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OUR WINDOW IS WIDER.[™]



Jeffrey D. Brauer is a licensed golf course architect and president of GolfScapes, a golf course design firm in Arlington, Texas. Brauer, a past president of the American Society of Golf Course Architects, can be reached at jeff@jeffreymbrauer.com.

NONINVASIVE PROCEDURES

If you're a regular reader of this column, you know I favor a comprehensive master planning approach to renovation. However, the reality for 2009 is that most renovations will focus on fixing specific problems rather than improving design. The renovation projects I see now are irrigation replacement, bunker sand replacement and greens regrassing. In a cost-sensitive environment, you can minimize your renovation cost through targeted design and minimally invasive course construction techniques.

If you want to make true design changes, it's important to work well beyond the remodeled green or bunker to tie in changes to the surrounding ground and make it look right. But as a work area increases, the cost of resodding it increases substantially, more so than simply replacing bunker sand and/or adding liners, and often becomes cost prohibitive.

If cost is a hindrance, changes should focus on necessary design improvements, such as routing overland drainage around bunkers, moving bunkers closer to the green, or downsizing bunkers to reduce future maintenance costs. Changes should be targeted to areas that allow working from inside the bunker as much as possible.

Aside from design, it's important to retain a contractor who has experience in targeted renovations because it's difficult to budget for cleaning up after a messy contractor. I spoke with some of the best contractors I've used on smaller renovations to learn about their secrets about working clean. They said it's a matter of having an attitude of "leaving it better than we found it" and a methodology that emphasizes small machines, hand work and minimizing damage.

"Our philosophy is to leave it the way we found it, which is a lot more expensive," says Max Beins, president of Wildcat Golf in Wichita, Kan. "It's difficult to compare bids when one company bids to restore the damage and others have no intention of

cleaning up."

To minimize the need for cleanup, Wildcat often uses conveyor belts to fill bunkers with sand from the cart path to avoid driving on turf.

Beins says the company has lost many bids for renovation work during the first phase of a project but is often brought in for the second renovation phase because of its reputation for working clean, even at higher cost.

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Minneapolis-based Park Construction's philosophy centers on not opening up too many areas before others are complete to minimize a mess, says Don Slegers, golf division manager. It also chooses its equipment carefully, buying Ford trucks instead of other brands because they're substantially lighter and using equipment with nonaggressive rubber treads. When hauling material, crews are instructed never to load to maximum capacity. Slegers also stresses communication between the contractor and club members is always paramount.

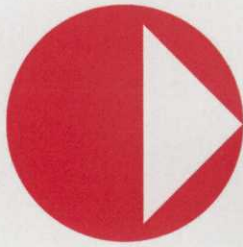
Don Henderson, president of Land Constructors in Southlake, Texas, seconds the notion that besides attitude, equipment choice is a key to working clean. During bunker renovation, he avoids using any type of bulldozer. Instead, he uses lightweight Cat 310.5 minihoes, which have rubber cleat tracks that can move along cart paths without damaging them. He changes buckets for different tasks within the bunker to minimize damage, and like the others, relies on a qualified hoe operator and a lot of hand labor inside the bunker. He adds sand to bunkers using a Tycrop dump trailer towed by turf utility vehicles rather than tractors that can go anywhere with minimal damage.

Jeff Cordes, regional manager for Lincoln, Neb.-based Landscapes Unlimited jokes, "We keep the plywood industry in business by covering all haul routes." The company also uses plastic covers on exposed areas during rain events and uses central stockpiles, planning optimal haul roads, hauling material in small amounts, working its way out of corners and cleaning up as they go.

So, what does all this mean for your targeted renovation? Even more so than for bigger projects, you should consider:

- Choosing contractors based on references for similar projects.
- Accepting a higher bid because a low bid may cost you more in the long run to clean up behind the contractor.
- Clearly specifying the methodology, equipment, haul routes and cleanup in the construction agreement because each is integral to your project's success.
- Asking for the company's most experienced small-projects operators.

