

Lessons Learned on Putting Greens During the Summer of 2005

A severe stretch of midsummer weather taught some painful lessons in part of the Mid-Atlantic Region.

BY DARIN S. BEVARD

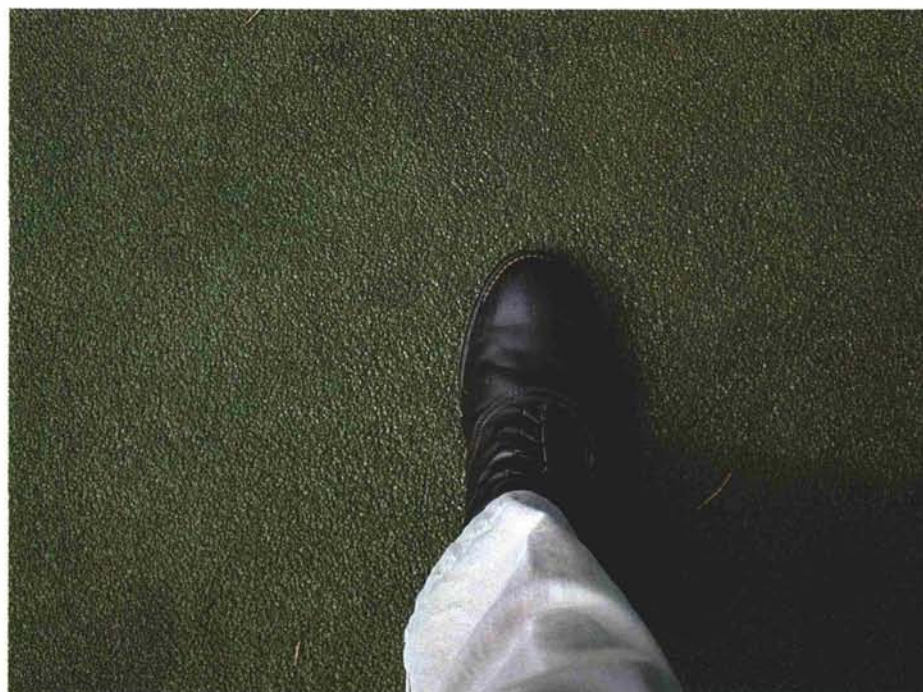
The summer of 2005 produced some of the most stressful weather conditions experienced in the Mid-Atlantic Region in the last 10 years. From mid-July to early August, heavy rainfall and high temperatures in many areas led to widespread turfgrass loss. In the transition zone, weather and aggressive maintenance practices often combine to cause some problems on fairways and tees during the summer months, but problems are less numerous on putting greens. In 2005, however, turfgrass decline was not only widespread; decline was severe on putting greens. Reasons for this decline varied, but more conservative putting green maintenance strategies were the difference between isolated problems and widespread decline of putting greens.

WHAT HAPPENED?

A combination of torrential rain and temperatures approaching 100 degrees at various times from mid-July to early August placed turf under severe stress. In some instances, this weather pattern reoccurred for two or three days in a row. The common response was to look for a disease pathogen to explain the damage. In most cases, pathogens were not to blame for damage that occurred. Two physiological conditions, scald and wet wilt, were the primary causes of turf loss.

Scald occurs when turfgrass is submerged in standing water after heavy rainfall. When the sun emerges in conjunction with high temperatures, the turfgrass is “cooked,” for lack of a better term. Turfgrass can survive standing water for longer periods of time when temperatures are cool. High temperatures and standing water lead to rapid turfgrass decline.

Wet wilt that occurred in 2005 was caused by a combination of saturated soils and high temperatures. Under these conditions, natural mechanisms



for cooling the turfgrass plant no longer function properly, and the turf and its roots are damaged. The result was areas of dead grass in low-lying and/or poorly drained areas of putting greens. For more detailed explanations of scald, wet wilt, and other mechanisms of heat stress on turfgrass, see Dr. Peter Dernoeden's article “Understanding Wet Wilt,” which also appears in this issue of the *Green Section Record*.

Mechanical damage was a major contributing factor in turfgrass decline on putting greens as well. In fact, in many instances, mowing of greens that were already stressed by wet wilt was the proverbial straw that broke the camel's back, causing a collapse of turfgrass populations.

WHAT WE LEARNED

Drainage is still the most critical aspect of keeping putting green turf alive, especially during periods of

When water appears with normal foot traffic, greens should not be mowed, especially under conditions of high heat. Chances for scalping and turfgrass decline greatly increase when these conditions are present.

severe heat stress and wet conditions. When heavy rains occurred, the less time that turf was submerged or saturated, the less the resulting damage. Sand-based putting greens with good thatch management programs and internal drainage suffered minimal damage. Sand-based greens with excess thatch and organic matter content in the upper portion of the soil profile suffered problems similar to their more poorly drained soil-based counterparts. Organic matter and thatch hold water at the surface, and this promotes softer greens that are more prone to scalping and other mechanical damage in any weather. Under high temperatures, water retained in the thatch accumulates heat, further stressing the turf. Excess thatch is an impediment to good putting green drainage and a major contributor to other management problems on greens.

