

Transition Management

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O'Brien contends that overseeding is tough on bermudagrass' roots and can cause a thatch buildup over time.

"Every time you overseed, it doesn't just disappear," he said. "It deposits a huge organic matter in the upper root zone."

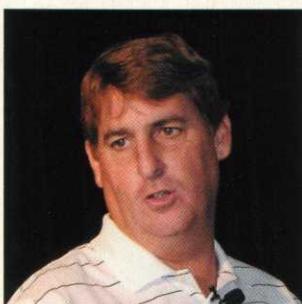
O'Brien says many Southern superintendents, who have ultradwarf bermudagrass on their courses, are now painting the greens instead of overseeding them.

"You can turn a dormant bermudagrass green into a surface that looks like the finest bentgrass you'll ever see in your life," O'Brien said with a smile, noting that it only takes about 30 minutes to paint one green with the appropriate tools.

The rest

Here are a few of the other highlights from the summit:

■ In his talk on "Bermudagrass Cultivar Effects on Transition Success," Virginia Tech's Askew noted that while an increased ryegrass seeding rate increases the speed of green cover during fall transition, the seeding rate has little influence on spring tran-



"I don't know if this is seamless. I think 'convergence' is a better word for it."

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sition back to bermudagrass. However, he noted that slower-growing bermudagrass cultivars require more aggressive management during spring transition.

■ Yelverton's topic for discussion was "What Happens to Bermudagrass During Spring Transition?" "One of the things that can happen is that it can die," Yelverton warned.

He pointed that more heat-tolerant ryegrasses have made transition more of a problem in the spring. Yelverton also said that bermudagrass needs light for the best transition. "It's well documented that bermudagrass does not like shade," he added.

■ Eric Kalasz, Bayer's marketing manager, added a little marketing to the turf science mix. Kalasz said chemical manufacturers have a list of challenges facing them

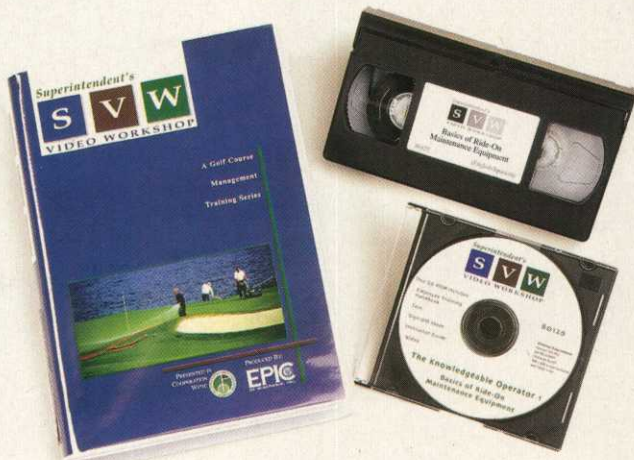
now and in the future, including:

- consolidation at all levels;
- more restrictive regulations;
- loss of older chemistry;
- increasing generic competition; and
- a struggle for differentiation. ■

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The Book on Bunkers

These hazards need to be moved up the maintenance priority list



The first rule to follow in bunker design and construction is not to let storm water run into a bunker.

MIKE KLEMMER

BY JON SCOTT

Bunkers are supposed to be bad, right? If golfers don't like them, they should stay out of them. After all, they are hazards. Who says they have to be fair?

Well, for starters, the USGA implies that bunkers should be fair by differentiating them from water hazards. According to the 2003 edition of the USGA Rules of Golf, "A bunker is a hazard consisting of a prepared area of ground, often a hollow, from which turf or soil has been removed or replaced with sand or the like."

There you have it: Bunkers are not water hazards. Water hazards are *supposed* to be bad. Rarely

will a ball skip across the water and out. Landing in the water will cost you at least a full stroke and sometimes two before the ball finds the cup.

On the other hand, even with a partially buried ball in a sand bunker, the golfer has a decent chance to stave off bogey with a well-struck wedge. Ultimately, the degree to which this is possible depends on how well the bunker was constructed and maintained, and whether the person in charge has the right attitude and skills to do so.

There are two main problems that affect how a bunker will play on a golf course. The first is how fast water moves through and out of the sand, and the second is the bunker's degree of soil contamination. Since the first problem is directly related to the second, it makes sense to start with good drainage.

The first rule to follow in bunker design and construction is not to let storm water run into a bunker. All it takes is a little attention to water-flow patterns to shape the subgrade and surface contours so that water is diverted to catch basins instead of flowing down bunker faces carrying sand and soil into the bunker bottoms.

Ideally, no sand would extend vertically up a slope instead of grass. Unfortunately, this doesn't put much excitement into the framework of a golf hole. So whenever sand is flashed up a face, it's critical that water goes somewhere else. Failure to heed this rule will almost certainly lead to erosion and contamination problems.

The next goal is to make sure the subgrade cavity is shaped well for drainage. A common mistake is to construct a subgrade as if it is the

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The Book on Bunkers

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finished surface, but that usually produces grade slopes that are too shallow for moving water to drains quickly. A good sub-grade pitch inside a bunker cavity is around 5 percent.

