



THE Facts ON Frost

GREEN MAINTENANCE GUIDE

Riding in my golf car on cold, frosty mornings always brings a feeling of rejuvenation. The clean, fresh air and bright sunlight lift my spirits and clears my head. The reflection of a million tiny rainbows

looking back at me from the crystalline turf reminds me of the wonders of nature and the good fortune of being in this business. "Those poor schlubs on the beltway heading to the city never get to experience this," I think to myself.

I zip my golf car up to the clubhouse and bounce out of it in an excellent mood — thankful for the day, for the great game of golf, for my luck to be where I am today. Expecting to be greeted with the same, I pull open the pro shop door and am met with ...

"Can we go yet?"

"Waddaya mean, frost delay?! There wasn't any frost at my house!"

"Can I let them go yet? What about 8:30? Do you think that will be OK? Huh? Huh?"

Peeking out the pro shop window, I see a golf car heading down No. 1, hightailing it out to the second tee in order to sneak out before the "official" starting time of "No-frost: 30."

"What about those two?" I hear. "They get to go out. Why can't we all go?"

Like a frozen icicle that can't hang onto the gutter anymore and breaks away to shatter on the sidewalk, my insanely optimistic mood is shattered by this onslaught of demands to play golf.

My experience in this business has taught me a few simple rules about golfers:

1. Rain or shine, winter or summer, golfers step on

Golfers get hot under the collar when the ice-cold crystals prevent them from playing. What's a superintendent to do?

By Jim Black CONTRIBUTING EDITOR

the first tee of the day with the hope and anticipation that the rounds of golf they are about to play may just turn out to be the best rounds of their entire lives.

2. Many (dare I say most?) golfers don't think about tomorrow when they're playing golf. The only thing that matters is this moment, this round, this score. I have found this to be the reason behind the divot and ball mark dilemma.

3. For the most part, golfers want the superintendent and crew to do everything possible at all times to make the golf course as perfectly playable as possible. This, of course, includes guarding from frost damage, aerification, topdressing, fertilizing, spraying, hand watering, mowing, etc. There's only one small catch: DON'T DO IT ON THE DAY THAT I'M PLAYING!

These rules come and go through my mind in an instant as I formulate my answers and prepare my prediction as to when the frost will melt enough to allow play. As diplomatically as possible, I let our most honored paying customers know when I feel in my best expert guess that it should be safe to play, then speed off in my utility vehicle in the hopes of

regaining my good mood somewhere else in my day.

I think to myself, "If only I could help them understand."

Send in the experts

"Why can't we play on frost?"

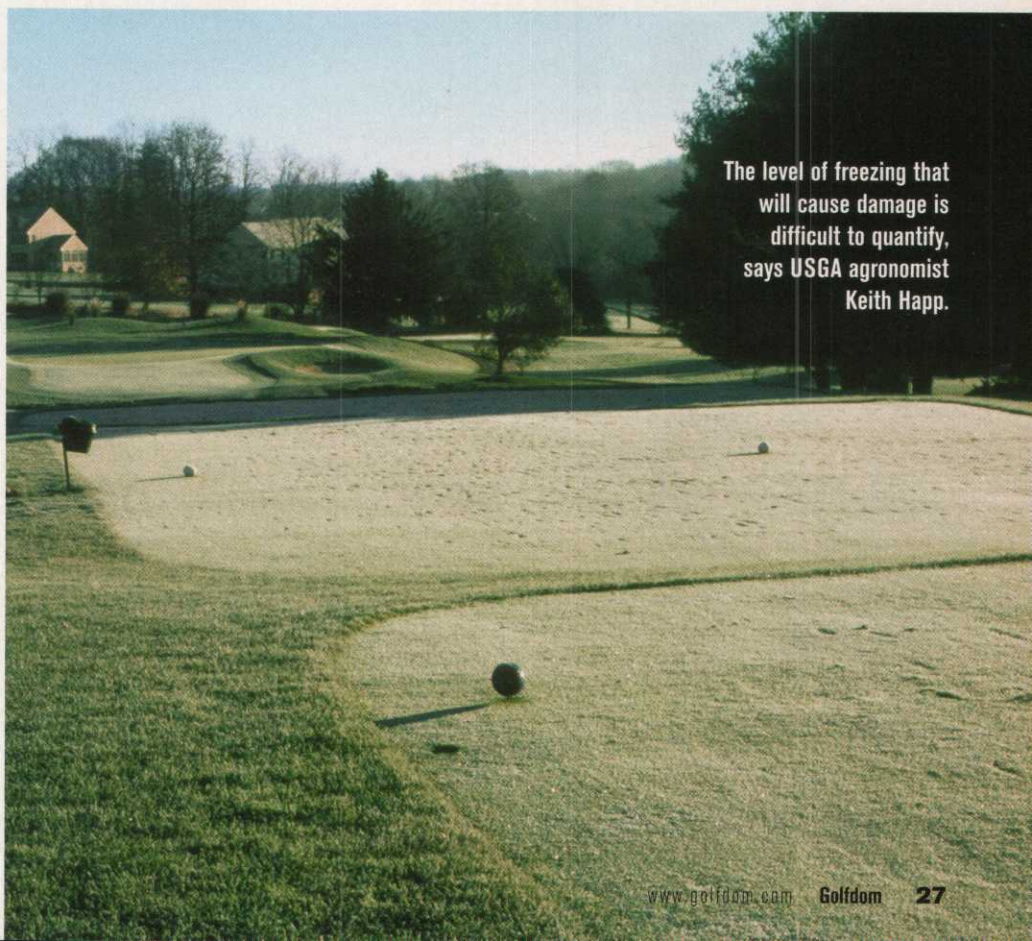
This is a simple enough question, but the answer might not seem so simple — especially to someone who doesn't want to hear it. I contacted the United States Golf Association's (USGA) Green Section to see if its staff could help with the answer.

