



[Home](#) » [Articles](#) » [The dirty half-dozen \(creeping bentgrass diseases\)](#)

The dirty half-dozen (creeping bentgrass diseases)

Peter H. Dernoeden

A multitude of fungal pathogens attack creeping bentgrass (CBG). However, the types of diseases that occur and their severity vary considerably among regions. For example, snow molds and yellow patch (synonymous with cool-temperature brown patch) are commonplace on golf courses in Northern states, while southern blight and copper spot are relatively rare and generally only occur in more Southern regions. Other diseases, such as dollar spot, yellow tuft and fairy ring are ubiquitous. Thus, to rank the top six CBG diseases for every region would be difficult. Nevertheless, some diseases are definitely more widespread and destructive than others.

Overall, the most damaging or intractable diseases in the United States are dollar spot, pink snow mold (synonyms include *Microdochium* patch and *Fusarium* patch), anthracnose, *Pythium* diseases (including *Pythium* blight and *Pythium* root rot or dysfunction), localized dry spot and take-all. Other CBG diseases such as *Pythium* snow blight, red thread, pink patch, gray snow mold and *Helminthosporium*-leaf-spot diseases may at times be troublesome but generally are not widespread, annual problems for most golf-course superintendents. The non-fungal malady known as "black layer" and plant-parasitic nematodes also can seriously debilitate CBG, particularly on putting greens. Here is a run down of what may be the six worst offenders. See the table on page G 36 for a listing of control products.

Dollar spot

Pathogen: *Sclerotinia homoeocarpa*. Dollar spot may be caused by at least two different fungi, but the taxonomy of these pathogens remains unclear. However, this disease is without question the most common disease of CBG. In regions where it is chronic, it is difficult and extremely expensive to manage.

Predisposing conditions: Dollar spot is most destructive when days are warm, nights are cool and heavy dew forms. For some regions, it is primarily a late-spring and early summer disease, which often recurs in the autumn. In more Northern regions, it is primarily a summer disease. In some years and regions, dollar spot may be active from late spring to late fall. It is more destructive to slow-growing or poorly nourished turf.

Nitrogen (N) enhances turf growth and can reduce dollar spot, but its use may result in more clippings and thatch and slower green speeds. Thus, increased fertilizer use is not an option on many golf courses. Further, the common practice of removing clippings also reduces the nutrient-potential of the turfgrass ecosystem, thus increasing dollar-spot severity. This collision between management considerations and agronomic practices invariably leads to

more pressure from dollar spot on golf courses.

Symptoms and signs: The disease appears as small, circular, straw-colored spots of blighted turf about the size of a silver dollar (1 to 3 inches in diameter), hence the name "dollar spot." White, cob-webby, foliar mycelium may be evident when heavy dew is present. Foliar infection often results in tip dieback or the production of bleached-white, hourglass-shaped bands on leaves.

Control: A balanced (N + P + K) fall-fertilization program, combined with spoon feeding small amounts of water-soluble N during active disease periods helps to reduce dollar-spot severity. Mowing early in the morning or dragging to remove leaf-surface exudates helps to speed the drying of leaf surfaces and eases dollar-spot pressure. When seeding large fairway areas in regions where dollar spot is a severe problem, it is prudent to avoid extremely susceptible cultivars such as Crenshaw, Emerald and SR 1020.

Many fungicides effectively control dollar spot. Rotating fungicides from different chemical classes helps to delay potential resistance problems and also reduces the possibility of reduced residual effectiveness due to enhanced microbial degradation of these chemicals.

Chlorothalonil has been on the market for 30 years and is about the only dollar-spot fungicide not associated with resistance. However, other effective materials are available and include iprodione, vinclozolin, thiophanate-methyl and DMI fungicides (propiconazole, triadimefon, myclobutanil, fenarimol and cyproconazole).

Pink snow mold/*Fusarium* patch

Pathogen: *Microdochium nivale*. Many pathologists refer to this disease as *Microdochium* patch. Because of frequent changes in the taxonomic status of this pathogen in the last 20 years (*Fusarium nivale*, then *Gerlachia nivalis* and now *Microdochium nivale*), numerous other names exist for the same disease. Many still refer to this disease as pink snow mold because it is a familiar name. The major objection to the name "pink snow mold" is that the disease also frequently occurs in the absence of snow. The snow-free phase of the disease historically has been referred to as *Fusarium* patch.

Predisposing conditions: Prolonged periods of cold, wet and overcast weather favor the *Fusarium*-patch phase, whereas snow cover is necessary for the pink-snow-mold phase. *Fusarium* patch is a chronic problem in the mid-Atlantic, Midwestern, Northern and Western states, especially the maritime climates of the Pacific Northwest and New England. Both phases are particularly destructive during growing-in periods on new golf courses when superintendents apply large amounts of N to speed establishment.

