

Stunted growth

Plant regulators are a California course's key to tree canopy management

Golf course management can be a complex job because there are so many strategies that need to be implemented for a facility to operate efficiently. Operating the Glendora (Calif.) Municipal Golf Course, a nine-hole, par-3 facility, presents challenges to the city, specifically keeping the course in good playable condition without exceeding the maintenance budget. And trees are part of that challenge.

Trees are an integral component of a golf course and provide value by:

- Lining fairways;
- Protecting other golfers on the course from stray golf balls;

- Showcasing a putting green; and
- Purifying the air.

At Glendora, trees are adjacent to netting, which is used to protect the public and other golfers on the course. In the past, the city would have to prune the branches away from the netting, and it's not uncommon that when a tree is pruned, secondary pests might attack that tree. Woodborers and dry wood termites might attack weak trees. In addition to insect pests, root rot also can attack weak trees.

When tree canopies are overgrown, they require dead-wood or complete-tree removal. In some cases, heavy equipment needed for

such a job might pose potential problems for golfers and possible damage to the golf course. Glendora has its own in-house tree pruning staff, but equipment limits how high it can prune. On numerous occasions, the golf course's sprinkler heads have been damaged or broken by heavy tree-pruning equipment, creating additional downtime for repairs. Turf damage and soil compaction also are negative consequences of using heavy pruning equipment.

CHOOSE TO INJECT

The city implemented an integrated pest management program for tree canopies. Before



The city of Glendora used to prune branches away from protective netting, which left trees susceptible to secondary pests. Photo: Mike Ventura

deciding on a product to treat the trees, the city needed to decide the application method for the program. Aerial spraying was considered but not prudent because of the liability of drift and off-target movement of the product.

The city also looked into soil drenching the product, but chose not to because it didn't fit the city's integrated pest management program and it's committed to implementing as many integrated pest management strategies as possible.

The city decided to use a tree growth regulator via tree injection. A certified arborist on staff

handles the injections according to manufacturer label rate and recommended timing. But before applying the tree growth regulator, the trees needed to be inspected first. If trees are in a weak growing condition or if they're in decline, they shouldn't be treated. The city first applied the tree growth regulator on Eucalyptus and Shamel Ash trees.

By applying the growth regulator via injection, the city:

- Protects the environment;
- Doesn't place a pesticide in contact with golfers;

- Doesn't have to worry weather conditions negatively affecting the treatment;
- Eliminates pesticides entering the air or soil;
- Eliminates pesticide odor from emanating into the air; and

- Is able to treat all needed trees quickly.

The tree growth regulator (flurprimidol) provides control as long as five years. The tree growth regulator program starts at the time of bud break and continues into May.

However, tree growth regulators aren't for every tree. The city doesn't apply tree growth

IMPACT ON THE BUSINESS

Preconditioning trees pays off

BY CINDY CODE

When it comes to maintaining golf courses, tree care generally isn't what superintendents like to do most – unless quick action is needed to remove trees ravaged by a storm or devastated by insect or disease damage.

While trees are often cited interfering with turf quality and golfer site lines, a proactive tree program and philosophy can add significant

beauty and charm to a golf course.

Just ask Mike Fabrizio, CGCS, director of grounds and golf maintenance for Daniel Island Club's Ralston Creek and Beresford Creek courses in Charleston, S.C. Ralston Creek recently was recognized by the National Arbor Day Foundation for its environmental leadership in tree preservation.

Fabrizio has learned much about

trees in his eight-plus years at Daniel Island. Before his involvement with the Ralston Creek course, he arrived on the scene four months before construction began on Beresford Creek, which was designed by Tom Fazio. This course, too, received the Arbor Day award in 2003.

"It's definitely a tree philosophy around here," Fabrizio says. "Everyone from the developer, who is environmentally conscious, to the architects and everyone throughout the island. Every neighborhood has a park associated with it. Trees definitely give the course a more mature look even when they're brand new. It shows that trees can coexist in a golf environment and enhance it."

