

DIAGNOSING COMMON LAWN AND ATHLETIC FIELD DISEASES



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Most turfgrass diseases are caused by pathogenic fungi that invade the leaves, stems or roots of plants, causing symptoms such as leaf spots, blighting, loss of stand density, root rot, or death of entire plants. Sometimes these fungi produce structures such as mushrooms, white powdery mildew or a fluffy, moldy growth. These fungi are present in most if not all soils.

Disease, however, generally occurs when environmental conditions favor growth of the fungus or other pathogens at a time when stress or other factors increase susceptibility of the turf. Turfgrass management and cultural practices such as mowing, irrigation, fertilization, thatch, traffic, soil pH and soil compaction alter the environment, and therefore have a major impact on the development of turf disease. The relationship between the environment, turf species, and pathogens are key factors in the development of diseases as well as their diagnosis and control.

Mowing helps to spread pathogens and favors infection by creating wounds through which a pathogen may easily enter the plant. The height of cut and frequency of mowing are major factors affecting disease susceptibility. Close and frequent mowing predisposes turf to most diseases, especially leaf spot and melting-out, rust, powdery mildew, smuts, dollar spot and summer patch diseases. The continuous removal of the youngest, most photosynthetically productive tissues when mowing below recommended heights causes depletion of food reserves in the grass plant. These reserves are needed for active disease resistance processes in plants and also are utilized by the plant to recover from injury.

Timing, duration and frequency of irrigation may greatly affect disease intensity. Light and frequent irrigations discourage root development, promote pathogen activity, and predispose turf to injury from environmental stresses such as heat and drought. Drought stress intensifies leaf spot and melting-out, stripe smut, summer patch, dollar spot, and fairy rings.

Excessive irrigation also restricts root development, promotes soil compaction, and encourages disease. Turfgrasses grown under wet conditions develop succulent tissues and thinner cell walls that are more easily penetrated by pathogens or are damaged by traffic. Algae and mosses thrive in waterlogged soils, particularly where turf is mowed low or where stand density is poor.

It is best to irrigate deeply to wet the root zone on an infrequent basis. Morning irrigation, when leaf drying occurs quickly, helps to minimize the intensity of Pythium blight, brown patch and other diseases.



Appearance of summer patch disease in Kentucky bluegrass in late summer. The orange-tinted leaves at the edges of dead patches, and 'frog-eyes' are typical.

KEY POINTS

Watch for environmental conditions that may promote turfgrass disease.

Traffic and frequent low mowing can be extremely damaging to turf.

Don't use nitrogen fertilizer excessively (especially in spring) because it can reduce turf disease resistance.

Identify the symptoms of disease and make appropriate treatments promptly.

Consult TT-38 for turfgrass disease control recommendations.



< **Brown patch** symptoms on tall fescue leaves. Note irregular chocolate-brown lesions with dark brown margins.

Dollar spot symptoms on Kentucky bluegrass. Note 'hourglass' shaped lesions with bleached centers and tip dieback >



The use of appropriate soil fertilization programs improves the vigor of plants and their ability to resist disease. Excessive use of nitrogen can encourage leaf spot, brown patch, summer patch, Pythium blight, and powdery mildew. Furthermore, excessive use of nitrogen promotes tissue succulence, reduces environmental stress tolerance, and encourages shoot growth at the expense of root growth.

Conversely, turfgrasses grown in nutrient poor soils are more prone to dollar spot, red thread and rust diseases, and do not recover rapidly from stress injury. It is best to apply most nitrogen fertilizer in the autumn to cool-season grasses such as fescues, Kentucky bluegrass and perennial ryegrass. The use of more than modest amounts of nitrogen in the spring can encourage several destructive summer diseases. It is important to use a complete fertilizer (i.e., nitrogen + phosphorus + potassium) in autumn to fertilize cool-season grasses, and to monitor and adjust soil pH to the range of 6.0 to 6.5.

Many turfgrass pathogens survive as resting structures or as saprophytes (organisms living on dead organic matter) in thatch. Fungal pathogens produce enormous populations of spores and other propagules in thatch, particularly when the thatch is subjected to frequent wetting and drying. Stripe smut, leaf spot and melting-out, summer patch, and fairy ring are diseases favored by excessive thatch accumulation. Thatch layers exceeding 0.5 inches in depth should be controlled in the spring or autumn by aeration and vertical cutting. Use of slow release nitrogen fertilizers helps to slow thatch production.

Traffic, like mowing, produces wounds that are easily invaded by some fungal pathogens. Compaction caused by heavy traffic impedes air and moisture movement into the soil and eventually restricts root function, causing a decline in plant vigor and disease resistance. Soil compaction is most severe in excessively wet and/or heavy soils, and can be alleviated by deep core aeration in the spring or autumn.

