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## A maintained hazard

SUPERINTENDENTS DEVOTE A LOT OF TIME, MONEY AND LABOR INTO MAKING BUNKERS LOOK AS NATURAL AS POSSIBLE

by  
DOUG  
SAUNDERS

**W**hen the game of golf began along the Scottish coastline, rolling sand mounds framed the route from the rudimentary teeing ground to the target hole. The mounds provided grazing sheep that burrowed into the hillocks shelter from the wind. These sandy holes created by the sheep were considered unsavory places for golfers to hit their ball, and the hazard known as the bunker was born.

As golf became more popular and designers began to create golf layouts on different types of terrain, sand bunkers became an important feature to defend the golf hole and added more strategy to the game. Players learned to avoid these hazards or develop the skill to play a shot out of them.

In the modern era, bunkers are much different than they were years ago. Bunkers have become road signs to guide players around a course and have become an integral part of the photogenic look of golf courses.

At the same time, the golfing public's perception has changed. Bunkers are the subject of as many complaints as any other feature on the golf course. While bunkers used to be considered a penalty zone, now players demand they are maintained like any other area of the course. Currently, golfers are concerned about sand type, compaction,

drainage and consistency to a degree that was unimaginable 10 years ago.

The public sees PGA Tour players preferring a bunker lie to a rough lie and feels this is proper strategy. They also are concerned about the playability of bunkers.

"Sand bunkers and their care have become more intense as golfers now look upon them as playable features," says Paul B. Latshaw, certified golf course superintendent of Muirfield Village Golf Club in Dublin, Ohio. "Every superintendent must address bunkers with a new intensity."

Latshaw has seen this transformation while working with his father, Paul R. Latshaw, preparing for seven major championships at such venues as Augusta National Golf Club in Georgia, Congressional Golf Club in Bethesda, Md. and Oak Hill Golf Club in Rochester, N.Y.

What makes bunker care so challenging is the combination of variables – sand quality, the strata under the sand, the effect of irrigation water around bunkers, and shapes and angles of the faces and edges of bunkers. Added to that are golfers shifting the surface sand and displacing it with shots.

### Sand type

The first priority for most superintendents is assessing the condition of the sand. Throughout time, bunker sand will deteriorate and become contaminated from rain, the intermingling with rocks and pebbles from the substrata, and the collection of debris in them. Most courses will see a need to add or replace sand every four or five years, but this expensive process dictates a careful plan to extend the life of additional sand.

First, it's important to consider proper sand to use. U.S. Golf Association standards for bunker sand set a range for particle sizes between 0.25 mm and 1 mm with 75 percent of the particles ranging in size between 0.25 and 0.50 mm. This size helps promote effective drainage by providing a percolation rate of 20 to 25 inches per hour. Angular particles are important because they cling together to create a consistent texture.

Next to consider are texture, color and cost.

Because the USGA-specified sands are specialized, finding the right local suppliers is important because it can be difficult to find the required sand. Sand color varies from bright white to tans, browns and grays. Color choice can be driven by preference and cost.

"You could purchase good bunker sand 15 years ago for \$18 to \$22 a ton, and now it runs about \$30 to \$40 per ton," says John McDonald of Jessup, Md.-based McDonald & Sons Construction. "I have even seen some courses paying up to \$60 to \$65 per ton."

### Bunker lining

Another aspect of bunkers is liners. Geotextile liners have improved bunkers. The fabric materials form a barrier between the bunker sand and the substrata that will control the migration of soil and rocks up into the bunker but will not impede drainage. Some of the newer fabrics come in a spun form similar to air filters for furnaces and vary in thickness. These materials also help hold sand better on steep-faced bunkers, which helps reduce repair time.

At the 36-hole, private Arrow Creek Golf Club in Reno, Nev., superintendent Mike Donahue had some concerns with a complete bunker renovation project last summer.

"Our first concern was dealing with a severe contamination problem by lining all of the bunkers," Donahue says. "I knew that this would be costly and time consuming, so rather than buying new sand, we recycled the original sand by screening it on site. We considered using a gunnite-sprayed bunker stabilizer to line the bunkers, but I felt the cost – almost 50 percent more than the fabric – was too steep. We rebuilt 130 bunkers on one course in a five-month period and never closed down the golf course."

