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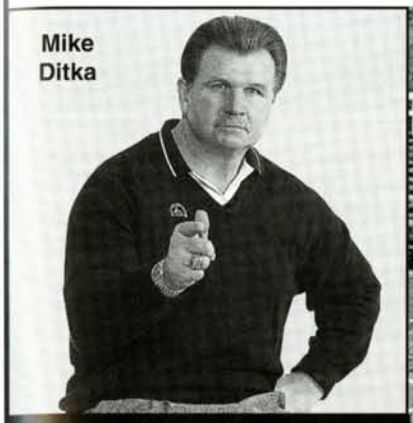

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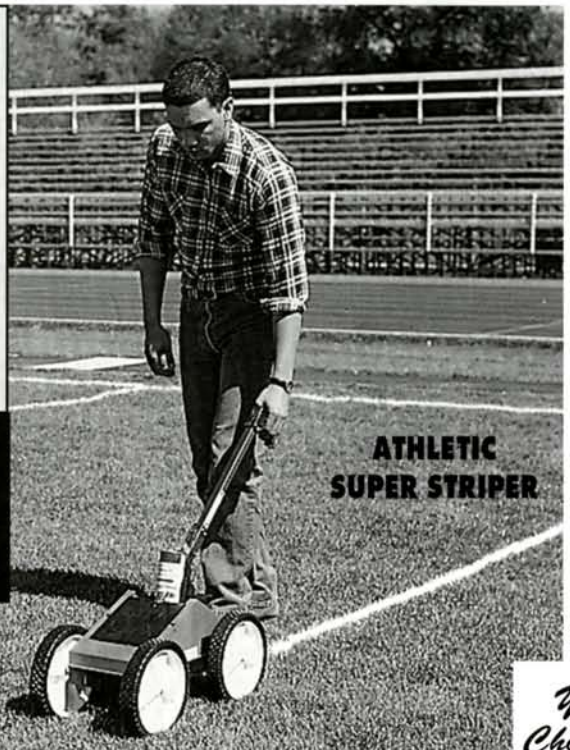

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Field Covers

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sees a P.A.T. field with sub-irrigation, the ability to pump the field dry and a root-zone heating system that can maintain 65 degrees F. However, at times all that is not enough to withstand the weather extremes in the Rocky Mountains. Besides the heat and cold, humidity fluctuations can be drastic, sometimes ranging in the 90s on a Saturday afternoon and falling to 50 percent by game time on Sunday.

The Kentucky bluegrass field is overseeded with a blend of pre-germinated perennial ryegrasses during early spring, early fall and prime playing periods. Lujan and his crew use field covers to help spur the growth and development of the seed, especially in early spring and late fall. With the cover, they can even get some growth during the winter season.

In-Season Protection

Wise cover management can often save a baseball game from being rained out. The key is knowing when to put the covers in place and when and how to remove them. For Jesse Cuevas, stadium manager for Johnny Rosenblatt Stadium in Omaha, NE, covers are essential for keeping the field in shape for the televised sessions of the College World Series. Midwestern spring warming comes only when it's ready, and the June weather in Omaha can range from cool and damp to hot and humid. Cuevas uses covers early in the spring to spur greening and growth and to control moisture levels to force deep rooting.

As with all baseball fields, during the playing season and especially during the College World Series at Rosenblatt, cover placement becomes a balancing act between weather conditions, necessary maintenance practices and field-use schedules. Cuevas monitors soil-moisture levels closely to determine how much rainfall the field can handle within a short period and still remain playable. Covers will be put in place prior to a game if water levels are near field capacity, and rainfall is predicted.

Football fields benefit from protection, too. Mrock and his crew use seven 20-by-60-yard sections of 14-ounce field cover as necessary to tarp the fields during the April to December period of active use.

Snow is easily removed from the field cover, leaving the protected turf in good condition. File photo.

The covers protect the field from heavy rains, reducing the wet, muddy playing conditions that are so damaging to turf.

At Mile High Stadium, Lujan uses three covers, each 224 feet across by 150 feet wide, to cover the entire turf area, not just the playing field. These covers have one black side and one white side. When covering is necessary in the early fall, the white side is placed upward to deflect the rays of the sun. When night temperatures fall below 50 degrees F, and the extra heat is needed, the black side is placed up. The black surface helps keep frost from settling or a light snow from accumulating.