Even for small "surgical" procedures, it makes sense to do all you can to improve the course. Thus, while many clubs feel using a golf course architect for smaller projects isn't cost effective, using one that's sensitive to construction realities can help you develop the best possible program to balance cost and constructive design changes that make sense within your budget. **GCI**



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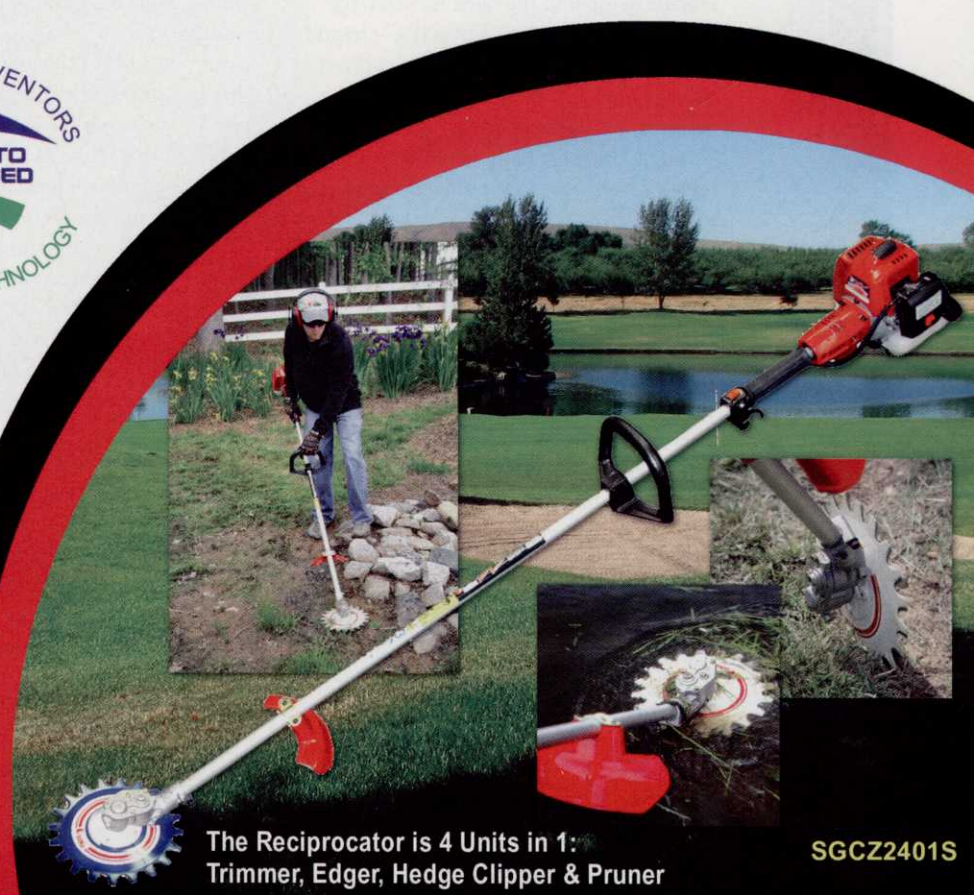
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Erik Christiansen is a licensed irrigator and president of EC Design Group, an irrigation consulting and water management firm based in West Des Moines, Iowa. A board member for the American Society of Irrigation Consultants, Christiansen can be contacted at erik@ecdesigngroup.com.

ROOM FOR IMPROVEMENT

Our industry has made great gains in irrigation system efficiency and application methods, most notably because of the need to conserve one of our most precious resources ... water.

Superintendents always have been stewards of conscientious irrigation applications. Golf course irrigation systems have a direct impact on turf playability; therefore, no superintendent benefits by poorly watering a property. That said, there's always room for improvement. And, as water becomes more scarce and expensive and lessens in quality, the need for effective delivery becomes more attractive – to golf course managers and all parties involved, from pump manufacturers to sprinkler technicians.