Although fabric linings have shown to protect against migration of subsoil effectively, they have presented other problems. Throughout time, the fabrics can shift, loosen or be pulled up by thoughtless raking or mechanical rakes and appear around the edges of the bunkers.

Matt Shaffer, superintendent at Merion



Photo: Kyle Phillips Golf Course Design

Architect Kyle Phillips says sand might be the best medium on which to place bunker drain pipes.

Golf Club in Ardmore, Pa., which recently remodeled its bunkers, says the course prides itself on its traditional look but wanted to improve the bunker quality through the use of modern materials. Geotextile linings were installed in all bunkers, and Shaffer found some helpful ways to deal with some of the problems they create.

"I find that you should occasionally check the staples that secure the liners to the bunker walls to make sure there is a solid connection to the soil," Shaffer says. "You must be careful not to pull the fabric up and let

sand start to work under it. I have found that using a propane torch to burn off any exposed edges of the fabric is much handier than trying cut away any fabric."

To maintain the distinctive, ragged-looking bunkers at Merion, Shaffer has let the fescues grow around and over the bunker edges and maintains them with pitchforks by working the edges of the grass to the sand on a regular basis.

### Drainage

When rebuilding a bunker, drainage must

be addressed. Because players want more consistency in bunkers and expect quicker recovery after heavy rains, it's necessary to use more piping. Usually this drain system is set in gravel, but there are other ideas about what material should be used.

Granite Bay, Calif.-based golf course architect Kyle Phillips, whose designs include the Kingsbarns Golf Links in St. Andrews, Scotland, says sand could be the best medium on which to place drain pipes in bunkers.

"An all-sand medium will naturally draw

Glen Arbor Golf Club in Bedford, N.Y., recently completed a major bunker renovation project.





Photo: Muirfield Village Golf Club

Muirfield Village Golf Club superintendent Paul B. Latshaw says he cares for bunkers on his course with added intensity to please golfers.



Photo: Muirfield Village Golf Club

Mechanical rakes are fine for large bunkers or bunkers with multiple exit points, but smaller bunkers might need to be raked by hand.

water to the drain pipe, where gravel can trap the water, causing ponding in the bunker," Phillips says.

## Raking

Adding sand, protecting against soil migration and improving drainage makes for a better bunker. Still, bunkers need to be maintained on a regular basis to prolong the life of the sand and maintain satisfactory playing conditions.

Many private clubs and high-end daily-fee facilities have opted to hand-rake bunkers to provide consistency players demand. Mechan-

ical rakes were introduced to quicken bunker preparation, but for many, using mechanical rakes has created problems. The mechanical rakes can help greatly in large bunkers and waste areas, but their use is limited in smaller greenside bunkers. The machines can turn on a dime, but in small bunkers there might only be one point of entry that, throughout time, will become an unsightly, compressed area. The machines can form piles of sand, leading to an inconsistent sand depth. Also, tongs on the machines can grab onto the geotextile linings, causing severe damage.

"I feel the best way to maintain bunkers is

by hand-raking," Latshaw says. "You can get a more uniform look and texture to the bunkers by hand-raking. The mechanical rakes are helpful if we have heavy rain damage and need to move a lot of sand back into place. We use them in some fairway bunkers, but only where there are numerous entry points. It's a good idea to provide a lot of training to the operator of these machines to avoid causing any major damage."

Ken Benoit, certified golf course superintendent at Glen Arbor Golf Club in Bedford, N.Y., recently completed a major bunker renovation project and also feels hand-raking is the best way to give players what they want.

"Bunkers are a completely contained environment that demands care and observation," Benoit says. "I train all of my employees on how to rake them properly to give me more flexibility with my manpower. Through hand-raking, crew members develop a better feel for the depth of the sand and can notice situations that could be the first signs of problems."