Playing Late

In Chicago, winter-like temperatures may hit in October and hang on until spring. Mrock uses covers to protect the fields from heavy snows that could hamper play. For as long as 24 hours prior to a practice or game, he uses covers to trap the heat generated by four 600,000 BTU kerosene heaters. This warming boost helps keep the turf growing a little later in the season. Even when turf growth can't be maintained, the heat keeps the field surface from freezing, providing a safer arena for the players.

Covers also provide snow protection at Mile High Stadium. In Denver, snow often falls in pockets, creating a blizzard at the stadium while the city is clear — or blanketing the city and by-passing the stadium. Lujan covers the field whenever events are scheduled and snow is forecast, so if removal is necessary, snow is cleared from the cover, not the field. Crews create a giant squeegee on the snowplow attachment of a 4 x 4 pickup truck by removing the skids and attaching two strips of half-inch thick rubber that extend the length of the plow. With this, they push the snow off the cover for removal from the stadium. Covers also are used during periods of cold, windy, dry weather to reduce turf desiccation.

Managing Adversity

Mike Andresen, head groundskeeper for the Iowa Cubs Sec Taylor Stadium in Des Moines, managed field cover usage to help turf pull through almost constant rains and double flooding during the 1993 season. The field was originally constructed of native black soil over an old landfill site at the point where two rivers — the Des Moines and the Raccoon — converge. The soil profile has been augmented over the last several years with annual applications of calcined clay.

During the rains, which fell on 60 of 80 days, the field was kept covered to retain the possibility of play. Yet some exposure was necessary because when the cover remained on for too long a period, the ground surface below the cover became dry and hard.

Then the field was flooded, once by river overflow and once by sewer backup caused by the inability of the river to take on more water. The flooding also disabled the city's water system.

Just before the first flooding, Andresen and his crew had slit-seeded the field with pre-germinated seed. After silt from the flood had been removed twice, they concentrated on restoring the existing turf and forcing growth of the seed that remained. The cover was put in place. Then, as the field moisture beneath the cover reached field capacity, and a water source was still unavailable, Andresen changed his strategy. The field was covered at night to allow soil moisture to rise to the surface, encouraging the new seedling growth, then removed during the day unless more rains threatened.

Wise cover management can speed turf establishment, extend field playability earlier and later into the season and protect fields from the need for extensive repair. The material and labor costs saved through any of these processes may more than offset the initial cost of the cover. ❑

Steve and Suz Trusty are partners in Trusty & Associates, a consulting firm located in Council Bluffs, Iowa. Steve is assistant chairman of the public relations committee of the national Sports Turf Managers Association.

Turf of the Month:

Lawn bowling greens must be maintained properly for optimal playing conditions. Photo courtesy: Joe Siegman, ALBA.

Pencross creeping bentgrass, shown here in a test plot, is the turf of choice for most cool-season lawn bowling greens.

Bentgrasses for Lawn Bowling

By Mike Augsdorfer

Most people think about sports turf in terms of athletic surfaces for baseball, football and soccer. These require sturdy, tough turfgrasses, such as bermuda, bluegrass or tall fescue, that are capable of handling heavy traffic and divoting. Bentgrass is not often categorized as a sports turf, at least not in the sense that these other species are. Bentgrass is commonly associated with golf courses, particularly golf greens, but it is also a popular turfgrass for low-traffic sports such as lawn bowling.

Of the three species of bentgrass — creeping (*Agrostis palustris*), colonial (*Agrostis tenuis*) and velvet (*Agrostis canina*) — only creeping bentgrass is widely used for bowling greens. It tolerates close mowing and produces a dense, carpet-like sod. Colonial bentgrass is less aggressive than creeping bent and is used occasionally in coastal regions. Velvet bentgrass is considered the most aesthetically pleasing of the bentgrasses and is more drought tolerant than the other two species, but it is not used for bowling greens very often.

All species of bentgrass create a dense, fine-textured turf which requires a high level of maintenance. The primary advantage of bentgrass is that it tolerates the very close mowing required of a lawn bowling green. It can be cut very low without damage, which explains why bentgrass is as popular for lawn bowling as it is for golf greens.

Maintenance Considerations

Maintaining a bentgrass lawn bowling surface, however, requires considerable patience and persistence. For starters, all bentgrasses have a high thatching tendency. Excessive thatch development can result in an unsuitable surface for lawn bowling. Proper lawn bowling conditions require a smooth, level surface that does not interfere with the natural roll of the bowl. Heavily thatched areas create irregular, slow conditions for lawn bowling. Thus an aggressive thatch-control program must be implemented when maintaining a creeping bentgrass lawn bowling green.

