

customer service job," he says. "They are interacting with golfers more often than ever."

Another challenge for Satterwhite is the expense of union labor, which is \$125,000 a year for two workers.

#### SUPPORTING NONGOLFERS

In Fond du Lac, Wis., the county-owned, 27-hole Rolling Meadows Golf Course operates as an enterprise. The maintenance budget, which has increased 4 percent during the past five years, is \$496,000 including labor, \$196,000 sans labor.

"It's helpful for us that we're an enterprise fund," says David Brandenburg, GCGS, golf course manager, who says there's no reason why a muni can't be self supporting. "It's better than a course that's part of the county budget where the county can pull money from us. We can borrow from the county, but we pay it back. We have to break even. The money we make, we keep. We pay the county \$71,000 each year in lieu of taxes. We've been successful. We're not a burden to the taxpayers because we support the county's general fund, so we're important to the nongolfer. The golf course supports county golfers and nongolfers."

Brandenburg has spent \$45,000 to \$50,000 on new equipment recently and \$20,000 to renovate tees, bunkers and build a new green – all of which was done in-house.

"We're investing," he says. "You have to spend money to make money."

Still, Brandenburg expects the course to break even this year, adding that he feels a lot of pressure because expenses seem to rise higher than what the county can charge for a round, which is \$27 during the week and \$30 during the weekend to walk. Because of that, he operates efficiently.

"We've cut back on hourly labor and capital purchases," he says. "We have a lot of part-time employees (college students and retirees) and only three full-time employees – a mechanic, an assistant and me. But it's difficult to cut back on fertilizer and chemicals. I'm trying to stretch the fungicide applications and cut back on fertilizing the rough. We added natural areas that are now mowed once or twice a year."

There's been little discussion about selling the 35-year-old golf course but nothing at the committee level, says Brandenburg, who has been at Rolling Meadows for 10 years.

## Keys to success for munis

**M**any golf course superintendents believe a municipal golf course isn't inherently at a disadvantage when it comes to operating a successful facility. Granted, budgets might be smaller than many, but having the right people involved and proper expectations are important.

At Traditions at Chevy Chase in Wheeling, Ill., Allen Parkes, CGCS and PGA professional, says he has a great supporting cast.

"I have a park board, executive director and general manager who understand maintaining turf at a high level is a process, not an event," says Parkes, who has been at Traditions for three years. "They've been patient and have acknowledged the progress we've made the past two seasons. The profitability objective and strategic initiatives are clearly articulated (repeatedly), and resources have been provided to realize those goals. The entire team is passionately committed to excellence. I couldn't ask for a more supportive environment to come to every day. I'm truly blessed."

#### PARKES CITES FOUR KEYS TO THE SUCCESS OF A MUNI GOLF COURSE:

**1. The right people.** "Marketing 101 states that to be successful you have to have the right product at the right price at the right place with the right promotions," he says. "I add a 5th P, and that's people. In the current environment of heavy competition, increasing costs and a near-zero growth rate, it's imperative facilities employ true professionals in every department: turf management, food-and-beverage, facility maintenance and golf operations. In this type of competitive environment, you've got to be hitting on all cylinders to retain customers and generate a normal profit. Each department must hold the other departments accountable for success if the entire operation is to improve. If one department is sub par, the weakness ripples throughout the entire operation and eventually will impact the guests' experiences negatively."

**2. Realistic goals.** The operational goals must be realistic and clearly stated. Also, the right tools must be provided to deliver the desired results.

**3. Equipment technician.** An experienced and dedicated equipment technician is critical.

**4. Employee retention.** "The only way we can deliver a high-quality product on a consistent basis is to maintain continuity in a well-trained turf management crew," Parkes says. "We conduct 30-, 60- and 90-day performance reviews. This provides a great opportunity to pat each and every team member on the back and to discuss areas that might need improvement. The quality of the course today becomes the expectation for the conditions the next time the golfer plays Traditions. Golfers want the product or service to be better the next time, but they don't expect to pay any more for it."

