Photo: Kevin Ross

Bunker quality factors

HIGHLY MANICURED BUNKERS WITH GREAT SAND QUALITY ARE BECOMING ALMOST AS IMPORTANT AS GREENS MANAGEMENT

by KEVIN ROSS, CGCS

Sand bunkers are a growing concern for golf course superintendents, right along with the conditions of greens. Bunker quality involves some controversy, mostly among golfers who tend to view sand in bunkers as being too soft, hard, wet, dry or inconsistent. Some golfers also will complain that there is too much or too little sand in the bunker. The solution for superintendents is to sometimes remind golfers that sand bunkers are a hazard. At the same time, bunkers need to be made a fair hazard.

The major issues with making bunkers fair hazards are sand quality and playability. Obtaining quality bunker sand is no easy task, and certainly not as easy as most of the golfing public thinks. There are very few places in the United States that have natural sand deposits that meet specifications for great bunker sand. Today, most premium bunker sand is manufactured in only a few locations across the country. These manufactured sands, along with a few rare natural deposits, make the process of finding great bunker sand very difficult and expensive.

What makes great bunker sand? The answer is complex. The USGA considers a list of seven factors when selecting bun-

ker sand: particle size, particle shape, crusting potential, chemical reaction and hardness, infiltration rate, color, penetrometer value and overall playing quality. Depending on the location and climate, how a superintendent ranks these factors may vary.

The one common denominator of great bunker sand, and probably the single biggest factor, is the "fried egg" test, or in technical testing terminology, the penetrometer value. The penetrometer is a tool that measures the energy required to bury a ball in sand. This value shows the ability of sand to resist the golf ball from burying, or in more scientific terms, its resistance to compression.

It's important to note that the penetrometer itself sparks controversy, and some think a better device is needed. Its chief limitation is that it does not factor in ball spin, which has major input on the resulting lie in a bunker.

Particle shape is the sand characteristic that influences the penetrometer value the greatest. Highly angular sand compacts easily, and therefore has a high resistance to burying a golf ball. However, this sand also has a tendency to become a very firm playing sand, which may be a concern to some players.

At the other end of the spectrum, well-rounded sand has a tendency to bury a golf ball, due to its inability to compact. Round sand also tends to be unstable on bunker faces.

Sand quality is the most important factor in bunker play, and suprisingly it can the most difficult issue to solve. According to Dr. Norm Hummel of Hummel & Co., Trumansburg, N.Y., "There are probably only a half a dozen sands in the United States that meet the criteria for an excellent bunker sand. Of all the sands we test for bunkers, we only approve about five percent, and even some of those are marginal."

Clubs that settle for less than perfect sand in bunker construction create a difficult situation.

Adding to the issue, not all golfers like the same sand. PGA Tour professionals and most low handicap players prefer firm sand, allowing spin to be produced on the ball. Higher handicap golfers who cannot develop the clubhead speed needed to get through a firm sand bunker shot prefer slightly softer sand. Comments from players often reflect the type of sand used. If you have firm sand, disgruntled players will insist there isn't enough sand in the bunker. With softer sand, players may insist that there is too much sand in the bunker. In both cases the sand depth may be an identical six inches.

GIVEN THE VARIABLES, BUNKER CONSISTENCY TENDS TO BE MORE IMPOSSIBLE THAN POSSIBLE

The effect of shot trajectory

Another issue in obtaining consistency is shot trajectory into a bunker. Since each hole is designed differently, different shots will enter bunkers differently. The worst angle a ball can enter a bunker is at a 90-degree angle to the sand slope. This angle offers the least reaction between the ball and the sand.

The speed of the ball when it hits the sand is another factor. A physics lesson isn't needed to explain this. A similar example is how different shots react on a green — they certainly are not all the same. Ball trajectory into a bunker can determine the outcome of a lie in a bunker, and this factor interacts with other variables already mentioned. For example, one of the worst scenarios is a par 3 that measures 130 to 150 yards, is slightly downhill, and is a southern-exposed/angled green complex. This results in a very high golf shot trajectory, with the golf ball hitting sand that tends to stay dry at about a 90-degree angle. This is one of the worst situations for "fried egg" lies. Even sand with decent specifications can have trouble overcoming these factors.

A totally different scenario could be a par 4 that measures 445 yards, with an uphill second shot to a green complex that faces north and has plenty of shade. Most players are hitting long irons and fairway woods for the second shot. Such bunkers would offer little chance for a buried ball, even with inferior quality sand. The playability would also be very different from, or "inconsistent" from, the above-mentioned par 3.

Bunker contamination

Bunkers constructed from even the best of sands can be damaged by contamination from washouts. Many areas of the country are susceptible to summer two-inch-plus gulley wash rains within a short timeframe. Such downpours wreak havoc on bunker conditions, even for the best-built bunkers with the finest drainage. When a bunker is washed out and be-

Photo: Kevin Ross

A brief bout with Mother Nature can change the playability of a bunker instantly.

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Some golf course design principles have a "what you see is what you get" and "play it where it lies" bunker theme.

comes contaminated with silt, its playability changes immediately. Most clubs cannot afford to bring new sand in to replace the contaminated material, so the bunker is repaired, and the club lives with it. Comparing the playability of this bunker to one that didn't washout, there certainly would be an instant change in consistency.

Most golf course superintendents agree that the No. 1 complaint from players regarding bunkers is that playability is not consistent. Again, no one has said that bunkers should always be consistent, and most superintendents agree that trying to make them consistent is nearly impossible. Many factors affect the sand condition in a bunker, including sunlight, sun angle, shade, irrigation, bunker design, bunker depth, drainage and more. Even if you have the best bunker construction and the ideal sand, you probably won't have perfect consistency.

Bunker design

Another factor affecting consistency is bunker design.Golf course architects don't clone one type of bunker and use it throughout the course. Each bunker is designed differently to offer various strategies to a hole, and various player penalties. The golfer argument may be, "Well, sure they are different in design, but the sand should be consistent." The fallacy in that argument is that no golf course is expected to offer 18 greens that are identical in playability, so why is bunker consistency expected?

In conclusion, is it possible to have consistent sand from bunker to bunker? While anything is possible, given all the variables, bunker consistency tends to be more impossible than possible. And from a playability perspective, the need for consistency is a matter of opinion. GCN

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