



Necrotic ring spot can make a mess of a lawn. It's time to reseed here.

Rx for sick turf

Spring is upon on us and disease pathogens are on the prowl, attacking new roots, crowns and leaves of turfgrass plants.

Most turfgrass managers dread the thought of diseases. Controlling them can be difficult because it involves not just one living organism, turfgrass, but a second living organism, the pathogen. When the two interact, it gets complicated and usually results with the turfgrass dying.

Some simple strategies can help you cope with most disease problems. The good news is that almost all turfgrass managers can learn them.

The "big picture"

Not all turfgrass problems are caused by pathogens. A pathogen is a microscopic living organism that interacts with a grass plant, one cell at a time. If the pathogen is allowed to kill enough cells, you'll see

Practical guidelines to diagnose and alleviate the effects of diseases that damage and destroy turfgrass

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the dead cells, and that's the symptom of one plant's disease. If the pathogen is allowed to spread from one plant to the next, it becomes an epidemic. Typically, we don't recognize turf diseases until they approach the epidemic stage; that's the "big picture."

Be aware that nearly all pathogens that cause epidemics in turf are fungi. Bacteria have also caused epidemics in turf, but this is rare. Other microbes including viruses, nematodes, mycoplasmas

and viroids also attack turfgrasses, but so far we have no clue how much damage they're doing.

One of our challenges as turfgrass managers is to stop a pathogen from killing too many grass cells and causing an epidemic. This sounds simple, but the pathogens that attack grass plants have been doing it for thousands of years and are good at it. In addition, many of the cultural practices that we use to grow turf predispose it to attack by pathogens.

Plan for prevention

Turfgrass disease management can be divided into two phases: prevention and recovery. But since complete prevention isn't always possible, the best we can do is to minimize the severity of disease epidemics. Once an epidemic gets going, we have to do something to slow down the pathogen and also speed up grass growth.

It's unlikely that you can eliminate all disease-causing fungi, and you wouldn't want to if you could. Many of the fungi that cause turfgrass diseases are also important in nutrient cycling, especially in breaking down thatch.

Here are some useful actions that will help you reduce the severity of damage caused by turfgrass diseases:

▶ **Plant the best grass genetic material you can for your area.** Study the NTEP results (www.ntep.org) for grasses with resistance to pathogens that are active in your area and also grasses best adapted for summer and winter survival.

▶ **Develop a history of climatic and edaphic (soil) conditions.** Temperature is the most important piece of information you need for predicting disease development, both in verdure and about two inches deep in the soil. Pathogens become active at specific temperatures, which can be used to predict their development and



Look for brown patch at the base of the leaves of turfgrass plants.



Dollar spot usually occurs as the result of infection in the leaves of turfgrass.

to initiate management practices to control them. Moisture is also important, but it's more difficult to measure and interpret. Moisture can exist as humidity (vapor) or as free water, but nearly all pathogens need it. The most important factor for disease is the length of time plant surfaces are wet.

▶ **Keep a record of disease epidemics in your area.** Know which, when and where diseases develop each year in your area. A given disease often develops in the same area of the same turf, year after year. However, you may only see it during years when conditions are favorable for pathogen development.

▶ **Know and watch disease "hot spots."** Whether you manage lawns or sports fields, specific locations will always develop disease epidemics first. Monitor them during the part of the year when the temperature and moisture are favorable for disease.

▶ **Communicate.** Thousands of eyes are better than your two. Call, visit, e-mail or read, but learn what others are seeing. Don't restrict your reconnaissance to your area. Know where diseases come from, and get information for areas up to 100 miles away from you.

▶ **Know your diseases.** Generally, only a handful of

Killers vs. non-killers

Is that turfgrass disease you're looking at a "killer" or a "non-killer?" By this, I mean what part of the grass plant is the pathogen attacking? You won't know until you get down on your hands and knees and take a hard look. A hand lens will be a big help.

The killers are going to cause the big turfgrass problems. Non-killers can generally be managed with mowing, fertilization and time.

