

# Cultural strategies against turf disease

*Protection starts with turfgrass selection, and then is managed in part by mowing practices.*

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**T**urfgrass diseases develop according to the classic plant pathology relationship triangle of host plant/pathogen/environment. The interaction of these factors can be the potential development of turfgrass diseases. Environmental and physiological stresses caused by high levels of turf management are often the major causes of turf disease development.

The principle cultural activities of turfgrass management include turfgrass selection, mowing, fertilization and irrigation. This discussion will focus on how these various turf management factors influence disease development in turf.

## **Turfgrass selection**

The ultimate ability of a turf manager is to select and plant the grasses he has to manage. This gives the turf manager the power to choose the grasses that are best adapted to the use site and potentially the easiest to grow. However, the final choice



**Stressed plants are more predisposed to diseases when favorable conditions for disease development exist. High levels of management may often cause disease stress.**

of a turfgrass is often a compromise of the best available candidates or sometimes the least objectionable candidate.

Turfgrass species are divided into three basic categories of ecological adaptation; northern, transition zone and southern grasses. These categories are determined by the ability of the grass to survive and grow in these geographical areas. There are grasses in each of these areas that grow best under management practices varying from a low to a high density of culture (mowing, fertilizing and irrigation), if the desired turf

is a roadside or home lawn or golf green.

Turfgrass breeders have also expanded the usefulness of the turfgrass species by developing many

cultivated varieties or 'cultivars' with a broad array of turf characteristics. Darker green color, lower growth habit, high leaf density, finer leaf textures, improved pest tolerance, and drought tolerance are some of the major traits sought in turf breeding programs. Some species like Kentucky bluegrass have over 200 named cultivars while others like bahiagrass have only a few.

The National Turfgrass Evaluation Program (NTEP) is a nationwide program of turfgrass cultivars conducted by state universities. NTEP produces reports by species that rank the cultivars for a broad range of adaptability, color, growth, and pest tolerance characteristics. Disease evaluation rankings are often conducted on species where a particular disease is a limitation to turf growth, such as brown patch in tall fescue or dollar spot in bentgrass. NTEP reports are the best source of non-biased, scientific performance data.

## **MAINTENANCE LEVELS FOR TURF**

Maintenance level	Northern	Transition	Southern
Low	fine fescues		Bahiagrass, centipedegrass
Medium	ryegrass, Ky. bluegrass	tall fescue zoysiagrass	St. Augustinegrass
High	bentgrass		Bermudagrass

Growing a turfgrass or a cultivar that is not adapted to a particular use or geographical region can lead to a number of physiological stress problems resulting in a higher than normal susceptibility to disease. For example, growing bentgrass golf greens in the deep south, mowing Kentucky bluegrass fairways at less than  $\frac{3}{4}$  of an inch or growing tall fescue in the southeast under moderate to high fertility are a few conditions that do not favor successful, long-term turf culture.

The ultimate success or failure of a turfgrass in a particular situation is often the careful application of management practices in a timely and judicious manner. Knowledge of how to manipulate the key practices of mowing, fertilizing, irrigating, and pest control is the key to successful turf management.

#### Mowing helps, but can hurt

Mowing is the principle management practice that separates turf culture from all other forms of agriculture. Frequent mow-

ing of turf at the correct height encourages a dense, low growth habit with a smooth and uniform surface. Each turfgrass species has a height of cut it will best tolerate. Mowing frequency is dictated by the turf growth which results from favorable growing weather, the fertility level and irrigation. The rule of thumb is to mow turf frequently enough to remove  $\frac{1}{3}$  or less of the total height per mowing.

Physiological stress on turfgrass plants results from improper mowing at lower than normal heights or infrequent intervals. Stressed plants are more predisposed

to diseases when favorable conditions for disease development exist. For example, extremely low mowed bentgrass golf greens, maintained at  $\frac{1}{8}$  of an inch or less, can grow and survive in the spring and fall with normal maintenance practices. However, in summer, with added heat stresses, only a rigorous fungicide program can prevent severe disease outbreaks of Pythium and Brown Patch. A high height of cut allows turfgrass plants to be physiologically healthy and better to tolerate potential disease development.

Mowing provides a constant potential for infection. Every mowing exposes fresh cell

sap at the cut leaf blade ends. The cell sap is an ideal growing media for fungi. However, in the field it is rare to observe this causing major disease problems in turf. Occasionally under ideal conditions one can observe a top dieback on leaf blades of bluegrass or bentgrass caused by the Dollar Spot organism.

The most common effect of mowing on the development of turf diseases is the mechanical spreading of the disease organism. Spores and fungal hyphae are easily dragged or blown on grass clippings from the mowing equipment. Classic examples of this problem are observed every year on golf greens where pythium or dollar spot symptoms are linearly streaked across greens by mowers.

Other cultivation practices such as aerifying, vertical mowing, spiking or grooming of turf on golf courses have not been shown to adversely affect disease development. These practices tend to encourage healthier turf which in turn creates plants that are more tolerant to disease development. □

*The author is product service lead for Zeneca Professional Products. Look for Part II of this series on cultural disease control in our May issue. Photos by Bruce Augustin.*

## IDEAL CUT & FREQUENCY

Turfgrass Species	Height of Cut (inches)	Frequency of Cut (days)
Bahiagrass	3-4	10-14
Bentgrass greens	<0.25	daily
Bentgrass fairways	0.25-0.75	daily-7
Bermudagrass greens	<0.25	daily
Bermudagrass fairways	0.5-1.5	2-3
athletic fields	0.75-1.5	3-7
home lawns	0.75-1.5	3-7
Centipedegrass	2-3	10-14
fine fescues	1.5-2.5	7-14
Kentucky bluegrass	1.5-3.0	7-14
perennial ryegrass	1.5-2.5	7-10
St. Augustinegrass	3-4	7-14
tall fescue	2-3	10-14
zoysiagrass	1-2	10-14

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