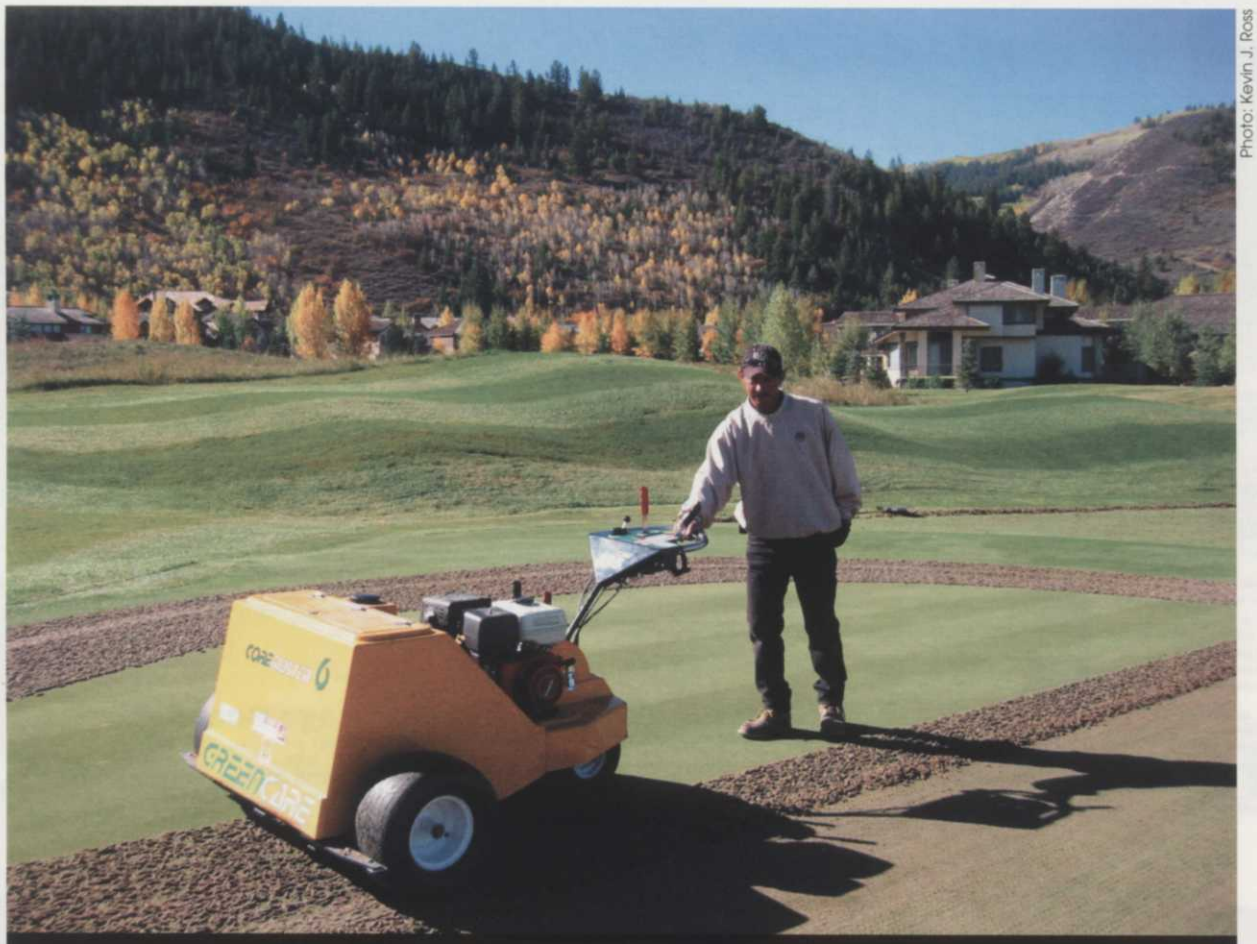


Photo: Kevin J. Ross

Aerification practices have changed throughout the years to closer spacings and smaller tines.

# Today's greens management

## IMPROVEMENTS CONTINUE, BUT WHERE DO THEY END?

by KEVIN J. ROSS, CGCS

There's no debating about the fact that the green surfaces golfers are playing on today are the finest ever produced. Present greens management programs have evolved from years of experience and technological advances that produce an excellent product worldwide.

Not too long ago, during the 1970s, greens were being cut at three-sixteenths of an inch and producing speeds of 7 feet on the Stimpmeter.

Presently, some golf courses are cutting greens as low as one-tenth of an inch and producing daily Stimpmeter readings of 11 to 12 feet. Times have changed from cultivar selection to fertilization practices and almost everything in between.

