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### G90-970 Summer Patch and Necrotic Ring Spot

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# Summer Patch and Necrotic Ring Spot

## Diseases of Turfgrass

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

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- [Summer Patch](#)
- [Necrotic Ring Spot](#)

Research since 1980 has resulted in considerable progress in identifying causes of the "patch"-type disease of turfgrass. Two of the most destructive patch diseases of turfgrasses are summer patch and necrotic ring spot.

Both summer patch and necrotic ring spot are present in Nebraska turfs. Unfortunately, necrotic ring spot and summer patch cause identical symptoms and cannot be distinguished in the field, and identification in the laboratory is time-consuming (3-6 months) and laborious.

### Summer Patch

#### Cause

Summer patch is caused by the soil-borne fungus *Magnaporthe poae*. This fungus is commonly associated with grasslands. It grows best between 80 and 85° F and infects the roots of grass plants, causing them to wilt during periods of moisture stress.

#### Disease Occurrence and Predisposing Conditions

Summer patch occurs in Nebraska from mid-June through September. Symptoms may disappear during cool periods in July or August, but reappear again with the recurrence of hot weather. Summer patch usually breaks out during hot, dry weather following a wet period. The fungus is most active in turfs irrigated by frequent rains or waterings. Plants with infected roots become sicker and may die in subsequent droughts, especially if it is also hot.

The pathogen is common in most turfs, and 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**

Affected turfs initially show scattered patches of bluish-green, wilted plants, which are usually not detected until infected plants begin to die. The pathogen tends to grow outward from the original infection site, producing the patch symptoms.



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

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 one- to two-foot rings of dead grass around tufts of apparently healthy grass. This effect is sometimes referred to as the "frog-eye" pattern. The dead grass is straw-colored and matted, giving the affected turf a pockmarked appearance.

Plants with crown and root rot are stunted, and infected crowns and roots appear dark brown in contrast to the white color of healthy crowns and roots.

**Prescription of Healthy Turf**

On established turfs the most important control is to eliminate stresses that favor disease development. The key is to avoid management practices that promote rapid top growth at the expense of root production.

Cultural practices integrated with fungicide treatment successfully control summer patch.

**Cultural Practices**

- Avoid heavy early spring and summer nitrogen fertilization.
- Develop a fall fertilization program supplemented with a light (1/2-rate) mid-summer fertilization, if necessary.
- Water deeply and infrequently when grass begins to dry out.
- Syringe heat-exposed turf during mid-day in July and August.
- Aerate in early fall or mid-spring.
- Remove thatch by aeration, vertical mowing, or power raking.
- Increase mowing height to 3 inches during July and August.
- Properly prepare seedbed to be sodded or reseeded.
- Yearly over-seed with improved cultivars.

**Cultivars (Varieties)**

Use a three-way blend of locally adapted turfgrass cultivars.

<b>Kentucky Bluegrass Cultivars</b>			
Adelphi	Cheri	Gnome	Nassau
America	Classic	Haga	Parade
Aspen	Columbia	Huntsville	Ram I

Baron	Coventry	Julia	Rugby
Bensun	Dawn	Liberty	Sydsport
Birka	Destiny	Majestic	Touchdown
Bristol	Eclipse	Merit	True Blue
Bronco	Freedom	Midnight	Trenton
Challenger	Georgetown	Monopoly	Vantage
Chateau	Glade	Mystic	Victa
<b>Perennial Ryegrass Cultivars</b>			
All Star	Dasher	Jazz	Pennfine
Barry	Dasher II	Loretta	Prelude
Belle	Delray	Manhattan II	Regency
Birdie II	Derby	NK-200	Regal
Blazer	Diplomat	Omega II	Repell
Blazer II	Elka	Ovation	Rodeo
Citation II	Fiesta	Palmer	Tara
Commander	Fiesta II	Patriot	Vintage 2DF
Cowboy	Gator	Pennant	Yorktown II
<b>Fine Fescue Cultivars</b>			
	Aurora (Hard)	Reliant (Hard)	
	Banner (Chewings)	Ruby (Creeping)	
	Bighorn	Scaldis (Hard)	
	Biljart	Shadow (Chewings)	
	Dawson (Creeping)	Spartan (Hard)	
	Jamestown (Chewings)	Victory (Chewings)	
	Koket (Chewings)	Waldina (Hard)	

The list of improved turfgrasses is considered tentative because screening tests and procedures to identify resistant cultivars are limited. These cultivars are adapted to Nebraska, but must be managed properly if severe summer patch injury is to be avoided.

