

TURFGRASS TRENDS

GREENS MANAGEMENT

Cruisin' for a Bruisin'

Ball marks — they're everywhere one looks, controversy swirls around their repair, and golfers don't always chip in to alleviate a growing problem

By Randy Kane

Complaints about the severity and longevity of damage from ball marks, or ball bruises, have been increasing over the last few years. The trend is probably correlated to changes in the game and its equipment, such as high-tech urethane-covered balls that spin more, perimeter-weighted game improvement clubs that hit the ball higher, and just more (perhaps lazier) golfers.

Problems with ball marks may also be increasing with our evolving greens management practices, such as increased amounts and frequency of sand topdressing, ever-lower mowing heights, frugal nitrogen rates and reduced irrigation. Of course, all of these things are done to get a firm, fast, consistently smooth putting surface for today's demanding golfers, so perhaps problems with ball marks are just another trade-off for these management trends.

Many superintendents have given up altogether and are just plugging out bruises, sometimes even going to the trouble of replacing the small plugs with new grass — a tedious chore indeed.

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Why does everyone fret so much about ball marks anyway? They are just another part of the game — along with divots, car traffic, footprints and mosquito spray.

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As the ball mark topic gets hotter, it seems to get more controversial as well; there are even conflicting views about how to fix the marks and what kind of tool to use to do the deed (no lifting!?). Also, there are many claims that the newer, dense semidwarf bentgrasses are more sensitive to ball bruises and are slower to heal once bruised.

Ball mark repair is becoming expensive, as most superintendents have crew members and man-hours devoted to ball mark repair, either as part of the morning mowing activity or as a separate, trained employee who custom-fixes ball

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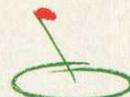
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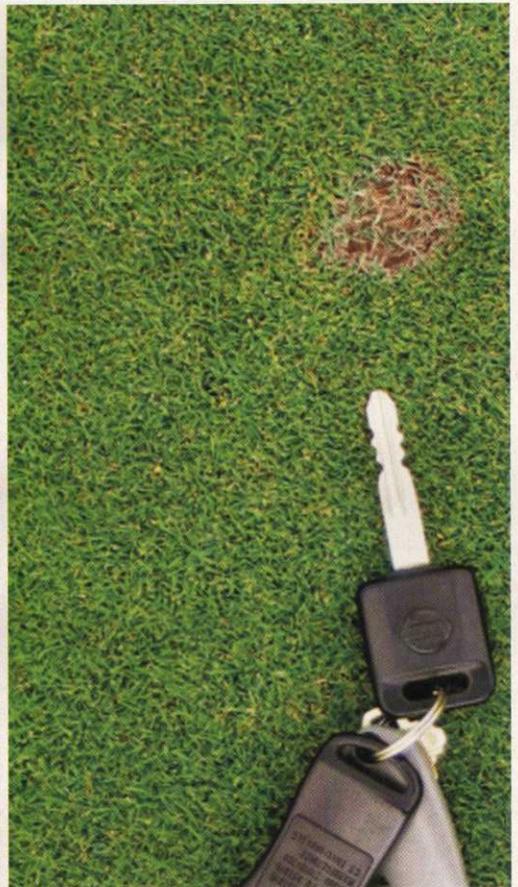
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QUICK TIP

As sure as spring is just around the corner, *Poa annua* seedheads will be popping up in greens and fairways. Reduced flowering through use of plant growth regulators will gradually lower the *Poa* seedbank in the soil and aid in *Poa* reduction. Proxy plant growth regulator provides excellent *Poa* and white clover seedhead suppression. Apply Proxy approximately 10 days before an expected spring flush of *Poa* seedheads.

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Actually, ball marks can be disruptive to the quality of the putting surface, no matter how many times you try to repair or smooth them as they heal. Greens with heavy ball mark damage can be uneven and bumpy, plus the purple to brown spots all over the surface don't add to the visual appeal. Perhaps just as important is the concern that thin, slow-healing ball marks act as entry points for weed seeds (like *Poa annua*) or moss spores. The ball mark problem can certainly be a bad one, but it's not going to go away until the golfers do. We don't want that, do we?

Impact and injury

Golf holes that require a short-iron approach are the most likely to have concentrated ball mark damage, most often in the front third of the green.

A short- to middle-iron approach may land on the green at speeds up to 60 mph to 70 mph, with a rotation rate of 2,500 rpm to 3,500 rpm. The direct force of the impact of a 1.62-ounce golf ball hitting the green sur-

Why does the seemingly innocuous ball mark on the left turn into the slow-to-heal ball bruise on the right?

face at 60 mph can severely injure turf leaves (crushed cells leak water and nutrients) and often causes a depression and pushes up a "hill" of turf in the direction of travel. If the surface is especially firm, only a small dent may form with no raised turf.

Although the speed and angle of descent contribute to the severity of the ball mark, the spin rate of the ball may be even more important. It seems likely (I have no proof) that more damage is done by a high spin rate impact, especially on new greens with little or no developed "mat" layer, or on recently (or regularly) sand-topdressed surfaces.

How many times have you seen sharply struck short iron shots hit heavily sand-topdressed greens with an explosion of sand and leaves? Even if carefully repaired, these ball marks will leave a distinct, mostly dead scar,

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especially during hot, dry weather in summertime. (The leaves are shredded by the impact and quickly wilt and die.) These ball marks will be slower to heal as well, since the dryness and high surface soil/sand/mat temperatures of summer will keep new shoot and leaf growth from developing.

If ball marks were consistent in size, shape and amount of turf displaced, they might be easier for golfers to find and fix, and for superintendents to deal with. Unfortunately, ball marks are highly variable, due to many factors (golfer related, and turf related). The distance the shot travels, club selection and angle of descent into the green all vary with each individual shot. Ball marks also vary greatly based on the agronomic character of the greens, moisture content and their day-to-day management.

