



## From The Director's Desk

# QUALITY SAND BUNKERS

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The Rules of Golf define a bunker as "an area of bare ground, often a depression, which is usually covered with sand." This definition projects the image of the old Scottish bunkers, or even those at the Pine Valley Golf Club, in Clementon, New Jersey. Sand bunkers are an important asset of any golf course because they affect its appearance, strategy, playability and character. For a quality course you must have sand bunkers which reflect care in original placement, construction, and maintenance.

What makes a good quality sand bunker? First and foremost, good sand. Research at Texas A & M University and at Mississippi State University resulted in the USGA Green Section recommendation for sand suitable for bunker use. The following table summarizes those recommendations:

Briefly, the recommended size range for the majority of the particles is from 0.25 mm to 1.0 mm. Some finer sand is allowable, but the percentages of these particles should be kept to a minimum. Silt and clay content should be negligible, because bunker sand is normally washed sand. The coarse particles present a special problem because they tend to remain on the turf surface when they are sprayed onto the green surface by an explosion shot. They affect the sharpness of the reels and bedknives on mowing equipment, and they cause players to continually pick, brush, or otherwise remove these particles from their line of putt. This slows play and increases equipment repair costs. Therefore, the finer sands, which coincidentally conform to our specifications for top-dressing sands, are generally preferred because they can be worked into the surface.

Of secondary importance is the color of the sand. Most golfers seem to prefer the white sands, but they are not universally available at reasonable costs. Good-quality playing conditions require sands of the correct particle size range. Color is of secondary importance.

Sand consistency is also important. Too often several different types of sands are used in golf course bunkers. The goal should

be to have all sand bunkers, especially those around the greens, contain a sand composed of the same general range of particle sizes. This will help ensure that playing conditions will be consistent.

Extreme softness or fluffiness is a frequent complaint about bunker sands. This is a difficult characteristic to determine because so many factors are involved — how long the sand has been in the bunker, its particle size distribution, its depth, its moisture content, how often and how deeply it is raked, and the shape of the sand particles. These are just some of the factors that determine the softness of sand in bunkers. It is sufficient to say that reasonably firm sands are preferred. Hard, packed, wet sands contaminated by soil do not play well. Conversely, soft and fluffy sands in which a ball imbeds represent the other extreme.

An important consideration with respect to providing good sand bunkers is how well they are maintained. Unfortunately, maintaining sand bunkers in peak condition is not easy, nor is it economical. It takes work.

A revolution in sand bunker maintenance occurred with the introduction of the mechanical sand rake. This machine allows the operator to rake large areas of sand much more rapidly than he could by hand. This labor-saving feature is welcome unless the operator is more interested in speed than in quality performance. The best-maintained bunkers receive a combination of mechanical raking, which smooths the largest area of sand, followed by hand raking, particularly around the edges and on the steep slopes. On many courses, this procedure is a compromise between the speed of the mechanical rake and the quality of hand raking. The result is a good-quality job accomplished within a reasonable period of time.

Other features of a good sand bunker maintenance program include periodic edging and weeding to remove undesirable vegetation and to define a clear edge for the hazard. This is important. There must be a well-defined edge so that the player will know when his

SAND PARTICLE SIZE CLASSIFICATION TABLE

*ASTM Mesh	Millimeter	Sieve Opening Inches	
4	4.76	0.187	
5	4.00	0.157	
6	3.36	0.132	
7	2.83	0.111	
8	2.38	0.0937	
9	2.00	0.0787	
10	1.68	0.0661	
12	1.41	0.0555	
14	1.19	0.0469	
16	1.00	0.0394	
20	.84	0.0331	
24	.71	0.0278	
28	.59	0.0234	
32	.50	0.0197	
35	.42	0.0165	
42	.35	0.0139	
48	.30	0.0117	
60	.25	0.0098	
65	.21	0.0083	
80	.18	0.0070	
100	.15	0.0059	
115	.13	0.0049	
150	.11	0.0041	
170	.09	0.0035	
200	.07	0.0029	
250	.06	0.0025	
270	.05	0.0021	
325	.04	0.0017	

RANGE  
FOR  
BUNKER  
USE

RANGE  
FOR  
SOIL  
MIXES

COARSE  
↓  
MEDIUM  
↓  
FINE

IDEALLY -  
MINIMUM  
OF 75%  
MEDIUM  
SAND



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ball rests in the hazard.

