



Necrotic Ring Spot



This is a serious disease that is especially common on high maintenance lawns. Necrotic Ring Spot is caused by *Leptosphaeria korrae*, a fungus which is most active in spring and fall, although symptoms may be observed throughout the season. Initial symptoms are patches 6-24 inches in diameter with a mixture of normal, straw- and red-colored blades around the outer portion of the ring, resulting in a "frog-eye" pattern. The roots and crowns of affected plants are covered with black strands of the Necrotic Ring Spot fungus. Thatch may decompose in the patch areas, giving them a sunken or depressed appearance. In warm weather, the red blades are seldom seen. Plants affected in the cooler weather of spring and fall are weakened and very susceptible to summer heat and drought stress. This stress may lead to the death of weakened plants and an apparent resurgence of symptoms, even though the fungus may not be active at this time.

Necrotic ring spot often appears two to three years after lawn establishment, although in some cases the disease may not develop for a decade or more. Initially light green to straw colored patches from several inches to several feet in diameter develop in the lawn. The patches may be localized to one part of the yard or widely scattered. As the disease progresses, patches develop more of a doughnut or frog eye pattern. The ring becomes matted and crater-like whereas the grass inside the ring remains healthy and green. Rings may eventually unite to create larger arcs of dead turf. Symptoms may persist through the growing season and increase in size and severity in successive years.

The major host of Necrotic Ring Spot is Kentucky bluegrass, but this disease is known to occur on fine fescues and annual bluegrass. This fungus also can cause diseases on warm season grasses such as spring dead spot on Bermuda grass. The conditions associated with severe outbreaks of disease including the following: compacted soils, frequent irrigation, heavy thatch, and conditions which impair root growth. Although the fungus is most active in the spring, with a second round of infection in the fall, the disease is not seen until the roots are under water stress, and often the disease is not seen until at least a year after initial infection. The life cycle of this organism is as follows:

SPRING: spores or mycelium in thatch/root zone infect roots, symptoms appear 12 to 18 months later

SUMMER: summer heat & dry conditions stop fungal growth, but dead rings more prominent with drought stress

FALL: cool and moist conditions allow fungus to resume growth and infect more turf roots

WINTER: fungus survives in roots and lower crowns, and on dead plant tissues

Control Measures

Once Necrotic Ring Spot is established, it is difficult to control and damage may remain or reappear yearly for 2-4 years. Control requires a combination of management practices including: thatch control, adjustment of fertilizer practices, relieving soil compaction, changing watering practices, and possible use of a fungicide.



Cultural Control

Necrotic ringspot tends to be more severe in lawns established from sod and on sites with compacted soils. Excessive irrigation and fertilization may also exacerbate the disease. Follow these cultural practices:

1. Core aerate the lawn at least once a year (spring or fall) to help reduce thatch buildup and improve soil drainage.
2. Do not overwater. Water the lawn to a depth of 6 to 8 inches as infrequently as possible without creating water stress.
3. Maintain a mowing height of 3.0 to 3.5 inches.
4. Avoid excessive amounts of nitrogen fertilizer (more than 4 lb N/ 1000 square feet). Follow the recommended application times for Kentucky bluegrass. Consider the use of slow-release formulations of nitrogen. This allows for more uniform release of nitrogen through the growing season and avoids 'bursts' of growth following fertilizer application.
5. If NRS develops, water the grass lightly at midday during periods of high temperatures. This will help cool the turfgrass and may prevent additional turfgrass death.

Chemical Control

Timing of fungicide applications is critical for disease control. Products must be applied in spring before root colonization by the fungus occurs. Fungicides are usually applied by professional lawn care companies. Make the first application in May when soil temperatures reach 65 degrees F at a depth of 2 inches. Consider making a second application in 30 to 60 days to maximize disease control. Lightly water the fungicide into the turf (less than ¼ inch) but do not drench the lawn. Fungicide applications only suppress disease development; they do not eradicate the NRS fungus. Therefore applications over several years may be necessary to manage NRS on severely damaged lawns.

Necrotic ringspot (NRS) is the most destructive disease of Kentucky bluegrass. The disease also damages red fescue and annual bluegrass. Necrotic ringspot is particularly damaging to bluegrass because it is a perennial problem and the fungus attacks and kills the roots and crowns. Recovery from a disease outbreak is often very slow.

Fact sheet information obtained from the Colorado State University Extension Office



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