

Common Diseases of Turfgrass in Utah



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Plant Disease Diagnostician

Types of Turf

- Cool-season grasses
 - Optimal growth 60-75°F
 - Not adapted to high temperature and drought
 - Bentgrasses (*Agrostis*), fescues (*Festuca*), ryegrass (*Lolium*), bluegrasses (*Poa*)
- Warm-season grasses
 - Optimal growth 75-95°F
 - Not adapted for prolonged or severe cold
 - Grama (*Bouteloua*), buffalograss (*Buchloe*), bermudagrasses (*Cynodon*), zoysiagrasses (*Zoysia*)
- Numerous diseases affect turf

Common Turf Diseases

- Snow mold
 - Pink snow mold
 - Gray snow mold
- Take-all patch
- Necrotic ring spot

Snow Molds

- Psychrophilic, cold-loving
- Attack plants under a layer of snow
- Two common snow molds
 - Pink snow mold (*Microdochium nivale*)
 - Gray snow mold (*Typhula incarnata* and *T. ishikariensis*)
- Almost all grass species are susceptible to both types

Pink Snow Mold Symptoms

- Circular patches after cool, wet weather
- Orange-brown to dark reddish-brown to light gray or tan
 - More commonly patches are dull white color
- White or light pink mycelium at edges
- “frog-eye” symptom possible



Pink Snow Mold Symptoms

- Patches will have bleached color and can be confused with symptoms of gray snow mold
- Small clusters of pink spores on leaf surface



Pink Snow Mold Disease Cycle

- Pathogen survives in infected plants and debris
- Mycelia will begin growing
 - Grows slowly allowing infected turf to be undetected
- Once weather becomes wet, overcast with cooler temperatures, pathogen spreads very rapidly



Pink Snow Mold Disease Cycle

- Sunny, dry conditions will dry out the turf and pathogen will be inactive
- Snow cover not a requirement for pink snow mold
- Spreads slowly when humidity is low or little moisture is present on surface
- Spreads rapidly in turf growing slowly and has thick layer of thatch
- Also favored by poor drainage and long, matted leaves

Pink Snow Mold Resistance

- All grass species are susceptible, but some less susceptible than others
- Annual bluegrass most susceptible
- Bentgrasses very susceptible
 - Colonial bentgrass more susceptible than creeping bentgrass or velvet bentgrass
- Kentucky bluegrass, perennial ryegrass, red fescue more resistant than other varieties

Pink Snow Mold Management

- Avoid applying nitrogen fertilizers late
- Do not leave grass uncut at end of season
 - Last cut can be much closer
- Avoid extreme thatch buildup
- Prevent large snowdrifts from forming
- Rapid drying and warming will lessen disease severity
- Remove snow to promote better drainage
- Remove mycelial crust by raking
- Maintain low soil pH and balanced soil fertility



Pink Snow Mold Control

- Fungicide not recommended for homeowner use
- Apply approximately two weeks before first snowfall
- Fungicides with ingredients such as quintozone, fludioxanil, iprodione, strobilurins



Gray Snow Mold Symptoms

- Light yellow, straw-colored turf
- Leaves matted down with white to gray mycelium growth
- Mycelia dry as grass dries turning leaves gray or silver
- May be ring of gray or white mycelia around edges
- Only leaves are killed, crown not affected



Gray Snow Mold Symptoms

- Production of sclerotia characteristic
 - Formed on leaves
 - Can be pink, white, amber when young
 - Darken to reddish-brown, dark brown, or black



Gray Snow Mold Disease Cycle

- Survives as sclerotia during summer
- Germinates in fall
- Sclerotia fall into thatch layer as leaves decompose in the spring
 - Appears in same areas year after year
- Severe disease occurs with persistent snow cover
- Most severe on unfrozen turf under snow or heavy mulch



Gray Snow Mold Disease Cycle

- Deep snow particularly favorable for disease
 - Unfrozen soil, humidity levels, matted leaves
 - Allows more time for pathogen to be active



Gray Snow Mold Management

- Avoid applying nitrogen fertilizers late
- Do not leave grass uncut at end of season
 - Last cut can be much closer
- Avoid extreme thatch buildup
- Prevent large snowdrifts from forming
- Rapid drying and warming will lessen disease severity
- Remove snow to promote better drainage
- Remove mycelial crust by raking

Gray Snow Mold Control

- Fungicides not recommended for homeowner use
- More effective when applied in fall
- Apply fungicide that is absorbed and translocated by plant in fall before leaf growth stops
- Combine contact fungicide with penetrant fungicide (iprodione, fludioxanil, etc.)
- Fungicides must be chosen carefully
 - Two different fungal species
 - Fungicide effectiveness will be different

Gray Snow Mold Resistance

- All species are susceptible, some less than others
- Bentgrasses and annual bluegrass most susceptible
- Kentucky bluegrass less susceptible, but differs with cultivar
 - Cultivars with some resistance: Adelphi, Baron, Glade, Monopoly
 - Cultivars very susceptible: Fylking, Merion, Nugget, Pennstar
- Fescues (red fescues) and perennial ryegrasses more resistant than Kentucky bluegrass and bentgrasses