Once the grade has been established, the proper installation of drain pipe is critical. Whether conventional round pipe or the newer, flat-type drain is used, correct size and spacing will insure that water flows quickly and smoothly out of the cavity. Placement and spacing should be dictated by the rule of not forcing water to flow more than 10 feet in any direction to reach a drain pipe. Just as with greens construction, a "smile" or exit drain at the low point where the drain leaves the cavity should be mandatory, extending as far in either direction as the end of the first laterals from the central mainline.

Four-inch diameter round tile bedded in gravel is most commonly used, but flat pipe is gaining in popularity because of



MIKE KLEMMIE

its efficiency and ease of installation. Flat pipe also requires a narrower trench and allows sand to substitute for gravel in the back-fill. If flat pipe is used, make sure it's at least 6 inches wide and installed according to the manufacturer's guidelines.

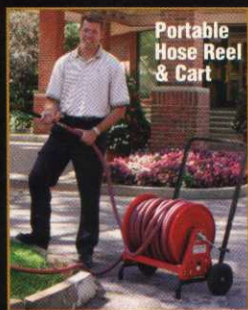
Once the right sand has been selected, it must be installed at the proper depths and distributed uniformly.

Round pipe can be a problem if no attention is paid to the sand and gravel particle-size relationship or bridging factor. When this is ignored, sand may migrate into the gravel, eventually clogging up the water flow channels. Any USGA-recommended laboratory can perform a test and issue an opinion on this potential.

The next step is to decide whether any type of soil sealant or fabric liner is needed to prevent soil or rocks from contaminating the sand from below or on slopes where sand frequently washes down during rainfall. If the answer is yes, there are several types and brands on the market, and each should be investigated carefully to separate the marketing hype from the reality of experience.

Fabric and mesh-type liners are popular because they are self-installed, but the one big drawback is keeping them attached to the subgrade surface in one piece, especially with mechanical raking. Soil binders and coatings are more difficult to install, but have the advantage of not causing the golfer to strain a wrist muscle if the club snags in a fold of material.

Once the bunker cavities have been properly constructed and drained, it's time to look for the proper sand. In spite



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of what you hear from the sand and soil companies, the only way to find the right bunker sand is to start with a proper lab test of your own using a company that knows good bunker sand. While there's no specification for bunker sand in the USGA Green Section Handbook, there is a guideline which can be obtained from www.usga.org.

Essentially, the criteria for bunker sand is not all that different from greens construction sand, except it tends to favor the coarse-medium fractions instead of the medium-to-fine grades more commonly used for topdressing. In bunkers, finer sands usually do not drain as well, will rapidly contaminate and are easily eroded by wind.

An often-overlooked criterion for sand selection is particle shape, as opposed to color, which is one that gets far too much attention. Sharp, angular sands work well for drainage and firmness, but they also abrade turf when blasted up onto greens

and collars. It's better to look for subangular sands with a good bit of gradation in the coarse-medium zone and enough fines on the other end to remain stable.

On the other hand, color can be important to course designers, television and green committees, but it's not important to good play or long-term performance. While it often becomes the overriding factor in sand selection, selection by color alone almost always ends up being a big mistake.

Once the right sand has been selected, it must be installed at the proper depths and distributed uniformly according to the plan. Too much sand on the faces will almost always produce plugged balls in the slope and under the bunker edge. Remember, this is not supposed to be a water hazard. The golfer should be able to expect a reasonable chance of saving par or getting up and in the hole in two.

Once the bunker project is complete, a great deal of grief and cost can be

avoided with a solid commitment to proper maintenance. This commitment is more than periodic raking and edging. There will be anywhere from 2 to 5 acres of sand to protect.

Bunker sand has a one-way ticket to nowhere through the wind, water erosion, soil contamination and swinging golf clubs. The best that can be hoped for is to keep adequate levels of sand in place, uniformly distributed, and make sure it stays functional for as long as possible.

This takes a lot of work, and it takes a sufficient annual budget line. Unfortunately, the former tends to be affected by the latter when budget priorities are rearranged to meet short-term financial goals. Instead of placing bunkers at the bottom, they need to be moved up the priority list — ahead of roughs, and at least even with the fairways and tees. It could even be argued that bunkers should be placed on a par with greens. Fail to rake

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The Book on Bunkers

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a bunker every day, and it starts to get weedy and covered with algae and deteriorates rapidly. Skip regular cultivation and the sand gets compacted and waterlogged. Put off adding sand and the bunker starts to grow stones and dirt chunks, making the surface rough and thin. Stop edging and the bunker begins to shrink to the point of becoming all grass instead of sand. Fail to keep the drains clean and the bunker becomes a swamp.

Quite simply, after construction, the main reason that most bunkers fail to perform is because of poor maintenance. Once this occurs, bunkers become costly and time-consuming to renovate.

Here are some maintenance tips from the PGA TOUR that will help give bunkers a long life and good performance:

- Periodically probe bunker cavities for proper depth and uniformity and either shift or add sand as required to meet the established guidelines. As much as 2 inches of sand can be lost per year to various types of erosion. Remember, a bunker without sand is not a sand bunker anymore.

