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G1507

Summer Patch and Necrotic Ring Spot Diseases of Turfgrass

John E. Watkins, Extension Plant Pathologist

This NebGuide describes the causes, predisposing conditions, and symptoms of summer patch and necrotic ring spot, and provides recommendations for their control.

Two of the most destructive turfgrass patch diseases are summer patch and necrotic ring spot, both of which are present in Nebraska. The symptoms of necrotic ring spot and summer patch are essentially identical, making it difficult to distinguish the two apart in an affected turf. If the symptoms begin in May, necrotic ring spot is probably the cause; if they begin in July and August, then summer patch is suspect. In Nebraska summer patch is probably the most common of the two diseases.

Necrotic Ring Spot

Cause and Hosts

The fungus, *Ophiosphaerella korrae*, causes necrotic ring spot. This fungus survives in soil, and infects the crowns, roots and rhizomes of grass plants. Hosts are Kentucky bluegrass, red fescue and annual bluegrass. There are some references to necrotic ring spot occurring on creeping bentgrass, but it is not considered a serious disease of this host. Severe damage

most frequently occurs on Kentucky bluegrass turfs in the third or fourth year following sodding.

Disease Occurrence and Predisposing Conditions

Necrotic ring spot commonly occurs in May and June following cool, wet weather. The onset of warm weather in summer slows disease development, but symptoms may reappear during heat and drought stress. The disease occurs in more acid-type soils and is more acute in compacted sites. On non-compacted soils, the roots may actually outgrow the infection. Dense turf with heavy thatch tends to be more prone to infection since the pathogen reproduces on old stems and rhizomes.

Symptoms

Symptoms of necrotic ring spot are visually indistinguishable from those of summer patch. Affected turf shows 6- to 12-inch circular patches of straw-colored plants (*Figure 1*). In turfs with a heavy thatch, deteriorating plants collapse creating doughnut-shaped depressions and giving the affected area a pockmarked look (*Figure 2*). Many of the patches have a small tuft of healthy grass in the center creating a ring or frog-eye appearance (*Figure 3*). Infection spreads outward until some of the patches coalesce, produc-



Figure 1. Patch symptoms of summer patch or necrotic ring spot (G. Worf, University of Wisconsin).



Figure 2. Pockmarked depressions caused by summer patch or necrotic ring spot (G. Worf, University of Wisconsin).



Figure 3. "Frog-eye" pattern.

ing a large blighted area. Plants growing in sites where the disease occurred the previous year often break dormancy late and appear stunted.

Plants at the edges of the patches are easily pulled as roots, rhizomes and crowns are progressively infected. These tissues are dark brown (Figure 4) in comparison to the tan color of healthy tissues. Stripping back leaf sheaths reveals brown to black lesions on the crowns. Infected rhizomes and roots are similarly discolored. Microscopic examination reveals thread-like fungal hypha growing over infected roots and rhizomes.

Summer Patch

Cause and Hosts

Summer patch is caused by the soil-borne fungus *Magnaporthe poae* and is now one of the most serious diseases confronting homeowners and turf managers. This fungus is commonly associated with grasslands. In turf sites it occurs on Kentucky bluegrass, annual bluegrass and fine-leaved fescues. Research has shown that infection occurs when soil temperatures at a 2-inch depth reach 65°F. In Nebraska this corresponds to mid to late May.

Disease Occurrence and Predisposing Conditions

Summer patch occurs on turf stands three years or older from late June through September during periods of sustained high temperatures accompanied or followed by heavy rainfall or irrigation. Symptoms may disappear during cool periods in July or August, but reappear again with the recurrence of hot, dry weather. The fungus is most active in turfs irrigated by frequent rains or waterings. Plants with infected roots progressively decline with sustained high summer temperatures.

Although not normally associated with golf greens, the disease can occur on the margins of a green and on the annual bluegrass in the green itself.

Certain environmental, site, or cultural conditions enhance the development of symptoms. These include heavy thatch; low mowing in mid-summer; unbalanced fertility; a light, frequent watering schedule; compaction; sites exposed to heat; steep slopes; and poorly adapted grass varieties.

Symptoms

There are no distinctive leaf lesions associated with summer patch, although leaves may show white bands. Affected turfs initially show scattered patches of bluish-green



Figure 4. Healthy and infected plant roots (R. Smiley, Oregon State University).

wilted plants, which usually are not detected until infected plants begin to die. The pathogen tends to grow outward from the original infection site, producing the patch symptoms.

