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USE READER SERVICE #15

The architect and superintendent mix

LEADING ARCHITECTS AND SUPERINTENDENTS SHARE THE SECRETS OF SUCCESS IN TEAMING UP FOR A GREAT GOLF COURSE RENOVATION

by MARK LESLIE

What makes great golf courses great is creative design. What keeps them great is excellent maintenance. In a course renovation the challenge is to create an innovative course that can be maintained to its original specifications. And that requires teamwork between the architect and superintendent.

Walt Wilkinson, superintendent at the 36-hole Indian Creek Golf Club in the Dallas suburb of Carrollton, Texas, says the place to begin is by selecting an architect who is the best fit in terms of design capability and chemistry with the superintendent.

"The architect-superintendent relationship is critical in a renovation," says Wilkinson. "Choosing an architect who is going to be the best fit is not a question of the biggest name, but rather who you can work with to provide the end product that you and your membership want."

"My favorite renovations — the ones I love — are ones where the superintendent and I think the same way," agrees Jeffrey D. Brauer, owner of GolfScapes, an Arlington, Texas-based architectural firm. Brauer worked with Wilkinson to renovate Indian Creek's 18-hole Creek Course in 2002-2003. "Walt was a true partner in the design. I had the same great relationship with superintendent Dave Downing at WildWing at Myrtle Beach, and superintendent Brian Malloy at Great Southwest Golf Club in Grand Prairie, Texas. It's been my experience that renovations that turn out the best are those in which the superintendent is integral to the process."

One critical value the superintendent brings to the process is realism, says Ron Forse, a Hopwood, Pa., architect known for restoring classic courses.

"Our experience has been that it's a real joy to work with superintendents who have their feet fully in the real world and have a high appreciation for creative design. Those situations produce incredible teamwork."

"I had to enter into Forse's world of design," agrees superintendent Mike McNulty, who successfully worked with Forse and Design Associate Jim Nagle, to restore nine holes each year for three years at the William Flynn-designed 27-hole Philadelphia Country Club.

Forse and McNulty say both parties should bring their expertise to the process with an open mind. The superintendent has an intimate knowledge of his property's microclimate, subsurface conditions, air circulation, drainage, other agronomic elements and the peculiarities of the club's membership. The architect's challenge is to take maximum advantage of the site's natural character — or to restore features according to the philosophy of the classic architect who designed it.

The superintendent's knowledge is invaluable, says architect Barry Serafin of New Albany, Ohio, who teamed up with superintendent Jim Cola of Worthingon Hills Country Club in Columbus. Cola was able to show Serafin the location of underground springs and rock outcroppings, factors affecting the final design.

"I try to be sensitive to air circulation, traffic and shade," adds Brauer, "but the superintendent can tell you about the real and potential problems right away."

"The architect and superintendent are in a give-and-take relationship," says Rees Jones, nicknamed the "Open Doctor" for restoring classic courses that are preparing to host U.S. Opens. "The architect must have a melding of the mind with the superintendent because he will be the one left to maintain the course."

That melding should begin even before the architect is hired, advises Forse, who has renovated more than two dozen courses designed by Donald Ross, as well as others crafted by Alister Mackenzie, A.W. Tillinghast, C.B. Macdonald and Seth Raynor.

The superintendent's role

From an architect's perspective, Forse says the superintendent's ideal role includes the following:

- Being the liaison between the architect and the club's greens and executive committees.
- Serving as the club's representative.
- Being realistic – "understanding perspective and not allowing the architect to go wild."
- Knowing construction procedures.
- Understanding specifications.
- Serving as the purchasing agent.
- Selecting the proper turfgrasses.
- Communicating project status to club membership.
- Continuing maintenance of the course during construction.
- Pre-applying fertilizers and amendments.
- Controlling staging, storage and traffic.
- Being on top of the irrigation system.
- Researching materials, suppliers and outside expertise.

Faced with several hundred trees on the course that didn't exist when it was originally built, McNulty brought in ArborCom of Toronto, whose Shademaster software determined the agronomic impact of trees. The result was removal of 700 trees to improve sunlight and air circulation.

If the course creation involved a famous architect, McNulty adds, "gain a familiarity with the original designer." McNulty once dug into the history of his club and uprooted documentation and aerial photographs of the course. Doing such homework is invaluable. "Research will help you better understand what the architect is trying to say, and he will respect you more."

Communication hub

The importance of communication by the superintendent starts at the concept stage, says Forse, because he or she is often a key person in getting membership approval of the master plan. The superintendent's central role in communication then continues throughout construction.

