

## Turfgrass Series

### Diseases – how to manage them in Guam lawns

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On Guam, turfgrass diseases are generally far less severe than weeds or insects. Nevertheless, homeowners should be aware how a disease develops, what management practices should be employed to reduce disease occurrence, and what major methods could be used to prevent or eradicate diseases from infected turf.

Turfgrass diseases develop only when pathogens (mostly fungi), susceptible hosts (particular turfgrass species) and suitable environmental conditions (mostly warm and humid) are present at the same time. Disease will not develop if only two of the three factors coexists. For example, if the pathogen and conditions favoring its development are present, but the turfgrass is tolerant to the pathogen, disease will not occur. Similarly, disease will not develop if the turfgrass is susceptible to a pathogen, but the environmental conditions are not favorable (Figure 1).

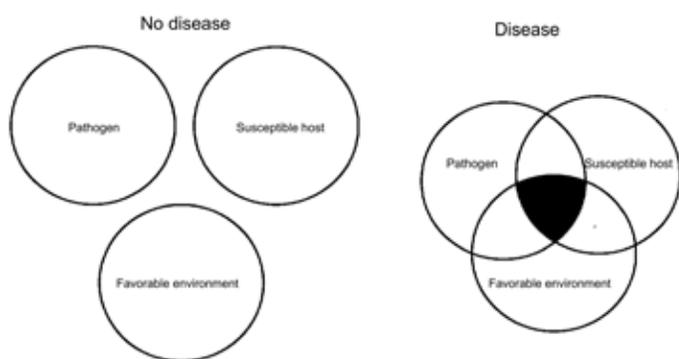
diseases are very typical and easy to identify, but others are not. For most homeowners identification of a particular disease is difficult. A local plant pathologist could be helpful, but for Guam prevention and proper turf management usually assures a good level of control.

#### Methods of disease control

Like weeds, diseases in turf can be controlled by means of prevention, usage of resistant cultivars (if available), proper cultural practices, and sometimes (the worst case scenerio) chemical interventions.

The most effective preventive measure is to provide unfavorable environmental conditions for the growth of pathogens. Some factors, like temperature, are quite difficult to modify in the tropics, but others, such as plant nutrition, soil moisture, and duration of leaf wetness, can be altered.

Temperature has a direct effect on the growth of fungi, but warm temperatures are still not a primary factor in promoting the development of disease. In the tropics, humidity within the turfgrass canopy seems to be the most important factor. Moisture-saturated air allows the germination of most fungal spores and the growth of fungal mycelia. After sunset, humidity inside the turf canopy usually increases and reaches the dew point. The moisture then condenses in the form of little droplets, which remain on the turf until sunrise. When the humidity is high and the evaporation of water from the leaf surfaces in the morning is slow, the favorable period for the growth of fungal pathogens becomes longer. More than 12 hours of leaf wetness are needed for most pathogens to grow and penetrate plant tissue. If actively growing fungal structures are dried rapidly before the fungus



**Figure 1. Turf-grass diseases develop only when pathogen, susceptible host, and favorable environmental conditions are all present at the same time.**

Although diseases are sometimes responsible for poor turf quality, they may not be the only cause; other factors, such as insects, drought, excessive water, or fertilizer burn can cause symptoms that may be confused with signs of disease. Some turfgrass

has penetrated the plant surface, the pathogen's life cycle is broken, and disease does not develop. Therefore, any measure that reduces the duration of leaf wetness decreases the development of disease and any measure that increases leaf wetness promotes disease development.

Humidity in the canopy can also be reduced by spacing or pruning shrubs and trees in the landscape to improve air movement that speeds the evaporation of dew. On the other hand, late afternoon watering extends the period of leaf wetness. Because the turf may not dry before the evening dew is formed, fungal growth can begin several hours earlier, and mycelium may penetrate the plants before they dry off in the morning. Therefore, late afternoon or early-evening irrigation should be avoided whenever possible; turfgrasses should be watered in the early morning (when it is often wet from dew) or at times that assure the leaf surfaces will dry before nightfall.

Other factors that can increase the occurrence of turfgrass diseases are nitrogen fertilization and mowing practices. It is better to fertilize when the turf surface is dry (i.e., not during wet season). The risk of infection can be also increased when leaf tips are severed by dull mower blades or when mowed turfgrass is wet and spores can readily move from infected to healthy plants.

### **Chemical disease control**

On Guam, sound management practices can prevent many diseases from occurring on a large scale and chemical intervention is seldom needed in residential turf. The use of fungicides should be left to professionals in order to prevent excessive damage to high-value turf areas such as putting-greens, tees and also on some sport fields. The selection of proper species and cultivars and best management practices usually guarantee healthy and vigorous residential lawns.

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