The patches are roughly circular, crescent-shaped, or have serpentine patterns (Figure 1). Whereas, younger patches vary in diameter and in the number of dead tillers, older patches often appear as 12- to 15-inch rings of dead grass around tufts of healthy grass (Figure 3). This effect is referred to as the frog-eye pattern. The dead grass is straw-colored and matted, giving the turf a crater-like appearance very similar to that of necrotic ring spot. Roots and crowns of affected plants are dark brown to black (Figure 4).

On golf greens with high populations of annual bluegrass, summer patch produces small yellow to reddish brown, circular patches. The patches may increase in diameter, coalesce and damage large areas of the green.

Cultural Management Practices for Necrotic Ring Spot and Summer Patch

- May 1-15: Aerify to improve soil conditions and reduce thatch. Spring aerification is more effective than fall aerification.
- June - October:
 - Apply 1/2 lb nitrogen per 1000 square feet per month in June, July and September using slow release nitrogen to promote root development and recovery from disease.
 - Do not fertilize in August.
 - Apply 3 lb nitrogen per 1000 square feet as a dormant application in late October.
 - Avoid excessive irrigation or drought stress. Usually 1 to 1.5 inches of water per week is sufficient.
 - Use a light frequent irrigation during dry periods to reduce heat stress and maintain moisture in the root profile.
 - Raise mowing height in summer.
- August:
 - Aerify in late August and then overseed with a mixture of perennial ryegrass and an improved Kentucky bluegrass

blend or, if damage is severe, renovate the turf area and seed with tall fescue.

Preventive Fungicide Programs for Summer Patch and Necrotic Ring Spot

Necrotic Ring Spot

- April 15-30: Apply fungicide to areas with a history of necrotic ring spot.
- May 15-30: Repeat the fungicide application 30 days after the first application.
- Products reported to provide fair to excellent control of necrotic ring spot include:

Commercial Products

azoxystrobin: Heritage
fenarimol: Rubigan
iprodione: Chipco 26GT
myclobutanil: Eagle
propiconazole: Banner MAXX
thiophanate methyl: Cleary's 3336, Fungo, Cavalier
chlorothalonil + fenaminol: TwoSome Flowable Fungicide

Home Lawn Products

thiophanate methyl: ferti•lome Halt Systemic, Dragon Systemic Fungicide 3336WP

Summer Patch

- April 20 - May 1: Begin preventive fungicide treatments when soil temperature at a 2-inch depth in mid afternoon reaches 65°F for five consecutive days.
- May 20 - June 1: Repeat the fungicide application 30 days after the first application.
- For curative fungicide treatments during the growing season, use Banner MAXX or Heritage. These are not as effective as the preventive treatments.
- Products reported to provide fair to excellent control of summer patch include:

Commercial Products

azoxystrobin: Heritage
fenarimol: Rubigan
fludioxonil: Medallion

myclobutanil: Eagle
propiconazole: Banner MAXX
thiophanate methyl: Cleary's 3336, Fungo, Cavalier
tridimefon: Bayleton, Lesco Granular Turf Fungicide, Accost
trifloxystrobin: Compass

Home Lawn Products

thiophanate methyl: Green Light Fung-Away II Systemic Lawn Fungicide, ferti•lome Halt Systemic, Dragon Systemic Fungicide 3336 WP
triadimefon: Green Light Fung-Away Systemic Fungicide, Bonide Lawn Fungicide with Bayleton

Fungicide Application Procedures for Summer Patch and Necrotic Ring Spot

For wettable powders, emulsifiable concentrates, flowables or dry flowables apply in at least 5 gallons water per 1000 square feet, or wash fungicides off of the leaves and into the root zone with a light irrigation (1/8-1/4 inch).

Apply granular products when the turf is dry, then irrigate with 1/2 inch of water. Fungicides do not completely kill the causal fungi, so a yearly repeat application is often necessary on turfs prone to either necrotic ring spot or summer patch.

Disclaimer

Fungicides listed represent the best information available. No criticism is intended of products not listed, nor is endorsement by the University of Nebraska given to those listed. Read and follow all product label directions for mixing and application.

File under: PLANT DISEASES

F-15, Turf

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