"Usually my main line of contact with the club is the superintendent, who is the go-between between me, the club pro and the greens chairman," says Serafin. "A good

superintendent knows the members, their likes and dislikes, and keeps an open line of communication with the club during the renovation."

"A superintendent can be on top of everything that's happening because he is there constantly, while we are in and out of the site," Forse adds.

Ken Mangum, director of golf courses and grounds at Atlanta Athletic Club (AAC), where Jones has renovated both 18-hole courses, says educating club members about the whole process is a challenge. Mangum, who just completed his Riverside Course renovation in mid-November, used a Web site to keep members informed on a daily basis using photographs of the work and progress.

"Public relations goes along with coordination of the construction," Mangum says. "I also gave tours for members every two or three weeks."

At Indian Creek, architect Brauer altered superintendent Wilkinson's vision for the course, and then Wilkinson, in turn, sold that idea to city officials.

"My original vision within the initial budget was to resurface the greens and tees, and leave most of the rest of the course untouched," Wilkinson says. "The city wanted to turn the course's fortunes around and Brauer understood how much money that would require. He was able to say we could get a lot more for our money and go to the next level. I grabbed his vision — to rebuild the tees, redesign the greens complexes, add bunkers, modify the layout and add drainage. Once we shared that vision, I worked to get people talking about the possible changes."

Working together, Brauer and Wilkinson have seen their vision accomplished.

While the superintendent should serve as the liaison between the architect and club, sometimes the project is best served by the architect's personal contact with members. "In some situations the membership won't believe their superintendent about the club's needs," he says. "But the architect is viewed as the expert since he's the consultant — the guy from out of town who is carrying the briefcase. In such a situation, the architect can help the superintendent sell an idea to improve the course. Sometimes it's easier for the architect to ask."

Overseeing all details

In a renovation the superintendents are usually the best overseers of details because of their knowledge of local suppliers and contractors. They are familiar with traffic patterns. And they know the course — prevailing winds, angles of the sun at different seasons, the best types of turfgrasses and the maintenance program.

To select the right turfgrasses, Wilkinson scrutinized the National Turfgrass Evaluation Program's Bermudagrass results, while McNulty visited other courses and tested varieties on one fairway before choosing the cultivars.

"Matching grass selections to the superintendent's maintenance program is crucial," Brauer says, "as well as types of bunkers. Do you build them flat, or with slope that is more attractive, like cape-and-bay bunkers? You need to balance design aesthetics versus maintenance concerns and budget. Similarly, if we go with cape-and-bay construction, what equipment do you have to use to mow around the bunkers? A good architect wants the superintendent to feel comfortable that the golf course is one that can be maintained."

In the renovation of his course, Wilkinson suggested moving the second green about 30 yards for better sunlight and circulation. The move had not been evident to Brauer because of the time of year he made his preliminary site visit, but it was adopted into the final design.

In-house construction?

While Wilkinson's course renovation was built entirely by GolfWorks, Inc., Austin, Texas; and Mangum served as general contractor at AAC; McNulty handled most of his renovation in-house, with some functions subcontracted.

"We tried to accomplish two things — keep our staff intact and save the club some money," Mangum says. "We subcontracted the major work. The benefit was that our guys got involved, were part of the process and had more pride in the finished product."

If a course is considering whether to handle work in-house, Forse says the superintendent should take into consideration several issues:

- The amount of work involved in major projects like irrigation
- The need to maintain the course during construction
- The overall size and scope of the work
- Crew abilities and experience
- The time of year
- Available equipment
- Member expectations in terms of construction quality

Smaller projects are easiest to handle in-house, including green expansion and modification, tree removal, fairway expansion, tee construction, light irrigation and sod cutting, removal and placement.

Forse does not recommend that grounds crews undertake bunker renovation or construction because of the intricacy involved, and the need to maintain a style.

Respecting design issues

While teamwork means the architect is open to the superintendent's ideas, Forse says maintenance considerations cannot dictate the design.

"Some superintendents fear that sand will wash out of bunkers," he says, "so they want unnatural, severe lips. That hides the sand, but it looks homemade and is unnecessary if the bunker is built properly. Features need to be maintenance-friendly, but never at the expense of proper design."

Another frequent superintendent suggestion is to be able to mow around the bunkers with riding mowers.

The need to hand-mow is a real maintenance issue, Forse says, so architects have to go to bat for the superintendent to ensure that sufficient maintenance budget will be set aside to allow hand mowing. "Without hand-mowing, bunkers look anemic and unnatural," he says.

By sharing a common vision, superintendents and architects can accomplish uncommon success.