Irrigation consultants tend to spend most of their time evaluating the muscle of every irrigation system – the sprinklers. Proper head spacing, application and nozzle selection can supply any golf course

with years of efficient and effective water delivery. Without proper sprinkler selection and installation, system management limitations will plague a course forever with compromised turf conditions that are costly to care for. Moreover, a facility will incur unnecessary expenses in the short-term and higher operating costs, in utilities and water, in the long-term.

It's critical we communicate to those writing the checks that monies spent upfront will deliver significant dividends, such as decreased costs and increased course playability and improved turf health, throughout time. It takes powerful communication skills to persuade ownership (public and private) a poorly designed system, although costing fewer dollars upfront, isn't in the best interest of the course's long-term health and viability.

Again, our focus is on the element that performs the work – the sprinklers. Their spacing needs and application performance need to be presented in a fashion that educates decision-makers. Such information may be boring to a layman, but it's crucial for a 25- or 30-year investment on a renovated or new irrigation system.

The golf industry in the U.S. consumes an estimated 476 billion gallons, or 1.5 million acre feet, of water annually. Each golf course will use an average of 28.5 million gallons, or 88.2 acre feet, in a given year. It's a matter of time before every course will be "encouraged" to use water more efficiently, while finding new ways to conserve.

Irrigation product manufacturers are committed to providing more efficient sprinklers, helping golf courses reduce their dependency on water without sacrificing course conditions. More effective water use results in improved turf quality. This is a win-win situation: The clubs enjoy much higher-quality playing conditions, while reducing water and power use, as well as potential chemical applications.

There are various methods used to measure irrigation design quality and sprinkler efficiency – the most common being a percentage of distribution uniformity, which measures how evenly a sprinkler distributes water over a given area.

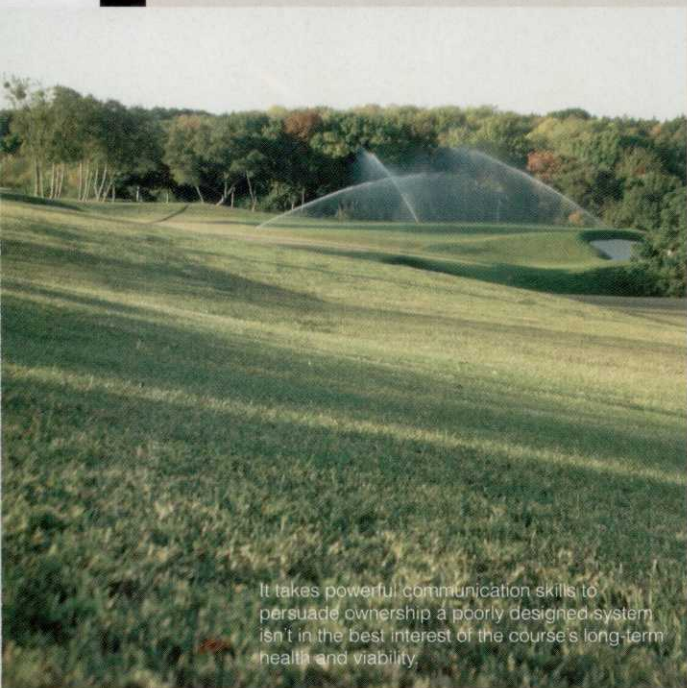
To calculate distribution uniformity, a series of collection cups is spaced evenly around the sprinkler head, typically in a triangular or rectangular pattern. After watering for a set time, the amount of water in each cup is measured. The average volume of water caught in the cups in the least watered area, usually the lower quantities, is divided by the average volume of all cups.

Another common measurement of sprinkler efficiency is the scheduling coefficient. The scheduling coefficient is a runtime multiplier calculated by dividing the average water application rate by the application rate in the critical dry areas (the driest usually being 5 percent). Ideally, the calculated scheduling coefficient value will fall below 1.5, with 1.1 being considered excellent efficiency. A perfectly even application of water, though virtually impossible, would result in a scheduling coefficient value of 1.0.

