PREVENTION AND CONTROL OF TURFGRASS DISEASES

Rudolph A. Khan
Agricultural Operations, University of California, Riverside, CA 92521

The demand for high quality lawns, golf courses, sports fields, and commercial landscapes has increased tremendously in the last half-century. Unfortunately, such facilities can be a haven for growth and survival of pathogens when conditions are ideal for disease outbreak.

Diseases of turfgrasses, as in other plants, develop from a complex interaction between a susceptible host, a disease-producing organism (such as fungus) and an environment favorable for the disease-causing agent. The evidence of such interaction can be observed in such symptoms as leaf blights, crown and root rots, and finally death of the plant. However, no other factor influences turf diseases more than the microenvironment--that environment between the tip of the leaf blade and crown.

Disease prevention centers on integration of good management practices, including proper maintenance: fertilization, irrigation, mowing at the recommended height, aerifying and overseeding when necessary. The turf manager should also take into account the stage of development of the turf, degree of plant vigor, soil types, and water-holding capacity of the soil.

A good fertilization program will stimulate a deep and extensive root system, control shoot growth and provide recuperative potential of the plant. Many turfgrass diseases become more severe where the ratio of N-P-K is out of balance, particularly when the nitrogen is excessively high or deficient.

Excessive nitrogen produces vegetative growth and encourages the development of Rhizoctonia brown patch, Bipolaris and Drechslera leaf spots, summer patch and Pythium blight. Stem and crown rust, dollar spot, and anthracnose are often associated with nitrogen deficiency.

Turf diseases most influenced by wear injury and compaction stress are dollar spot, rusts, and summer patch. Heat and drought stress promote summer patch; cool wet weather is deal for rusts, leaf spots, and melting out.

Leaf spots and melting out appear as small, dark spots on the leaf blade. Infected blades turn yellow, thereby giving the turf a mottled appearance.

Dollar spot is diagnosed by the presence of tan lesions with reddish brown margins on leaf blades. The fungus thrives under prolonged high humidity in the turfgrass canopy. Moderate to high nitrogen application is recommended during the period of dollar spot activity. Water thoroughly (deeply) and as infrequently as possible without causing stress between watering periods.

Necrotic ringspot or summer patch is characterized by 6-18 inch circular or semi-circular patches of dead grass with a tuft of healthy grass in the center of individual patches. The roots of such infected plants are dark brown and become partially rotted.

Summer patch can devastate a poorly managed turf. The causal organism attacks roots during periods of heat and drought stress. Plants with shallow root systems due to compaction, excessive nitrogen application are easily killed when infected. Fall fertilization supplemented with light summer fertilization using slow release nitrogen is recommended. This disease is frequently more severe when turfgrass is maintained under conditions of low mowing height and frequent, light irrigation.
Field symptoms of *Rhizoctonia* brown patch include rings of dead or dying grass. On cool-season grass that are close-cut or are very wet, circular irregular patches of blighted areas developed rapidly. The blighted area is purplish green initially and quickly fades to a light brown. During periods of warm humid weather, a "smoke ring" area may appear at the margins of the patches. On grasses that are cut higher, light brown circular patches may appear without the "smoke ring."

Rusts are recognized by the presence of orange pustules on infected blades and occur on all turfgrass species. Grasses growing under stressful environmental conditions are mostly easily parasitized by rust fungi. Typical stresses include drought, nutrient deficiency, low mowing height, shade, and other pathogens. Control of this disease is usually achieved by fertilizing as needed and mowing at the recommended height for the grass species.

Diseases caused by *Pythium* spp. are often referred to as *Pythium* blight, grease spot, cottony blight, crown and root rot. All turfgrasses are susceptible to attack by *Pythium* spp.; however, cool season species are most commonly damaged. The most obvious and severe damage to foliage is caused during hot, humid weather. The foliar disease is most severe with lush, dense grass growing under high nitrogen fertilization. WATER MANAGEMENT IS ESSENTIAL IN REDUCING DISEASE POTENTIAL.

The key to successful disease control is early diagnosis. The final component in turf disease management involves the integration of overall good management practices as well as a practical fungicide program.