

Warm-season DISEASE CONTROL

Fungal diseases in turf pose significant problems and have economic importance. Before beginning your warm-season disease control program, review the following list of the various symptoms.

By JANELL STEVENS JOHNK, PH.D.

Diseases play a major role in determining the success or failure of turfgrass. Early recognition and proper identification are essential for successful disease management.

Proper variety selection, fertilization, site maintenance, and cultural practices reduce disease pressure and increase the effectiveness of pesticide applications. Pesticides alone cannot control most diseases. No amount of pesticide controls plant disease if good cultural practices aren't in place.

Too often, a single disease is dealt with, while a single plant species or cultivar may be attacked by many diseases throughout its growing season. Before accepting recommendations of cultivars, cultural practices, and pesticides, consider the impact these recommendations could have on other diseases occurring throughout the season.

Symptoms, factors, strategies

Fungal diseases are the most significant turfgrass diseases and have economic importance due to the threat they pose to large areas of turfgrass.

The following list of turfgrass diseases outlines symptoms, environmental factors favoring disease and management strategies for the most common southern turfgrass diseases.



Dollar spot: most severe in hybrid bermudagrass, above, and zoysia.

Brown Patch

(*Rhizoctonia solani*)

In cool-season grasses, brown patch primarily causes a blight, or dieback, of the leaf tip. In warm-season grasses, brown patch fungus attacks the base of the leaf sheath. On closely-mowed turf, patches are roughly circular. And under high humidity, a "smoke ring" of water-soaked dark leaves and fungal mycelium may be present around the outer margin of the diseased area. On higher-mowed turf, smoke rings usually aren't present and patches often have irregular rather than circular shapes.

Brown patch is a common summer disease of cool-season turf, yet it occurs during transition periods in warm-season turfgrasses. Extensive damage can occur during cool, wet periods prior to winter dormancy or breaking spring dormancy. Brown patch infection takes place long before symptoms are evident. Carefully time preventive fungicides.

Management strategies

- 1) Use minimal nitrogen applications since nitrogen increases susceptibility.
- 2) Improve soil drainage.
- 3) Deep, infrequent irrigation.

- 4) Drag, pole, or mow early in the morning to speed leaf drying and reduce disease activity.

Dollar Spot

(*Sclerotinia homoeocarpa*)

Dollar spot is most severe on bermudagrass and zoysiagrass. It appears as small, circular, straw-colored spots about the size of a silver dollar. On grasses maintained at higher mowing heights, patches are larger and irregularly shaped. Grass blades die from the tip back and have straw-colored spots shaped like hourglasses with distinctive reddish-brown to purplish margins.

Dollar spot occurs when it is warm and humid. Nitrogen-deficient turf has more severe damage, especially if the turf is drought stressed before high humidities or rains occur. Several fungicides control dollar spot, but don't rely only on sterol inhibitors which can lead to resistance.

Management strategies

- 1) Avoid drought stress by irrigating deeply during early morning hours so foliage dries quickly.
- 2) Maintain balanced fertility.

Gray leaf spot

(*Pyricularia grisea*)

Leaf spots first appear on St.

Augustinegrass as tiny brown spots with purplish margins. As spots enlarge, they become diamond shaped. Lesions may completely consume leaves and girdle stolons resulting in a scorched appearance. Gray leaf spot occurs during hot humid weather. It is more severe in newly-established turf and in shady locations with poor air circulation.

Management strategies:

- 1) Irrigate early in the morning to allow foliage to dry quickly.
- 2) Avoid excessive nitrogen applications during hot, humid weather.

Rust

(*Puccinia spp.*)

Rust infects zoysiagrass and overseeded ryegrass. From a distance, affected turf has a yellowish to reddish-brown appearance. Red, black, orange, or yellow pustules are found on diseased leaves. Rust damages poorly-nourished turf or turf grown under low mowing

heights. Prolonged periods of overcast weather or shaded environments favor disease. Generally, rust-affected turf needs no treatment and can be effectively maintained with good cultural practices.

Management strategies

- 1) Maintain balanced fertility.
- 2) Deep, infrequent irrigation.
- 3) Increase mowing height and frequency.

Helminthosporium complex; Leaf spot / melting out

(*Bipolaris sorokiniana*, *Exerohilum rostrata*)

Bipolaris sorokiniana causes leaf spots and crown and root rots of bermudagrass and zoysiagrass. In spring and fall, distinctive purplish-brown spots with tan centers appear on older leaves. During warm, wet weather the spots increase in size to encompass the entire width of the blade, causing a dieback from the tip. Disease progresses to

crown and root rots during the summer. "Melting out," spots with purplish margins can be seen on the stolons.

Exerohilum rostrata causes a leaf spot on St. Augustinegrass and bermudagrass. However, these diseases are rarely severe and can be managed culturally.

Management strategies

- 1) Use resistant varieties.
- 2) Mow frequently at proper heights to reduce leaf spot phase.
- 3) Avoid high nitrogen fertilization.
- 4) These fungi produce many spores when thatch is frequently wet; irrigate deeply, infrequently.

Pythium-cottony blight, grease spot, crown and root rot

(*Pythium spp.*)

While more of a problem on cool-season grasses, *Pythium* spp. also may cause root rots in warm season grasses. Root-infecting *Pythium* spp. generally are more severe in shaded areas, low spots or near surface water where air circulation is poor. Root rots occur during or following long cool periods when soils are excessively wet.

