



## Necrotic Ring Spot: *Ophiosphaerella* (syn= *Leptosphaeria*) *korrae*

### Introduction

Kentucky bluegrass (*Poa pratensis*), annual bluegrass (*Poa annua*), fescues (*Festuca* spp.), and bentgrasses (*Agrostis* spp.) can decline during the summer due to an interaction of environmental factors and a root and/or crown rot caused by the fungus *Leptosphaeria korrae*. The high level of difficulty involved in clinical evaluations of *Leptosphaeria korrae*, *Magnaporthe poae*, and related fungi, and the extreme ease of isolation of decomposer fungi such as *Fusarium* spp. caused this disease and another disease known as [Summer Patch](#) to be grouped together into a disease complex previously known as Fusarium Blight. Eventually, the organisms involved were better distinguished and separated into the diseases now known as Summer Patch, caused by *Magnaporthe poae* and Necrotic Ring Spot, cause by *Leptosphaeria korrae*. The latter disease is described in greater detail here.

### Symptoms and Signs

Symptoms are usually first noticed in late spring and early autumn but can be observed throughout the growing season. It can be difficult to diagnose this disease by symptoms alone during the early stages. The disease begins as scattered light green patches 5 to 10 cm in diameter. These patches may then grow as large as 1 meter in diameter, and turn dull-tan to reddish-brown. The most diagnostic of these larger patches in the lawn may exhibit a "frog-eye" pattern. In frog-eyes an apparently healthy green patch of grass is partially or completely surrounded by a ring of dead grass. Distinct streaks, crescents, and circular patterns are found in the affected lawn area.

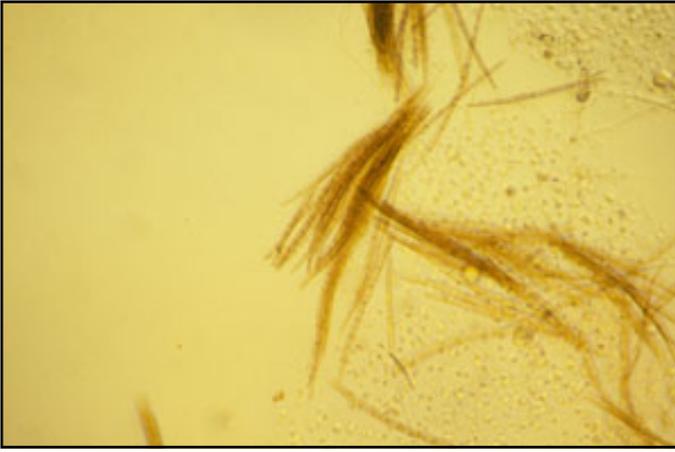
Necrotic Ring Spot may occur throughout the growing season but tends to be worse during the cooler parts of the year (April/May - Sept/Oct). If Necrotic Ring Spot continues through the summer months, it may cause a rot where the crown and roots become blackened and dark mycelium may be viewed on infected parts. Leaf lesions are often, but not always, associated with this disease. If present, they are variable in size, shape, and color. They usually extend across the blade and are yellowish, dull-tan, or reddish-brown. Many other fungal diseases can also cause leaf lesions. Microscopic examination is often necessary to determine the cause of the problem.



Figure 1: *Pseudothecia* on fescue roots (provided by Dr. Eric B. Nelson, Cornell University)

### Disease Cycle

The fungus survives unfavorable conditions as dormant mycelium or sclerotia in infected plants and plant debris. The fungus infects plants, and symptoms usually develop in spring. Symptoms may begin to fade as the season progresses and summer



**Figure 2: Ascospores of *Leptosphaeria korrae*** (provided by Dr. Eric B. Nelson, Cornell University)

temperatures rise above 86°F and the fungus become dormant. However, as summer heat increases symptoms may again become apparent as the stress on the turf increases, even though the fungus may not be active. Symptoms may also reappear as the fungus becomes active again in early autumn. The pathogen may be spread through infected turf and mechanical equipment.