#### PARKES ALSO CITES TWO BARRIERS TO SUCCESS:

**1. Labor agreements.** These might not be beneficial to the facility.

**2. Organizational problems.** Support is either not provided for the upkeep because other entities (parks, swimming pool, etc.) are deemed to need the available funds or resources generated from operations are used to subsidize other programs rather than being reinvested back into the facility.

In addition to these keys and barriers, a renovation can contribute to success. What initially pulled people back to Traditions was the buzz that followed the renovation that was completed in 2003, Parkes says.

"Golfers wanted to see the new Chevy Chase," he says. "What has kept us on their play list is the continued improvements to the course and the great service that golf professional Bob Falkiner and his staff deliver once the golfer pulls into the parking lot. Bob provides valet club service, name plates on every cart and an extremely friendly staff that reacts promptly to customer needs. They genuinely like people, and it's demonstrated in virtually every customer touch." **GCI**





There has been a steady decline of revenue at the three municipal golf courses, including Prairie Vista, in Bloomington, Ill., since 2001, says Kerry Satterwhite, CGCS. Photo: Prairie Vista Golf Course

“It’s not an overbuilt area, so the land the golf course sits on wouldn’t be a premium property,” he says.

#### LACK OF GROWTH

Much like Satterwhite and Brandenburg, Dennis Lyon, CGCS, manager of golf for the city of Aurora, Colo., faces operating difficulties. Aurora owns seven golf courses – six 18-hole facilities (all with budgets of \$600,000 or more) and one nine-hole, par-3 course. Lyon’s three biggest difficulties are:

1. Uncontrollable increases in operating expenses without the ability to increase revenue at a comparable pace;
2. No real growth of the number of rounds played per 18-hole golf course during the past five years; and
3. The development community building public golf courses to sell houses instead of meeting a demand for golf in the area.

“The course ends up cannibalizing rounds from surrounding courses,” Lyon says. “Golf operations are subsidized by home sales, and the developers eventually leave with their pockets full of money and turn an albatross over to the homeowners to figure out how to manage and maintain it.”

For Aurora municipal golf courses, total rounds have declined from 322,332 in 2001 to 295,482 in 2006. However, annual revenue has

been more stable. The courses generated \$9 million in 2001, declined to \$8.4 million in 2004 and increased to \$9.3 million in 2006.

Lyon cites attitude and corporate culture as the best examples of operational efficiencies.

“By this I mean management sets the bar high; the employees are committed to achieving the expectation; everyone is tasked to figure out how best to do their job given the opportunity to do it; and if there’s a dollar to be saved, it’s saved and celebrated.”

#### PATH TO SUCCESS

The biggest mistake Brandenburg sees other munis make is operating like a park with tee times instead of a daily-fee golf course. Some munis add an extra step for players to come play, Brandenburg says.

“For example, residents here complained they needed to buy a discount card, and second, they needed to show the card when they checked in to receive the discount,” he says. “Nonresidents felt cheated because they had to pay more, when in reality, they paid the normal price and card holders received a discount. We eliminated the card and went to a single pricing structure to eliminate complaints from both sides. Everyone needs to be treated the same.”

County employment can make operating a muni difficult, too.

“It’s easier for county employees to be lazy,”

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The city of Aurora, Colo., owns seven golf courses, including Saddle Rock (opposite page). It faces uncontrollable increases in operating expenses without the ability to increase revenue at a comparable pace.  
Photo: Saddle Rock Golf Course



Brandenburg says. "I'm not required to work anymore than 40 hours. But in the real world, you're expected to work extra hours. We work extra hours just like any other golf course. Labor-wise, you have to be a self-promoter rather than working with the threat of being fired."

Munis also are known for bidding things out, which can be detrimental because it's not always about buying the cheapest product or service, Brandenburg says.

"We shop around and get tight specs and buy what works for us," he says. "Doing things strictly on cost can be a negative, though. But if you're not efficient and not on top of things, you'll struggle. A good purchasing operation is key."