"The process is similar to restoring a classic car," McNulty says.

Forse adds, "Superintendents care about what they're working on, so they're going to be very attentive to the needs of the project. We see the genuine love they have for their golf courses. It's a tough job, but a labor of love as well."

By sharing a common vision, superintendents and architects can accomplish uncommon success.

In a renovation, the superintendent and architect are "in the same boat," Mangum concludes. "You can't afford to be fighting in that boat. In our renovation I didn't claim to be a designer, and Rees didn't claim to be a superintendent. It's all about teamwork. Being able to bond and form a great friendship improves the end result." GCN

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How to maximize your fungicide purchases

COMPARISON SHOP YOUR FUNGICIDE PURCHASES BY COMPUTING THE COST PER OUNCE, COST PER DAY AND TOTAL APPLICATION COSTS

by GREGG PHILLIPS, JR., AGRN.

With maintenance budgets under pressure, fungicide purchases can be a major factor in a golf course maintenance program. Often, superintendents or their purchasing agents consider the case, bag or unit price to determine which product is the most economical to use. Getting the most for your money requires a range of considerations.

Use vendor price lists to simplify comparisons

One way to comparatively shop fungicides is to distribute a price list for vendors to submit to you. In putting a price list together simply list the product name, an estimate of the number of units you will need for the coming year and an estimated delivery date. Giving the vendor a delivery date allows them to consider delivering the product through their own trucking schedule, which can save you commercial shipping costs. Because shipping costs add up very quickly be sure to note whether the vendor's price includes shipping, and also ask for a copy of their shipping policy. Organizing delivery dates will ensure products will be on hand when you need them and keep your inventory down.

Smart fungicide purchase decisions require making apples-to-apples comparisons.

Your bid list should also include the quantity per unit. For example, one vendor may give you a price for Banner Maxx per 2-gallon case while another may give you a price per gallon. Being specific will cut down on confusion and ensure you are getting an apples-to-apples comparison. An example bid list can be found in Table 1.

You may also include a letter or a note on the sheet to encourage any special financing available and a copy of their payment policy.

Traditionally fungicide prices are in vendors hands in November for the following year. This allows you to send out the bid list in November with a request for responses by mid-January and have time for questions and budget considerations.

The chemical group a fungicide belongs to is defined by its mode of action on a fungus. There may be differences among products in a particular group. However, all products in that group will attack the fungus in the same manner. For this reason, the differences between products within the same chemical group are usually agronomically insignificant. For example, the fungal group of Dithiocarbamates includes the active ingredients Mancozeb, Maneb and Thiram. The trade names of products with these active ingredients include Fore, Dithane, Manex, Spotrete 75 and Thramed. When forming your price list be sure to consider the other products are within the same chemical group. This will give you the ability to not only compare vendor prices, but prices among several manufacturers as well.

Having the unit prices from your vendors is one element of the equation. Other considerations include:

- Past performance of the fungicide
- How long will the fungicide control the pathogen once applied to the turf
- What the fungicide controls
- What rotation will be required to insure resistance does not occur

Computing the cost per ounce price

After you have the cost of the product containers you should convert the price to a cost per ounce basis. For example, Curlan/Touche comes in 11-ounce soluble packets, four to a pack and four packs in a case – giving you a total of 176 ounces per case (11oz x 4 x 4=176 ounces). Now, take the total price per case and divide it by the total ounces in the case. (Price / 176 ounces = cost per ounce). This will give you the cost of the product per ounce. Once you found the price per ounce you are ready to begin to compare the other factors in the cost equation.

Consider the effect of application intervals

Fungicide labels specify recommended application intervals based on how long the fungicide can be expected to control the pathogen and thus when the next application should be made. However, the actual application interval can vary by area and is dependent on heat, humidity and other environmental conditions. Look at the application interval as a guide in your consideration.

A key element when looking at the application interval is how long is the fungicide likely to control a particular pathogen. For example, compare two different fungicides/active ingredients used to control brown patch: Mancozeb (Fore, Dithane) and Vinclozolin (Touche, Vorlan, Curlan). Products with Mancozeb as the active ingredient will give seven days of control before the next application is needed, according to the label. Products with the active ingredient Vinclozolin need to be applied every 14 to 28 days depend-

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TABLE 1.

EXAMPLE BID LIST

Product	Size	Approximate Delivery Date	Projected Min. Quantity Needed	Unit Price	Total Price
Heritage	1 lb	May 30, 2003	1		
Signature	4 x 5.5 lb	May 30, 2003	4		
Manicure or Daconil	2 x 2.5 gal	May 30, 2003	2		
Touche or Curlan	11ozx4x4	April 1, 2003	2		

ing on disease pressure, according to the label. With the application interval in mind we need to then consider the application rate of the product.