Symptoms and signs: *Fusarium* patch appears as reddish-brown spots 2 to 3 inches in diameter, but spots may enlarge to 6 or more inches. Foliar mycelium may be evident during early morning hours in the margins of large patches. Streaks of blighted turf, reminiscent of *Pythium* blight, can occur when spores and mycelium are moved by wheels or water. Pink snow mold develops under snow or at snow melt. The leaves of infected plants initially are water-soaked and patches range from 3 to 8 inches in diameter. Large patches can be associated with snow cover. As snow recedes, patch size increases and the centers become bleached-white, but the peripheries display a distinctive pinkish color. As plants collapse and die, the leaves become matted and develop a tan color. On closer inspection, you may notice that these leaves have a pale-pinkish cast.

Control: Modest rates of N (2 to 3 pounds per 1,000 square feet) in the fall do not enhance disease, but excessive levels (8 to 12 pounds per 1,000 feet) applied during the establishment period greatly encourages both disease phases. Ammonium sulfate may help to reduce disease severity in alkaline soils. In the Pacific Northwest, sulfur and phosphorus nutrition may reduce Fusarium patch. However, you should use sulfur cautiously on greens in most other regions to avoid burn. Fungicides used to prevent pink snow mold/Fusarium patch are numerous (see table, page G 36). Studies have shown that tank mixes of a penetrant plus a contact fungicide generally are more effective than either component alone.

Anthracnose

Pathogen: *Colletotrichum graminicola*. Superintendents recognize anthracnose mostly as an annual-bluegrass disease, but increasingly it is becoming a major problem in CBG. Foliar and basal-rot phases of this disease both occur in bentgrass, but basal rot is by far the most difficult to control. Different biotypes of the anthracnose pathogen likely exist, partially explaining why the disease occurs from spring to fall in annual bluegrass, but primarily in summer for CBG.

Predisposing conditions: Overcast weather prior to or following high-temperature stress or drought is most often associated with an outbreak of anthracnose in CBG. Perhaps of equal importance are low mowing heights in addition to lowered nitrogen fertility. Management practices that cause wounding of stem tissues, such as topdressing, are viewed as important contributing factors to severe anthracnose infections. Shaded and wet or compacted sites can be particularly vulnerable. While anthracnose may appear as early as June in CBG, it is most active in July, August and early September in most regions.

Symptoms and signs: In CBG, infected turf develops an orange or reddish-brown color and thins out in large, irregularly shaped areas. These symptoms mimic red leaf spot and *Pythium* root rot. However, the basal-rot phase generally is not associated with the appearance of the diagnostic black setae (hair-like structures) of acervuli (the saucer-shaped fruiting bodies of these fungi, which bear the setae) on leaves. Therefore, the superintendent should detach a sample of reddish-brown turf and inspect it in the office with good lighting and a hand lens. Carefully strip all leaves to expose the stem base. During the initial disease phase, only small, black "fly specks" are evident on stems and it's easiest to see these with the aid of a hand lens. Advanced basal-rotted plants typically display a distinctive blackening and water-soaking on stem bases and stolons. The black setae of acervuli often appear on the blackened stem tissue but not necessarily on the leaves.

Control: Once you've made a diagnosis, use fungicides tank-mixed with 0.1 to 0.2 pounds of N (from urea) per 1,000 square feet. Chlorothalonil tank-mixed with thiophanate-methyl, propiconazole, triadimefon or fenarimol provides effective anthracnose control, particularly as a preventive treatment. Only high label rates will arrest the disease after it appears. Recent studies also show that azoxystrobin is effective on anthracnose. It is wise to increase mowing height and to avoid topdressing and other potentially abrasive practices when the disease is active.

Pythium blight

Pathogens: *Pythium aphanidermatum*, *P. ultimum* and others. *Pythium* blight is mostly a problem in low-lying, wet and shaded sites. It can attack CBG in sunny, well-drained sites,

but normally this only occurs during weather conditions associated with thunderstorms (high temperature and relative humidity). Pythium root rot is caused by numerous Pythium species and is most often associated with relatively young bentgrass stands. Pythium root rot can be severe in older putting greens, but the causal factors in bentgrass are imperfectly understood.

Predisposing conditions: Hot, humid weather--in particular, night temperatures above 70 degrees F and relative humidity in excess of 90 percent for more than 14 continuous hours--is necessary for massive blighting to occur. Tree-lined fairways, swales and low-lying "pocket" greens where little air movement occurs are most vulnerable to severe disease outbreaks.

Symptoms and signs: The disease often first appears in small spots 1 to 2 inches in diameter. Turfgrass leaves in these spots appear water-soaked and are slimy to the touch. During early morning hours the spots may be accompanied by a grayish-white foliar mycelium. These water-soaked spots collapse and take on an orange-bronzed color. By noon the spots turn brown and the plants die.

If you don't treat soon enough, spots may increase in size over a period of two to three nights, and can develop into 6- to 12-inch-diameter patches or "frog eyes." Heavy rain or nighttime irrigation can move spores and mycelium along the drainage path and into low-lying areas where water collects. These areas may be severely blighted and often are completely killed. Large amounts of cottony mycelium engulf leaf blades, eventually leaving plants in a water-soaked and matted state.