All of the care for and work on bunkers is going toward one goal: providing the best sand surface for golfers to play and at the same time maintaining a natural look to the hazard. Latshaw describes the work as trying to create a look of benign neglect. Shaffer puts it another way.

"We spend so much time and money to make it look like we did nothing at all," Shaffer says. GCN

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Photo: Glen Arbor Golf Club

Workers at Glen Arbor Golf Club are trained how to hand-rake bunkers so they can notice situations that could be the first signs of problems.



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*See GCBAA at the "Building of the Green" at the Golf Industry Show in Orlando.*



# Getting along

## COURSES OFFER TIPS FOR COEXISTING WITH NEIGHBORS

by  
DEREK  
RICE

**O**wning a home on a golf course is a dream for many people, but for those who have made it a reality, errant golf shots, noisy equipment, flooding and other issues can turn that dream into a nightmare.

So how do clubs and courses deal with these issues? After all, it's not as if a course can ban golfers who hit bad shots or morning maintenance. Both are vital to a course's survival. And while it's reasonable to expect that homeowners understand what they're getting into when they purchase a home on a golf course, there always are gray areas that can compromise the relationship between a course and homeowners.

### Fore!

At one time or another, every golfer has hit a shot that didn't go exactly where he or she

was aiming. In most cases, this results in a tough next shot, but when there are homes lining a fairway, that off-target shot can result in property damage.

This is something Brad Dutler, the general manager of Plantation Golf Club in Frisco, Texas, has come to expect. All of Plantation's fairways are lined on both sides with homes, creating a rather unforgiving space for golfers.

"I've never seen homes as close to being in play as they are at Plantation," Dutler says. "You have your playing corridor, 20 to 25 yards of rough, then you have a fence line all the way around the golf course, five to 10 yards of homeowner grass, and then the house. So it's tight."

While Dutler couldn't say exactly how many broken-window complaints the club receives in a year, he says there are a lot of

issues, but nothing too serious. How those incidents are resolved depends mainly on the golfer.

"Golfers are responsible for their actions," he says. "We hope that if they do break a window, they're honest and come forward and talk with the homeowner, but I can't make them do that. If a homeowner calls, and his window has just been broken and says the person wasn't forthcoming, we'll try to help them out. I, or a member of my staff, will go out if they've got a good description of the group or a cart number, we'll try to talk to them and mediate that way if possible. Sometimes we're successful, and sometimes we're not."

Plantation, which is owned and operated by Evergreen Golf Alliance, doesn't have the market cornered on broken windows, though. At Weymouth Valley's Fox Meadow



Drainage is one of the biggest complaints from homeowners living near Fox Meadows Golf Course in Medina, Ohio.

Photo: Fox Meadows Golf Course

Golf Course in Medina, Ohio, superintendent Tim Cunningham has heard plenty of complaints.

"We've had the situation come up, and the club takes the stance that golfers are out there at their own risk," he says. "Most of the time, they'll knock on the door or leave a business card, but not always. That doesn't make the homeowner very happy because they then have to pay the deductible on their insurance."

While Don Sutton, superintendent at Kinsale Golf Club in Powell, Ohio, hasn't had much trouble with errant shots on his course, which opened in 2004, that doesn't mean he's unfamiliar with the problem.

"At a previous course where I worked, there was this certain house that tended to get hit a lot," Sutton says. "In that situation, the homeowner decided he wanted to plant trees and asked if he could plant them on the golf course, so that was a win-win situation for us and for him."

## Maintenance

For those homeowners who live close to a tee, green or maintenance facility, the sound of equipment starting at the crack of dawn during the summer can be a nuisance. But at the same time, it has to be done to keep a course in tip-top shape. Fortunately for Dutler, that hasn't been an issue at Plantation.