Plant diseases are diagnosed using signs and symptoms. Signs represent the visible parts of the pathogen. Prominent signs include foliar mycelium (the white or gray, thread-like network that comprises the fungus body) of fungi that cause dollar spot, brown patch and Pythium blight, and mushrooms of fairy ring fungi. Spores, fruiting bodies and resting structures are signs that generally can only be seen with a microscope. Symptoms are the outward expression of a plant that is suffering from a disease. Examples include leaf spots, tissue blighting, rots, yellowing, wilting and stunting. Symptoms of most turf diseases take the form of leaf spot lesions, leaf tip dieback, blighting of leaves and sheaths, water-soaking of leaves, crown or root rots.

A symptomatic key to common lawn and athletic field diseases is provided on the following pages. The first key is for tall fescue, and the second key is for Kentucky bluegrass, perennial ryegrass, and fine fescue. Control of diseases by the use of fungicides may become necessary in some situations. Fungicides that are recommended for the control of turfgrass diseases are listed in TT-38 'Maryland Turfgrass Disease Control Recommendations'.

Part I: Key To Diseases of Tall Fescue

Tall fescue is widely used as a lawn and athletic field grass in Maryland. This diagnostic key is provided because symptoms may be different on tall fescue than those of other species. Tall fescue strengths include good drought tolerance, moderate fertility needs, and good insect and disease resistance. Tall fescue is susceptible to *Drechslera* (formerly *Helminthosporium*) leaf spot, net-blotch, crown rust, pink and gray snow mold, red thread, brown patch, and dollar spot. Of these diseases only net-blotch and brown patch are considered common diseases of tall fescue turf in Maryland. Red thread and dollar spot, however, are becoming more common in tall fescue. Pythium blight and gray leaf spot are uncommon, but may develop in low-lying wet areas during hot and humid weather.

COMMON TALL FESCUE DISEASES AND DESCRIPTION

SEASON & COMMENTS

NET BLOTCH Initially, symptoms appear as tiny brown or purple-brown specks on leaves. As the disease advances, dark-brown, net-like linear patterns of necrotic lesions develop on leaves causing a net-blotch appearance. These net-blotches may coalesce, and leaves turn brown or yellow and die-back from the tip.

BROWN PATCH Initially, circular patches are 3"-6" in diameter, increasing to 12" or greater. There may be a gray "smoke ring" on the perimeter of patches in the early morning. Patches often coalesce during extended hot and humid weather. Leaves severely blighted; bearing oval to elongated, chocolate-brown lesions with dark-brown margins.

DOLLAR SPOT Roughly circular spots 3-6" in diameter. Leaves dying-back from the tips. Lesions somewhat oblong, white in color with a brown border where green and white tissues meet. Hour-glass shaped lesions are less commonly seen than in other grasses.

PYTHIUM BLIGHT AND GRAY LEAF SPOT These diseases may occur in intensively managed athletic turf, particularly when covered with tarps.

Spring and fall, especially during cool, moist periods. When extended overcast weather conditions persist, stand density may deteriorate.

June to September, especially during hot, humid nights when dew forms or during hot and rainy periods. Disease is more severe under high nitrogen fertility or frequent irrigation, and often reduces stand density. Foliar mycelium common.

May to September, especially during periods when days are warm, but nights are cool. Foliar mycelium may be evident during early morning hours when there is heavy dew.

July to early September. See accompanying key for symptoms and signs of these diseases.

Part II: Key to Diseases Of Kentucky Bluegrass, Perennial Ryegrass, and Fine Leaf Fescue

CIRCULAR PATCHES, SPOTS OR RINGS OF THINNING OR DEAD AREAS

SEASON & COMMENTS

LEAF SPOT Leaf spots, brown or purple-brown, oval shaped or elongated. Centers of spots may develop a tan color. Turf may thin out in irregular patterns.

PINK SNOW MOLD Circular patches of matted leaves appearing late fall, winter, or early spring. Generally appearing at snow melt or in the presence of plenty of surface moisture during cool to cold overcast periods. Patches 1" - 6" diameter; matted leaves have a pinkish or red-brown color. Center of patches may be bleached white in color.

GRAY SNOW MOLD Patches 6"-36" diameter; matted leaves have a grayish color. Sclerotia (compact masses of fungal cells covered with a protective rind) may be present, which are chestnut brown or black in color, 1/8 - 3/16 inches in diameter, and are usually found embedded in sheaths or on leaves of diseased turf during spring following snow melt.

DOLLAR SPOT Lesions on leaves are hour-glass shaped, bleached white, tan or straw-brown in color and extend across the entire width of leaf, normally bordered by brown, purple or black bands. A bleached-white tip dieback is common. Affected patches are circular and 2" - 6" in diameter. Foliar mycelium may be evident with a heavy dew in the morning.

RED THREAD Circular or irregular patches 3" - 12" in diameter. Leaves water-soaked and covered with a pink gelatinous fungal growth. Dead leaves in center of affected areas straw brown, tan or slightly pinkish in color. Red, brittle, thread-like strands extending from tips of dried grass blades.