### Fungicides

Chemical control is most effective when fungicides are applied as preventative rather than curative treatments. In Nebraska, make the first application **no later than early May**, and repeat as necessary. Treatment after mid-August is usually not needed.

Common Name	Some Trade Names	Application
Benomyl*	Benomyl, Tersan 1991, Lebanon Fungicide Type-B	Drench
Fenarimol	Rubigan	Foliar

Iprodione	Chipco 26019	Foliar
Propiconazole	Banner	Foliar
Thiophanate-ethyl	Cleary 3336	Drench
Thiophanate-methyl	Fungo 50	Drench
Triadimefon	Bayleton, Pro-Turf Fungicide 7	Foliar
*Research has shown that soil drenching with a tank mix of benomyl and thiram, mancozeb, or chlorothalonil provides effective curative control.		

## Necrotic Ring Spot

### Cause

The fungus *Leptosphaeria korrae* causes necrotic ring spot. This fungus survives in soil, and infects the crowns and roots of grass plants.

### Disease Occurrence and Predisposing Conditions

The name necrotic ring spot originally was given to a patch disease occurring in Wisconsin. It was found in Nebraska in 1985. Much less is known about its distribution in Nebraska and the conditions that predispose turf to infection than is known about summer patch.

Necrotic ring spot commonly occurs when wet weather is followed by hot, dry periods. The range of temperature and moisture conditions at which this disease develops is much broader than that for summer patch, so disease outbreaks can occur from mid-spring through late fall.

Kentucky bluegrass is the primary host, but necrotic ring spot has occurred on red fescue lawns and *Poa annua*. Dense turf with heavy thatch tends to be more prone to infection. In Nebraska, patches of necrotic ring spot have been seen during May in association with Ascochyta blight in some turf areas. Symptoms of both diseases seem to subside by early summer.

### Symptoms

Symptoms of necrotic ring spot visually are indistinguishable from those of summer patch. Identification of the two diseases by culturing the causal fungi takes 3 to 6 months and is not a simple procedure. Affected turf shows 6- to 12-inch circular patches of straw-colored plants. Deteriorating plants within the patches create doughnut-shaped depressions and give the affected area a pockmarked look (*Figure 2*). Many of the patches have a small tuft of healthy grass in the center.



**Figure 2. Doughnut-shaped depression caused by summer patch.**

(Photo: J. Watson, University of Nebraska) Disease development may briefly subside during summer, and then flare up again. Infection spreads outward until some of the patches coalesce, producing a large blighted area.

Plants at the edges of the patches may appear stunted, unthrifty, and off-color. This is due to infection and deterioration of roots and crowns as the disease progresses outward. Stripping back leaf sheaths reveals brown to black lesions on the crowns. Infected rhizomes and roots are similarly discolored.

### Prescription for Healthy Turf

## Cultural Practices

Cultural practices recommended for summer patch improve general turf health and also help prevent necrotic ring spot.

## Cultivars (Varieties)

Kentucky bluegrass, bentgrass, bermudagrass, and fine-leaf fescues screened for reaction to necrotic ring spot were all highly susceptible. At this point, no cultivars of these turf species can be suggested to suppress necrotic ring spot. Perennial ryegrass and tall fescue appear to have high levels of tolerance to this disease.

## Fungicides

If patch-like symptoms, some with the "frog-eye" pattern, appear in May or early June, the disease is more likely to be necrotic ring spot rather than summer patch. A preventative fungicide program on these lawns needs to be initiated **no later than mid-April**.

Some lawns may respond rapidly to fungicide application, others more slowly, and some do not respond at all. Since fungicide treatments are costly, use them wisely in a total turf health program, as opposed to rescue treatments.

Common Name	Some Trade Names	Application
Benomyl	Benomyl, Tersan 1991, Lebanon Fungicide Type B	Drench
Fenarimol	Rubigan	Foliar
Iprodione	Chipco 26019	Foliar
Propiconazole	Banner	Foliar

Benomyl, fenarimol, propiconazole, and iprodione also are recommended for control of summer patch. Where diagnosis is uncertain either of these four fungicides will control both necrotic ring spot and summer patch. Use the rates suggested for Fusarium blight on the product label.

The lists of fungicides for control of summer patch or necrotic ring spot represent the best information available. No criticism is intended of fungicides not listed, nor is endorsement given by the University of Nebraska to those listed. Before applying a fungicide, always read and follow all label directions.

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