Compare the label application rates

Variables in application rates are based on the product used, disease pressure and even the particular fungus. Taking our example between Mancozeb and Vinclozolin, let's look at the application rate for each chemical. Mancozeb, according to the label, will need to be applied it at 4 ounces per 1,000 square feet to control brown patch. The label rate for Vinclozolin is 1 ounce per 1,000 square feet.

Computing cost per day

The cost of control per day of a fungicide gives you a valuable indication of the cost of the fungicide. This amount can be calculated for each fungicide you are considering. The cost of control per day is calculated by taking the application rate then multiplying it by the cost of the product on a per ounce basis then dividing the result by the recommended application interval. This will give you a cost per day to control a pathogen.

Using our earlier example of Vinclozolin and Mancozeb, Table 2 illustrates the equation. When comparing the two fungicides we can see it would cost $0.08 cents per day to when using Vinclozolin, and $0.23 cents per day when using Mancozeb to control brown patch.

Computing total application costs

Using the costs illustrated in Table 2 on a course with 130,000 square feet of greens we can calculate and compare how much it would cost to control brown patch over a 21-day period. As indicated in Table 3, a club could control brown patch over a 21-day period for $336.70 less using Vinclozolin rather than a Mancozeb product.

Control methods and fungicide use

Control methods must be designed and executed by the superintendent based on differences from course to course and even turf area to turf area. The two basic program options are preventive or curative. In a curative program, no treatment is made until the turf damage symptoms are noticed. In a preventive program, fungicide applications are made when environmental conditions are favorable for fungal growth.

It may seem logical that a curative approach would ensure that fungicides are only used when absolutely necessary, resulting in less fungicide use and lower costs. However, this may not be the case for three key reasons: First, preventive rates are frequently one half the curative rate. Second, once fungus is prevalent enough in a turf area to cause symptoms or turf damage, two treatments at the curative rate are often required. Third, turf weakened by fungal damage is less able to fight off future infection which can result in more fungicide use to maintain turf quality.

The adage that an ounce of prevention is worth a pound of cure holds truth. For example, let's say course A on May applies a preventive 2 ounce per 1,000 square feet application of Daconil for dollar spot that yields 14 days of control. Course B, using a curative method, waits until the disease appears and applies a curative rate of 4 ounce per 1,000 square feet Daconil on May 4. Both courses receive 14 days of control for each application. On May 15, course A applies another 2 ounces of Daconil as a preventive treatment. On May 20 course B has another outbreak of dollar spot and applies another 4 ounces. In order to control dollar spot in the month of May, course A used a total of 4 ounces of Daconil while course B used 8 ounces. In addition, course A had no dollar spot damage.

Conclusion

Putting all of these factors and techniques together will ensure you have all of the information you will need to make an effective evaluation of the prices among vendors and products. Setting up delivery dates, knowing the actual application costs of products in advance and ensuring they are available when needed, and executing an efficient fungal program will make the most of your purchase decision. GCN

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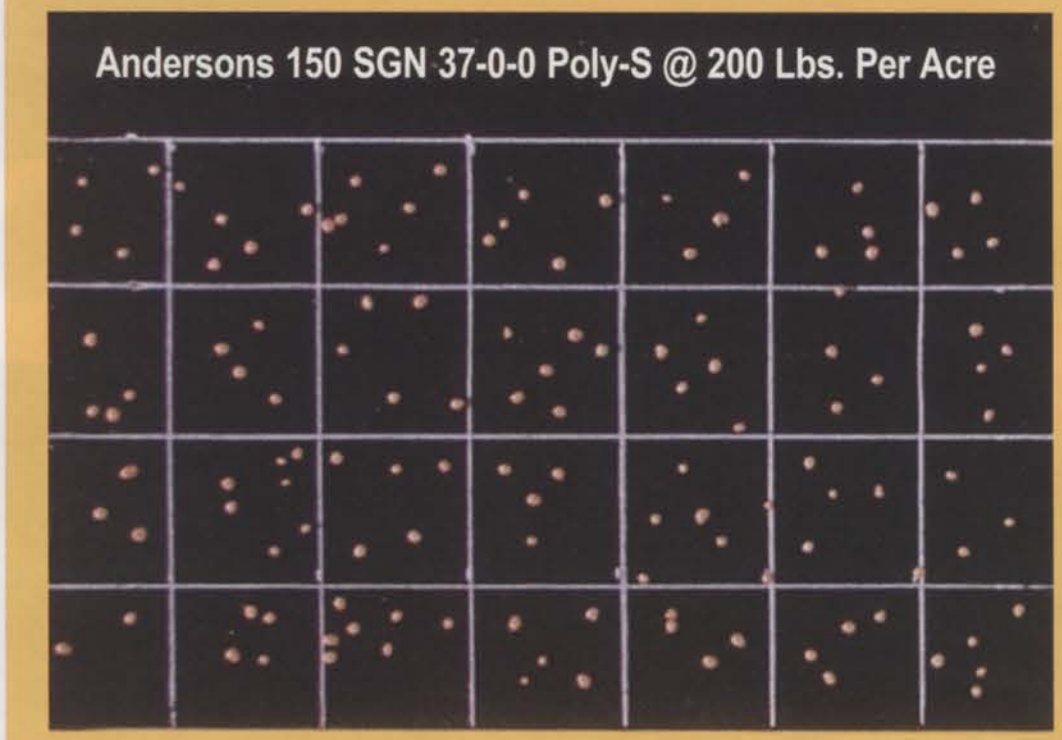
TABLE 2.

