; avoid vertical mowing or aggressive cultivation during conducive weather; and limit use of thiophanate methyl which may increase symptoms.

Prevention of mini ring by fungicides is critical because any bermudagrass injury in the fall can last until the following spring. Also, curative applications are less effective in controlling mini ring. Preventative applications should begin in the spring, when maximum daytime temperatures are above 85°F, and continue until late summer/fall. Mini ring control recommendations include Densicor® and Mirage® Stressgard® to target *R. zeae*.

In summer, preventative applications of Signature™ XTRA Stressgard or Chipco® Signature plus a contact fungicide applied to prevent summer decline can improve plant health and reduce fall symptoms of *R. zeae*. Signature Brand Fungicides contain Stressgard, which mitigates stress by improving density and wear tolerance, as well as turfgrass color. Past research has shown Signature or Signature XTRA alone can improve turfgrass photosynthesis under low-light conditions in controlled studies (Huang and Liu, *International Turfgrass Society Research Journal*, 2009).

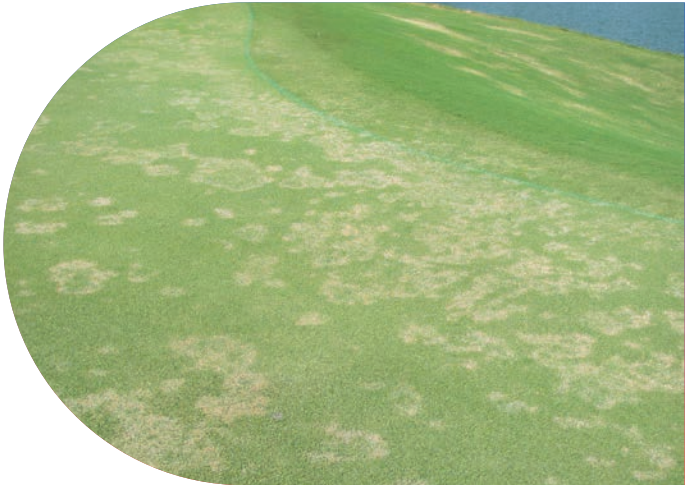
Leaf & Sheath Spot Solutions

Solution ¹	Rate (per 1,000 sq. ft.)	Application Interval ²
Densicor ^{®3}	0.196 fl. oz.	14 - 21 days
Mirage [®] Stressgard ^{®4}	1 fl. oz.	21 - 28 days

¹See fungicide labels for complete details. Always read and carefully follow label instructions. ²For specific interval information, refer to product labels. ³Do not exceed more than 0.588 fl. oz./1000 sq. ft./yr. or 25.6 fl. oz./A and not yet labeled for use in California. ⁴Do not use more than six applications of Mirage Stressgard or 6.5 fl. oz./1,000 sq. ft./year.



Mini ring damaging an ultra dwarf bermudagrass green with irregular-shaped patches and rings. (Dr. Bruce Martin, Clemson University)



Mini ring can cause a range of symptoms on bermudagrass greens. Distinct mini rings appear to have a darker green patch interior. (Dr. Bruce Martin, Clemson University)



Mini ring can cause a range of symptoms on bermudagrass greens. Mini ring symptoms appear yellow to orange in color. (Dr. Bruce Martin, Clemson University)



Darkened leaf sheaths and stolons caused by *Rhizoctonia zeae* infection of ultra dwarf bermudagrass. (Envu)