### Greens cultivar selection

Since the late 1950s, Penncross creeping bentgrass has dominated the bentgrass market. Even with the newer bentgrasses on the market, Penncross is still the world's No. 1 selling bentgrass – about 750,000 pounds are sold annually.

While Penncross still dominates the market, the newer superbents (such as the A and G series, L-93, SR1119, etc.) are the new popular choices for greens. These superbents offer finer texture, greater density, upright growth patterns and the ability to be cut at preferred heights of one-eighth of an inch and lower. These bents also offer tremendous rooting potential, which translates to a water-efficient plant. Unlike the past, when Penncross was the sole option, superintendents now are faced with a difficult decision about what bentgrass to use.

Determining the best bentgrass cultivar for a particular area takes extensive research. But where should one start? The National Turfgrass Evaluation Program (www.ntep.org) might be the best starting point. This program evaluates all the major golf course turfgrass species. There are various sites throughout the United States (primarily universities) that conduct the testing.

However, one should be careful when evaluating NTEP testing results. For example, assume bentgrass A is the overall, top-ranked performer for a particular year. While a testing site such as Orono, Maine, might have it ranked fairly low, other sites might have it ranked much higher. So what's the concern? While the overall rankings are good, the real meat of the rankings should be looked at from a regional standpoint. The optimal way to decipher the rankings is to compare testing areas that match, or are similar to a course's climatic conditions. If a superintendent plans to grow bentgrass A in Springfield, N.J., then the performance of that particular cultivar in Orono, Maine, might be of less concern.

Possibly the best method for evaluating bentgrass cultivars is individual testing by a superintendent at his course. No data and observations can be better than testing under the exact growing conditions. For example, if one is faced with the decision to select a bentgrass for green surfaces before a reconstruction project, that person should consider developing a test green for evaluation. Many superintendents have done this successfully.

To do this, construct a test green including the top eight cultivars being considered. Then, throughout a 12-to-16-month period, watch these bents under your management practices and climatic conditions. As a result of this testing, select the bentgrass that would ultimately perform the best in your area and under your management programs. This is the ultimate way to evaluate what will perform best. This testing hinges on timing that requires forward thinking 12 to 18 months out. This can even be done in a new construction situation. There's easily enough time during the construction phase for a test green to be constructed and evaluated.

### Construction

The greens that superintendents produce today are, in large part, a result of greens construction specifications that have been refined throughout the years and offer the ultimate in soils physics. The U.S. Golf Asso-

ciation continually reviews and improves its specifications for greens construction – not only from a scientific standpoint, but also from a cost standpoint. Current specifications are based on scientific laboratory testing that will ensure, with proper construction, a green that will perform for many years.

Along with the USGA-specified green, the California green has gained a lot of popularity during the past 10 years. Although this construction method had its early share of problems, many superintendents are reporting excellent performance with this method.

Superintendents should thank technology for producing excellent sand-particle sizing and root-zone blending. Golf course material suppliers presently have sophisticated sand screening and mixing machines at their disposal. These machines ensure the proper material will be produced and mixed for greens root zones. The increased popularity of the California green might be a result of the technological advances in sand screening machinery. The most critical part of the California green is the sand-particle sizing. With today's machinery, the particle-size specifications needed for the construction of a California green are much easier to obtain.

These two methods create debate among superintendents and academics. Regardless of which green method an individual prefers, both have their place in today's golf course construction world.

## Irrigation

The old design of a common irrigation system that watered greens and surrounds isn't used anymore. This might be one of the biggest reasons for great greens quality and proper water management. Presently, most golf courses have a dedicated greens system that waters the green surface only. This offers the flexibility to water the green surface independently from the surrounds area, therefore, putting exactly the amount needed on the green. Irrigation companies also should be commended for developing efficient sprinkler heads and computerized controls that offer considerable flexibility.

## Water management

Overwatering might have been the biggest mistake made when superintendents switched from managing soil push-up greens to managing sand-based USGA greens. Their past experiences with push-up greens, in which watering almost every night was the norm, didn't translate to sand-based greens. The perched water table theory of the USGA green ensures efficient water usage. This table, along with independent watering systems, has changed the face of watering practices to more of a fill-the-glass approach. For many, this approach means irrigating to fill the root-zone cavity (the glass) to field capacity, plus an additional amount sometimes for flushing through positive drainage. Then, the turf is dried down the cavity water (drink the glass) nearly empty, and the cycle is repeated. This method of watering has produced excellent turfgrass and water conservation results. Many of the past failures of the USGA green have been directly related to overwatering. Now, through experience and irrigation design, these overwatering failures have been reduced drastically.