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A new, sand root zone (USGA-type) green with thin, less-established turf will probably have much more disruptive ball-marking than an older, push-up soil green with a dense turf and a well-developed mat and thatch layer. Greens that are maintained at very low mowing heights with minimal nitrogen and with light frequent PGR applications will likely suffer differently from ball impacts than higher-cut, well-fed greens that are not under growth regulation.

Bruisin' the new bentgrasses

Which brings us to the next topic of concern: the vigor and recovery rates of the newer, semidwarf creeping bentgrasses. Varieties such as Penn A-4 and L-93 have higher shoot densities and a finer leaf growth habit than old standbys like Penncross and Pennlinks. On these new greens, a dense, soft mat and thatch layer may quickly develop during grow-in. So

even though lower cutting heights and fast green speeds can be maintained, these greens can get soft and spongy. Therefore, the amount and frequency of sand topdressing has been increased to try to firm the surface organic layers.

Often the sand applications start soon after establishment, well before a new green is even open for play. Ball bruising on new greens managed in this way has been very severe and has led to a lot of negative comments from golfers, superintendents and the industry press.

There have been a few research projects that have tried to answer questions about the initial damage and recovery rates of newer vs. older bentgrass varieties, including some meager attempts by the author a few years ago at the Cantigny research site. Perhaps the best study to compare ball mark recovery rates was recently published by professor Jim Murphy and his cohorts of Rutgers University. Summaries of this research can be found in *Golf Course Management* (December 2003) and the *Green Section Record* (July-August 2003).

Murphy built a gas-powered "gun" to shoot golf balls into putting green height test plots, then measured initial injury and recuperative ability of 15 bentgrass cultivars, including a couple of velvet bents. The study was conducted in such a way as to remove confounding construction and management variables — they really only wanted to look at the contribution of genetic variability among the grasses. It is notable that the research green they used was only in its second year of establishment but was not heavily topdressed with sand.

Not surprisingly, Murphy's group found less initial damage and more rapid turf recovery on the newer bentgrass cultivars (including the new velvet bents) than on older, Penn-cross type grasses. Their study also included factorial treatments of simulated wear and compaction, which were found to increase initial damage and slow recovery from ball-marking. The study was initiated in 2001 and repeated in the summer of 2002, and the second year's data showed that the additional year of maturity for all the grasses lessened the damage from ball marks.

The authors suggest that, in most cases,
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two or more years of growth are required to allow root zone stabilization and a sufficient mat to form in order to resist the damage from the combined impact and spin of golf balls.

Alleviate damage

There are two main reasons you might have a significant or abnormal amount of ball mark damage:

- the initial strike of the ball is seriously harming the turf, or
- it takes an inordinate amount of time for the ball mark damage to heal.

If you can identify which issues are causing the damage or slow recovery rate, addressing those issues should alleviate the ball mark problem and assuage angry golfers.

Immature or poorly developed turf, lack of sufficient mat, or too much sand at the surface can lead to severe ball impact injury on greens. Low nitrogen rates or other fertility or soil salts problems also could be contributing to weak turf. Striving to keep greens firm and fast by withholding water or nutrients (or piling on sand) may contribute to excessive ball mark injury and slow recovery — especially in the heat of summer.

Maintaining a balance between what is good for green speed and what is good for turf is part of the “art” of putting green management. Having a robust, healthy, resilient turf will not only ease ball mark damage but will help with other turf issues, such as traffic stress, heat stress and diseases.

What about ball mark repair? Are golfers really to blame — either for not fixing marks or for fixing them incorrectly and increasing the damage to turf? It’s always easy to point the finger at someone else, but in this case most of the complaints about golfers are accurate. An unrepaired ball mark, or one that sits for several hours in the sun (or overnight), is going to heal much more slowly than a well-repaired mark.

Mowing machines with bench settings of .1 to .15 inches will usually scalp unrepaired or poorly repaired marks, thus adding insult to injury — which is why many crewmen repair ball marks before cutting greens in the morning.

What about ball mark repair tools and the

prescribed methods we have today? Are some golfers, who are attempting to do the right thing, actually doing it all wrong? Poking a tee or two-inch fork in the ground under a mark and lifting it straight up will usually tear roots from shoots, and could lead to some mower injury.

The GCSAA-backed method of poking the fork in the sides of the mark and twisting the turf toward the center could also be quite damaging, not only to roots but also to stems and stolons.

Gentler methods are needed, especially on newly established greens or those with thin, weak turf.

A new ball mark repair system has been developed by Danny Edwards of Royal Grip

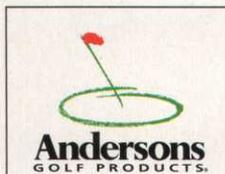
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and PGA Tour fame, called the GreenFix Golf System. A small, more oval shaped “fork” is attached to the butt end of a putter grip, and a short, nontwisting jab around the mark is the recommended action to repair turf without tearing roots.

Getting golfers to use this tool effectively before putting out will be the trick, but at least they don’t have to bend over anymore.

Randy Kane has been the director of Turfgrass Programs/Turf Advisor for the Chicago District Golf Association since 1985 and an adjunct assistant professor in the department of natural resources and environmental sciences at the University of Illinois since 1992. He has a Ph.D. in plant pathology from Cornell University, and a B.Sc. in turf management from Purdue.

Disclosure: *Neither Randy Kane nor the CDGA has commercial interests in any product mentioned in the article; this article is based solely on observations and opinions of the author and Illinois golf course superintendents. No research has been conducted by the author to support the views expressed herein, and no funding has been solicited or received to study this topic.*



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