Fabrizio's background is turf, but he has surrounded himself with tree experts. He says he's been fortunate to work with Ken Knox of Hendersonville, N.C.-based Tree Doctor. Knox is a consulting arborist who visits courses annually to inspect and diagnoses trees. Fabrizio also has worked with Theo Meade, a local arborist, for about 30 years.

"They both have a passion for trees and help us out tremendously," Fabrizio says. "They catch problems

earlier than I ever would."

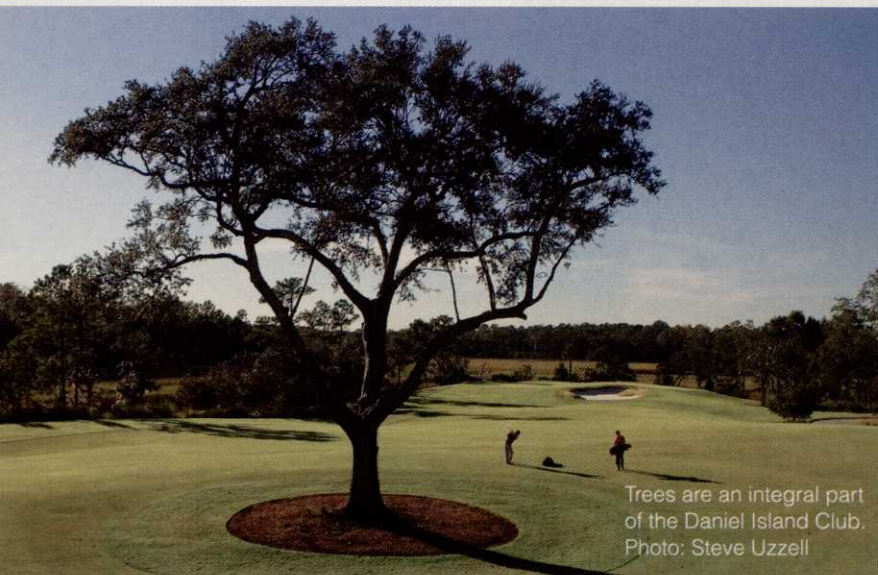
Fabrizio's maintenance budget for grounds and the two courses is about \$2.8 million. Trees alone account for about \$60,000 to \$65,000 annually, primarily for pruning and fertilization. Additional dollars are allocated for tree maintenance if a large tree dies or is struck by lightning.

Larger trees on the course are deep-drilled and aerified annually and fertilized every three to four years. New or recently transplanted trees are fertilized every year. Aside from fertilization, most treatments are curative rather than preventive. An exception is nursery trees susceptible to spider mites.

Small jobs are done in-house while all major pruning, aeration and fertilization are done by an arborist.

Fabrizio spends about \$30,000 to \$35,000 in the spring for mechanical and tree health care. The course's oak trees are pruned to remove heavy foliage that makes trees susceptible to wind damage. They'll also reduce tree canopies to protect turf health if they find they're encroaching on the turf.

The developer and golf course architect, Rees Jones, began working two years before construction started



Trees are an integral part of the Daniel Island Club. Photo: Steve Uzzell

Using plant growth regulators on trees can reduce or eliminate the need for heavy equipment to remove or prune trees. Photo: Mike Ventura



on Ralston Creek to plan a course routing that would impact a minimal number of trees. Preconstruction work included stress conditioning. Root pruning began in the fall of 2003, and the course opened in the spring of 2006.

Arborists removed unnecessary foliage off the top and dead wood from the interior to lighten the trees. Roots on the top 12 inches around trees are pruned. These areas develop small fibrous roots that aid nutrient and water uptake and help trees adapt to new locations.

Fabrizio spent about \$100,000 on preconditioning the trees. Even the trees on the course that weren't moved were pretreated to withstand environmental stresses associated with the dirt moving and shifting all around them.

Once construction was under way, crews transplanted 42 oak trees and about 100 pine trees to other areas of the course. Some oaks were at least 60 years old and had trunks as large as 31 inches wide, requiring one of the nation's largest tree spades to help with the transplanting process.