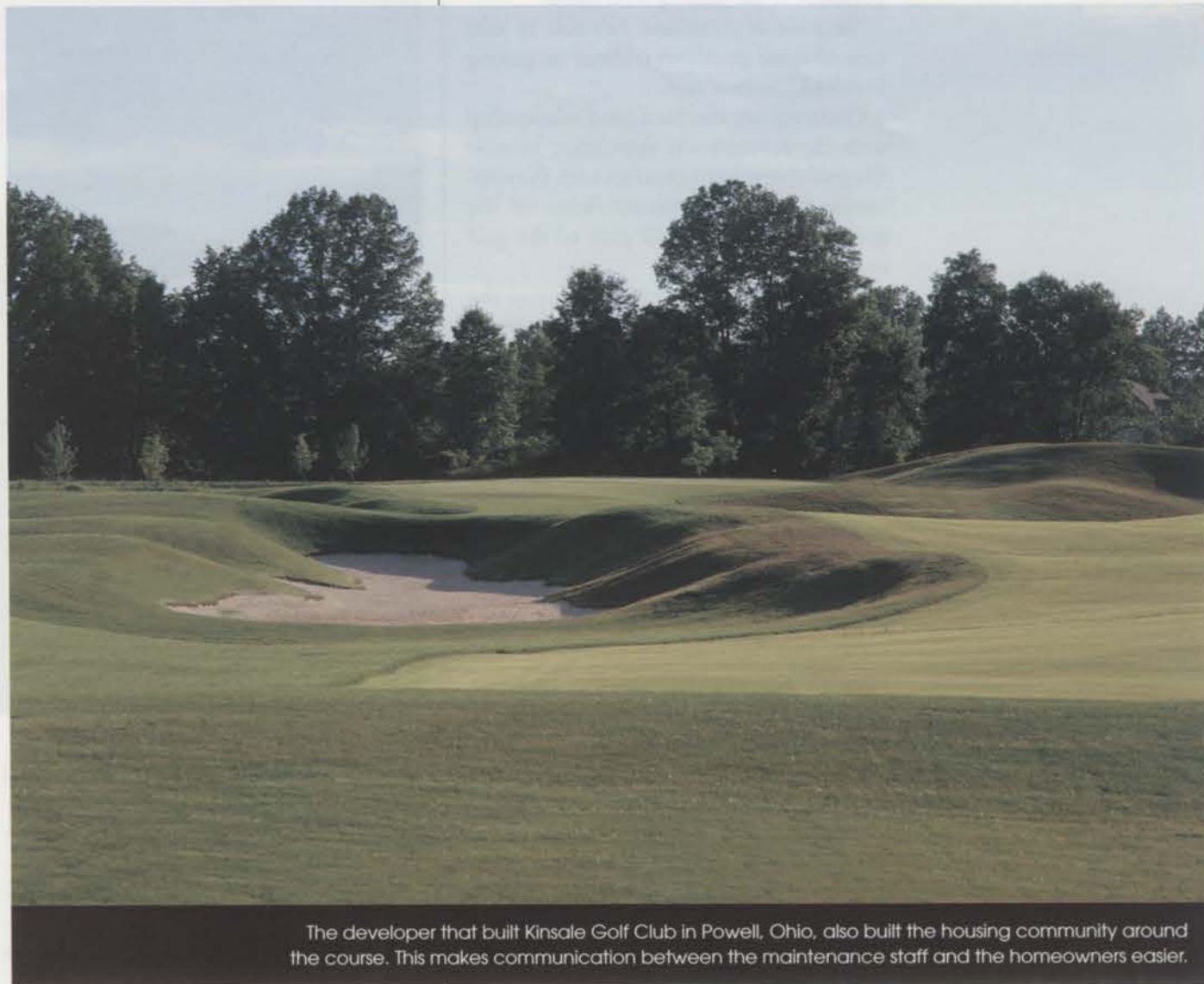
"The City of Frisco has a noise ordinance that states we can't operate machinery until a specific time each day, and we try to abide by that as much as we can," he says. "Obviously, there are some days when we can't because we have to get golfers on the course. If it's heavy machinery, we're not going to operate that until the specified time."

According to Cunningham, noise hasn't been an issue at Fox Meadow, which might be surprising given the proximity of one of the homes to the maintenance facility.

"He was good about working things out before building," Cunningham says. "Before he built, the homeowner did his due diligence – he wanted to know what time we normally started our equipment."