For operational success, munis need the right people, need to differentiate themselves from the competition, need continuity of thought and don't need to discount so much, says Allen Parkes, CGCS, (who is also a PGA professional) at Traditions at Chevy Chase in Wheeling, Ill.

"Munis aren't inherently at a disadvantage," Parkes says. "You have to be spending money at the right time and on the right things and on the right people. Competitive markets change. I've seen a county come in and compete with the private sector at a ridiculous price. You have to spend money to make money. Yet, I'll price out generic chemicals, and we buy used equipment. I'm not buying the newest toys either. We'll run fairways mowers well past the five-year lease because we have a good technician."

Traditions, which has a maintenance budget of \$700,000 and revenue of \$1.5 million in 2006, might be doing better than most munis. Parkes says rounds are limited to 30,000 annually because the city and course management don't want the course to become run down.

The course is competing in the upscale market. As a result, the course was renovated in 2002, Parkes hasn't been turned down for equipment since he has been there, he's been able to spend \$20,000 annually on flowers and is investing \$20,000 on decorative curbing.

"A lot of the success is location," he says. "We're on the north side of Chicago in a wealthy suburb where there are a lot of retired folks. But the executive director, board and g.m. all want this to be a showcase of the parks district."

To be successful, Lyon suggests munis concentrate on adding value rather than cutting expenses.

MUNICIPAL GOLF COURSE SUPPLY (18-HOLE EQUIVALENTS)			
Year	Openings	Closings	Total at 12/31
2000	21	NA	2,222.5
2001	24.5	NA	2,205.5
2002	15.5	NA	2,192
2003	16	3.5	2,195
2004	15.5	2.5	2,219
2005	10.5	4	2,239
2006	9	3.5	2,256

Source: National Golf Foundation

"Avoid discounting with coupons etc., because you diminish your value in the eyes of your customers," he says. "Implement a loyalty program that caters to your core golfers, not the one-time bargain hunter. Develop new golfers and concentrate on customer service throughout the golfer's experience."

Regarding the future of muni golf, Lyon doesn't make a distinction between muni and public access golf but says the price of public access golf is increasing in response to the cost of doing business.

"The marginal operators might not survive because of product, location or management," he says. "Courses with debt will have an even more difficult time. The ability to invest in

infrastructure and equipment replacement for the foreseeable future looks grim."

Overall, munis have the same challenge most other facilities do – declining or stagnant rounds. But it's not dollar driven, it's a competition for time, Satterwhite says.

"Golf has to be faster," he says. "People don't have five or six hours to play golf. We need to find out what the needs of the golfer are and meet those needs. For example, The Den wanted to cater to the competitive golfer. Now we're hearing golfers think it's too hard. If we weren't a muni, we wouldn't be in business. Munis aren't concerned as much about making money. They have more flexibility to weather the storm." **GCI**



BY T.R. MASSEY

# roll away... to faster green speed



Rolling greens is an age-old practice that fell out of vogue between the late 1920s and the 1980s. Because research showed its merit, the practice has caught on again. Photos: Muirfield Village Golf Club



Researchers and superintendents extol the benefits of using rollers

**F**or a long time, everyone thought lowering the height of cut on greens was the only way to achieve faster speeds. Turns out everyone was wrong.

Research shows a combination of mowing and rolling greens is the way to go. Rolling greens is an age-old practice that fell out of vogue between the late 1920s and the 1980s. Twenty years after the discussion of rolling reemerged, when research showed its merits, rolling greens has caught on again. Since the beginning of this decade, superintendents throughout the country have rediscovered how rolling, in addition to mowing, can save time and money; produce smoother, faster greens and even stop the spread of disease.

"I know more and more people who are doing

it," says Thom Nikolai, Ph.D., turfgrass academic specialist at Michigan State University. "I don't know anyone who doesn't roll."

Nikolai wrote a book about greens rolling, "The Superintendent's Guide to Controlling Putting Green Speed," which was published by Wiley & Sons in 2006. Nikolai says if he writes another edition, he'll write more like 80 pages rather than the 20 he did in his latest book.