Dallas-based Environmental Designs was hired to relocate the

trees. They designed a 144-inch tree spade that had to be put together on-site for the project. Standard tree spades are between 90 to 100 inches.

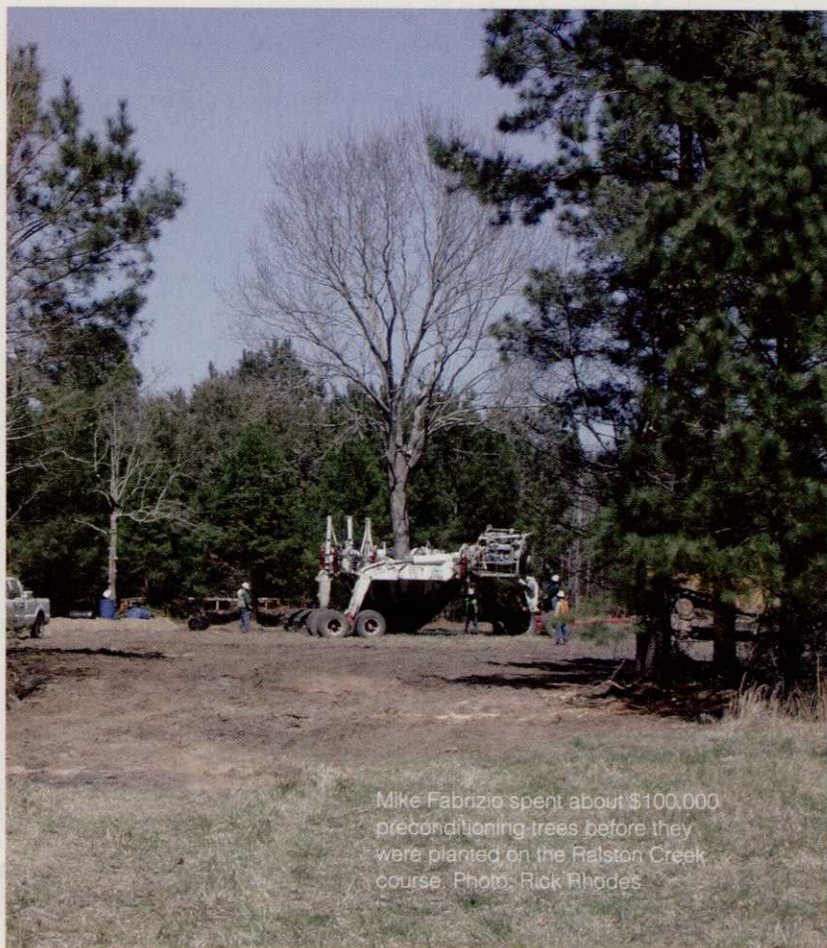
The majority of the trees survived the move, and less than a half dozen died, Fabrizio says.

"I can't stress enough about preconditioning," he says. "It's the third time I've done it, and it's \$100,000 well spent."

In addition to saving trees on the golf course, the Daniel Island Co. has planted more than 16,000 trees on the 4,000-acre island since development 10 years ago.

Fabrizio attributes much of the success to the fact that the corridors are 50 feet wider than most and wider corridors allow one to keep trees and still have healthy turf. Traditional 200-foot-wide corridors force trees to be crammed in resulting in too much shade in the play area.

"With our wide corridors, trees aren't a detriment to golfers," he says. "Sometimes I don't think they realize they're there or appreciate them. The course looks like it's been there for a long time. They take the trees for granted." GCI



Mike Fabrizio spent about \$100,000 preconditioning trees before they were planted on the Ralston Creek course. Photo: Rick Rhodes

Research

regulators on slow-growing trees, only on moderate to fast-growing trees. An understanding of tree physiology is recommended before setting out to inject trees.

Aside from tall trees such as the Shamel Ash and Eucalyptus, the city has numerous smaller trees on the golf course but doesn't treat them because it wants the tree canopies to develop. Once the younger, smaller trees have developed canopies, the trees will be treated.

