

# WINTER KILL!

by JIM HARRIS

CGCS, Stonebridge Country Club, Memphis, Tennessee

**W**INTER KILL is a catch-all term that is used to cover a multitude of sins as well as the abnormalities of nature. The label *winter kill*, in simple terms, refers to the loss of turf during the winter season. Actually, this turf problem is much more complicated than that.

The culprit most associated with winter kill, especially in southern areas, is low temperature; however, there are many factors that contribute to this multifaceted monster, including low mowing heights, too

much water, too little water, desiccation, traffic, shade, and others.

Looking for a pattern in the dead turf area is the best way to determine the cause of turf loss. The loss of warm-season grasses on the northern exposure of hills would indicate direct low-temperature kill, whereas southern slopes receive more heat from sunlight, which oftentimes is a key component in surviving harsh winter months. Dead turf at the base of slopes and in drainage ways would be an indication of too much water,

which during the winter leads to intracellular freezing of the turfgrass plant. Dead turf at the top of hills could be an indication of desiccation. Turf loss in fairways, leaving the rough areas unscathed, is a sure sign of mowing too low. And dead turf directly under trees as a result of low-temperature kill can be associated with excess shade, tree root competition, and possibly concentrated traffic conditions.

This leads us to the phenomenon of multiple contributing factors, which is probably

*Several factors, including low mowing heights, high-traffic conditions, and competition from trees, contributed to winter kill at the edge of this Tifway (419) bermudagrass fairway.*





what happens in most situations of winter kill. The concerned golfer wants to find the specific cause for dead turf and eliminate it so it won't happen again — logical, but sometimes not practical.

The predominant factor governing the extent of winter kill is directly related to the whims of "old man winter," of which no one has control. Furthermore, rather than one specific controllable factor, more times than not a combination of factors collectively contribute to the loss of turf in conjunction with excessively cold temperatures.

The fact that height of cut directly affects turfgrass root depth, and good root depth is a factor in minimizing winter kill potential, is a given. Almost any superintendent can determine the appropriate mowing height for the upcoming winter if an accurate season-long winter weather forecast could be made. Unfortunately, this "ideal" situation does not exist in real life. If the course is mowed at elevated cutting heights and the winter is severe, then the superintendent is considered a hero. On the other hand, if it is a relatively warm winter, then he is viewed with less enthusiasm because the need for higher mowing heights was perhaps not necessary. As too often is the case, due to player demands for extended summer play

conditions, the height of cut is maintained too low prior to the onset of dormancy and then the potential for winter kill is back in the hands of "old man winter."

Another aspect of winter kill relates to various other factors with respect to fertilizer and pesticide applications, particularly with respect to timing (education), weather conditions (meteorology), carriers (technology), method of application (employee training), how bad a night the person applying them just had (personnel management), and if the applicator was mad at the superintendent when he put them out (ability to motivate).

The precautions that can reduce winter kill potential are some of the very things that make the game of golf more difficult and to some degree less enjoyable, such as higher heights of cut, elimination of cart traffic, reduction of foot traffic, wetter or drier turf, and many others. The tongue-in-cheek saying among golf course superintendents is that the golf course would be a great place to work if it weren't for the golfers. This, of course, is ludicrous, but it does demonstrate the predicament that turf managers face.

Another aspect of winter kill is not winter kill at all, but *spring kill*. Many people rolled their eyes and respectfully kept quiet when Dr. Lloyd Callahan of the University

of Tennessee first mentioned this several years ago. Research shows that he was right. Less is known about spring kill than winter kill, but it is a reality and the average golfer is totally unfamiliar with the term. The research side of it shows that green-up periods that are dominated by cloudy and rainy weather sometimes yield turf that suddenly goes from being vibrant and alive to dead. From the standpoint of evidence, many superintendents dig down and find white stolons that break with a snap in late winter or early spring, and the same stolons are brown and limp a few weeks later. This is called spring kill due to the fact that actual death occurred during the spring rather than winter.

The spring of 1994 emerged with significant turf loss across a large section of the southern part of the country. Golfers were dumbfounded because it had been, for the most part, a mild winter. Superintendent Dave Green, CGCS (Golf Club of Tennessee and the ultimate record keeper) believes that when average temperatures are as much as one degree below normal, some degree of turf loss can be expected.

Golfers unhappy about golf cart restrictions and the disruption this spring caused by sprigging, seeding, and sodding work

initiated a cry across the country that the reason for the problem had to be poor management practices on the part of the turf managers. What was the cause? What was the pattern? Who was to blame if not the superintendent?

As it became clear that specific turf areas were not going to green up, the search for patterns began. The first accusation was low mowing heights. Many fairways and tees showed more kill than did rough areas, but a less-noticed pattern was that some areas maintained at lower mowing heights were the first to green up. Next was the north slopes, but by mid-season the amount of dead turf on south slopes was about equal to that of north slopes. There was dead turf found in low areas, an indication to some that the superintendent was watering too much, but dead turf at the high points was equally

High-traffic areas adjacent to tees were especially prone to loss of bermudagrass from the cold winter temperatures.







Winter kill of bermudagrass on north-facing slopes, especially in high-traffic areas, can be a common occurrence.

much, but dead turf at the high points was equally visible. There was no green-up under trees, a sure sign to those whose ball landed there that a pruning program must be implemented immediately. High-traffic areas near landing zones showed turf loss, but loss was also seen in the seldom-trod-upon front yards of clubhouses and home lawns. Some golf courses actually recovered from the turf loss before a pattern could be fully identified.

What then? A pattern that few people remembered or even recognized, except by those who kept records, was one that showed the grass breaking dormancy, followed by a heavy frost. This was followed a month later by another green-up and another equally heavy frost. This scenario was repeated a third time by a lighter frost, but one that was just as deadly. The visual patterns indicated that virtually all previously mentioned factors contributed to this winter kill situation, but not as evident was the factor of spring kill, which seemed to be the biggest culprit this past season. This is not to say there was

no winter kill; however, the extent of the damage depended on where in the country the course was located.

Each year in late winter, turf managers would be wise to bring in selected sample plugs from low areas, high areas, low-mowed areas, high-mowed areas, and any other turf area that is often associated with winter kill. Plant these representative samples in a pan of native soil (with holes for drainage), place them in a room beneath a heat lamp and grow light, maintain favorable soil moisture, and force an early break in dormancy. This will give you an early indication (the emphasis is on *indication*) of what might come if winter kill in fact occurs. (Note: The more samples taken, the better the indication for damage.) This particular preview test procedure may not be totally accurate, however, if some degree of spring kill is experienced after these samples have been taken.

Each year in mid-spring, if turf loss is obvious, concerned golfers should ask if

this problem is unique to their course/city/region/state. If your course appears to be the only one to sustain damage, there may (emphasis is on the word *may*) be a management or personnel problem. Don't take the word of an irate golfer. Rumors survive until late in the season, and truth sometimes never breaks dormancy. Check with your regional Green Section agronomist, as he usually has a broad view of the range of such problems.

Also, remember that golf courses sometimes have little in common other than the game of golf. An 18-hole course spread out over 160 acres with 30,000 rounds often doesn't sustain the damage of an 18-hole course with 60,000 rounds spread out over 95 acres. There are many, many factors that must be entered into the winter/spring kill equation.

The most difficult culprit to identify in winter kill and spring kill is a varmint called *work place politics*, but that is a story for another time.