UNIVERSITY OF ILLINOIS EXTENSION
College of Agricultural, Consumer and Environmental Sciences

report on
PLANT
DISEASE

RPD No. 413
May 1986

DEPARTMENT OF CROP SCIENCES
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

RED THREAD AND PINK PATCH OF TURFGRASSES

RED THREAD

Red thread is caused by the fungus *Laetisaria fuciformis* (formerly called *Corticium fuciforme*). In Illinois, this disease is of chief concern when it attacks the grass blades and leaf sheaths of fine-leaf fescues (red and chewings), Kentucky and annual bluegrasses, perennial ryegrass, and bentgrasses during cool, damp weather in the spring and fall. Fine-leaved fescues and perennial ryegrasses are very susceptible. Velvet bentgrass cultivars are more susceptible than colonial and creeping bents. Other grasses that are susceptible include bermudagrass, redtop, sheep fescue, tall fescue, hard fescue, velvetgrass, zoysiagrasses, and quackgrass. Although red thread rarely kills turfgrass plants outright, it does weaken them and contributes to their decline and death from subsequent stress diseases.

Figure 1. Red thread infecting South Dakota Common Kentucky bluegrass. Note the fungus mycelia binding the leaf blades together.

Red thread is an important disease, especially on slow-growing, nitrogen-deficient turf in the cooler and more humid areas of the Northeast, Pacific Northwest, and in the Midwest during excessively moist weather in the spring and autumn. Red thread has even been found growing under the snow. The disease is favored by slow-growing, nitrogen-deficient turfgrass, excess thatch, low calcium levels in the soil, water stress, a sudden drop in temperature, misused herbicides, and exhibits weakening from attack by other pathogens.

Symptoms

The *Laetisaria* fungus forms conspicuous, pale to bright coral pink, orange, or red mycelial masses on the grass blades and leaf sheaths. In moisture-saturated air, the gelatinous mycelial masses may completely cover the leaves, being bound by a delicate pinkish web of mycelia that also mats the blades and leaf sheaths together (Figure 1). The gelatinous masses, usually 1/16 to 1/4 inch long, are formed by strands of branched hyphae. They often protrude from the tips of grass blades and leaf sheaths as pointed and sometimes as branched, antler-like appendages (Figure 2). The bright coral-pink to blood-red mycelial mats harden and become threadlike (red threads) and brittle when they dry, and function as sclerotia.

Further information concerning Turf Diseases can be obtained by contacting Nancy R. Pataky, Extension Specialist and Director of the Plant Clinic, Department of Crop Sciences, University of Illinois at Urbana-Champaign.

Initially, small patches of infected blades and leaf sheaths appear to be partially or completely water-soaked. They shrivel and die rapidly and fade to a bleached tan when dry. Death usually progresses from the leaf tip downward. Where infection is severe, diseased turf is bleached tan, yellowed, or "scorched" in roughly circular- to irregular-shaped patches, varying from an inch to more than 1 feet in diameter. Dead leaves are generally interspersed with apparently healthy leaves, giving diseased turf a scorched and ragged appearance (Figure 3). The spots may be scattered within a turf area, or a number of patches may merge to form large, irregular areas of blighted turfgrass with a reddish-brown or tan cast. Only the leaves and sheaths are infected.

Figure 2. Close-up of the branched gelatinous masses of the red thread fungus. The mycelial mats harden and become blood-red "threads" (courtesy of R.W. Smiley).

Disease Cycle

The *Laetisaria* fungus survives from season to season as threads of dried, dormant mycelium on the leaves and in the debris of previously infected plants. The fungus is disseminated to healthy turf areas by bits of red threads and microscopic spores (arthroconidia and basidiospores) and as dormant mycelium in infected leaf tissue. Spreading occurs by splashing or flowing water and by wind, shoes, mowers, and other turfgrass equipment. Infection and disease development are favored by air temperatures of 60° to 75°F (15° to 24°C) coupled with prolonged periods of overcast weather, light rains, heavy dews, fog, and moisture-saturated air. The red threads and dormant mycelia resume growth, and hyphae penetrate unwounded leaves through stomates or cut tips when free moisture exists on leaf surfaces and the proper temperature becomes suitable for disease development. The infection quickly spreads throughout the leaf tissues. Water-soaked leaf spots are evident 24 to 48 hours after penetration has taken place. The pinkish mycelial masses can be seen within another day or two. The fungus may be spread rapidly from plant to plant by cobwebby, pinkish mycelial growth from the gelatinous masses on infected leaves.