Control: Pythium blight is not a chronic problem in CBG in many areas. However, due to its ability to kill huge amounts of turf in a single night it is frequently the object of preventive applications of fosetyl al, propamocarb or metalaxyl. Chloroneb and etradiazole provide excellent curative activity, but their short residual generally precludes them from use in preventive programs.

Water- and air-movement management are key cultural approaches to reducing Pythium-blight problems. You should aggressively reduce shade and improve air circulation by removing brush or thinning tree canopies. Tree and brush removal that allows morning sun to rapidly dry leaf surfaces also dramatically reduces disease susceptibility, especially on greens. Install drainage pipe or gravel-filled slit trenches in chronically wet sites. Apply irrigation water early in the day and adjust sprinkler heads to ensure that excessively wet pockets do not develop.

Localized dry spot

Pathogens: unidentified Basidiomycetes. The precise cause of localized dry spot in bentgrass putting greens is unknown. The most accepted theory is that fungi from the group that includes mushrooms (the Basidiomycetes), which also cause fairy rings, are indirectly responsible. These fungi live on dead organic matter and grow rapidly through sandy soils in search of more. When the older mycelium dies, microbes degrade it. Organic by-products of the degradation process, such as fulvic acid, coat sand particles. This coating is hydrophobic, and as the coated sand particles pack they create a zone impervious to water. Plants in affected areas eventually succumb to drought.

Predisposing conditions: Localized dry spots begin to appear with the advent of high temperatures and dry periods during summer. The disease is common on relatively new, high-

sand-content greens or "push-up" greens aggressively topdressed with sand. The condition often appears about 1 to 3 years after construction or the start of a sand-topdressing program.

Symptoms and signs: Localized dry spots appear as circular, serpentine or irregularly shaped areas of wilted turf. Soil within affected areas remains bone-dry despite frequent irrigation: water penetrates the thatch, but not the underlying soil. Plants in affected areas develop the familiar blue-gray or purplish color of wilted turf and eventually die due to drought.

Control: Verti-draining and core or water-injection cultivation in combination with frequent application of wetting agents will alleviate, but not cure, the condition. You should apply wetting agents at a high label rate and thoroughly water them in at the first appearance of symptoms. Hand-syringing several times daily during hot, dry periods may be necessary to keep turf in affected areas alive. Fungicides are not likely to reduce the severity of localized dry spot. The first summer or two of localized-dry-spot development can be severe, but in most cases the condition subsides over time.

Take-all

Pathogen: *Gaeumannomyces graminis* var. *avenae*. This is a disease that all superintendents believe they have experienced at least once in their career. That, however, is unlikely unless you are dealing with a new golf course or recently fumigated greens. Take-all is almost exclusively a disease that appears in the first or second spring after seeding a new golf course or re-grassing fumigated greens. The initial year is variable. On some courses, only a few patches appear. Others may experience a massive outbreak. The disease naturally declines over time, but some patches may recur in the same areas for 10 or more years. Mostly, however, the disease is severe for just the first 5 to 7 years following seeding. Where soils are alkaline or irrigation water has a high pH, the decline will likely take longer. Further, the disease may disappear but recur several years later following a heavy liming.

Predisposing conditions: This root pathogen grows rapidly and becomes most invasive during cool and wet periods of spring and fall. In most cases, the patches do not appear until the advent of warm, dry weather, which places a lethal stress on the dysfunctioning root system. Therefore, while patches may appear in the spring or fall, it is normally during the summer when it becomes widespread and intractable problem.

Symptoms and signs: Initially, circular spots or patches a few inches in diameter appear, and they normally are yellow-orange, bronzed or reddish-brown in color. The patches often increase in size to 6 to 8 inches in diameter, but patches up to 2 feet or more across may eventually develop. During dry periods, the patches develop the blue-gray or purplish color of wilted grass and if not frequently syringed, plants turn brown and die. Where numerous, patches coalesce and large, irregularly shaped areas of turf die.

Control: It's best to approach take-all management by combining a soil-acidification program with multiple fungicide applications. It is folly to attempt to manage this disease with only one strategy, particularly on greens. Ammonium sulfate consistently is a superior nitrogen source for fighting take-all. Apply it at a rate of at least 3.0 pounds of N per 1,000 square feet annually. In the fall, apply it in increments of 0.5 pounds of N and water it in immediately. Most of the ammonium sulfate is applied during the fall, but some may be applied in small amounts (spoon feeding in 0.1 to 0.2 pounds per 1,000 square feet increments) at other times of the year. Granular products frequently cause speckling, particularly when you apply them

in small amounts and do not immediately water them in. When applying small amounts (0.1 to 0.2 pounds of N per 1,000 square feet), you can minimize the burn potential by spraying a clean grade (that readily dissolves and will not clog screens) followed by irrigation using the syringe cycle.

Propiconazole, triadimefon, azoxystrobin and fenarimol reduce take-all severity. You should apply these fungicides in April, May, October and November. The combination of the ammonium-sulfate program and the four annual fungicide applications for 2 or 3 years will greatly reduce, but not necessarily eliminate, take-all. It is important to avoid heavy liming, especially if soil pH is above 5.5.

Dr. Peter H. Dernoeden is professor of turfgrass science at the University of Maryland (College Park).