The take-away in both of these examples is that a higher distribution uniformity and/or a lower scheduling coefficient shows the greatest amount of efficiency and, therefore, uses less water and resources. Furthermore, we have technologies that project irrigation efficiencies when sprinklers are moved or changed out altogether.

With all of the facts in hand, most facilities could realize a 20- to 30-percent increase in irrigation system efficiency. By simply paying attention to design and product-application details, improved efficiency will conserve water and utilities while providing better playing conditions for golfers.

It's essential owners and regulators have a basic understanding of the above concepts to grasp why and how they need to make fundamental improvements to their facilities' irrigation systems. **GCI**



It takes powerful communication skills to persuade ownership a poorly designed system isn't in the best interest of the course's long-term health and viability.

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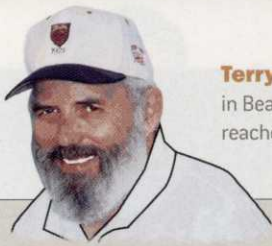
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Terry Bonar, CGCS, is the golf course superintendent at Canterbury Golf Club in Beachwood, Ohio. Bonar, who won the 2009 USGA Green Section Award, can be reached at tbonar@aol.com or 216-561-0909.

ASSISTANTS' KEYS TO SUCCESS

The following suggestions are geared to help assistant golf course superintendents succeed in the world of golf course management:

1 Learn as much as you can about the operation and repair of the irrigation system. It's important to learn when and how much to water. Many times, good water management is the most important factor of having a successful season.

2 The assistant's No. 1 job is operational efficiency. It often can be the difference between mediocre, good or excellent conditions. Have people work smarter, not necessarily harder. Get jobs going in a progression that avoids having people standing around waiting for someone else to finish an operation before they can start. When people are standing around, red flags should sprout over your entire body.

3 Keep a list of jobs that need to be done. List priority jobs based on time (half-hour jobs, one-hour jobs, plus longer jobs) and projects you think need to be done as time allows. Always carry pencil and paper or a tape recorder and make note of jobs that need to be done as you travel the course. Always be aware of what's going on around you, both right and wrong.

4 Take a course in small-engine repair (through adult education or some other source). Know how engines operate. Take care of small repairs in the field yourself rather than calling the mechanic to come all the way out on the course to fix it. Remember, it's all about efficiency.

5 Learn how to adjust mowers and grind reels. This is important. If you apply for an assistant's job and have that knowledge, you have an advantage over someone who doesn't. If you're an assistant and someone else is responsible for mowers, make sure you learn.

6 Offer ideas and suggestions. Don't be offended if the superintendent decides not to do it your way. It's your job to offer ideas and suggestions, but it's the superintendent's job to figure out the best way to get it done. Don't ever take it personally if it's not done your way and never let it deter you from offering other ideas and suggestions.

7 Play golf even if you're not good at it right now. Playing golf is important to your ability to see problems on the course and relate to golfers.

Never demean a simple job. On the contrary, talk about the importance of less-skilled jobs such as weed-eating, trimming, bunker-raking, divot repair, etc.

8 Take pictures. Before-and-after photos of projects are great resources.

9 Go to work early, and be prepared to stay late.

10 When you tell employees what to do, make sure you get your message across. You should explain the job to them and then ask if they understand and if they have any questions. After they go out on the job, you should check to see if they're doing what you want. You should make sure they actually see you so, if they have any questions, they can ask.

11 If someone isn't doing what you told him to do, don't immediately criticize him. First, look at yourself. Did you explain the job correctly? Did you enunciate clearly? Were there any interruptions when you were talking? The vast majority of people want to do the right thing. I can't ever remember someone coming to work thinking, "I'm really going to mess this job up!" Most people want to do the job right. It's up to you to communicate it correctly. This takes practice.