Turf specialist J.M. Vargas, Jr., a professor of botany and plant pathology at Michigan State University, notes that turf managers must be especially careful with fertilization of bentgrass greens. "Excessive use of nitrogen is one way to lose your grass in a hurry," he writes in his book, *Management of Turfgrass Diseases*. "As more nitrogen is supplied, more shoot growth is produced," he continues, "but this is usually at the expense of the root system." Vargas recommends no more than three pounds of nitrogen per 1,000 square feet per season in cool-season regions and no more than four pounds per 1,000 square feet when bentgrass is used in southern regions.

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Bentgrass

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Irrigation is a primary concern with bentgrass bowling greens. Because bentgrass root systems are usually shallow, the tendency is to water bentgrass greens frequently. Some turf managers will water bentgrass greens daily in dry climates. However, turf managers must be cautious with irrigation to avoid overwatering. "Excess water in the soil denies oxygen to the roots," says Dr. Edgar Haley, chairman of the greens committee of the American Lawn Bowl Association. "The roots will extend only so deep as oxygen is available," he adds.

Haley recommends irrigating only when the green needs water and suggests that automatic irrigation systems can be detrimental to the health of a bentgrass green. "Invariably, when greens are irrigated on an automatic basis, they become water-soaked, and the roots, deprived of oxygen, extend to a depth of 0.75 to 1.5 inches only." In extremely hot, dry conditions, such as those in the desert Southwest, bentgrass greens may be watered very lightly at midday — just enough to cool the turf but not enough to cause any saturation problems.

In 1984 Haley, who is widely considered the foremost expert on construction and maintenance of lawn bowling greens, published the fourth edition of his book *Maintenance of the Lawn Bowling Green,* which is still used by turf managers charged with the care of lawn bowling greens.

While Haley admits that hybrid bermudagrass is the preferred surface for lawn bowling greens, he adds that bentgrass works well in cooler climates where bermudagrass is not practical. "You only use bentgrass where you cannot use bermuda," says Haley.

He suggests the use of Pencross creeping bentgrass for lawn bowling greens in cool season conditions. In his book, Haley also recommends Pencross for overseeding hybrid bermuda lawn bowling greens in the winter. Seaside creeping bentgrass has also been used for lawn bowling greens with some success, but Haley cautions that special care must be taken with the Seaside variety. "Seaside," he writes, "after a year or so will develop patches of turf having variations in density and grain sufficient to cause a slight change in the behavior of the bowl. Pencross has a less tendency to develop these variations."

Haley dismisses the notion that creeping bentgrass will not root firmly enough to provide a stable surface for lawn bowling. "Pencross bentgrass will root down to seven or eight inches," he relates. "If you build your green so that the levels of air and water are optimal, that's where the roots will go."

Drainage Helps Deep Rooting

Proper drainage is the key to achieving deep rooting, says Haley. "It's very important that your drainage pipes are level," he explains. The right base is also a crucial element. "We use 100% washed sand," he notes.

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Bentgrass
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The size of the particles plays an important role in providing water and oxygen to the roots of the grass. "Pure sand of relatively fine and uniform size (80 percent or more of the particles having 0.15 to 0.5 mm in diameter) and containing little or no clay (under four percent) appears to be the ideal soil for the bowling green," Haley writes. The fine particles allow proper distribution of moisture and oxygen to the roots of the plant. Loamy soils may become saturated, and the roots will not get the oxygen they need, effectively drowning the turfgrass.

The size of the sand particles also affects the playing surface. "The surface tension is dependent on the size of the particle," says Haley. Finer particles create a firmer surface for bowling.

Earl Shafer, general superintendent of grounds at DuPont Country Club in Wilmington, DE, maintains a bentgrass/*Poa* bowling green at the club. "We maintain it just like a golf green," he explains. The primary difference is in the frequency and timing of aerification on the bowling green. "We go with three aerifications: spring, fall and somewhere in the middle," says Shafer. "Without the third aerification, the edges get worn."

Michael Ashton Phillips, marketing director for the ALBA, has played on greens throughout the country and notices a subtle difference between playing conditions on hybrid bermuda and bentgrass greens. "You get a little more pace out of bermuda," he explains. Phillips feels that bentgrass greens are about two seconds slower than bermuda greens. (Pace of a lawn bowling green is judged by the number of seconds that elapse from the time a bowl is released until it comes to rest 90 feet away.) Phillips says bowling on bentgrass greens demands a slight adjustment in technique. "The bentgrass requires more bodily effort," he notes.