On older, soil-based greens, the lesson was similar. However, surface drainage played a very large role in their success or failure. Flatter greens or poorly drained areas of greens declined in many instances. More contoured greens with good surface drainage suffered less damage. Soil-based greens with supplemental internal drainage also performed markedly better. Supplemental

drainage was enough to remove water from green cavities to limit damage.

Under harsh weather conditions, the newer creeping bentgrasses can succumb to summer stress just like their predecessors. In the last five years, establishment of creeping bentgrasses such as the “A” series and L-93, among others, has increased on putting greens. These grasses tolerate heat and low mowing heights under stressful weather conditions and still exhibit a more dense growth habit than older putting green grasses. However, this can provide a false sense of security. The belief that fast green speeds can be maintained on a daily basis with these new grasses without consequence regardless of weather was dispelled in 2005. Some of the most severely damaged greens were established with the newer grasses. Grooming and maintenance practices need to be curtailed on greens with these new grasses just as they do on *Poa annua* or older creeping bentgrasses when severe heat stress occurs. In many instances, golf courses have been closed to establish these newer grasses, and course officials feel entitled to fast greens on a daily basis once they are installed. These grasses perform very well in our region, but they are not bulletproof when weather conditions that are

Areas of greens that hold water are prone to damage whenever heavy rainfall occurs. When air temperatures reach the mid to upper 90s, turfgrass loss likely will occur in these poorly drained areas. Improving drainage in these areas will improve the reliability of the turfgrass.



truly unfavorable for cool-season turfgrasses prevail for long periods.

WHAT ABOUT NEXT TIME?

There will be a next time. The weather pattern that led to putting green decline during the summer of 2005 may not occur on a widespread basis for some years. It could happen again next year. For certain, there is no better time than the present to devise strategies that will be implemented to minimize the potential reoccurrence of the problems experienced on putting greens.

Communicate consequences of maintenance practices during times of severe stress. Communication is the best tool that superintendents have, and it is often under-utilized. Even after heavy rain, when high temperatures were predicted, greens were prepared normally for daily play. Superintendents are under great pressure to provide the best conditions for weekend and tournament play. They should take the opportunity to explain potential consequences of normal preparation to the green committee chair or other course officials prior to implementation under these conditions.

This allows course officials to be informed and understand potential consequences of maintenance under severe stress. The benefits of closing greens or skipping mowing when greens are saturated are great. While this may provide inconvenience or slower greens for a day or two, it can be the difference between keeping the grass alive or suffering a long-term decline in playability. Not every course official will be supportive in these situations, but often they are more understanding than they are given credit for. At least offer them the opportunity to be an ally. Unfortunately, this weather occurred when many clubs were hosting member-guest or other major events, providing additional pressure to not only keep greens open, but to groom them to optimum conditions, which caused additional stress.

Do not mow greens that are saturated. Mowing saturated greens (the dreaded pushing water with the greens mower) is always bad, but you're especially asking for trouble when the grass is already stressed. If portions of greens are saturated, mowers will sink in to produce a lower effective height of cut, and this may cause scalping. Even if scalping does not occur, the grass is placed under further stress. At the very least, mowing heights should be raised before cutting saturated greens, and grooved rollers should be replaced with solid rollers to limit stress and mechanical damage.



Soil-based greens with poor surface drainage can be especially hard hit by the combination of heavy rain and high temperature. In some instances, repeated rainfall keeps greens saturated for two to three days, providing little chance for turf survival.



Installation of internal drainage in older, soil-based greens greatly improves their chances for survival in general, but especially under poor weather conditions with wet patterns and high temperatures.



Standing water and high temperatures can lead to rapid turfgrass decline caused by scald and wet wilt.

Other cultural programs such as grooming, verticutting, brushing, and topdressing should be suspended, even though reduced green speed will provide short-term grumbling. If this year is any indication, golfers will become more understanding of slower greens if the greens on their course are alive and playable while other greens falter under increased stress.

Syringe greens when conditions are favorable for wet wilt. Syringing wet greens seems counterintuitive. However, applying a very light application of water to only wet the leaf blades will help to cool the turf plant and increase chances for survival. There needs to be some education here! When golfers see water being applied to already wet and sometimes closed greens, there can be a negative reaction because they do not understand the purpose of the water application. Let them know that you are not watering the greens; you are cooling the turfgrass plants. Remove standing water from greens to prevent scald.

Resist doing anything that just does not feel right. This is a catch-all. However, when the heat is on during the summer, if you have any question whether a maintenance practice is going to cause serious detriment to the turfgrass, don't do it. Your gut feeling is probably right.

These strategies are painfully simplistic. Unfortunately, they were not implemented often enough when unfavorable weather patterns placed severe stress on the turf. Ask yourself if you will have a plan to deal with this type of weather situation in the future to limit turfgrass decline, or will you try to devise a plan under fire? There will be a next time.

Conservative maintenance strategies on greens result in slower green speeds, but they may only be needed for a short period of time, depending upon the duration of stressful weather. If putting green turf is killed, it may take weeks or even months to return the turf to acceptable playability. Many greens in the Mid-Atlantic Region still bear the scars of the past summer. The summer of 2005 is proof that dying is the only thing that grass does quickly, and providing recovery of damaged greens is a long, hard road. Learn from the problems that we experienced.

DARIN S. BEVARD is an agronomist in the Mid-Atlantic Region, where weather patterns routinely provide significant challenges for management of cool- and warm-season grasses.