

Ten Ideas to Make You a Better Turfgrass Disease Manager

(A Short Refresher For The “Old” Pros!)

It is now July; the 2003 spring in the Midwest was good and moderately wet. From the InteractiveTurf.com program, we know that the soil-borne and leaf-blighting pathogens were active. This means that the stage is set for serious summer diseases if the weather goes hot and humid, and in the Midwest, it usually does. Turfgrass diseases are the most difficult aspect of turfgrass management to handle, and for some very good reasons.

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I once made the mistake of suggesting that turfgrass management was “child’s play” compared to managing turfgrass diseases. My horticultural colleagues looked at me askance! Nevertheless, dealing with turfgrass diseases is difficult because it involves not just one living organism, turfgrass, but a second living organism, the pathogen. When these living organisms interact, especially in a pathological way, it is a very complicated process, and usually results in plant death.

In this short article, I will try to give you some useful ideas for managing turfgrass diseases. Remember, no one is all-knowing about turfgrass diseases, so get some help, talk to your friendly plant pathologist and read!

What is a turfgrass disease? Not all problems in your turf are caused by pathogens. A pathogen is a microscopic (darn small), living organism that interacts with a grass plant, one cell at a time. If the pathogen is allowed to kill enough cells, you will see the dead cells, and that is the symptom of the disease on one plant. If the pathogen is allowed to spread from one plant to the next and the next and the next, until there are hundreds or thousands of plants showing symptoms, you have a small epidemic. Most turf diseases are recognized by their epidemic symptoms, which I call the BIG picture. It is also interesting to note that nearly all pathogens that cause epidemics in turf are *fungi*. Nematodes also cause damage to grass roots. Predicting their damage to turf is difficult, however, in general the number of nematodes that must be in soil to cause serious damage is higher than recent reports would suggest. Dr. Randy Kane and I have some excellent information for dealing with nematodes, so if you think you have a problem, contact us. There are bacteria that have caused epidemics in turf, but these occurrences are rare. Rest assured that other microbes—including viruses, mycoplasmas and viroids—also attack turfgrasses, but so far we have no clue how much damage they are doing to the turf!

What is turfgrass disease management? It is the practice of stopping a pathogen from killing *too many* grass cells and *causing* an epidemic. This sounds simple, but believe me, the pathogens that attack grass plants have been doing it for thousands of years and they are very good at it. In addition, many of the cultural practices you use to manage your turf actually predispose the same turf to attack by pathogens. Life is just not fair to the superintendent!

(continued on page 16)

How do you manage turfgrass diseases? Turfgrass disease management can be divided into two phases: *Prevention* and *Recovery*. The most effective superintendents are those who are able to minimize the severity of turf epidemics. Once a disease epidemic has developed, the superintendent must both slow down the pathogen and speed up the growth of the grass. Here are some useful ACTIONS that you can use to be more effective in both Prevention and Recovery!

Preventing turfgrass disease epidemics!

The goal here is not to eliminate all turf disease-causing fungi. Remember, many of the same fungi that cause turfgrass diseases also are important in nutrient cycling, especially as it relates to thatch breakdown. You don't want to kill the "little rascals," you just want to ride herd on them!

1) Plant the best grass genetic material you can for your area.

- Grasses with resistance to pathogens that are active in your area.
- Grasses with the best adaptation for summer and winter survival.

2) Keep a record of and watch the climatic and edaphic (soil) conditions!*

- The single most important piece of information you can gather for predicting disease development is temperature: both in the verdure and about two inches deep in the soil. Pathogens start to become active at certain temperatures, which can be used to predict their development and time the management practices to control them. See Table 1, *Disease Activation Temperatures and Infection Sites*. This information is specifically written for the Midwest and generated through your support of the ITF.
- Moisture is also important, but a bit more difficult to measure and interpret. Moisture can exist as humidity (vapor) or as free water. Moisture is required by nearly all fungal pathogens, and the most important factor for disease is the length of time that plant surfaces or soil are moist!

3) Keep a historical record of disease epidemics in your area. Knowing which, when and where diseases develop each year in your area will give you a tremendous advantage over the pathogens. It is very likely that a given disease will develop 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.*

4) Know and watch disease "hot spots!" Whether you manage lawns, golf courses or sports fields, there will be specific locations in your area that always develop disease epidemics first! Learn these, and check them during that part of the year when the temperature and moisture are favorable for disease.