NO MORE INTERFERENCE

The trees creating the city's greatest challenge are Shamel Ash and Eucalyptus (blue gum) trees. The Eucalyptus is a good fairway tree, providing golfers protection from stray golf balls. Also, protective netting is near many of the tees. The branches and foliage from Eucalyptus trees create a maintenance problem, and replacing the netting is quite expensive.

Since treating the Eucalyptus trees, the city has noticed a decline of new foliage production in the canopy, as well as a darker green foliage, which is desired during the growing season. Without the growth reduction, branches and foliage would be growing into the netting.

Wind damage also can be a problem with the

Shamel Ash and Eucalyptus trees. A tree treated with a growth regulator reduces the potential for limb or tree failure caused by wind.

BENEFITS

The city is benefiting the environment by incorporating a tree growth regulator program into its golf course management program. By reducing the need for regular pruning, the city is able to preserve tree canopies and allow trees to clean the air. A stub or topped tree isn't capable of purifying the air. The city believes that by using tree growth regulators it's able to reduce the cost of pruning and the amount of green waste that would normally end up at a landfill.

Another benefit of tree growth regulator applications is labor savings. Because treated trees grow slower, the city is able to reallocate man-hours and can spend more time managing the turf, soil and bunkers on the golf course because turf conditions and managing the playing surface is critical to a successful golf facility operation. **GCI**

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At the Glendora Municipal Golf Course in California, Eucalyptus tree growth needs to be controlled because they're right next to protective netting. Photo: Mike Ventura



BY JOHN WALSH

In due time

Minnesota superintendent tends to irrigation system while he waits for overhaul

Fred Taylor and his crew might not have the best irrigation system in Minnesota, but they've made do repairing and maintaining the 18-year-old system, and will continue to do so, until a new one is installed – which won't be for another eight or nine years.

"Right now, we have more urgent needs, such as a bunker renovation, drainage improvements and a clubhouse renovation that will take three years to complete," says Taylor, certified golf course superintendent at the private, 18-hole Mankato Golf Club. "We're reviewing our master plan right now with architect Garrett Gill."

Mankato opened in 1920 as a nine-hole course designed by golf course architect Tom Bendelow. In 1954, it expanded to an 18-hole facility. Architect William Langford designed the additional nine holes. The club has about 340 golfing members out of a cap of 350. The course features a turfgrass mix. The greens are *Poa annua* and bentgrass, and the fairways are the same mix with the addition of bluegrass.

Taylor, who has been working at the club for 27 years, started there as an intern while attending college. He worked there for five years, left and went back to school, then returned. His maintenance budget is \$455,000

sans utilities, which are part of the club's administration budget. Because of that, Taylor says he doesn't have a good idea of what he spends annually on water.

"We don't really pay for water other than \$500 for the permit," he says.

Throughout the years, Taylor has allocated a small amount of his budget for repairs and maintenance of the irrigation system. This year, he budgeted \$3,650. This line item has increased a bit more recently than in

years past. About seven years ago, Taylor was spending about \$1,500 for repairs and maintenance to the system.

"We're popping more sprinkler heads," he says. "Over time, the plastic becomes brittle, the pipes become brittle, and the valves leak."

Mankato's irrigation system was installed in 1989, and Taylor says there hasn't been much talk of getting a new irrigation system just yet.



From left, Scott Ness, Allen Starke and Fred Taylor make sure Mankato's irrigation system runs smoothly. Photo: Mankato Golf Club

The maintenance budget at Mankato Golf Club is \$455,000.

Mankato's irrigation system can pump 900 gallons a minute.

Fred Taylor budgeted \$3,650 this year for irrigation-system repairs.

"However, Bob Vavrek from the USGA looks at our maintenance practices, and he has talked about a new system more seriously than I," Taylor says. "A new irrigation system is eight to nine years out."

The irrigation system is a double-row system from Toro, but one could make the case that it's wall to wall because there are rough lines in most places where the fairway heads don't cover, Taylor says. The system pumps 900 gallons a minute at full go. Taylor doesn't have individual control on the sprinkler heads, but he can run two heads per control station.

"When the system was put in, it was a way to save money," he says.