One misconception some homeowners have is that golf course maintenance staffs also are their own personal maintenance staffs. Whenever Sutton sees that, he makes sure to nip it in the bud.

"From time to time, some people think we can stop and pick up their clippings from their yard," Sutton says. "That's not a service we offer to them, so as quickly as I see that starting, I will approach the homeowner and ask them not to do that."



The developer that built Kinsale Golf Club in Powell, Ohio, also built the housing community around the course. This makes communication between the maintenance staff and the homeowners easier.

## Drainage, water issues

Drainage and flooding can be rather contentious issues between homeowners and golf courses. At Plantation, most of the homes sit higher than the course, but there are those that sit lower.

"All the water from the homes will run onto the golf course, and it just happens to run toward these other people's homes because they're a little bit lower," Dutler says. "For the most part, however, it doesn't cause too many problems, except in the spring, when the rains are at their most torrential."

Fox Meadow has dealt with drainage and flooding as well. Cunningham says it's one of the biggest homeowner complaints.

"Drainage has been one of the big problems that we try and rectify," he says. "If there is a problem we correct it. In one particular situation on our driving range, we made an adjustment – we brought a bulldozer in here and did some regrading to redirect water."

Besides flooding, the most common water-related issue Dutler has at Plantation is

the occasional sprinkler head that misfires.

"Sometimes the settings get knocked off and at two or three in the morning, they get peppered with perimeter heads hitting their house," he says. "Our perimeter heads are set to cover 180 degrees, but sometimes the setting that keeps it from making a full circle will get knocked loose. That might happen once every couple of years."

## Building good will

One advantage Kinsale has is the developer who built the housing community also owns the golf course. This allows the company to have a person in charge of the homeowners association, making communication and cooperation between homeowners and the course much easier.

"He can field a lot of the questions and deal with any contractor we might use for mowing open spaces and things like that," Sutton says. "He's really a liaison between the homeowners association, the golf course and the developer. So that's something that has worked out really well for us."

Having that liaison allows Kinsale to be proactive when dealing with issues.

"In a lot of situations, he's able to take care of those problems without us getting involved," Sutton says.

Cunningham also has a good relationship with the homeowners association because the golf course has a contract with the association to perform maintenance on the green spaces that aren't part of the golf course.

"It benefits the company because the green spaces, which you would assume are part of the golf course, are actually owned by the association," Cunningham says. "We worked out an arrangement with them in which we are contracted to do the fertilization, weed treatment and mowing of the bigger green spaces that are closer to entrances to the development."

Attentiveness is the key to Cunningham's approach when dealing with homeowner complaints.

"We need them like they need us, so when they call with any concerns, I make sure I listen and then meet with them and look at the situation," he says.

Often, even minor situations command Cunningham's attention.

"We have a restroom out on the fifth hole," he says. "It's a well-done restroom – not a portable one – but we had a homeowner who complained that they could see it from their backyard. They asked if we could screen it with some pine trees, and we did that just to alleviate any other problems."

When dealing with homeowners, Dutler agrees listening and being polite can go a long way toward keeping the peace – although that's not always the case.

"We try to be as cordial and helpful as we absolutely can, but sometimes we aren't able to give them the result they're looking for,"



When dealing with homeowners, listening and being polite can go a long way toward keeping the peace between a golf course maintenance staff and homeowners.

Photo: Revere Country Club

he says. "We've got to be sure we're doing things that everybody can live with as opposed to being ultra-aggressive and drawing a line in the sand."

Dutler says being cordial is a two-way street, and while golf course staff at Plantation technically doesn't offer services to homeowners, there are exceptions.

"Sometimes a homeowner might need some help with something, and they'll ask my superintendent to help out with something they don't have the equipment for," he says. "If they ask and they're friendly about it, our superintendent is more than willing to help out with those issues when he has time to do that. If they ask nicely,

generally it's not a problem. It's those little things that really help us develop a good relationship with the individual homeowner and with the homeowners association as well."

But perhaps the best advice for keeping the peace with homeowners comes from Cunningham.