Figure 3. Red thread in red fescue turf (courtesy of D.H. Scott).

Growth and disease development essentially stop below 33° and above 86°F (1° to 30°C). However, the causal fungus can survive extremes in temperature. Mycelial growth in infected leaves or from mycelial mats continues when conditions are again favorable.

Control

Cultural Practices

1. Maintain adequate and balanced soil fertility, based on soil test reports and the recommended turfgrass-fertilization program for your area and the grasses grown there. Red thread is most severe

where potassium, phosphorus, calcium, and especially nitrogen are deficient. Avoid overstimulation from fertilizer, particularly fertilizer with a water-soluble, high-nitrogen source.

2. Where red thread has been a problem in the past, maintain a soil reaction (pH) between 6.5 and 7.0. Test the soil pH, and treat the soil accordingly if practical.

3. Increase light penetration, air movement, and rapid drying of the grass surface by pruning or selectively removing dense trees and shrubs that border the turf. When landscaping, space plantings properly to avoid excess shade and allow for adequate air movement.

4. Avoid overwatering and frequent sprinkling in the late afternoon or evening. During summer or early fall drought periods, water established turf thoroughly early in the day so that the grass surface can dry before night. Water infrequently and deeply, moistening the soil at each watering to a depth of 6 inches or more.

5. Provide for good soil drainage when establishing a new turfgrass area.

6. Remove excess thatch, preferably in late summer or early fall, when it accumulates to 1/2 inch. Use a “vertical mower”, “power rake”, or similar equipment. This equipment can be rented at many large garden supply or tool rental stores.

7. Mow frequently at the height recommended for the area and for the grasses grown there. Mow upright grasses, such as Kentucky bluegrass, ryegrasses, and fescues, at 1½ to 2 inches in spring and fall; 2½ to 3 inches in the summer. Creeping grasses, such as bentgrass and bermudagrass, may be mowed to 1/2 inch or less. Remove no more than one-fourth to one-third of the leaf surface at one cutting.

8. Collect the clippings during periods when the grass is growing slowly and the disease is active. This may reduce the number of red threads that eventually fall back into the turf.

9. Improved perennial ryegrasses reported as being resistant to red thread include Birdie II, Citation II, Linn, Pennant, Pippin, Premier, and Tara.

   Blazer, Caprice, Manhattan, Ovation, and NK-200 are very susceptible. The following perennial ryegrasses lie somewhere in between: Acclaim, All-Star, Barry, Birdie, Cittion, Cupido, Cowboy, Cockade, Dasher, Delray, Derby, Diplomat, Eaton, Elda, Ensporta, Epic, Fiesta, Game, Manhattan II, Omega, Palmer, Pelo, Prelude, Ranger, Regal, Repell, Yorktown, and Yorktown II.

   Some fine-leaf fescue cultivars that are resistant or moderately resistant to red thread include Atlanta, Aurora, Bighorn, Biljart, Dawson, Epsom, Flyer, Golfrood, Reliant, Scaldis, Shadow, Spartan, Valda, Waldina, Weekend, and Wintergreen. Susceptible fine-leaf fescues are Boreal, Ceres, Commodore, Ensylva, and Ruby. Hard fescues are often overseeded where red thread is a serious problem.

   Somewhat resistant Kentucky bluegrass cultivars resistant to red thread and other diseases are listed in Table 1. Other resistant Kentucky bluegrasses include Adelphi, Admiral, Aspen, Banff, Barblue, Bonnieblue, Bono, Bristol, Classic, Dormie, Eclipse, Haga, Harmony, Holiday, Merit, Midnight, Mona, Mosa, Nassau, Ram I, Trenton, and Welcome. Susceptible Kentucky bluegrasses include Apart, Argyle, A-34 or Bensun, Glade, Kenblue, Mystic, South Dakota common or certified, and Sydsport.