The system's central control used to be a VT3 video, a first-generation central control that was operated with a light pen. But the flaw of the controller was that the pen wouldn't always work with the monitor. So, Taylor and his staff found a used VT2 mechanical controller and used that for a few years. Then, Scott Ness, one of Taylor's assistants who has a computer and electronics background, made his own central controller from a computer. Using timing software, the staff upgraded to a one-of-a-

"Five years ago, we were quoted between \$40,000 and \$50,000 to upgrade the control system. Instead, we spent \$600."

— FRED TAYLOR

kind system that has worked great for five years, Taylor says.

"Five years ago, we were quoted between \$40,000 to \$50,000 to upgrade the control system," he says. "Instead, we spent about \$600."

Taylor usually discovers weaknesses in the system when he winterizes it in late October, a process that takes about eight or nine hours.

"When blowing it out full of air, I've seen a weak head shoot 20 feet in the air," he says.

When pressurizing the system in the spring, Taylor drives around the golf course looking for puddles, which are indications of busted pipes.

"If it's a break associated with freezing

and thawing, it's a major deal," he says. "You'll have a lot of water."

When a nozzle base or gear drive assembly needs to be replaced, Taylor says those parts are usually on hand in the maintenance facility. Other parts such as fittings and pipe usually are purchased from a local plumbing house.

"I can get fittings from Toro and Rain Bird, but it's easier to buy pipe from the local plumbing house," he says. "We are blessed with two good distributors. They're a phone call away to help with a problem."

Starting about three years ago, Taylor and his crew have been replacing the old nozzles on all greens and tees with FCI brass nozzles, and they've seen an improvement. Eight years ago, Taylor and his crew added a variable frequency drive and jockey pump to the pump station.

"We couldn't go two weeks without a pipe breaking before that," he says. "That's when it's crucial to have an experienced irrigation guy on staff. Fortunately, Allen Starke, the other assistant at the club, has been with us for about 15 years and knows the system inside and out."

When a complete irrigation system upgrade takes place, most of the pipe will have to be replaced, some of the pipe can be used again, all new heads and controls will need to be replaced, as well as the pump station, but there will be no need to reroute the system.

"It would be nice to duplicate the heads on greens, so one set waters the greens and the other set waters the surrounds," he says. "Having individual head control would be great, too."

Taylor and his crew will make small upgrades to the system – just like they have been doing for years – between now and when they get a new one.

"We'll get by until a major upgrade is done," he says. **GCI**



A new irrigation system at Mankato is about eight or nine years away. Photo: Mankato Golf Club

BY JOHN WALSH

Water delivery

Development team chooses decoder system for irrigation

In the context of building a golf course, an irrigation system is an unglamorous (and unseen, most of the time) part of a project. Yet it's vital to a successful project. Golfers like – and in many cases demand – green grass everywhere, and effective and efficient irrigation helps provide those results. And for some development teams, a decoder system is the control option of choice.

In Wilson, Mich., the 18-hole Sweetgrass Golf Club is being developed for about \$5.5 million. Golf course architect Paul Albanese of Plymouth, Mich.-based Albanese & Lutzke designed the course. Construction started in August of 2005, and it's scheduled to be completed in July. The 7,300-yard, public course is scheduled to open in May of 2008.

Dan Grassi, owner and president of Grassi Enterprises, a golf course construction company, is Sweetgrass' project manager who's overseeing the irrigation installation. Grassi first looked at the project in February of 2003 and came on board in June of 2005. Kuhn & Associates, an irrigation design firm, drew the original irrigation plans. Changes were made to those plans, mainly adding to the irrigation system because length was added to the course.

Toro, Rain Bird and John Deere bid the irrigation system, Grassi says.

"We looked at the price, then narrowed it

down to service and reliability of the product," he says. "Then we made our decision. John Deere made a package deal, including the maintenance of the golf course after it was grown in, through One Source. Toro also came up with a package. We were looking long term."