BROWN PATCH Circular patches 6"-24" in diameter. Affected areas brown; outer margin of diseased patches may have a grayish "smoke ring". Leaves blighted with elongated oval chocolate-brown lesions. Foliar mycelium may be evident during early morning when dew is present.

SUMMER PATCH Circular or irregular patches or rings, sometimes rings with living grass in center ("frog eyes"). Patches initially 1" - 2", increasing to 6" - 24" in diameter. Patches may be sunken and leaves at the periphery may have a yellow-orange or bronzed appearance. Tip dieback of leaves giving turf a straw-brown color. Initially, disease may mimic dollar spot.

PYTHIUM BLIGHT Circular spots 1" - 3" in diameter. Leaves are grayish or copper-colored, water-soaked, and mycelium is normally present on leaves during early morning hours. Leaves are rapidly blighted and entire plants die in 24 hrs. Dead plants in affected spots are brown or red-brown in color, and matted.

FAIRY RINGS Rings or arcs of dead grass bordered by inner and outer zones of dark green grass; or rings of luxuriantly growing grass without a dead zone. Rings 1 - 4 feet in diameter or larger. Mushrooms or puffballs growing at the edge of the ring may be present following rainy weather.

Spring, summer, and fall; but most common in spring. All species.

Late fall, winter and especially spring. All species, esp. perennial ryegrass

Late winter and early spring. All species, especially Kentucky bluegrass.

Spring, summer, and fall; most common in early summer and fall. All species, esp. poorly nourished turf.

Primarily spring and fall; also prolonged rainy periods in summer. All species, especially perennial ryegrass and fine leaf fescues.

June to September. Normally occurs when night temps are over 68°F, high day temperatures, and high relative humidity. All species, esp. perennial ryegrass.

July to early September. Kentucky bluegrass and fine leaf fescue turfs.

July to early September. Perennial ryegrass and occasionally tall fescue, esp. during hot, humid periods in poorly drained sites. Seedlings of all species planted during warm and humid periods.

All year, especially summer. All species, especially droughty sites and poorly nourished turf.

IRREGULAR PATTERN OF THINNING OR DEAD AREAS

LEAF SPOT Turf thinning-out, and brown or red-brown in appearance when observed from a distance. Brown or purple-brown, oval-shaped leaf lesions on leaves and sheaths.

GRAY LEAF SPOT Turf appears wilted despite good soil moisture and looks brownish or gray from a distance. Brown or gray leaf spots with a yellow halo and lesions on leaf margins. Leaves may have a twisted, water-soaked, and velvety appearance in the morning.

PYTHIUM BLIGHT Circular spots 1" - 3" in diameter, but spots may coalesce to cause a non-uniform blighting, especially where water drains over turf. Leaves are grayish or copper-colored, water-soaked, and mycelium is normally present on leaves during early morning hours. Leaves are rapidly blighted and entire plants die in 24 hours. Dead plants in affected spots are brown or red-brown in color, and matted.

STRIPE SMUT Leaves bearing parallel black or silvery-gray stripes that extend the length of leaves. Leaves eventually shred and curl along lines releasing masses of black, powdery spore masses. Leaves may be yellow.

RUST Leaves bearing red, orange, yellow or black pustules. Turf has a yellow or reddish appearance when observed from a distance.

SEASON & COMMENTS

Spring and fall; primarily during wet, overcast weather. All species, especially poorly nourished or excessively fertilized common-types of Kentucky bluegrass and creeping red fescue.

July to October. Perennial ryegrass and rarely tall fescue in Maryland.

July to early September. Perennial ryegrass and occasionally tall fescue, especially during hot and humid periods, and in poorly drained sites. Seedlings of all species planted during warm and humid periods are susceptible.

Spring and fall, but turf may die in hot, dry periods in summer. Primarily Kentucky bluegrass 3 years of age or older

Late summer and fall, occasionally at other times. All species, especially perennial ryegrass, zoysiagrass, and Kentucky bluegrass

MOLD OR OTHER LEAF RESIDUES

SLIME MOLD Gray, purple, or black cigarette ash-like residue on leaves. Crusty material (fruiting structures) is easily rubbed-off and appears after a rainy period. Moldy residue may form on plants in rings or arc patterns.

STRIPE SMUT Leaves with black or silver-gray stripes that rupture causing leaves to shred and curl; releasing black, powdery spore masses.

RUST Leaves bearing red, orange, yellow or black pustules. Turf yellow or reddish in appearance from a distance.

POWDERY MILDEW Leaves bearing a whitish or gray moldy growth. Leaves eventually turning yellow.

SEASON & COMMENTS

Spring, summer and fall, especially after prolonged rainy periods. All turfgrasses.

Primarily spring and fall. Primarily Kentucky bluegrass older than 3 years.

Primarily late summer and fall. Primarily perennial ryegrass and Kentucky bluegrass

Spring to fall; primarily late summer and fall. All species, especially Kentucky bluegrass. Often develops on turf in shaded environments.

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