- Check and clean out drains when cavities begin holding water. This can be as simple as putting fresh sand over the pipe or as complicated as digging up the pipe and resetting or replacing it. It's a lot easier to fix a drain than it is to replace all the sand.

- Maintain good edge definition but don't overexcavate. It's important to delineate the hazard boundary, but it can be overdone.

Exposed dirt edges bleed soil and stones down into the sand, causing contamination and ultimately drainage failure. Trim the grass, not the sod. It has to be done more often this way, but the soil will stay where it is supposed to stay, supporting the turf above it.

- Cultivate the sand regularly, either by mechanical raking with spikes or by hand with steel rakes. In extreme cases, like with the coral sand of Hawaii, it might take a rototiller. Failure to include this in a maintenance program will usually produce concrete hardness in the bottoms and the consistency of sugar on the sides.

- When raking with a powered machine, make sure to use an experienced operator. Raking should be slow and methodical. Bad operators ruin more bunkers by raking too close to the edge. This activity picks up stones, brings in dirt, and wrecks edges. All edges should be raked by hand with light-weight rakes, preferably from the inside of the bunker.

Once again, remember that bunkers are not water hazards. Players who hit their balls in bunkers should have a reasonable opportunity to make par.

If bunkers are supposed to be more of a penalty to an errant shot, why not use water instead? Because golf would be boring without bunkers. Golfers like the anticipation and thrill that come with a well-struck sand shot. ■

Scott is vice president of agronomy for the PGA Tour.

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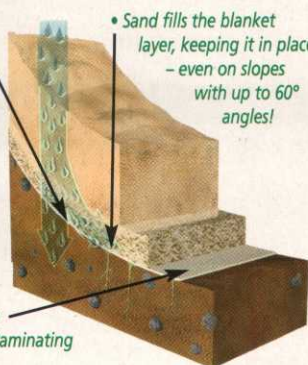
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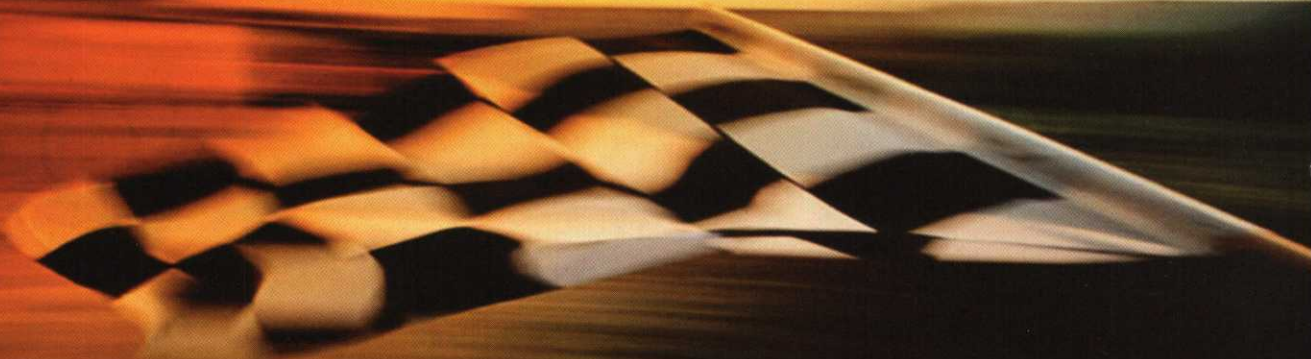
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Quick, Buy That Mower!

Thanks to recent tax breaks, there's never been a better time to purchase new equipment. Just don't wait till Jan. 1

BY JOHN McPHEE

According to that old saying, the only unavoidable things in life are death and taxes. However, most of us still like to put them off whenever we can.

Fortunately for golf course owners and superintendents, the government is now trying to help with the taxes part. The Jobs & Growth Tax Relief Reconciliation Act of 2003 (Public Law 108-27) was created to provide larger tax deductions for small businesses that invest in new equipment. By making it easier and more attractive for businesses to purchase needed items, the program is intended to increase demand for manufacturing and distribution. That in turn helps stimulate the general economy. Everybody wins.

Specifically, Section 179 of the law allows golf courses to deduct up to \$100,000 of qual-

ifying equipment investments as a direct expense. (Previously it was a \$25,000 deduction limit.)

It gets better. In addition to the actual dollar amount, which can be written off this year, the revised tax law includes a "bonus depreciation." That means qualifying equipment is also allowed a first-year depreciation of 50 percent (raised from 30 percent) of its adjusted basis.

This tax reform is especially useful for many golf courses. Being tied directly to equipment acquisition, the special deduction and depreciation are valuable incentives to add or upgrade your mowers, aerators, and utility vehicles if you act now.

To qualify for the tax breaks, any machinery you obtain must be:

- new equipment;
- placed in service before Jan. 1, 2005;

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Special deduction and depreciation are valuable incentives for golf courses to add or upgrade mowers and other equipment.



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