Lawn bowling is a game of precision that requires a consistent, true surface for play. With proper maintenance procedures, creeping bentgrass provides an excellent surface for lawn bowling greens in cool-season regions. Creeping bent may also be used for overseeding lawn bowling greens in warmer climates during the winter months. ❑

Bowling Green vs. Golf Green Maintenance

By Lloyd Woods

At first glance, it would seem that the maintenance requirements of golf and lawn bowling greens would be almost identical. However, the differences are significant, and turf managers who have been involved with both agree that bowling greens require the higher level of maintenance to produce an acceptable playing surface.

A bowling green must be fast, level and true if bowlers are to play with self-confidence and finesse. Compared to a golf green, it must be very firm and thatch-free, and if the bowls are to run true, the green should be level to within 1/8 inch over its entire area.

Because of the differences between the weight of a golf ball (approximately 2.5 ounces) and that of a bowl (up to 3.5 pounds), a stimpmeter cannot be used to give a meaningful measure of the speed or "pace" of a bowling green. Instead the standard pace measurement — stated in seconds — is the time it takes a bowl to roll from its delivery until it comes to rest at a point 90 feet up the green. Nine seconds is slow, 12 seconds acceptable, and 14 seconds is considered very good for a bentgrass green in our climate. The width of draw —the amount that the bowl curves during its travel — is related to pace. As the pace increases, draws become wider, up to ten feet in the case of a 14-second green.

Since good pace is so important, a great deal of the maintenance effort is directed toward creating a firm surface. This means that thatch production must be kept to a minimum, and the thatch that does develop must be removed on a regular basis.

Close, regular mowing reduces thatch production. Typically, bowling greens are mowed four or five times per week at a mowing height of 1/8 inch or 5/32 inch, as opposed to 3/16 inch or so for golf greens. Thatching is also controlled by limiting the amount of nitrogen applied. One pound per 1,000 square feet per growing month is considered an absolute maximum.

In spite of one's best effort to control it, some thatch will inevitably develop and must be dealt with. Regular topdressing, as is practiced on golf greens to provide a firm surface, is not acceptable on bowling greens for two major reasons: 1) repetitive topdressing will in time raise the level of the green relative to the plinth (the board that runs around the inside of the ditch surrounding the green), and 2) sand on the surface of the green damages bowls and makes for unpleasant playing conditions.

The answer, then, is regular dethatching. Weekly verticutting throughout the playing season is needed if a firm, fast surface is to be achieved and maintained.

Also, since a dry surface runs faster than a wet one, irrigation must be more disciplined. Of course, this increases the chance of localized dry areas, particularly in the case of sand greens which are built without any peat or other amendments. Therefore, applying the right amount of water is a real balancing act which can be made somewhat easier if wetting agents are used.

Low thatch levels and the use of less water tend to reduce the incidence of disease, so preventive use of fungicides is uncommon. However, the same diseases which inflict golf greens are also found on bowling greens from time to time. *Fusarium*, *ophiobolous*, *pythium*, brown patch, dollar spot, etc., show up on occasion and must be dealt with.

Wear distribution is achieved by moving the rink center (analogous to moving the cup on golf greens), and the direction of play should be changed regularly. During tournaments and other times of heavy use, the rinks are best moved after every game.

The green must be kept level over its entire 14,400 square foot area (120 feet by 120 feet). Identification of low areas and selective topdressing is required and is usually accomplished before or after the playing season. Core aerating is also limited to the off-season and is an operation that must be done very carefully since the levelness of the surface may be compromised. All holes must be back-filled because areas with incompletely filled holes are prone to sinking.

The maintenance regime of close mowing, dethatching, restricted fertility and limited water places the green under a great deal of stress, particularly in hot, dry weather and during periods of heavy play. It is indeed a challenge to maintain the turf in a healthy condition. Fortunately, the bowling season usually lasts only about six months, and the turf gets time for rest and recovery through the winter months, so all is not gloom and doom.

Fortunately too, bowlers seem to be somewhat more tolerant than golfers and will accept playing surfaces which are not particularly green if only the pace is maintained and the draws are wide and true. Of course, even with almost perfect playing conditions, lawn bowlers, like golfers, have been known to criticize the green — more so when the result of their game was less than satisfactory!

Lloyd Woods is a greens consultant in Victoria, British Columbia. The contents of this article were originally presented at the 1995 Western Canada Turfgrass Association Conference and were printed in Turf Line News. *The article is reproduced with permission from the WCTA. Special thanks to Bob Wick of the WCTA for his help.*