

# Necrotic Ring Spot

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## INTRODUCTION

Necrotic ring spot is caused by a root-infecting fungus (*Ophiosphaerella korrae*) that affects Kentucky bluegrass and annual bluegrass. Although it is not often a devastating disease that kills large areas of turf, moderate to severe outbreaks will disturb the appearance of the turf stand and may adversely affect playing surfaces. Golf greens with mixed annual bluegrass and creeping bentgrass may appear mottled in appearance. Necrotic ring spot often is considered a disease of relatively young (3 to 10 years) turfgrass stands, but disease development on older turf is not unusual.

## SYMPTOMS

Initial outbreaks of the disease normally occur during cool, wet weather in spring or fall months. Symptoms first appear as small (~6" in diameter) clustered patches of gray-tan colored turf. Because it is a root disease, initial above ground symptoms include die-back from the leaf tips followed by collapse of the leaf and decline of the entire plant. Infected roots appear stunted and necrotic when compared to healthy roots. Microscopic inspection of affected roots will reveal the presence of numerous runner hyphae. Over several years, patches enlarge and turf that was not killed at the initial outbreak site will recover, giving the affected turf what is known as a 'frog eye' symptom.

## CAUSAL AGENT

The pathogen survives as mycelium in dead and decaying root tissues. It is spread with the transport of soil with infected roots, primarily through maintenance operations such as core aeration. Infection occurs during cool wet periods of temperatures between 60 and 75F. However,



symptoms may continue to be expressed during summer months, as plants with infection-impaired root systems suffer from drought stress. The expression of necrotic ring spot symptoms in summer often leads to confusion of this disease with summer patch.

## MANAGEMENT

Cultural practices are targeted towards minimizing the effects of necrotic ring spot infection. Management practices that promote deep rooting during spring and fall will help reduce the extent of necrotic ring spot symptom expression. Also, the effects of infection will be reduced with practices that are designed to relieve summer stresses associated with compaction, drought, and nitrogen deficiency. These include implementing a balanced nitrogen fertilizer program (preferably with slow-release sources of N), redirecting traffic when possible, and judicious use of irrigation. The use of deep and infrequent irrigation and or syringing as part of a program to reduce the effects of summer stress is favored.

Effective chemical control of necrotic ring spot involves the timely application of systemic fungicide during the spring months. Preferred fungicides include Banner MAXX<sup>®</sup>, Chipco 26019<sup>®</sup>, Cleary's 3336<sup>®</sup>, Eagle<sup>®</sup>, and Rubigan<sup>®</sup>. In situations where annual bluegrass is considered a desirable species, the use of Rubigan should be avoided. Sprays should be applied when environmental conditions favor growth of the pathogen. This includes soil temperatures at a 2 to 3" depth between 60 and 70F. Since fungicides need to reach the roots in order to be effective, practices that facilitate delivery of the fungicide to the rhizosphere may improved fungicide performance. These include irrigation pre and post-application irrigation and even aeration prior to fungicide application.



Adapted from BP-116-W, Richard Latin, Purdue University

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