Take-All Patch

- Fungal disease caused by *Gaeumannomyces graminis*
- Primarily affects roots
- Major disease of cool-season turf
 - Affects bentgrasses, fescues and bluegrass species
- One of many fungi that cause patch diseases
- Seems to be most severe in areas recently disturbed areas
 - Decrease in diversity of soil microorganisms

Take-All Symptoms

- Root infection occurs in spring and fall; aboveground symptoms visible in summer
- Begin as small, circular patches
 - Light brown or reddish brown
- Symptoms look very similar to Microdochium patch (*Microdochium nivale*)
- Patches reddish brown or bronze when actively developing



Take-All Symptoms

- “Frog-eye” symptom possible
- Symptoms noticeable in hot, dry weather
- Dark mycelial strands colonize root
 - Parallel to root axis
- Roots develop dark brown streaks internally
- Stolons, rhizomes, roots, shoot bases turn dark brown to black



Take-All Symptoms

- Brittle roots in warm, dry weather allow plants to be easily pulled from soil
- Perithecia develop in late fall on culms



Take-All Disease Cycle

- Survives as perithecia and mycelium
- Ascospores inside perithecia penetrate root hairs and epidermal cells
- Runner hyphae colonize root surface and produce simple hyphopodia and infection cushions
- Penetration of root cells achieved by hyphopodia
- Dark brown streaks in vascular tissue as fungal hyphae builds up

Take-All Disease Cycle

- Spread by direct contact between plants
 - Spread underground growing along root surfaces and rhizomes
- Long distance spread
 - Moving infested soil or plant material
 - Contaminated equipment



Take-All Management

- Recovery is slow
- Plant a mixture of grasses
- Soil pH around 5.5 to 6.0 may reduce disease severity
 - Utah soils are alkaline (high pH)
 - Requires ongoing applications of management practices (acidifying fertilizers)
- Maintain balanced fertilization program
 - Manganese, potassium, phosphorus deficiencies

Take-All Management

- Supplement any nutrients in fall or spring
- Restricting root growth increases disease severity
 - Avoid excessive irrigation and nitrogen applications
 - Provide adequate drainage
 - Aerate turf when symptoms are absent



Take-All Prevention

- Effectively clean equipment before working with healthy plants
- Fungicides are available, but are only effective as a preventative measure
 - Applications in fall and early spring most effective
 - Triazoles (Eagle, Banner Maxx), azoxystrobins (Heritage), fluoxastrobin (Disarm)

Take-All Resistance

- All species of *Agrostis* (bentgrasses) are susceptible, but some cultivars have moderate resistance
- Kentucky bluegrass and creeping red fescue are highly resistant



Necrotic Ring Spot

- Fungal disease (*Ophiosphaerella korrae*)
- Primarily affects roots
- Many cool-season turf species affected
 - Kentucky and annual bluegrass, tall fescue
- Symptoms easily confused with other diseases
- Causes a patch disease

Necrotic Ring Spot Symptoms

- Patches develop in cool, wet weather
 - Small light green areas
- Leaves turn reddish-brown to bronze to light straw color
- “frog-eye” symptom
 - Sunken depressions occur when turf dies
- No leaf lesions
- Roots, crowns, lower stems turn black or brown due to fungal hyphae



Necrotic Ring Spot Symptoms

- Infected roots become rotted
- Pseudothecia present in crowns or roots
- More severe in sod and areas with compacted soil
 - Symptoms appear 2-3 years after establishment of turf



Necrotic Ring Spot Disease Cycle

- Survives in plant debris
- Moves by growing on roots and rhizomes
- Hyphae colonize roots
- Injection hyphae enter root and infect inside
 - Decrease in water and nutrient uptake predisposing plant to other injuries



Necrotic Ring Spot Disease Cycle

- Roots, rhizomes, leaf sheaths, crowns infected in spring or fall
- Patches may fade with higher temperatures
- Patches may reappear under drought or heat stress
- Recovery from this disease is slow



Necrotic Ring Spot Management

- Use management practices that reduce stress
- Water deeply and infrequently
 - In presence of NRS, water more frequently
 - Light applications applied daily in hot weather



Necrotic Ring Spot Management

- Prevent over-watering
- Core-aeration to minimize soil compaction
- Avoid nutrient deficiencies
- Maintain balanced fertilization program
 - Nitrogen, Phosphorus, Potassium
- Slow-release fertilizers reduce severity
 - More uniform release of nutrients

Necrotic Ring Spot Resistance

- No varieties of Kentucky bluegrass that offer complete resistance
 - More tolerant: Adelphi, Eclipse, Midnight, Majestic
 - Somewhat resistant: Monte Carlo, Baron, Unique, Voyager, Beyond
- Plant mixtures of grass species or cultivars
- Perennial ryegrass reported to be immune

Necrotic Ring Spot Prevention

- Severely infected plants pulled easily from soil
- Clean equipment before working with healthy turf
- Preventive fungicide application may suppress development
 - Timing is essential
- Apply in the spring before pathogen begins colonization



Necrotic Ring Spot Prevention

- Chemicals labeled for NRS
 - Thiophanate methyl,
iprodione, propiconazole,
azoxystrobin
- Research has shown control of NRS with fungicides has been erratic



General Disease Management

- Practice good cultural techniques
 - Avoid excessive thatch buildup
 - Promote good drainage
 - Balanced soil fertility
 - Don't apply fertilizer late in season
 - Low soil pH
 - Core-aeration