"Try to alleviate anything you see that might flare up and become volatile," he says. "Nip it in the bud and be proactive, because it can come back to hurt you." GCN

*Derek Rice is a freelance writer and editor from Portland, Maine. He can be reached at derekrice@maine.rr.com.*



Equipment noise hasn't been an issue for homeowners near Fox Meadows Golf Course.

Photo: Fox Meadows Golf Club

## Tips for keeping the peace with the neighbors

- **Be proactive.** If you see a potential problem that might arise in the future, head it off early.
- **Communicate.** In most cases, you can keep in touch with the surrounding community through a homeowners or neighborhood association.
- **Lend a hand.** If it doesn't stress your schedule or your budget, help out a homeowner who asks for it. The good will you develop will pay off in the long run.
- **Be attentive.** If you ignore homeowners, their complaints will only multiply. Listening to their issues and realizing you need them as much as they need you will go a long way toward smoothing out any problems.
- **Don't be a pushover.** If you feel a homeowner is taking advantage of you or your staff, speak to them. Often, the root of the problem will be a simple misunderstanding.



## Curative management of dollar spot in fairways

A curative management test was conducted at The Ohio State University Turfgrass Research Center in Columbus, Ohio, on Penncross creeping bentgrass and annual bluegrass. The mowing height was 0.4 inches with the clippings removed, and the area was irrigated as needed.

The condition of the sward was poor because of active dollar spot with fair color, no thatch and good density. No fertilizer was applied before or during the evaluation unless noted in the treatments. The soil was Crosby B silt loam with a pH of 7.3. Individual plots measured 6 feet by 10 feet and 2 feet between blocks. They were arranged in a randomized complete block design with four replications.

Treatments were applied with a hand-held, carbon-dioxide-powered boom sprayer with 6503 TeeJet nozzles at 40 psi (a water equivalent to 2 gallons of water per 1,000 square feet). All treatments were started July 24, 2003. A single application was made with each of the fungicide treatments.

The percentage of plot area blighted was assessed visually on a linear 0-to-100-percent scale in which zero equals no blight, and 100 equals the entire plot blighted. The average high and low air temperatures (F) and rainfall (inches) for each month were: 83.6, 62.7 and 4.3 in July and 84.0, 64.1 and 12.9 in August.

Environmental conditions were favorable for dollar-spot development and activity from mid-July to mid-August. At the be-

ginning of the evaluation, high levels of the disease symptoms were expressed in the test area from natural inoculum. The test area has no resistance to fungicides.

The study was to evaluate how rapidly a single application of a fungicide, or combination of fungicides and other products, would reduce dollar spot to an acceptable level and how long the disease would be managed. After six days, all treatments showed a significant reduction of disease compared with the untreated check. A less-than-2-percent disease rating was required to be considered acceptable. Low label rates, single applications of contact fungicides, fertilizer alone and the use of growth regulators were unacceptable in the management of the disease. GCN

## Product evaluations

Treatment, formulation, rate per 1,000 square feet	% plot blighted by dollar spot			
	July 15 1 DAT*	July 30 6 DAT	Aug. 8 15 DAT	Aug. 20 27 DAT
1. Untreated	27.5	43.8	62.5	22.5
2. Emerald, 70WG, 0.18 oz.	23.8	4.5	0.3	1.8
3. Banner Maxx, 2EC, 1.0 oz.	27.5	4.5	1.8	14.8
4. Daconil Ultrex, 82.5WG, 1.8 oz.	30.0	13.0	38.8	31.3
5. Daconil Ultrex, 82.5 WG, 3.2 oz.	31.3	8.0	18.8	32.5
6. Daconil Ultrex, 82.5WG, 1.8 oz., plus Banner Maxx, 2EC, 0.5 oz.	23.8	5.5	3.3	22.5
7. Daconil Ultrex, 82.5WG, 3.2 oz., plus Banner Maxx, 2EC, 1.0 oz.	30.0	6.8	0.5	4.8
8. Daconil Ultrex, 82.5 WG, 3.2 oz., followed by Banner Maxx, 2EC, 1.0 oz. 7 days later	28.8	8.5	0.8	0.5
9. Daconil Ultrex, 82.5WG, 3.2 oz., plus Banner Maxx, 2EC, 1.0 oz., plus Green Relief, 0.75 lb. N per 1,000 sq. ft.	23.8	7.3	0.3	5.8
10. Daconil Ultrex, 82.5WG, 3.2 oz., plus Banner Maxx, 2EC, 1.0 oz., plus Primo, 1ME, 0.25 oz.	26.3	13.3	20.0	45.0
11. Fertilizer 18-3-18, 0.75 lb. N per 1,000 sq. ft.	20.0	47.5	48.8	22.5
12. Chipco, 26GT 2SC, 2.0 oz.	23.8	3.3	1.8	14.3
13. Chipco, 26GT 2SC, 4.0 oz.	27.5	5.3	1.0	18.8
14. Banner Maxx, 2EC, 0.25 oz., plus Bayleton, 50WG, 0.13 oz.	21.3	3.0	5.8	26.3
Least significant difference 0.05	14.17	15.05	14.67	13.17