CALCULATING FUNGICIDE COST PER DAY OF CONTROL

	(Application Rate oz/1,000	X	Cost/oz*)	/	Application Interval in days	=	Cost Per Day of Control
Mancozeb	4		$0.40		7		$0.23
Vinclozolin	1		$1.70		21		$0.08

*Cost of Mancozeb is based on a 768 oz case at $306.00 Vinclozolin based on a 176 oz case at $299.75



(Gridlines are marked in one inch increments)

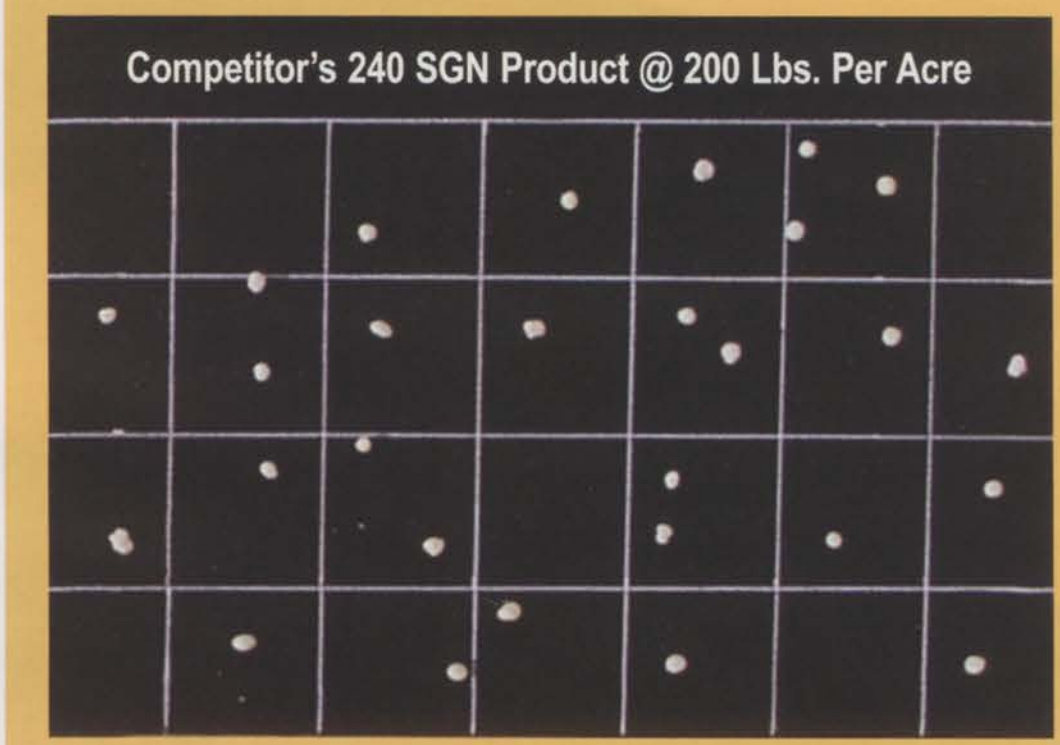


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Photo: Kevin Ross

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.

Photo: Kevin Ross

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

Kevin Ross, CGCS, is director of golf course management at Country Club of the Rockies, Vail, Colo., and a contributing writer to Golf Course News. *He can be reached at kjross@vail.net.*