# Use of Bermudagrass as a Summer Annual for Emergency Turf

We've all had these bare-ground or thin-turf areas that somehow didn't get replanted last fall. Now spring has moved into the dog days of summer and it's too late to get that maturing stand of coolseason grass capable of withstanding summer stress.

Instead of fighting summer annuals and summer stress. why not plant a warm-season turfgrass that will behave as a summer annual? There are some pretty decent seeded bermudagrasses that provide a nice-looking, tough turf that outpaces crabgrass, thrives in the heat, and is droughttolerant.

Having grown up and lived in Iowa for 37 years, I recognize that it's a lot easier to establish cool-season grass during June in northern Illinois than in southern Illinois. Regardless, wouldn't you rather wait until August or better yet, September to do the seeding? If you do it in June, you have to contend with rapid soil-moisture loss and possible loss of stand if you miss irrigation at a critical time. If you seed in June, you might have to contend with summer diseases that can devastate thousands of square feet of seedling turf overnight. And you have a drought-susceptible turf all summer long, even if it survives. Worst of all, you have to fight summer annual grasses. And in southern Illinois we have goosegrass, which actually crowds out crabgrass. Imagine what it can do to Kentucky bluegrass. It ain't pretty.

Instead of fighting summer annuals and summer stress, why not plant a warm-season turfgrass that will behave as a summer annual? Bermudagrass is aggressive. Many consider it a weed in its own right. But there are some pretty decent seeded bermudagrasses that provide a nice-looking, tough turf that outpaces crabgrass, thrives in the heat, and is drought-tolerant.

"But what if it survives the winter and invades my beautiful bentgrass, bluegrass and ryegrass?" It won't. Do you see any bermudagrass in your area? The only one I know of that has ever survived in the north is 'Guymon,' and that was under a 2- to 3-inch clip east of Lake Michigan with its temperature moderation. Any bermudagrass that is cut short simply lacks the energy to remain alive through a five-month dormancy. It doesn't matter if the winter is hard or soft.

Some professors you might know, David Minner of Iowa, Roch Goussain of Nebraska and Steve Keely of Kansas, conducted a cooperative two-year study using bermudagrass as a summer annual (Iowa Turfgrass Research Report, 2000). You might have heard of it. Here's their report of the Iowa story in a nutshell. On July 2, Minner planted some of the best-known seeded bermudas into a turf area killed with glyphosate after verticutting several times to expose about 50% of the soil surface. And he planted a perennial ryegrass check. By August, he had virtually complete bermudagrass turf cover with all the bermudagrass varieties and 23% cover with the perennial ryegrass. On August 24, he slit-seeded a perennial ryegrass into half of each plot. The following year he observed no surviving bermudagrass during June. In early July, he again slitseeded bermudagrass into the dead bermuda as well as the surviving perennial ryegrass. He applied simulated traffic during August and September. During September, he recorded 100% bermudagrass cover in plots not seeded with perennial ryegrass and 10 to 28% bermuda, 72 to 90% perennial ryegrass in the plots with mixed stand (adding up to 100% covers). The check plot that received only perennial ryegrass the entire two years had a 90% cover. By (continued on page 13)



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#### Use of Bermudagrass as a Summer Annual . . . (continued from page 11)

December, the bermuda and bermuda/rye plots had 5 to 17% exposed soil while the ryegrass plot had 37% exposed soil. I think this research demonstrates effectively that bermudagrass can do the job through the summer, leave room for perennial ryegrass going into fall, and be out of the picture after winter kill.

Will Kentucky bluegrass or bentgrass do just as well as ryegrass with bermudagrass in northern Illinois? The best-looking, lowmanagement turf that stays green vear-round in southern Illinois is bermuda/blue. Both of these species are spreaders with moderate shoot density, which is very important. It allows them to coexist, spreading into each other as the seasons transition, providing a high level of uniformity. I have never seen a bermuda/bent situation. Given the high shoot density of bentgrass, it is probable that there would be segregation of the two species within the turf. But for you folks up north, that doesn't matter. The bermudagrass is dead by March. And the preexisting stand of dving bermuda would provide a nice mulch to slit-seed into, or verticut and overseed into during the fall, no matter what cool-season grass you want. And on slopes there would be the added advantage of a rooted mulch to prevent soil erosion during the rainy seasons while the coolseason grass establishes. Remember, the bermudagrass was started during the drier season.

In case I have actually convinced you to try bermudagrass as a summer annual, see Table 1, Table 2 and Table 3 for further details on varietal performance and turf treatment.

Bermudagrass loves nitrogen, even more than other turfgrasses. In fact, it's absolutely passionate about it, and goes into withdrawal without it. So if you push it with nitrogen, you can get a fast, full cover from a very young bermudagrass turf within a few weeks after germination. And if you are thinking you can get faster established turf for an emergency by laying a cool-season grass sod, don't bet on it. And you will spend a lot more money laying sod.