## Cultural practices

One benefit of the new superbents has been the development of equipment that will help manage them. Using aerification equipment, which produces tight spacings – as close as one inch by one inch – seems to be popular. Much more attention is being given to thatch and organic matter build-up than ever before. Many superintendents are basing their programs on a 15- to 20-percent surface area removal impacted theory – or using research conducted by Dr. Bob Carrow of the University of Georgia – which suggests a maximum of 4-percent organic matter be in the upper 2 inches of the green surface, to design their aerification programs.

The development of true dethatching units also has been beneficial for managing the thatching potential of present day bentgrasses. These machines offer depths as deep as 1.5 inches and various blade widths from 1 to 3 millimeters. Many superintendents are performing dethatching and aerification operations at the same time. This can increase the SARI drastically and lower the thatch/organic matter percentage quickly.

## Topdressing

Looking back to the three-sixteenths of an inch cutting heights of the 1970s, superintendents could count on one hand the number of times per season greens would be topdressed. That has changed. Lighter topdressing applied more frequently throughout the major portion of the growing season seems to be the standard. Many clubs are using fertilizer-type rotary spreaders with kiln-dried sand throughout the summer every two to three weeks. Some clubs are even using green-died sand for the light and frequent applications. The color of the sand blends into the turf surface so well that golfers can't tell the green has been topdressed. Along with these light dustings, superintendents probably are topdressing

Photo: Kevin J. Ross

The practice of rolling greens has become commonplace for superintendents and their management programs.

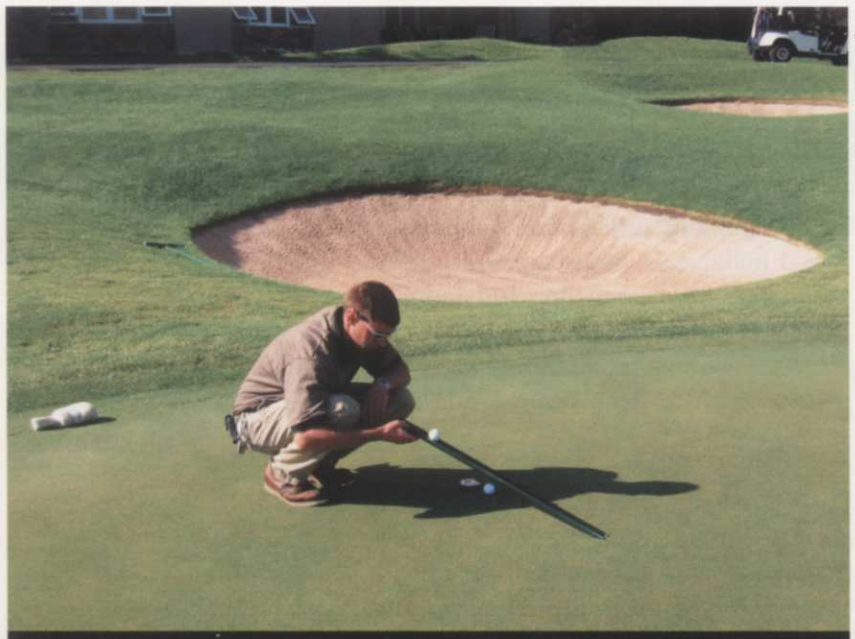

Photo: Kevin J. Ross

The days of greens being cut at three-sixteenths of an inch and rolling at 7 feet on the Stimpmeter are over.

more heavily than in the past. Credit should be given to material suppliers for producing spec topdressing sand, whether colored, dry or normal. There also is a fairly new product on the market: sand (topdressing) coated with fertilizer. Initial research shows positive results from this material when used in conjunction with aerification.

## Mowing and green speed

It wasn't that long ago that three-sixteenths of an inch was the normal cutting height for greens. At most courses today, three-sixteenths of an inch might get someone a pink slip. Tees, approaches and some fairways are cut at this height. Today, some golf courses are cutting greens below a tenth of an inch. But how low can one go? The bottom is approaching rapidly.

There's no question the need for speed has brought these low heights, and speed is most likely here to stay. When determining the perfect speed, a variety of inputs should be considered – from green design to player's ability. The best way to determine a proper green speed might be to follow the model of Mike Morris, superintendent at Crystal Downs Country Club in Frankfort, Mich. He ran a two-year study using weather data, membership surveys, cultural practices and Stimpmeter readings. With these inputs, Morris was able to determine the optimum green speed range the membership desired and what he could deliver on a daily basis. Maybe the most important policy Morris and his club came up with was not to alter green-speed range. So no matter what the day, tournament or not, it's the same. This eliminates, quite possibly, the biggest problem many superintendents do to themselves: Soup up the greens for the big club tournaments (13 feet) and then slow them back to reality a week later (10 feet). The floodgates for complaints have been opened now.

