

## **DIAGNOSIS OF COMMON LAWN DISEASES**

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### **INTRODUCTION**

Diagnosis of common lawn diseases may be very easy or exceedingly frustrating. Some common diseases show symptoms that are readily recognized even without a microscope; others can be diagnosed accurately only in a laboratory. Probably the most difficult problems to diagnose are those related to unusual weather or a site problem rather than a specific disease. When a lawn disease does not easily match up with the pictures in a book, other possible causes of lawn problems need to be considered. Mowing injury, insect problems, or misapplication of fertilizers and pesticides can all cause symptoms that might be similar to disease symptoms.

To make a diagnosis, it is necessary to keep in mind a few simple facts about the fungi that cause the common lawn diseases. These disease-causing fungi (pathogens) are actually parasites that use turfgrasses as a source of nutrients. They grow as threadlike mycelium and reproduce by forming spores. Spores are survival structures for a fungus. They also serve as packets of fungus that can be dispersed across a lawn on feet and mowers, especially in wet conditions. Once a lawn has been established for a few years, it is likely that most of the fungi that cause common lawn diseases are present and waiting for an opportunity to infect the grass plants.

### **THE DISEASE DIAGNOSIS TRIANGLE**

Disease occurs only when three factors are present: a pathogen, a susceptible plant, and an environment favorable for the disease. Diagnosis of a disease requires observation of these same three factors. The fungi that cause common lawn diseases are generally microscopic so your field observations will be limited. However, in the early morning hours when the grass is wet with dew and guttation fluid, it is common to see the mycelium of the fungus that is causing a disease. Sometimes masses of spores may also be observed. While not all fungi, particularly root-infecting fungi, will be visible without a microscope, the observation of an active fungus is invaluable in disease diagnosis.

It is not a coincidence that most turfgrass disease names include the words "spot" or "patch." Fungi generally begin to grow outward from a central point to form circular spots or patches of diseased turfgrass plants just as they form circles of mold on cheese and fruit. The chance of observing the circular nature of disease is greatest in the early stages, before the circles coalesce into a large blighted area. However, many diseases cause similar symptoms, so observation of the symptoms alone may not lead to an accurate diagnosis.

Some information about the environmental conditions that occurred just before and during a disease outbreak is also important. Many fungi have a temperature preference, so we expect certain diseases whenever an extended period of cool, warm, or hot weather occurs, especially when it is accompanied by excess moisture.

Stress factors that contribute to disease. Turfgrass is more susceptible to certain diseases when it is stressed. Examples of stress factors include soil compaction, drought, poor drainage, mower scalping,

dull mower blades, low or unbalanced fertility, and soil pH that is too high or too low. Careful observation of stress factors can aid in disease diagnosis. For instance, does the disease seem more prevalent in a high-traffic area of the lawn? Lawn care professionals do not always provide all services for the care of the lawn. If the homeowner is responsible for irrigating and mowing the lawn, they should be questioned about these practices and informed about the role they play in disease development.

Specific examples of diseases that are more common in stressed turf include necrotic ring spot, dollar spot, red thread and rust. Necrotic ring spot is a particularly frustrating disease because it can be very destructive. It is caused by a fungus that infects the roots of the plant, so most of the damage is done by the time the above ground symptoms are observed. These symptoms include rings (or frog-eyes) or patches of necrotic grass about 6 to 8 inches in diameter. Symptoms are common in early summer and fall. Damaged areas may be overseeded with perennial ryegrass, which is not susceptible to the disease, or with Kentucky bluegrass cultivars with tolerance to the disease.

Dollar spot is named for the small spots that develop on golf putting greens. In lawns, the straw-colored spots may be 6 inches across and are usually observed when grass is growing slowly because of low fertility, compaction, or drought in warm weather. This disease responds well to improved growing conditions and a number of common fungicides.

Red thread is easily diagnosed by observation of the pink to red, gelatinous threads that grow past the ends of infected leaf blades. The disease is most common in cool, wet weather and seems to be more severe in perennial ryegrass, fine fescue, and Kentucky bluegrass lawns in recent years. It is most common on nitrogen-deficient lawns.

Rust is named for the powdery, rust-colored spores produce by the rust fungi. The spores usually take 10 to 14 days to develop, so they are not usually observed on lawns that are mowed regularly. If the turf is slow-growing because of low fertility, compaction, and drought, this late-summer disease is common but usually not very destructive.

## **FACTORS THAT INCREASE PATHOGEN OPPORTUNITIES**

Most leaf-infecting fungi require water droplets on the grass blades so their spores, like seeds, can absorb water, germinate, and produce new mycelium. Extended periods of rain or irrigation favor infection. The succulent growth produced following a nitrogen application may be more susceptible to infection by many fungi. Often a combination of abundant moisture and high nitrogen contribute to lawn diseases because these factors favor infection by the disease-causing fungi. Records of irrigation and rainfall, temperature, and recent fertilizer applications are particularly useful in identifying conditions that have given fungi more opportunities to cause disease.

Turfgrass diseases that are more common when conditions favor infection by fungi included brown patch, leaf spot/melting out, powdery mildew and snow mold. Brown patch is common on lawns with high nitrogen fertility in hot, humid weather. It is an important disease of tall fescue lawns, but also occurs in other turf species. The patches are often quite large and may expand over time. The grayish mycelium of the fungus may be observed in humid conditions.

Leaf spot fungi are common in spring and fall in cool, wet weather. Leaf spot is more severe in lawns with high nitrogen fertility. If only a few leaf spots are present on a leaf blade, they may be mowed away as the grass grows. In prolonged wet weather, however, many leaf spot infections may occur, leading to blighting of the entire blade and a thinning of the grass called "melting-out." Overseeding damaged areas with genetically-resistant cultivars is usually more effective than fungicide applications for the long-term control of this disease.

Powdery mildew occurs only in shaded turf or where air movement is greatly reduced by dense landscape plantings. This minor disease is easy to identify because the grass blades look as if they have been sprinkled with lime or flour. Powdery mildew is most common in humid conditions on grass with high nitrogen fertility. Although it can be controlled with fungicides, modification of the environment to enhance air movement is more appropriate. In heavily shaded areas, other groundcovers should be considered.

The fungi that cause snow mold grow on turf blades beneath the snow. Thus, snow mold is most severe following prolonged snow cover and when the turf plants are green and succulent at the time of snowfall. Gray snow mold is a common disease on lawns which can appear very severe after the snow melts, but it does not generally kill the plants. The lawn will usually recover with the return of warm weather.

### **WHY A FUNGICIDE MIGHT NOT BE THE SOLUTION TO A DISEASE PROBLEM**

The diagnosis of a lawn disease might seem to lead to a fungicide application, but this is not always necessary. Many lawn diseases develop during unusual weather conditions that are only temporary. Once the weather pattern changes, the disease may no longer pose a serious threat to the health of the lawn.

Fungicides will not bring dead turfgrass back to life. If homeowners and other customers expect that a fungicide application will eliminate existing damage, they will be disappointed with the results. Overseeding damaged areas and correcting faulty irrigation or mowing practices may be a more effective solution.

Finally, not all turf problems are diseases. If a clear diagnosis is not possible, a fungicide is probably not justified because it is not possible to choose the right product or apply it at the correct time. Further investigation into soil condition, fertility, pesticide misapplications, or other site problems may be more fruitful. The more clues we have, the more likely a satisfying conclusion will be reached.