Nikolai also lectures about greens rolling.

"I believe it was 2002 in Orlando where I gave a talk," he says. "I was given 25 minutes. I asked how many people roll regularly. Two hands went up of the couple hundred people who were there. I gave my talk, and someone came up and said, 'You just sold a roller to every single

guy in that room.' I was trying to get a couple of roller companies to fund a study with me prior to that presentation, and they wouldn't. After my presentation, they all decided to fund research that year. It worked out well."

Nikolai has access to a repository of almost every paper ever written about golf course management practices called the Turfgrass Information File. The mechanical mower was invented in 1836, and before that, courses were "mowed" by bunnies and sheep, he says.

"I strongly believe rolling was the first mechanical practice, but I have been unable to find a reference to green rolling prior to 1900," he says.

Nikolai believes rolling lost favor for two reasons. First, in the mid- to late 1920s, there was an outburst of new mower invention, and suddenly, grass could be mowed to .187 inch. With those heights, greens were fast enough. The second reason was that people thought compaction as a result of rolling wasn't good for root growth.

"So rolling disappeared from the literature," Nikolai says. "From 1900 to 1928, we'll say you could find numerous articles about lightweight rolling on greens. You get to the point where there's a debate about it, how often and how much they should weigh. From the late 1920s to the late 1980s, every hit you get is for rolling once in the spring for home lawns or for cricket or lawn bowling. It's just gone."

Because people began to demand faster green speeds during the mid-1980s, the discussion reemerged. That was when research about the subject began. Today, Nikolai conducts three studies per year at Michigan State. Other schools throughout the country also conduct studies.

"It's safe to say from these studies that rolling every other day on greens that have a normal topdressing program results in no compaction and is beneficial to the turfgrass and golfer satisfaction," Nikolai says.

The biggest negative of a roller is that it can spin out when it hits the collar of a green and cause abrasions or wear because the sidewind-

ing action of modern rollers means fast stops and starts.

"This can often be corrected by using a different kind of roller or the operator using it in a different manner," Nikolai says.

But a superintendent has to know what he wants to do with a roller before he purchases one.

"How do you want to use it in your frequency, what's your topography, do you want to use it for something other than rolling the greens, like rolling after you topdress with a vibratory roller?" Nikolai asks. "I know of one gentleman who vibratory rolls after applying organic fertilizers so he doesn't pick up so much the next day."

Sidewinding riding machines cost between \$8,000 and \$12,000 each and vary by the number of rollers, width, weight, speed and setup. Other units attach to triplex mowers, and older drum-style rollers are pulled behind maintenance carts. Most modern rollers are ridden sideways by a staff member who needs to have the skill and practice to do it well. On average, it takes two operators two hours to roll 18 greens.

"Find someone who has one and talk to him," says Nikolai about advice for buying a roller.

"Demo three or four."

As with many aspects of turfgrass management, the art and science of rolling need to be considered.

"We know a little bit of the science of rolling, but incorporating it into a program is the art of greenkeeping – how to take the tools and employ them at your facility," says Chris Hartwiger, a senior agronomist for the USGA Green Section since 1995.

In the early 1990s, Hartwiger conducted greens rolling research at North Carolina State University for his master's degree. He found rolling increased green speeds and improved smoothness. He also found there were no compaction issues. He conducted tests on a sand-based green and a clay-based green and, even at highest rolling frequency (70 consecutive days), he couldn't detect any change in compaction levels.

"Hopefully, we busted that myth," he says.

Neither Nikolai nor Hartwiger know of a golf course superintendent who doesn't roll greens, except for those who can't afford the machines.

"Our mission is to help each golf facility produce the best product given the existing cir-



It's possible to raise the height of cut on greens 25 percent by rolling them, says John Fulling, CGCS. Photo: Kalamazoo Country Club

At Muirfield Village Golf Club, Paul B. Latshaw, CGCS, rolls greens three times a week, morning and night. Photo: Muirfield Village Golf Club



cumstances,” Hartwiger says. “At a course with a lower budget, I might not recommend it. But if they have one, I’ll recommend rolling, and we’ll talk about how to do it best.”

