

Summer Stress on Turfgrass

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Turfgrass stress is not limited to summer conditions; but without question, this is when it is the most severe. Stressed turf is generally recognized by poor growth (slower leaf growth or light green or yellow turf color), and the causes of turf stress are both complicated and numerous. However, instead of identifying the causes of stress, focus on how the turfgrass plants respond to the many stresses that they are exposed to. The grass plant is the "control center" in terms of determining the quality of a turf. Every year, your turf will be exposed to numerous stresses; and at certain times, the com-

bined effect of multiple stresses could result in turf destruction. More often, turf plants respond to stresses in a way to minimize the damage, thus preventing destruction. As a turf manager, your goal should be to predict and understand the various stresses that your turf is exposed to and use proper methods to minimize their impact. To help you achieve this, I will first consider the natural behavior of turf exposed to summer climatic conditions and then look briefly at the various pests and cultural practices and how they could affect your turf.

Cool season turfgrasses respond to the change in seasons much as trees do. In the spring, the roots are active and the leaves are extending at rapid rates. Mid-spring brings on the drive to flower and produce seed. When a

turf is trying to flower and produce seed, root growth and leaf extension will naturally slow down. These various processes are controlled by hormones produced by the plant. The stress of flowering causes the plant to slow leaf and root growth. One possible means of reducing this natural stress is to supplement the turf with fertilizers, especially nitrogen and potassium. As the turf completes the flower-seed forming stage of growth, the soil and air temperatures have warmed considerably. Generally, it is June by this time, and the turf will resume root and leaf growth. During this time, the turf generally shows very little symptoms of stress. When grass is growing strong, the amount of stress required to significantly weaken the turf is high. Consequently, you often do not

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see poor quality turf in June. Even damage from diseases and insects, which are active during this time of the year, is not often reported.

Remember: Turf that is growing strong can tolerate a lot of stress before it will decline!

In late June (this can vary depending on where your turf is located in the cool season turf growing region), the soil and air temperatures continue to climb to near or above 80°F (25°C), and the amount of natural precipitation declines. In addition, the length of daylight hours is changing. Of the three climatic conditions (temperature, moisture and daylight), temperature is the most influential. When the cool season grasses heat up, they want to slow down their growth. Generally, root and leaf growth are dramatically reduced, while rhizomes or stolons continue to grow. This is the time that other stresses are going to be much more damaging to the turf. There are three reasons for this: (1) disease and pest activities will be at their highest during this time, (2) the turf cannot produce new tissues as fast as they can be destroyed, and (3) use of turf is intense.

Diseases of turf destroy grass tissues. If the rate of destruction is greater than the rate of plant growth, you will see the symptoms of the disease. This is the case in the summer. The turf simply cannot recover from losses due to disease. Likewise, insects chew on the roots and crowns of turf during the summer months. When the rate of insect injury exceeds the rate of turf growth, the plants will suffer and show it. This, too, occurs during the summer months. Finally, the use of turf increases in the sum-

mer. Foot traffic, wear, compaction, and general damage from various sports activities all add to the pressure on the turf. If the plant cannot respond, which is difficult and slow, at best, in the summer, the turf will show the symptoms of stress: thinning, blue-green color, brown leaves, stunting, and death. The challenge for the turf manager is to both revive the grass and reduce the severity of the various stresses.

A practice that most turf managers attempt is to try and force the turf to grow, even during the summer months when the grass is trying to go dormant. Yes, in the summer, cool season grasses will go partially dormant. This is a natural response to heat and drought. The plant will shut down the leaf growth and put its limited reserves into growing rhizomes, stolons, and crowns. The reason is simple: These are survival structures, and they will prevent the turf plants from dying should the heat and drought of summer persist for months. For example, during hot summers without rain, grass only needs about one-fourth of an inch of water per month to remain viable. It will look dead, but in fact, its rhizomes or stolons are alive and waiting for cooler temperatures and moisture. Managers that continue to supply turf with water and nutrients during the summer will force the grass to grow, but the activities of diseases, pests, and humans also increase. As most managers know, staying ahead of problems during the summer is a challenge.

Here are a few suggestions to consider for managing your turf in the summer and reducing the effects of stress:

1. In the spring and early summer, encourage the grass to grow. This can be achieved in part by maintaining moist soil around the roots and keeping an adequate

supply of nutrients in the root zone soil. In addition, practices that reduce compaction and increase aeration and drainage will improve the health of the turf.

Remember: Turf that has grown strong in the spring will tolerate the stresses of summer!

2. In the summer months, water the root zone, i.e., that depth of soil in which the roots are found.
3. Spoon-feed your fertilizer; apply a balanced (N:P:K) fertilizer and/or other nutrients as needed, but do not oversupply them.
4. Do not make dramatic cultural changes during the summer. For example, do not change the height of cut dramatically but continue to mow the grass as needed.
5. Use preventative pesticide programs for those areas with a history of disease or insect problems.
6. Distribute use patterns on the turf as much as possible to reduce compaction and wear.
7. If you have the opportunity to renovate or reestablish turf, select those cultivars that have good summer quality ratings for your area.

Summer stress on turf is brought about by a combination of the natural growth patterns of cool season grasses, climatic extremes of heat and drought, your cultural practices, the use of the turf, and pest pressures. A strong turf with plenty of roots, rhizomes, or stolons and crowns will resist stress the best. To manage stress, you must try and establish balance in your turf, thus avoiding dramatic changes which could exceed the ability of your turf to tolerate stress. ■