5) Communicate! Thousands of eyes are better than your two! Call, visit, e-mail or read, but learn what others are seeing. Do not restrict your reconnaissance to your course. Know where diseases come from, and get information for areas up to 100 miles away from you. *This is the very heart of the InteractiveTurf.com program.*

6) Know your diseases! Generally, there are only a handful of pathogens that routinely cause problems on your course. The "ole-timers" and local plant pathologists will know which ones these are. There will also be a group of pathogens that rarely show up; know these, too. *Expect the usual diseases, but keep your eyes open for the unusual ones.* The next important aspect about a disease is to understand if it is a "Killer" or a "Non-Killer." By this, I mean what part of the grass plant the pathogen is attacking. Killing pathogens are going to cause you and your turf 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 is attacking the *crown*, it is serious!
- If it is attacking the *lower, older leaves or tips of leaves*, it is not as serious.
- If it is attacking the *new leaves or base of grass leaves*, it could become serious.
- If it is attacking the *roots*, it will predispose the turf to heat and drought, and could be serious.

Table 1
Turfgrass Disease Activation Temperatures and Infection Sites

DISEASE'S NAME	ACTIVATION TEMPERATURE (°F)	INFECTION SITE
Anthraxnose	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 & 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 & lower leaves
Yellow ring	61° – 77°	thatch
Yellow tuft	46° – 61°	crowns & leaves

Recovery from a turfgrass epidemic!

The disease that you have seen develop in your turf is now increasing to the small epidemic. There are two basic actions you can take, and which or both you select will depend on which disease you are dealing with, and what part of the turfgrass plant is being attacked (see #6). *The two actions are: reduce the pathogen activity, and grow new grass tissue.* However, both of these are dependent on knowing exactly which pathogen is attacking your turf.

7) Diagnose the turfgrass disease! With a bit of experience, you can combine your knowledge from scouting, temperature-recording and handy reference materials (see the end of this article for a list of useful reference materials) to make a solid diagnosis. In Illinois, superintendents are “blessed” by having four turfgrass pathologists to assist them. With the use of a digital camera, e-mail and the telephone, a call to a plant pathologist (or via InteractiveTurf.com) can confirm your diagnosis. *Guessing is not an option for a good superintendent!*

8) Reduce or manage pathogen activity with cultural and chemical practices. Once the epidemic has started, the pathogen has the upper hand in the turf. You are not beat, but you are on the ropes as a superintendent! To bring back a balance between turf and pathogen, the pathogen’s activity must be slowed. There are a lot of ways to do this, and you should include both cultural and chemical approaches. *How fast and how serious the disease epidemic is will dictate whether you have time to work with only cultural practices, or whether fungicides or other biological treatments will be required.*

9) Grow new grass tissue! Once a pathogen has attacked a turfgrass plant, there is no recovery: the cells have died, and they are not coming back. However, that is where turf offers you a special advantage as a superintendent. Turfgrasses are vegetative and perennial, which means they will grow new tissue as long as they have enough heat, water and nutrients. Unfortunately, some of the tougher diseases attack turf when the

grass is not growing: summer and winter. In the summer, it is possible but tough to try and push a diseased turf to grow; in the winter, there is no chance of growth. In these cases, it is best to wait until turf-growing conditions return in the fall and spring and install sod or overseed.

10) Remove diseased tissue from the turf! Once you have reduced the pathogen’s activity and started to grow new tissue, your next objective is to remove the diseased (dead) tissue from the turf. I have seen many cases in which the disease was diagnosed correctly and an effective fungicide was applied, but the turf did not recover. Recovery of turf following an epidemic is dependent on growth. If heat and moisture conditions will not permit grass to grow, the turf will look like it still has an epidemic, even though the pathogen is not active. However, once the grass is growing, simple procedures like mowing, raking and topdressing will help to remove the disease symptoms and restore the turf to “health!”

Remember!

Turf diseases are tough to manage! You must be diligent and relentless in your pursuit of them. By all means, you should work cooperatively with other superintendents and pathologists to solve your pathological problems!

* Conducted as part of the InteractiveTurf.com program.

Some useful references!

1. 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). Call 217-333-7738 to order (all sales support turfgrass pathology research).

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



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