#### THE REAL WORLD

Aside from researchers and consultants, golf course superintendents are experiencing the benefits of greens rolling firsthand. John Fulling, CGCS, of Kalamazoo Country Club bought two new DMI Speedrollers this year, and swears by them.

“You couldn’t rip these out of my cold dead fingers,” he says. “I can’t imagine doing it without them. I don’t get excited, ever, and these excite me. It’s worth the investment. Imagine the turf health. If you can raise the height of your green by 25 percent, imagine what you’ve saved in the time and effort and hand-watering.”

At Muirfield Village Golf Club in Dublin, Ohio, Paul B. Latshaw, CGCS, prepares the golf course for the PGA Tour’s Memorial Tournament each May and maintains course conditions for an upscale membership during the rest of the year. He rolls greens three times a week, morning and night. He uses three mechanical rollers and six pushing rollers.

Mark Swygert, golf course superintendent Sage Valley Golf Club in Graniteville, S.C., bought a roller immediately following the opening of the course in 2001. Since then, he has purchased a second Tru-Turf roller.

“Basically, it was a way for us to get better green speeds,” he says. “There are a lot of benefits having them, but our initial one was green speed. After topdressing and aerifying, it’s something you’ve got to have.”

Swygert mows Sage Valley’s bentgrass greens at .115 inch and raises them to .140 inch when

it’s really hot.

“We roll probably two or three times a week, and when we have a tournament, we bump that up a little bit,” he says. “After aerification, we roll to smooth out the surface. After topdressing, we use the roller instead of a mower so we don’t pick back up the sand we just put down on the greens. So there are other uses of a roller than just green speeds.”

Swygert realizes savings when he sends out five employees to mow and two to roll instead of 10 workers double-cutting. He uses seven guys and gets the job done faster, saving labor costs as well.

“Especially for us in the summer time, we can let the plant grow to make it healthier,” he says. “We might skip a cut and roll, and you really don’t lose much speed. In the summer, the plant’s not growing that much. You don’t lose the speed, and the plant isn’t as stressed.”

Sean O’Connor, CGCS, is another superintendent who promotes rolling. He oversees two courses, the East Course and West Course, at Forest Akers Golf Course at Michigan State. Both were redesigned in 1990 by Arthur Hills. O’Connor rolls the greens on the West Course but not the East Course.

“I do it for financial reasons,” he says. “I don’t have the money or staff.”

This unique way of practicing, though, produces side-by-side comparisons.

“I started experimenting with rolling three years ago,” says O’Connor, who uses two DMI Speedrollers. “I started off because of pressures about green speeds, and I didn’t want to reduce my height of cut. I’m to the point now where I’m rolling every day and alternating my mowing. I’m rolling more often and getting more consistent and faster green speeds.”

For O’Connor, rolling means disease control, too. He uses the same fertility and disease management on both his courses, yet the greens he rolls have fewer dollar spots.

“On the East Course, I was having breakthroughs,” he says. “I never saw any active dollar spots at all on the West Course last year.”

At the Alister MacKenzie-designed Crystal Downs Country Club, which rests on a bluff overlooking Lake Michigan and Crystal Lake, Mike Morris, CGCS, rolls greens daily.

“There’s less disease with rolling, less localized dry spots,” he says.

O’Connor also can mow the annual bluegrass greens higher and achieve faster speeds.

“I get faster green speeds at .135 with rolling than at .125 and not rolling,” he says. “There’s a great benefit to it. I went into it with great trepidation, and now I’m completely the opposite.”

At Kalamazoo, a 1909 Tom Bendelow/Willie Watson design, Fulling switched from triplex rollers to sidewinders this year.

“Rolling is the greatest thing that ever happened to golf,” he says. “I get as much as 20 inches extra with rolling. There are no compaction issues, and the plant is healthier. When I Stimped, we saw between 15 inches and two feet after rolling. It’s been fantastic.”