Keith Happ and Darin Bevard, both senior agronomists for the Mid-Atlantic Section, were more than happy to help out.

"Physiologically speaking," Happ says, "there is the potential damage to turf from the cells rupturing as they are exposed to traffic stress when frozen. This damage is irreversible. Yes the plant will eventually grow out of it, but surface quality will be affected and playability will suffer.

"The level of freezing (shade, elevation, grass type, soil type, soil moisture) that will cause damage is difficult to quantify," Happ adds. "There are just too many variables to consider.

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"While there may be times when brown grass does not result, there still is damage that predisposes the plant to other problems."

We can all understand Happ's point, but what about the guy who says: "I've stepped on frosted grass plenty of times before and didn't see any footprints or damage at all. I don't believe you."

Bevard offers up this interesting analogy.

"Consider the flu or common cold. Obviously, when you go to a supermarket, sporting event, conference or fly in an airplane, you're constantly exposed to germs. However, you don't get infected with a cold or flu every time that you engage in one of these activities.

"There is a variety of variables that must come together when you're exposed to these germs for you to get a cold. With all of the money spent medically on these issues, we still do not know what those variables are.

"When you're dealing with living organisms, it can be difficult to pinpoint the catalyst for problems," Bevard continues. "I always tell people that you may walk on frost eight out of 10 times and never see damage. The problem is I can't tell you when the two times you will cause severe damage will be. It's like Russian roulette."

Meteorologically speaking

Understanding what frost actually is was my next logical step in trying to find out why it



can be so devastating to golf course turf if not treated with respect. Also, I was curious as to why there can be frost on the grass when the temperature has risen above freezing.

Interestingly enough, "surface temperature" or "ambient temperature" is an official measurement that is taken between 4.1 and 6.6 feet off the ground. Since cold air is more dense, it will settle below what is the measured surface temperature and keep the air at true ground level below freezing after the thermometer rises above it. This would also explain why frost is more prevalent in the valleys and hollows of the golf course.

And, contrary to popular belief, frost is not frozen dew. According to "The Weather Doctor," (www.islandnet.com/~see/weather/whys/frost.htm), "frost is a covering of ice crystals on the surface produced by the depositing of water vapor to a surface cooler than 0 degrees Celsius (32 degrees Fahrenheit)." Since the water vapor changes directly from a gas to ice, dew technically isn't a factor in the equation.

The USGA's Bevard also had this to add to the scientific equation: "The level of plant hardening is a major component. I believe a hardened, frosted plant will sustain less damage than one that has not completely hardened because there is more water inside the cells in the actively growing plant."

Superintendent knows best

Every superintendent knows his course's microclimate best and what it can handle as far as the frost goes. Sometimes it's a matter of science and nature, but other times common sense kicks in.

Paul Masimore, certified superintendent of Marlton Golf Club in Upper Marlboro, Md., offers a logical and common-sense approach.

"Have you ever tried to putt or even wanted to putt on a frosted green? It is not a good, quality playing surface," he says. "My feelings are, if I can't send my staff out to mow, roll or blow off the surface, then it is not

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playable. I like to see two-thirds of my first green frost-free before I send my staff out for maintenance. After we have cleared the third green, I let play out. If I am only blowing the surface clean and no other maintenance, I let play out as soon as I clear the first green.

"The only visible damage I've seen are footprints. I've never gotten down with a scope to look at the turf with footprint damage to see how extensive the damage might be. And just imagine what you would hear from some golfers about having to putt through a very obvious footprint.

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"I was taught not to let anyone on frosted turf, and I have not varied from that policy during my career," Masimore adds. "If one considers how frost is formed, then it's obvious that damage can be serious. Letting play out for usually a small number of golfers just does not justify the risk for potential damage. If the course was booked solid for play

during that time of year, then maybe I would look at other options for getting play out faster."

So you can see, the damage potential to the turfgrass clearly outweighs the need to "let them go" because they're pressuring you. The fact that caring for a golf course is a year-round task gets lost on the golfer who has called in sick for the opportunity to tee it up.

A golfer will never know that because he damaged the turf that day by walking on a frost-covered green, the turf will have a harder time coming out of dormancy two months down the road and it will be the first grass to succumb to disease when the conditions are right for it. ■

Jim Black is a turf professional and contributing editor for Golfdom.