Preventing Summer Dormancy

of cool-season grasses

By Doug Linde

What if you stop eating food for a few days? Your body begins using its stored carbohydrates—also known as fat. As these reserves are depleted, you become weak and more susceptible to illness. There is a similar relationship within the cool-season grass plant.

As temperatures get into the high 80s, photosynthesis by cool season grass slows and fewer carbohydrates are produced. Eventually, carbohydrate use from respiration can exceed production. During this period plants rely on stored carbohydrates to remain alive. Even though the plant is dormant and its leaves are void of chlorophyll, the plant continues to respire. If it doesn't respire, it's dead. As the stored carbohydrates become depleted, the plant becomes more susceptible to disease and climatic stresses.

Understanding basic plant physiology is critical in preventing summer dormancy. Although irrigation is a major component in dormancy prevention there are other practices that can improve the plant's ability to avoid, survive and recover from dormancy.

Carbohydrate production lag

Kansas State University researchers studying bentgrass have found that the respiration rate actually increases as soil temperature increases. Combine this with the natural reduction in photosynthesis during high temperatures and it results in a condition in which carbohydrates are used faster than they can be produced. This is a main reason for summer bentgrass decline.

They also determined that by raising the cutting height, the gap between carbohydrate production and consumption becomes smaller.

Summer dormancy is a survival mechanism of cool season turfgrasses. These grasses will enter dormancy when exposed to extended heat and moisture stress. Processes significantly slow and growth ceases but the plant remains alive. Letting cool season grasses fall into dormancy is not an option for many turf managers.

Most U.S. golfers demand green playing surfaces and extended dormancy can lead to plant death—although 1999 in the Northeast proved that grasses can be highly resilient even after an extended summer dormancy period. I was surprised how well grasses recovered, even those straw-brown areas in the rough that were battered by cart traffic.

Know plant physiology

Understanding basic plant physiology is critical in preventing summer dormancy. Although irrigation is a major component in dormancy prevention there are other practices that can improve the plant's ability to avoid, survive and recover from dormancy. Most of these practices must be implemented before the summer stress period. Some managers refer to these practices as pre-stress conditioning.

1. RAISE THE MOWER. Higher mowed turf results in a deeper and more dense root system.

2. IRRIGATE DEEPLY AND INFREQUENTLY – This irrigation regime improves rooting and causes other morphological alterations that improve drought tolerance. Jack Fry from Kansas State University recommends "drawing-out the irrigations as far as possible without affecting quality of the putting surface". Mildly stressing turf between irrigations will slow shoot growth and promote root growth. Also, irrigate sparingly in the spring to force roots deeper before high temperature stress periods of summer. However, during high temperature stress periods make sure adequate soil moisture is available for transpiration cooling.

3. AVOID N APPLICATIONS IN SPRING OR SUMMER THAT PRODUCE RAPID SHOOT GROWTH. Plants burn carbohydrates for shoot growth. Root growth is sacrificed during periods of rapid shoot growth.

4. ESTABLISH SPECIES OR VARIETIES THAT ARE MORE HEAT AND DROUGHT TOLERANT. For example, Crenshaw bentgrass is more heat tolerant than Penncross bentgrass. Tall fescue is more drought tolerant than Kentucky bluegrass and perennial ryegrass.

5. ENCOURAGE ROOT GROWTH – Do everything you can to improve rooting throughout the year. A deeper, more extensive root system improves drought tolerance and the plant can extract water from a larger volume of soil. Core cultivation increases soil pore space in which roots can grow.

6. COOL THE SOIL – Forcing cool air into drain lines of a putting green. This is gaining popularity—especially for greens that historically have problems during summer.

7. COOL THE TURF – Syringing and air movement cool the turf by evaporation.

8. LIMIT TRAFFIC – Spread traffic wear. Keep carts on paths or in roughs only.

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