Fulling wants to raise mowing heights to .125 inch and keep his speed. Last year, he cut at .100 inch. He used to double and triple cut. Now he mows and rolls once a day.

“There’s 25 percent more leaf blade, plant food production, carbo storage – everything,” he says. “It’s gotta be better. They’re already looking better.” **GCI**

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# SPOON-FEED YOUR TURF

WHILE IT MIGHT NOT COMPLETELY REPLACE TRADITIONAL FERTILIZER APPLICATIONS, FERTIGATION ALLOWS SUPERINTENDENTS TO BE EFFICIENT AND HAVE MORE CONTROL





BY JOHN TORSIELLO

At Old Ranch Country Club (opposite page), Richard Swinhart, golf course superintendent, fertigates as a supplement to traditional fertilizer methods. Photo: Old Ranch Country Club



At Bayville Golf Club, Cutler Robinson, CGCS, uses fertigation to apply about 20 percent of his chemical treatments. Photo: Bayville Golf Club

**F**ertigation, using an irrigation system to deliver fertilizer, wetting agents and other chemical treatments to fairways, tees and greens, has become a more popular and effective way to help manage turf conditions.

“I had experience with fertigation at other courses, and when I got here, I started running a micronutrient program through our irrigation system,” says Kevin Jasinski, golf course superintendent at Minisceongo Golf Club in Pomona, N.Y. “I saw an immediate change in some of the greens – they gained color. I’m also running a wetting agent through the system. That allows me to use less water and also keeps the turf healthy in spots where we’ve had drying problems.”

Fertigation may never completely replace spreader applications of fertilizer, other chemicals and wetting agents on golf courses, or even eliminate the need for manually treating troublesome spots. But it’s a valuable tool superintendents have at their disposal in their ongoing struggle to maintain the best possible playing conditions.

“No, it doesn’t replace fertilizing a golf course through traditional methods, but it’s a nice supplement,” says Richard Swinhart, golf course superintendent at Old Ranch Country Club in

Seal Beach, Calif. “With our high salt content, we really push the gypsum, and it makes a big difference in the quality of the turf. We’ve had the injector break down and be out of action for a few weeks. When we got it up and running again, you could see the difference in color.”

Fertigation is a great tool for a grow-in and spoon-feeding certain areas of a course during its first seven to 10 years of growth, says Mark Mansur, golf course superintendent at Wintonbury Hills Golf Course in Bloomfield, Conn.

“It’s a nice way to enhance manganese levels, and you can incorporate wetting agents into the system to enhance turf conditions,” Mansur says.

Brad Fox, golf course superintendent at New Jersey National Golf Club in Basking Ridge, N.J., believes he has found a magic potion to keep the course’s playing conditions top-notch.

“I’m using the irrigation system to inject sulfuric acid with small amounts of urea to eliminate localized dry spots in the fairways,” Fox says. “This treatment is common out West where they might have poor water quality. I can set the pH level anywhere I want, usually around 6.5, and injecting the acid allows the water and fertilizer to get through the soil profile more effectively. When I run fertilizer and acid through the system

I’m killing two birds with one stone.

“One of the key advantages is that I’ve reduced my water usage by about 50 percent,” he adds. “I’m running the spinning heads only between 15 to 20 minutes four to six times a week. And I don’t need 18 guys going around the course hand-watering fairways. We don’t do any of that, so it saves on man power as well.”