12 Learn how long it takes to do each morning job. An assistant should be able to tell if things aren't going well by noting if someone's out of place at a certain time. If it takes 30 minutes to mow a green and it's been two hours and the person is only half done with his third green, something's wrong. The same is true of fairway mowers, tee mowers, cup changers, bunker rakers, collar mowers, etc. Efficiency should be at a peak in the morning because there are no golfers. Practice checking where people should be at a certain time.

13 Get a pesticide license before you leave school. If you're out of school, get one as soon as possible. It shows you have a commitment to your chosen career field, and it's another advantage over your competition when obtaining a job.

14 Never demean a simple job. On the contrary, talk about the importance of less-skilled jobs such as weed-eating, trimming, bunker-raking, divot repair, etc. Those jobs, done correctly, often are the difference between a good course and an excellent course. Never use a less-skilled job as a form of punishment. This attaches a negative connotation to that particular task.

15 As an assistant, be upbeat, particularly in the morning. Your mood often carries over to the crew. Try to bring a little levity to the operation. Humor is often an excellent way to get a serious point across. **GCI**

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Stephen Tucker is the equipment manager at the Ritz-Carlton Members Golf Club in Bradenton, Fla., and a member of the International Golf Course Equipment Managers Association. He can be reached at 941-309-2913 or stephen.tucker@ritzcarlton.com.

THE TECH'S VIEW OF THE GIS

The GIS experience, as I like to call attending the Golf Industry Show, happens during one of the most exciting times of the year. It's when you have the opportunity to take a look at all the product innovations, meet with industry colleagues, build relationships and expand your knowledge base.

There are always positives and negatives to attending trade shows, but having the opportunity to attend one can be a blessing for an equipment technician. It seems managers don't always have a clear picture of what technicians could gain from attending a national event versus an equipment field day or state trade show. While the GIS isn't designed for technicians, it can be beneficial.

For technicians, the GIS is an opportunity to discuss equipment with individuals on your level who understand what you're talking about. When you ask about the rake angle of a reel, someone there will be able to answer that question. Many times ideas are born on the show floor, whether it's a technician seeing a piece of equipment that could be useful at the facility or identifying

something he could build on his own to save the club money.

The education offered at the GIS is another benefit for equipment technicians. While the content doesn't exactly meet technicians' needs and could certainly be improved, there's always something that pertains to our jobs.

Believe it or not, technicians should have some knowledge of agronomy, environmental awareness, tournament setup, computers and many other offerings that are geared for superintendents. Many times in these classes, you learn what pertains to your position and how your superintendent comes to conclusions when making decisions. The more trained your eyes are on the golf course, the better your operation will run. Think about having another person who can see disease when it pops up or someone else who can see when a hot spot needs water. The benefits of trained technicians are endless.

The GCSAA is dedicated to educating superintendents, which should be its focus; however, there are many superintendents who also serve as technicians, and they

need more technical education so they to can learn the correct ways of maintaining equipment. One of the most worthwhile programs the GCSAA provides is one about superintendent/technician relationships. This program should be a prerequisite to certification. The relationship between these two people at a facility is pertinent when managing a successful operation. The GCSAA is expanding its opportunities in this arena, and I hope to see more of them in the future.

The International Golf Course Equipment Management Association continues to support technicians in this educational effort along with sponsoring equipment manufacturers. During the past two years, manufacturers have managed to send six technicians to the GIS, which has allowed those individuals to write about their experiences. Every one of the technicians stated how overwhelming the conference was and what a huge benefit it was to finally see it firsthand. Many of them didn't realize all the different equipment options that were available, and each of them took back something that benefited his facility. The manufacturers realize the important role equipment technicians play, and sponsoring them to attend the conference is just one of the many ways they recognize that.

Finally, consider how sending a technician to the GIS can build the superintendent/technician relationship, benefit your facility and motivate your technician. While travel expenses aren't becoming any cheaper and budgets continue to decline, sending a technician to the GIS may be unrealistic. But if you get a quote on a new fairway mower or greens triplex, you'll notice those prices aren't declining either. Because of the size of the investment, making the right decisions about purchasing and maintaining equipment is more important than ever.