\* Denotes days after treatment

Source: The Ohio State University, Department of plant pathology, J.W. Rimelspach, T.E. Hicks and M.J. Boehm; 2003.



**Terry Buchen, CGCS, MG,** is president of Golf Agronomy International. He's a 35-year member of the GCSAA and can be reached at [terrybuchen@earthlink.net](mailto:terrybuchen@earthlink.net).

Globetrotting consulting agronomist Terry Buchen visits many golf courses annually with his digital camera in-hand. He will share helpful ideas relating to maintenance equipment from the golf course superintendents he visits – as well as a few ideas of his own – with timely photos and captions that explore the changing world of golf course management.

travels with  **TERRY**

A dedicated greens roller is useful for increasing the speed of a putting surface and smoothing out ball roll. Using walk-behind models has its advantages over riding models because they're easier to use on significantly contoured greens. Moving along the contours better, they cause less damage and can be turned around much easier when bunker surrounds are close to the putting surface.

The walk-behind greens roller (at right) began as a 1949 Toro Series IV greens mower that was significantly modified by David Kimmelman, a former equipment mechanic who envisioned, designed and constructed the greens rollers. The bed bar and reel were removed, and a large stock front roller from a Toro GM3 roller kit was installed with greaseable bearings and seals where the reel used to be mounted. To add more weight, a 3/4-inch-thick steel plate (weighing about 110 pounds) was placed on the frame, replacing the sheet metal the motor was formerly sitting on. A metal rack was built in-house to hold the 4-inch-by-18-inch-by-3/4-inch weight bars. The weight can be adjusted by using one to four bars at a time. Each bar weighs about 20 pounds. The mower alone weighs about 225 pounds, and by adding four weight bars, it weighs 305 pounds.

Tom Walker, golf course manager at The Inverness Club in Toledo, Ohio, uses five dedicated greens rollers, including the one pictured, in his routine maintenance regimen to help improve playing conditions for his members and their guests.



As soon as maintenance equipment usage is done for the day, and then after it's refueled, thoroughly cleaned and parked in its designated space, the engine compartment is raised to the open position. This helps remind the maintenance employees to check all the fluid levels prior to the next usage.

Examples include: raising hoods to expose the engines on the riding green, tee, fairway and rough mowers; raising the dump bodies on the turf trucksters; raising the seats on the gasoline and electric turf vehicles, etc. This simple, but highly effective procedure, helps perform a pre-engine startup check of the fluid levels – engine oil, radiator, battery water, power steering, hydraulic fluid – as directed by the golf course manager and equipment technician before they're used.

The procedure has been in use for the past seven years at Golf und Country Club Seddiner See in Wildenbruch, Germany, and no equipment failures have occurred from lack of fluids. The procedure encourages the maintenance staff to take ownership and better care of the maintenance equipment.

David Duke, MG, course manager at the Golf und Country Club Seddiner See is pleased with the pride his employees have taken in this procedure, which has helped improve the reliability of the maintenance equipment and reduce equipment-repair costs. GCN