The irrigation system is controlled by a decoder system instead of a satellite or hard-wired system. All the heads require fewer

wires than heads that are part of a completely hard-wired system, so there's less copper wire and labor required for installation, Grassi says, adding that the price of copper wire has increased considerably recently. With a decoder system, irrigation can be controlled via the Internet, cell phone or hand-held radio.

At press time, Grassi had four holes left to install.

"It's been a much easier and faster instal-



The number of irrigation heads was increased because of the windy site. Photo: EPIC Creative

lation because of the decoder system," he says. "This is the first decoder system John Deere has done in the U.S. I had my doubts, but I've been pleasantly surprised by the performance. For example, the heads feature a flushing system that helps prevent sticking caused by the dirt around them during construction."

When completed, the system will have about 1,200 heads, all with individual control. A double-row system is in place from the tees to landing areas. Near putting greens, there are two sets of heads, one to irrigate the greens and one to irrigate the surrounds. The system cost about \$750,000 including the pump station by Watertronics and the control system by Signature Controls. The pump station, which features 60-horsepower motors, pumps 1,500 gallons per minute.

Because Sweetgrass sits on a windy site, trajectory adjustments were made to various nozzles and extra heads were added, mostly on par 5s and tees, and John Deere accommodated that, Grassi says.

"Those extra heads will be taken out because the turf will be in no-mow areas, but enough water is needed to establish them," he says.

Because of the no-mow areas, Grassi says



there are fewer heads (about eight per hole) incorporated into the system than if there weren't any no-mow areas.

Reclaimed water and rain water will be used to irrigate Sweetgrass, yet nothing in the irrigation system had to be changed because of reclaimed water use, Grassi says.

The fairways and tees are a mix of L-93 bentgrass and Southshore, and the greens are straight L-93. John Hoberton, the golf course superintendent who was brought in when the grass started to grow, is in charge of maintaining the turf.

The irrigation system has a 15-year life span. Throughout time, Grassi expects no problems with the system. The pipes will remain, but he expects some heads might need to be swapped out, which is common with any system. **GCI**



With a decoder system, irrigation can be controlled via the Internet, cell phone or hand-held radio. Photo: EPIC Creative

Terry Buchen, CGCS, MG, is president of Golf Agronomy International. He's a 38-year and AA life member of the GCSAA. He can be reached at terrybuchen@earthlink.net.



EQUIPMENT IDEAS

Weigh it down

Don W. Taylor, CGCS, director of golf maintenance at Virginia State Golf Association's Independence Golf Club in Midlothian, has a John Deere front-end-loader tractor without a backhoe mounted on it. When his staff uses the fork-lift attachments mounted in place of the front-end-loader bucket to lift pallets of sod or other heavy loads, a large concrete weight is used to keep the rear wheels on the ground for traction in a safe, functional and efficient manner. In the past, implements such as rototillers were mounted on the rear for additional weight.



Former equipment manager Kenneth Price built the large concrete weight that attaches to the three-point hitch. The weight can be taken on and off the tractor easily as desired.

When making the weight, a steel frame was placed inside a concrete form (wooden box) measuring 4 feet by 2 feet by 18 inches. Three, three-quarter-inch-diameter rebar were bent into shape – one at the top and two at the bottom – and welded to the steel frame for additional support. Water was added to Sacrete instant cement and then placed inside the form.

After the concrete dried, it was painted green using specialized concrete paint. The weight weighs more than 500 pounds. The cost of materials used and the mechanic's labor was about \$250.



Say it with pictures

Supervisory staffs at golf courses constantly retrain maintenance employees and train new personnel. Darren J. Davis, director of golf course operations at the Olde Florida Golf Club in Naples, Fla., is the epitome of a great communicator, having hosted countless video workshops and written many articles.

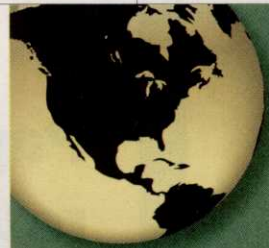
The correct and incorrect way of performing specific maintenance procedures is displayed prominently on the employee's lunchroom wall with vivid, digital color photos. The photos are mounted on two Advantus Grip-A-Strip display rails. A roller system organizes the photos on the wall like a bulletin board without tacks. The display rails are available at Office Depot in two size – 24 inches long (\$16.99) and 48 inches long (\$30.99). After each photo is downloaded to a computer, they're printed on 8.5-inch-by-11-inch, HP glossy photo paper, which can be bought in 100-sheet packs for \$29.99.