Management strategies:

- 1) Irrigate early in the day to avoid moist foliage at night.
- 2) Improve drainage and increase air circulation.
- 3) Fungicides generally are not used in lawn care for *Pythium* blight control. However, they are considered necessary in golf course management. To avoid the build-up of fungicide resistant fungi, rotate fungicides and apply in tank-mix combinations whenever feasible.

Spring dead spot

(*Leptosphaeria spp.*, *Gaeumannomyces graminis* var. *graminis*, *Ophiosphaerella herpotricha*)

Spring dead spot occurs on bermudagrass grown in transition zones. Hybrid bermudas are more susceptible than other types. The longer the period of winter dormancy and the colder the temperature, the more damage spring dead spot can cause. Circular patches of bleached, dead grass appear as the turf breaks dormancy in the spring.

Patches may range from a few inches to several feet in diameter. Turf is sunken in affected areas. Patches may reappear and expand over the years.

Management strategies

- 1) Avoid excess nitrogen applications, especially in the fall just prior to dormancy.
- 2) Manage thatch and promote vigorous root growth.
- 3) Few fungicides are labeled for this disease and may be of limited use in certain states.

Take-all Root Rot (Patch)

(*Gaeumannomyces spp.*)

Most warm-season grasses are susceptible to take-all root rot, sometimes called bermudagrass decline which is generally active during the rainy season. However, symptoms often don't appear until the affected turf experiences stress; high temperatures, dry weather.

Patches are irregularly shaped and plants in affected areas have short, rotted root systems. Plants are easily pulled or lifted from the ground. Nodes and stolons become infected and show a brownish discoloration and rotting.

Management strategies

- 1) Improve drainage.
- 2) Prevent thatch build-up.
- 3) Avoid overwatering.
- 4) Maintain balanced fertility.
- 5) Preventive fungicide applications may slow disease development.

Fairy rings

(caused by various soil-inhabiting fungi)

Fairy rings are caused by many fungi that grow in thatch and soil. They may appear as circles or arcs of dark green, fast-growing grass. Nutrients are released as fungi consume dead organic matter. Fairy rings also may appear as circles or arcs of dead grass. The massive build-up of fungal mycelium forms a hydrophobic barrier preventing water infiltration. This causes the turf to suffer from drought stress. Fairy rings may persist and increase in size over many years.

Fairy rings are difficult to control due to the impermeability of infected soil. The fungi grow deeply in the soil, making chemical control generally ineffective. Symptom sup-

Briefs from academia

University of Rhode Island: Bridget Ruemmele, K. Field and S. Legare have tested golf shoes with metal or plastic spikes, textured soles and alternative spikes in replicated plots on silt loam and modified sand bentgrass greens. Volunteers walked each of four designated patterns up to 48 repetitions each per plot per day. Significant differences among golf shoe treatments for many evaluation criteria were observed.

Michigan State University: Studies on nitrogen injections into turf using the Toro HydroJect water injection aerifier on fairways and putting greens have been conducted by Drs. Karcher and Rieke since 1994. Nitrogen was applied on seven dates during the growing season at 24-day intervals. Plots injected with urea had consistently higher clipping yields, nitrogen content in leaf tissue and color ratings than when urea was surface applied. In 1995, ammonium nitrate was used as the N source, with very similar results. Therefore, suggest Karcher and Rieke, it is likely that factors other than ammonia volatilization increase nitrogen efficiency when applications are made via injection.

University of Florida: Drs. Al Dudeck, Jerry Sartain, J.L. Cisar and L.E. Trenholm have studied bermudagrass responses to nitrogen and potassium during establishment. "FloraDwarf" and "Tifdwarf" varieties were evaluated. Nitrogen consistently increased growth. However response to potassium differed by cultivar and season. Greater K response occurred in the fall study, reports the research team. □

pression is the most practical management approach.

Management strategies

- 1) Core aeration, deep watering, and proper fertilization make symptoms less obvious.
- 2) Use wetting agents to improve water infiltration.
- 3) Remove soil to a depth of 18 inches and replace with fresh soil or use a soil fumigant to sterilize the soil.

Nematodes

Nematodes are microscopic unsegmented roundworms. A small group of nematodes can damage turfgrasses. They feed on turfgrasses by puncturing plant cells with a hollow, tube-like structure, and then injecting enzymes into the cells. Nematodes can damage turfgrasses by themselves, or in conjunction with an infectious fungus.

Above-ground symptoms of nematode damage include:

- ▶ wilting under moderate

moisture stress;

- ▶ slow recovery of wilted turf after rain or irrigation;

- ▶ thinning or gradual decline of turf.

Because nematodes are not distributed evenly in soils, damage rarely appears in uniform areas. Roots damaged by nematodes are usually short and dark colored, with few lateral or 'feeder' roots. They may be rotted because of secondary fungal activity. Sometimes the root tip is swollen. The damaged root system will not hold soil together when a core or plug is lifted.

Management strategies

- 1) Use clean seed or sod and topdressing soil.
- 2) Clean equipment of all dirt, especially when moving from an area infested with nematodes.



Rust in a zoysiagrass lawn. The disease thrives in under-nourished turf.

- 3) Irrigate more frequently to compensate for reduced root systems.

- 4) Nematicides reduce nematode numbers but don't completely eradicate them from the soil. **LM**

The author is extension plant pathologist, Texas A&M University at Dallas. Watch for her article on disease control in warm-season ornamentals in the June LM. Photos by Janell Johnk.



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