Fungicide Applications

Where red thread has been troublesome, apply a suggested fungicide at 7- to 21-day intervals during moist weather in the spring and fall, when daytime temperatures average between 65° and 75°F (18° to 24°C). Begin spray applications when the disease is first evident. For the most effective control, uniformly spray 1,000 square feet of turf with 5 to 10 gallons of water that contain only one of the fungicides listed for red thread in the current edition of Illinois Homeowner's Guide to Pest Management.

PINK PATCH

Pink patch, formerly thought to be a form of red thread and caused by the fungus *Limonomyces roseipellis*, is a minor disease of frequently mowed grass. Apparently, the disease is restricted to perennial rygrass, Kentucky bluegrass, creeping red and chewings fescues, creeping bentgrass, bermudagrass, and zoysiagrass. Pink patch is much more severe on either unmowed or infrequently mowed grasses that are grown under low nitrogen fertilization than it is on highly maintained turfgrasses.

Figure 4. Pink patch infecting creeping bentgrass. Patches are two to six inches across (courtesy of P.H. Dernoeden).

Symptoms

Although patches generally remain green, diseased turf may have a tannish cast. Affected areas are irregularly shaped in coarse-textured turf, but distinct pinkish patches, two to six inches across, occur in creeping bentgrass (Figure 4). The disease occurs in spring and autumn during prolonged periods of heavy dews, light rains, and fog on turfs with inadequate nitrogen fertility. Small, irregularly-shaped areas of turf become covered with a pink to reddish film of mycelium that tends to form first along the leaf margins. Later, the entire width of the leaf blade is covered. Only leaves and sheaths are infected, and diseased leaves die from the tip downward.

There are three key diagnostic characteristics that are used to separate pink patch and rd thread: the red threads and arthroconidia are not produced by the pink patch fungus, and hyphae of the Limonomyces fungus have clamp connections whereas the hyphae of the red thread fungus do not.

Disease Cycle

The disease cycle of pink patch is similar to that of red thread, except for the absence of arthroconidia and red threads.

Control

Control measures are usually not necessary on mowed turfs. Mow frequently at the recommended height of cut for the grass or grasses that are grown. Fertilize on the basis of soil test recommendations, as outlined for the control of red threads.

Table 1. Modern Kentucky Bluegrass Cultivars Adapted to Illinois and Reported to be Moderately to Highly Resistant (R)[a] to one or More Diseases

Kentucky Bluegrass Cultivars	"Helminthosporium" diseases	Leaf smuts	Leaf and stem rust	Summer patch & necrotic ringspot	Sclerotinia dollar spot	Typhula blight	Septoria leaf spot	Red thread
A-20	R	R	R	R	R		(b)	R
A-34 (Bensun)	R	R	R	R				
Adelphi	R	R	R	R	R	R	R	R
Baron	R	R	R	R	R	R		R
Bonnieblue	R	R	R	R	R	R		R
Brunswick	R	R	R	R	R			
Cheri	R	R	R	R	R		R	
Enmundi	R		R	R	R			R
Enoble	R							
Fylking	R	R	R				R	
Geronimo	R				R			R
Glade		R	R	R		R		
Majestic	R	R	R	R	R		R	R
Monopoly	R	R		R		R		R
Nugget	R	R	R			R	R	R
Parade	R	R	R	R	R		R	
Plush	R	R	R		R			R
Rugby	R	R	R	R	R			
Sydsport	R	R	R		R		R	
Touchdown	R	R		R			R	R
Vantage		R		R	R			
Victa	R	R	R	R				R

a A resistant (R) rating does not mean that a particular cultivar will be resistant in all locations every year. Due to the presence of physiological races or strains of the various fungi that cause these diseases, a cultivar may be susceptible in one locality and highly resistant in another. This is especially true of powdery mildew and is the reason we omitted this disease from our ratings.

b A blank under a given disease does not necessarily indicate susceptibility. In some cases it means that no data are available on which to evaluate the relative susceptibility or resistance to a particular disease.