Then, a caption is written about each photo and translated into Spanish. The captions are printed on Avery 8160 address labels (1 inch by 2 5/8 inches), which can be purchased in packs of 750 for \$11.99, and are affixed to each photo. Because the photos and captions are constantly rotated on display, they're stored in Avery nonstick sheet protectors, which can be bought in packs of 25 for \$5.79.

The photos demonstrate tee-marker placement and alignment, repairing divots on tees and fairways, rope and stake placement, ball-mark repairs, etc.

The total cost was less than \$100.

Each employee has his individual photos proudly displayed along with his first name on the employee lunchroom wall. **GCI**



Travels With Terry

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.

This year, *Golf Course Industry* is publishing feedback from golfers throughout the United States. We're conducting this research to establish a dialogue between the professional community and golfers. On this page, we'll report trends, likes/dislikes, suggestions and other information we gather through our face-to-face, Web-based and phone research.

Paying for a round of golf

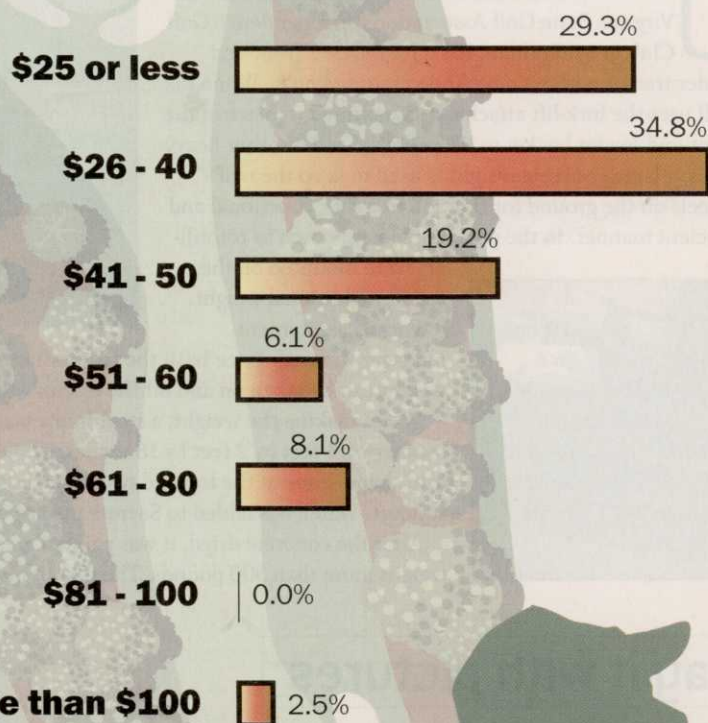
Because of stiff competition and stagnant growth of the number of rounds played nationally, many golf facility operators throughout the country find it difficult to increase or even maintain revenue. Among the many options to boost the bottom line and improve business, green fees is one area of an operation that can move the needle.

Some operators of public facilities have maintained fees, others have lowered them, and still others have increased them as a result of recent course renovations. Which category can your course be grouped?

With so many choices, it's difficult for golf facilities to increase their base of loyal customers. Price is a primary factor for golfers when determining which courses to play. The charts to the left and below offers a glimpse into what Joe Golfer thinks about when paying for a round of golf. Consider this information the next time you're meeting about green fees.

A random sample of golfers throughout the country were surveyed by InsightExpress, a market research company. Golfers surveyed play at least five rounds a year. There were a total of 200 responses, and multiple answers were allowed. Given the sample size and desired confidence levels, the data tolerance is +/- 7 percent.

What do you typically pay for a round of golf (18 holes, cart included)?



What is the maximum amount you are willing to pay for a round of golf (18 holed, cart included)?

Min:	\$10
Max:	\$500
Average:	\$69
Median:	\$50