having to coil and replace the marking ropes.

The hitting stations are separated with a white 2×4 equipped with stakes to hold it into the turf. Bag stands, club scrubs, chairs, and garbage cans also are standard items at the Huntington Crescent Club practice facility. Mr. Bahrenburg changes the six- to eight-foot-wide hitting area once per week and rotates from the front of the tee to the back. The tee is mowed two to three times per week. The worn area is top-dressed, leveled, overseeded, and fertilized lightly with a starter fertilizer to encourage recovery and new seedling establishment. Irrigation is applied as needed to encourage seedling establishment, but Mr. Bahrenburg has found the tee to perform best when kept firm. A combination of perennial ryegrass and chewings fescue is used at the Huntington Crescent Club, but whatever turfgrass species is best suited to your region should be used on the practice tee. Of the cool-season turfgrasses, perennial ryegrass has the greatest wear tolerance and is the quickest and easiest to establish.

The next tip is the use of color-coded yardage posts placed on either end of the practice tee. These serve as quick reference points for golfers to determine the distance to the various target greens at the practice facility. The color-coded yardage on the post corresponds to the color of the flag placed on the respective target green. The yardage posts are much more convenient than in-ground distance markers and are definitely an improvement over those practice facilities with the standard 100-, 150-, and 200-yard markers without an established reference point on the tee.

As more people are introduced to the game of golf and existing golfers strive to improve their games, golf course superintendents will face an increasing challenge when it comes to maintenance of the practice facility. These two turf tips illustrate that innovative ideas such as these will be required by golf course superintendents across a greater range of the golf course, including the practice facility. As it is often said, nothing can replace experience. After all, *practice makes perfect!*

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SOUTHERN EXPOSURE

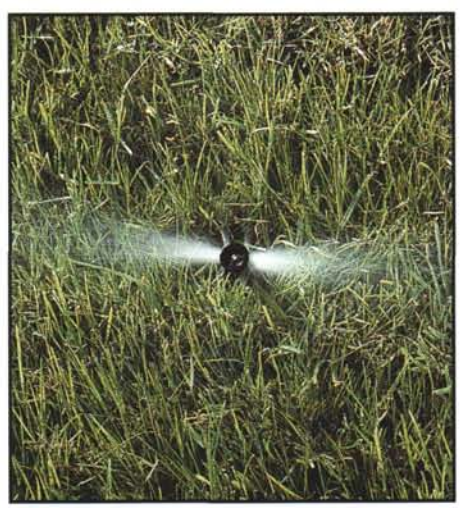
Using pop-up sprinklers to irrigate steep bunker faces.

by PAUL VERMEULEN

EVERY SPRING tourists by the hundreds of thousands flock to the southern states to soak up the warm rays of the sun. If they are not careful about overindulgence, however, overexposure to the sun and/or failing to apply ample amounts of sunscreen can lead to serious problems. In the short term, exuberant sunbathers can develop first-degree burns and, in the long term, the increased risk of skin cancer and premature wrinkling should be enough to warrant extra precaution.

While not life-threatening to people, the overexposure of turfed bunker faces can lead to serious problems for golf course superintendents. Turfed bunker faces are the steep, grassy embankments along bunker edges the compel golfers to hit a high, lofted club out of a hazard. The best example would be the so-called revetted bunker faces found throughout Great Britain.

Revetted bunker faces are constructed by stacking thick pieces of sod to establish an almost vertical angle. By stacking the sod in this fashion, the turf becomes very difficult to irrigate and, consequently, suffers from drought symptoms long before other areas on the course. When the drought symptoms cannot be taken care of in a timely manner, the turf slowly perishes and the dry soil underneath becomes loose and eventually collapses.



To ensure that the sod on steep bunker faces is properly irrigated, sprinkler heads can be installed perpendicular to the embankment. The best models for this application are the low-precipitation mist heads that throw water over a 60° angle on either side.

The life expectancy of turfed bunker faces depends greatly on their orientation to the sun. Bunker faces that are exposed to the sun for longer periods due to their southern orientation can dry out and crumble in one to three years time, whereas bunker faces with a northern orientation last up to twice as long.

The rapid deterioration of revetted bunker faces with a southern exposure became a serious issue for John Philp, Links Supervisor at Carnoustie Golf Links in Scotland, as he began to plan maintenance activities for the 1999 British Open. If a solution could not be found, then John and his staff would have to rebuild dozens of revetted bunker faces within the 12-month period before the Open to have the course in tip-top condition. Making such an effort would overwhelm both his staff and his supply of sod, which is grown on site to ensure quality control.

In search of a solution, John began investigating the various sprinkler system designs that have been used to apply supplemental irrigation to steep bunker faces around the world. This investigation led him to two conclusions. First, sprinkler systems that are

Revetted bunker faces are constructed by stacking thick pieces of sod. The life expectancy of turfed bunker faces depends greatly on orientation to the sun.

In preparation for the 1999 British Open, John Philp, Links Supervisor at Carnoustie Golf Links in Scotland, installed an irrigation system along the middle of the south-facing revetted bunker faces. This sprinkler system prevents the sod from developing drought symptoms, which cause the turf to perish and the dry soil underneath to collapse. Through irrigation, the life expectancy of the sod increases by two to three years.

installed along the upper ridge of steep bunker faces tend to miss the target area by throwing most of the water past the turf. Furthermore, they are easily affected by wind and can cause water to pool in the bunker cavity. Second, sprinkler systems that are installed along the lower ridge of steep bunker faces are plagued by frequent mechanical failures because they are either damaged during routine raking and edging or become clogged with sand from repeated explosion shots.

After concluding his investigation, John decided to blaze a new trail and install a sprinkler system along the middle of each bunker face. To ensure that the water would not miss the target, John positioned each sprinkler head perpendicular to the revetted bunker face. Also, he chose low-precipitation models that only throw water over a 60° angle on either side.

The sprinkler heads were installed during the normally scheduled renovation of each revetted bunker face on the course so as not to overwhelm his staff. Once installed, the new sprinkler heads were then wired into the irrigation system controllers so they could be operated by remote control, as needed. On a typical summer day at Carnoustie the bunker faces are irrigated for two to three minutes twice a day.

The results have been terrific. So if you are going to expose your south side, John recommends installing a few sprinklers to keep your turf from overheating in the afternoon sun.

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