Another note for the sod growers in the audience: you might consider having a small area of bermuda sod ready for those summer repairs. It knits in a lot faster during the summer than cool-season grasses. You then come back in September to replace it with a cool-season grass sod. You double your sale per sight and get greater customer satisfaction.

Just with

| Table 1.<br>Seeded bermudagrasses<br>and their relative<br>turf qualities.<br>(from NTEP data 1997-2001)      |         |
|---|---------|
| TURF  | OHALPEY |
| Distant   | QUALITY |
| Riviera   | 0.0     |
| Princess  | 0.1     |
| Iranscontinental  | 5.6     |
| Southern Star   | 5.4     |
| Blackjack   | 5.4     |
| Majestic  | 5.3     |
| Savannah  | 5.3     |
| Sydney  | 5.2     |
| Shangri La  | 5.1     |
| Pyramid   | 5.0     |
| Sundevil  | 5.0     |
| Blue muda   | 5.0     |
| Numar Sahara  | 5.0     |
| Miner-Sallara   | 3.0     |
| wiirage   | 4.9     |
| Jackpot   | 4.9     |
| Arizona Common  | 4.5     |
| LSD   | 0.2     |
| New seeded cultivars that remain to be proven<br>are: Yukon, Lapaloma, Sunbird, Panama, Sunstar<br>and Mohawk |         |

Table 2. Preemergent herbicides for warm-season grasses, only. Isoxaben

Metolachlor Napropamide Oryzalin Simazine

| Table 3.<br>Postemergent herbicides |            |  |
|-------------------------------------|------------|--|
| for bermudagrass.                   |            |  |
| BROADLEAF                           | GRASS      |  |
| WEED                                | WEED       |  |
| CONTROL                             | CONTROL    |  |
| Atrazine                            | Asulam     |  |
| Imazaquin                           | Diclofop   |  |
| Metsulfuron                         | DSMA,      |  |
| Simazine                            | MSMA,      |  |
| Pronamide                           | CMA        |  |
| Ouinclorac                          | Metribuzin |  |
| Foramsulfuron                       |            |  |

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## Cruisin' for a Bruisin'— Ball-Mark Injury and Repair

Why does the seemingly innocuous "ball mark" on the left, turn into the slowto-heal "ball bruise" on the right?



Complaints about the severity and longevity of damage from ball marks (a.k.a. "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 gameimprovement clubs that hit the ball higher, and just more (perhaps lazier) golfers. Problems with ball marks may also be increasing in conjunction 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 the aforementioned 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.

Ball marks can be disruptive to the quality of the putting surface, no matter how many times you try to repair/smooth them as they heal. 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, claims abound that the newer, dense, semi-dwarf 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 in the guise of a separate, trained employee who custom-fixes ball marks. Many supers 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.

And why does everyone fret so much about ball marks anyway? It's just another part of the game—along with divots, cart traffic and footprints from mosquito spray. Actually, ball marks can be disruptive to the quality of the putting surface, no matter how many times you try to repair/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, and we don't want that, do we?

#### **Ball-Mark Physics: 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

(continued on page 17)





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short-to-middle iron approach may land on the green at speeds up to 60-70 miles per hour, with a rotation rate of 2,500-3,500 RPMs. The direct force of the impact of a 1.62 oz golf ball hitting the green surface 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) sandtopdressed surfaces. How many times have you seen sharply struck shortiron 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, 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 (golferrelated 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. A new, sand-rootzone (USGA-type) green with a 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 N and with light, frequent PGR applications will likely suffer differently from ball impacts than higher-cut, wellfed 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, semi-dwarf 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 very 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 lead to a lot of negative comments from golfers, superintendents and the industry press (the "nattering nabobs of negativism").

There have been a few research projects that have tried to answer questions about the initial damage and recovery rates of newer versus 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 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). Dr. Murphy built a gas-powered "gun" to shoot golf (continued on page 19)



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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 (to me anyway), 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, Penncross-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 '02, 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, two or more years of growth are required to allow rootzone stabilization and a sufficient mat to form in order to resist the damage from the combined impact and spin of golf balls.

#### Alleviate the Damage, Assuage Angry Golfers!

If you are having a significant, or abnormal, amount of ball-mark damage, there are two main reasons this is happening. One, the initial strike of the ball is seriously harming the turf, or two, 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 ballmark 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, like traffic stress, heat stress, diseases, etc.

And what about ball-mark repair? Are golfers really to blameeither for not fixing marks, or for fixing them incorrectly and increasing the damage to turf? It is 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 0.1 to 0.15 inches will usually scalp unrepaired or poorly repaired marks, thus adding insult to injury-and this is why many crewmen repair ball marks before cutting greens in the morning.

And 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. If performed carlessly, the GCSAA-backed method (see page 17) 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 (and especially in the hands of the gorillas and beer-cart hounds who play a lot of golf around here!).

A new ball-mark repair system has been developed by Danny Edwards of Royal Grip and PGA Tour fame, called the GreenFix Golf System (no, this is not a paid endorsement). A small, more oval-shaped "fork" is attached to the butt end of a putter grip, and a short, non-twisting 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 any more!



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