Maintaining a 3- to 4-inch lip on the bunker in the direction of play is recommended for bunkers near the putting surface. The goal is to deter the player from putting out of the hazard. Sand should be raked flush with the back and side edges of a bunker. Lips are not required on fairway bunkers.

Good drainage is essential for all areas of the golf course, and sand bunkers are no exception. Sometimes rainfall and irrigation water accumulate in sand bunkers because of their shape, depth, and location; therefore adequate sub-surface drainage is especially important. Nothing is more aggravating to a player than to find his ball lying in water or very wet sand days after a rain. Quality playing conditions for bunkers require an effective draining system.

In conclusion, there are two basic considerations in providing good-quality playing conditions for sand bunkers. First, the sand should conform to a recognized set of guidelines, and, secondly, meticulous maintenance of sand and the area surrounding the bunker is essential. Sand bunkers should add to the beauty, character, and playability of a golf course, not detract from it! Maintenance personnel at the best golf courses are constantly reminded of the special attention required to insure quality playing conditions from the sand bunkers.

## ZONTEK, SNOW HIGHLIGHT APRIL MEETING

Wet, sloppy snow gave Easter in southern Wisconsin a Christmas-like appearance, shocking Golf Course Superintendents as much as National Weather Service

forecasters. Bruce Worzella's golf course was covered with 2 inches of snow as late as 10:00 Tuesday, the day of the WGCSA's April 24th meeting. By 1:30, warm sunshine had melted away almost all of the snow, and Bruce opened the course to play. Eight hardy and hearty WGCSA members "played away".

Despite the possibility of cancellation of the day's golf activities, we counted about 75 members in attendance at the meeting. Good, old-fashioned comradery and Gemutlichkeit among the gathered members seemed a fair substitute for golf that day.

The West Bend Country Club is a favorite meeting place of the WGCSA, and the West Bend staff — Pro Don Hill, Club Manager Bob Monaghan, Bruce and Assistant GCS Roger Baumann — were the gracious hosts they always have been. We were served an excellent evening meal and treated to a dessert selection few could refuse!

Stan Zontek returned from his United Kingdom trip just in time to address the meeting. Speaking without slides (that **had** to be a first for Mr. Zontek!), Stan shared many of the experiences and observations about his trip to the land where the "ancient and honorable" game of golf began. His remarks had a theme of "Similarities and Differences" of British and American golf courses and golf course superintendents (greenkeeper, in England). It was interesting to learn that the Europeans struggle with many of the same problems we do — Poa annua, poor drainage, soil compaction, thatch, soil layering and

low budgets, to name a few. Some of the differences in golf course management between the two countries are dramatic and shocking — few pesticides are used, practically no fertilizer applications are made, and soil aerification is accomplished by "slitting" rather than coring as we do. A depressing difference, we learned, was the incredibly low salary levels of English Greenkeepers and the minimal contact and input they have with members in the decision-making process.

Stan felt they had a strong advantage over us in one area, however. In Britain, the attitude of the players is that you "play the course as you find it". They seemingly are untroubled by many of the things that tend to aggravate and upset the American golfer. Also, Stan noticed a real sense of pride and a near reverence for history and tradition among the British golfers, an attitude he found himself caught up in. He also spoke of a moment of silence at the grave of OLD TOM MORRIS of St. Andrews, the first "keeper of the green" in golf.

The only business conducted by the membership was action on a recommendation of the Board of Directors to grant a \$1500 gift to the Wisconsin Turfgrass Association for turfgrass research at the University of Wisconsin — Madison. Tom Harrison spoke to the need for support from the golf course industry in Wisconsin and of the necessity for a strong commitment on the part of the WGCSA to research at Wisconsin's land grant college. The motion carried by a unanimous vote.

All in all, it was a delightful and educational day for everyone.

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