"Weather and Disease"

**DR. Joe Russo & Dennis Watkins*

Wet weather has dominated most of the northeastern United States for the better part of 2003. This excess of seasonal moisture has brought disease control to the forefront of turfgrass management. In this column, we will discuss the relation between weather and disease and the implications of this association for a sports field manager.

Disease can be defined as any abnormality of an organism. Infectious diseases are the result of causal agents. For plant diseases, these agents include bacteria, fungi, viruses, and nematodes. While most agents are nearly ubiquitous in the soil and air, they become infectious during certain host □urfgrass□al (life) stages and environmental conditions. The time until infection depends on agent type and number, plant-host sites, and the prevailing heat and moisture conditions. For example, one kind of agent, airborne fungal spores, may take more than a day to reach an infectious state after contacting a host under moist conditions and cool temperatures (between 40 to 50 °F). The same spores on the same plant may take just hours to become infectious under moist conditions and warm temperatures (between 65 to 75 °F). Another kind of agent, soilborne fungi, may need a long incubation period of consistently warm temperatures before becoming active. The severity of a disease depends on several factors, such as the period of favorable environmental conditions, the health of the host, the degree of genetic resistance, and cleanliness of plant material.

Since heat and moisture are key conditions for infection, a warm and wet spring and summer can become particularly challenging for a sports field manager. A manager must not only pick the right method of control for a particular disease, but must also apply that control in a timely manner. An application that is either too early or too late is a wasted effort both in time and money. Even worse, a mistimed application allows a disease to get established, making later prevention even more difficult and costly. Given the number of information tools available to a manager today, there is no excuse to have disease-inflicted losses. A manager, who has the experience and is willing to put in the effort, can locally observe weather variables, such as temperature, relative humidity, precipitation, and leaf wetness, to anticipate a disease event and ensure the proper timing of a control measure. Another manager, who has neither the time nor inclination to monitor pests, can rely on public or private services for the prediction of disease episodes. These services typically use weather data as input into predictive models. One of the most effective models presently in use forecasts the incidence and severity of Gray Leaf Spot – the single most threatening problem

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for fields with perennial ryegrass. Knowing the potential for an outbreak is essential for controlling this disease in turf. Using the predictive model to time the right fungicide application has given managers the effective margin of control to manage this disease.▲

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Answers to Test Your Understanding from "Before You Can Mow it," page 7:

1. PH, air, soil moisture, nutrient availability, height of cut, intensity of use
2. 1/3
3. Aeration
4. Macro
5. Micro
6. Large pore space, bulk density
7. Leach
8. Salt index
9. Excessive
10. Alligators

"One Sports Field Manager's Experience"

Developing a Renovation Strategy

by Jim Hermann, CSFM

It was around May of last year when I had the opportunity to be involved in the renovation of three adjacent soccer fields. This opportunity was unique in that we were able to utilize different techniques and products on the different fields with the common objective of achieving a quality stand of turf. By understanding the products and equipment we were using, we hoped to gain optimum results thru different applications and procedures.

As should always be the first objective in any renovation, soil samples were taken and we had both a physical and chemical analysis accomplished on each field. The physical analysis gave us the sand, silt and clay composition or "texture" of the soil. The chemical analysis of the soil provided us with the level of availability of all the major nutrients necessary for the establishment and maintenance of healthy turf. Along with providing us with the current level of availability, the chemical test results gave us recommendations to bring deficient nutrient levels up to optimum.

Our physical analysis reported the soil "texture" to be that of a "sandy loam" with 56% sand, 34% silt and 10% clay. This information was necessary in determining the compatibility of our topdressing material. We wanted a material of the same classification (sandy loam) with at least as much or more sand content.

The first problem we noticed when reviewing the chemical test result was that the soil Ph was reported as 5.5 with a lime recommendation of 150 lbs./1000 sq. ft. Turf grows best at a Ph from 6.0 – 6.7. In addition, the test results recommended that the lime be applied at no more than 50 lbs./ 1000 sq. ft. per application. Subsequently we scheduled the initial application of lime that very week. Lime is very slow to react in the soil and we wanted as much benefit from the lime as possible, prior to seeding. A second application was scheduled to coincide with our renovation around the third week in August. This is considered the optimum time for turf renovations in our area. With ph addressed we moved on to the next priority in our renovation process; evaluation of the balance of the soil test results. Along with the low level of calcium that was addressed with our lime application, our chemical soil analysis also reported phosphorous to be at a low level of availability. Since phosphorous is necessary for the development of a healthy root system, it was imperative to address this deficiency in our renovation process.

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