## Management Strategies

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Various stresses may contribute to the development of this disease or may increase the severity of symptoms. These include the presence of excessive thatch, nutrient imbalances, or excessive nitrogen fertilizer applications or incorrect timing of fertilizer applications that stimulate rapid growth. Low mowing height, soil compaction, and low soil pH may also contribute to disease development, while a high turf canopy temperature may increase symptoms on stressed plants. Many of these stresses can be reduced through appropriate cultural practices as described below.

Correct excess soil acidity by liming annually to maintain a pH above 6.2. For most bluegrass lawns, two to five lbs. of nitrogen/1000 sq. ft. is sufficient, but if you do not typically fertilize, it is important to get your soil tested to obtain a specific recommendation for your site. Apply a fertilizer balanced by phosphorus and potassium. Do not apply even small amounts of fertilizer during the June through August stress period. Fertilize only in autumn (September through November) and in late spring

(May), and use a slow release fertilizer to allow Nitrogen to be released over a longer period time.

Although deep watering is essential for proper root growth, frequent irrigation is not usually recommended. In this case however, it may be helpful under certain circumstances. To minimize drought stress, water the soil under disease-prone areas to a depth of 15 to 20 cm every 7-10 days during dry periods in the summer. Soaker hoses are very useful for supplemental watering of steeper slopes where other sprinklers are inefficient. During periods of excessively high temperature, plants with injured root and crown tissue may be under increased stress so frequent application, i.e. a light sprinkling of the surface at mid-day, may help to minimize the harmful effects of excessive temperature on the stressed turf.

Proneness to disease in turf is increased as the cutting height is decreased. Cut lawns at 6 to 9 cm height, and do so often enough that less than 1/3 of the leaf blade is removed during each mowing.

Thatch (the layer of organic matter between the mineral soil and the green grass) should be no more than 2 cm in thickness. Thatch can be removed by vertical slicing machines and/or aeration during the spring and early fall. Over a longer period thatch will be reduced by using the other cultural practices discussed above.

Kentucky bluegrass cultivars such as *Adelphi*, *America*, *Aspen*, *Columbia*, *Eclipse*, *Glade*, *Midnight*, *Nassau*, *Parade*, *Ram I*, *Sydsport*, *Touchdown*, *Vantage*, *Windsor*, and *Victa* have been determined to be less susceptible to Necrotic Ring Spot than others. Blend seed of a resistant cultivar with that of one or more otherwise desirable cultivars. Blending 10-15% (by weight) of perennial ryegrass seed into bluegrass seed will prevent this disease from occurring. Ryegrass can also be seeded into existing lawns.

Chemical treatment is efficient only when the previously mentioned cultural practices were first used. Furthermore, applications must be made before the crown rot develops sufficiently to cause visual symptoms of the disease. For homeowners in New York, several fungicides may be registered to aid in

disease management. For a list of some products that may help to manage this issue please see our [turf fungicide table](#). Be certain any formulation of pesticide you purchase is registered for the intended use, and follow the label instructions. The label also contains information on how to apply the fungicide as well as any precautions.

Thoroughly water areas with a history of this disease (applying 2 to 3 cm of water) several days before applying the fungicide, and then follow label directions. Additional pesticides may be available for commercial turf applications. Commercial applications should refer to the appropriate pest management guidelines, or contact their local Cooperative Extension Office for more information on currently registered products.

**Reference:**

*Compendium of Turfgrass Diseases*, Third Edition, 2005. R.W. Smiley, P.H. Dernoeden and B.B. Clarke. APS Press.

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**READ THE LABEL BEFORE APPLYING ANY PESTICIDE!** Changes in pesticide regulations occur constantly. All pesticides distributed, sold, and/or applied in New York State must be registered with the New York State Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to the appropriate Cornell Cooperative Extension Specialist or your regional DEC office.

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