Here are some general rules for assessing the threat from a turf disease:

- ▶ If it's attacking the crown of turfgrass plants, it's serious.
- ▶ If it's attacking the lower, older leaves, it isn't as serious.
- ▶ If it's attacking the new leaves or tips of grass leaves, it's going to get worse.
- ▶ If it's attacking the roots, it will predispose the turf to heat and drought, and could be serious.

pathogens routinely cause problems in an area. The "old-timers" and local plant pathologists will know which ones these are. It's a good idea to be able to recognize pathogens that show up occasionally, too.

Road to recovery

Maybe you got there too late or maybe you didn't see it on a previous visit, but you notice that a small disease epidemic is under way on the turfgrass you're maintaining. You have two options — reduce pathogen activity and/or grow new grass. Your course of action will depend on which disease you're dealing with and what part of the turfgrass plant is being attacked. (See "Killer" sidebar above.)

Useful disease references

Illinois Pocket ID Series: "Cool-Season Turfgrass Diseases," H.T. Wilkinson and D. Pedersen. ISBN: 0-9722902-0-6 (English); 0-9722902-1-4 (Spanish). Visit the Web site www.summitseed.com.

"Controlling Turfgrass Pests," T.W. Fermanian, M.C. Shurtleff, R. Randell, H.T. Wilkinson and P.L. Nixon. Third Ed. Prentice Hall, Upper Saddle River, NJ. ISBN: 0-13-098143-5.

► **Diagnose the turfgrass disease.** With a bit of experience, you can combine your knowledge from scouting, temperature recording and handy reference materials to make a solid diagnosis. But why guess? Take some pictures of the disease with a digital camera and e-mail them to a local plant pathology lab to help you confirm the diagnosis.

► **Reduce or manage pathogen activity with cultural and chemical practices.** Even



When signs of stress appear, you can reduce pathogen activity or grow new grass.

though an epidemic is under way, you're not beat. To slow the disease's progress, consider both your cultural and chemical choices. This is where your knowledge and experience as a turf manager comes in. Determine the severity and speed of the epidemic and put together a program of cultural practices, fungicides, biological treatments or a combination of these.

► **Grow new turfgrass tissue.** Once a pathogen has attacked a turfgrass plant, there's no recovery. The cells have died, and they aren't coming back. However, that's where turf offers you a special advantage as a manager. Turfgrasses are vegetative and perennial, which means they'll grow new tissue as long as they have enough heat, water and nutrients. Unfortunately, some of the tougher diseases attack turf when the grass isn't growing, such as in the summer and winter. In the summer, it's possible but tough to push a diseased turf to grow; during winter in the north, there's no chance. All you can do is wait until the turf starts growing again, whether it's in spring or fall.

► **Remove diseased tissue from the turf.** Once you've reduced the pathogen's activity and started to grow new tissue, remove the diseased (dead) tissue from the turf. Turf recovery following an epidemic is dependent on growth. If heat and moisture conditions won't permit grass to grow, the turf will look like it still has an epidemic,

even though the pathogen isn't active. However, once the grass is growing, simple procedures like mowing, raking and top-dressing will remove the disease symptoms and restore the turf to health.

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TURFGRASS DISEASE ACTIVATION TEMPERATURES AND INFECTION SITES

Disease name	Activation temperature (°F)	Infection site
Anthracnose	46-61°	base of leaves
Brown patch	80-95°	base of leaves
C-15 decline	61-77°	leaves
Dollar spot	61-77°	leaves
Fairy rings	61-87°	thatch layer
Gray snow mold	32-55°	lower leaves
Leaf blights	61-77°	leaves
Necrotic ring spot	45-61°	roots
Nigrospora blight	61-77°	leaves
Pink snow mold	55-68°	lower leaves
Powdery mildew	61-77°	leaves
Pythium foliar blight	86-100°	leaves
Pythium root & crown rot	50-60°	crowns and roots
Red thread	61-77°	leaves
Rusts	61-95°	leaves
Smut	50-75°	leaves
Summer patch	68-70°	roots
Take-all patch	55-60°	roots
Yellow patch	46-61°	crowns and lower leaves
Yellow ring	61-77°	thatch
Yellow tuft	46-61°	crowns and leaves