## Fertilization practices

There are two big changes regarding analyzing greens fertilization. First, the total amount of nitrogen used per 1,000 square feet has declined dramatically throughout the past 30 years. "Turfgrass Science and Culture," the textbook written by James B. Beard in 1973, stated the nitrogen requirement for bentgrass should be 0.8-1.4 #N/M per growing month. Now, even Beard acknowledges that was too high. Today, some greens are being managed with as low as 1-2#N/M per year, while a new course grow-in might be as high as 6-12#N/M. Disregarding a grow-in situation, the nitrogen amounts have declined from Beard's first recommendations to the current 0.25-0.50#N/M range per growing month.

The second change is the popularity of foliar feeding. This might be the one practice that has led to the use of decreasing amounts of nitrogen. Spraying low amounts of nitrogen with the use of a solubles/liquids has become one of the most popular methods of fertilization during the past 10 years. This method, or spoon-feeding as it's been coined, isn't strictly limited to greens. Many courses have used this on tees, and fairways are becoming a popular spoon-feeding target, too. The ability to spray these materials more frequency while using extremely low rates benefits the health of the turfgrass. This type of approach can't be accomplished with traditional granular fertilizers.

## Seeding vs. sodding

For years, seeding had been the preferred method for greens establishment, and sodding was taboo. But sodding has made major gains, which have been made primarily because of the ability of sod producers to grow quality sod and address the layering phenomenon. In the past, failures of sodded greens have been related mostly to an incompatible match of the root-zone mix with the sod medium. With proper laboratory testing to determine the compatible match of a root zone and the material the sod is grown on, the sod disasters of the past are pretty much over.

With sodding gaining more acceptance, the debate about whether courses should be sodded completely is heating up. Developers and owners can make money more quickly if courses are sodded entirely. Sodding probably won't displace seeding, but it seems to be an acceptable method and can no longer be labeled taboo.

## The future

Are superintendents practicing the ultimate greens management? Maybe. Can the height of cut be lowered more? Not much. Years ago, Penncross was considered the ultimate, as was five-thirty-seconds of an inch and 10 feet on the Stimpmeter. Anything could be possible 25 years from now. GCN

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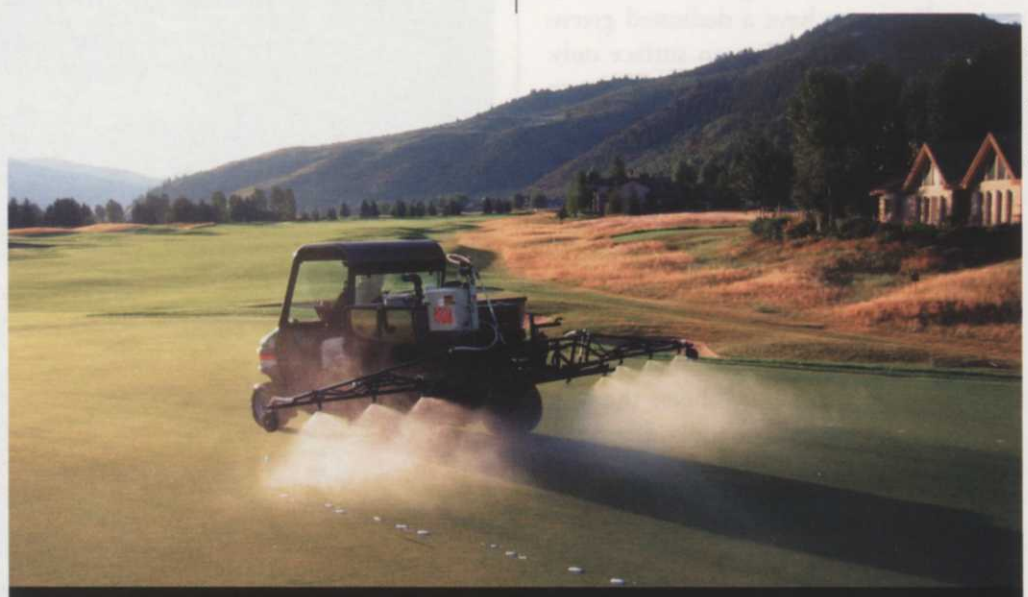

Photo: Kevin J. Ross

The use of solubles is the current rage for summer fertilization.