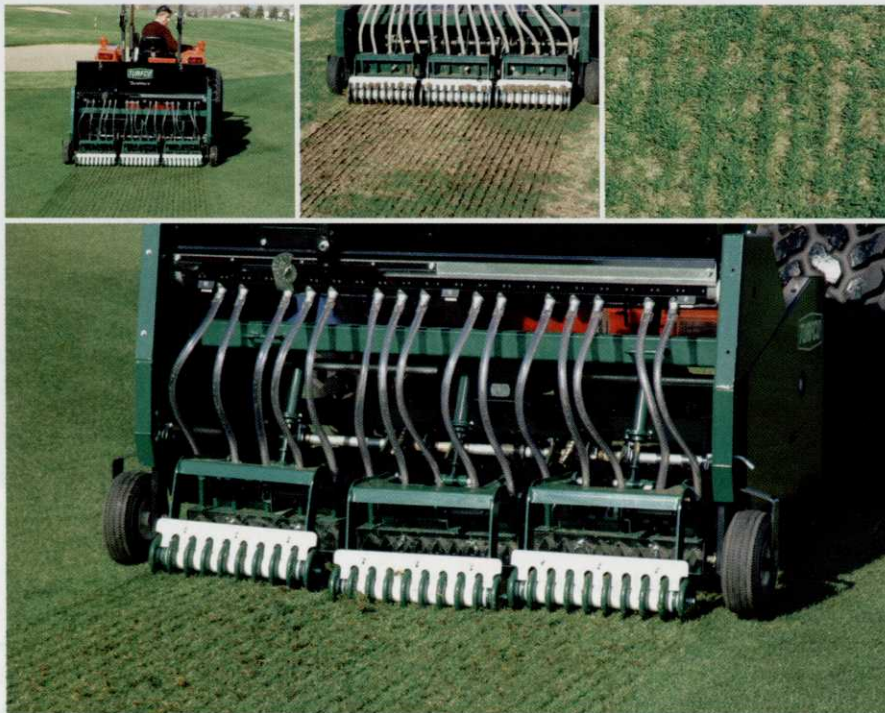
#### IMPROVED TECHNOLOGY

Using an existing irrigation system to apply fertilizer, wetting agents and other chemical treatments is nothing new to the industry – it’s been around since the 1970s. But the technology has improved, prices of the pumps and injectors needed to fertigate have decreased, and chemicals used in fertigation are more attainable, although golf courses compete with agricultural enterprises for product. Chemicals can be pumped through various types of irrigation systems, from fixed sprinklers to drip and surge irrigation systems.

One of the main benefits of fertigation is that chemical applications can be targeted to specific areas and fertilizer can be applied directly into the soil where it can be most effective for improving and maintaining turf. Because superintendents can spoon-feed turf through fertigation,



Fertigation is a valuable tool for spoon-feeding certain areas of a golf course. Photo: Rain Bird



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the needs of the plant can be met with a higher degree of specificity, producing a better density in the turf canopy, improved grass quality and color, and enhanced plant strength.

Ali Harivandi, Ph.D., a researcher with University of California, is a proponent of fertigation because it's an effective turf management tool.

"One of the major pluses is that the labor involved in spreading large applications of fertilizer once or twice a year isn't there," Harivandi says. "And more importantly, because the plant is receiving a smaller amount of material regularly, the plant can use it more efficiently. What you're doing is spoon-feeding the plant. It's like a human eating five or six times a day instead of one big meal. You process the food better if you spread out your meals and eat smaller amounts."

Fertigation systems have improved considerably during the past 10 to 15 years, Harivandi says.

"Because most systems are now automated, which means levels of fertilizer passing through the system can be closely controlled by a computer, the systems are more reliable and efficient," he says. "I'd say the use of fertigators on golf courses has doubled during the past 10 years."

Many new courses design their water pumping stations to include fertigation equipment. The cost of installing fertigation equipment into an existing water pumping station, while not inexpensive, isn't cost prohibitive for many facilities – somewhere between \$10,000 to \$15,000. The cost might be recouped within a few years through the decreased use of fertilizer and other chemicals, as well as a reduction in labor.

A fertigation system is tied to liquid fertilizer tanks and injection rates are monitored by an injector pump that's tied into the irrigation control panel. The injector pump can be adjusted to several flow rates depending on the specific fertilizer being applied. Control valves allow for multiple tanks to be employed on the same system. Thus, fertilizer can be applied separately or combined to create a specific blend.

"The systems have improved like any other technology," says Joe McCleary, CGCS, at Saddle Rock Golf Course in Aurora, Colo. "We monitor our fertigation system every day and keep track of what we're putting out there and how many gallons of water and chemicals we're using. You can't count on fertigation