So, the next time your equipment package is up for renewal, think about sending your equipment technician to the GIS to find what you need equipmentwise for your operation. I assure you, it won't be disappointing. **GCI**



The GIS is an opportunity for technicians to discuss equipment with individuals on their level.

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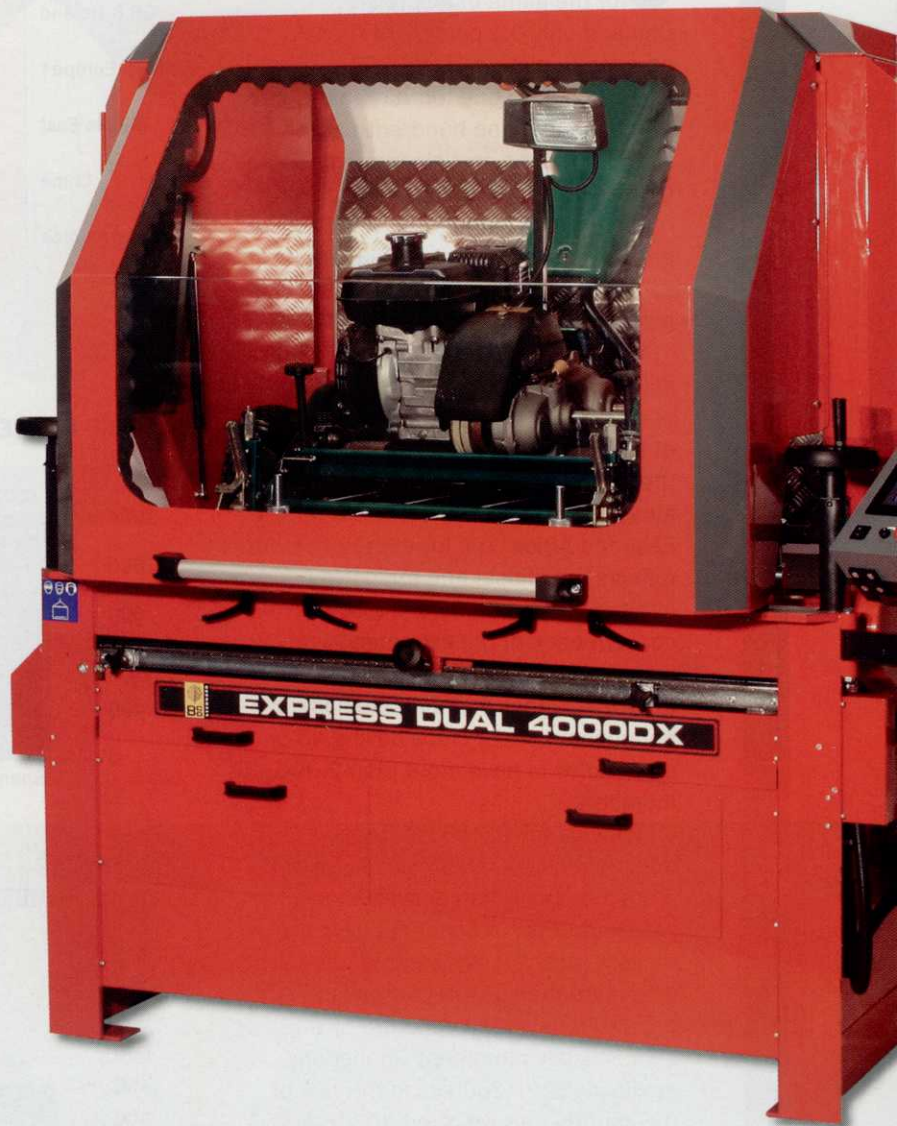
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A VIEW OF CHINA

Clearly, there's a lot of potential for the game of golf to grow in China. If only 0.1 percent of China's population plays golf by 2030 – which is equivalent to one-tenth of the European and one hundredth of the North American participation rates – China would have 1.3 million golfers.

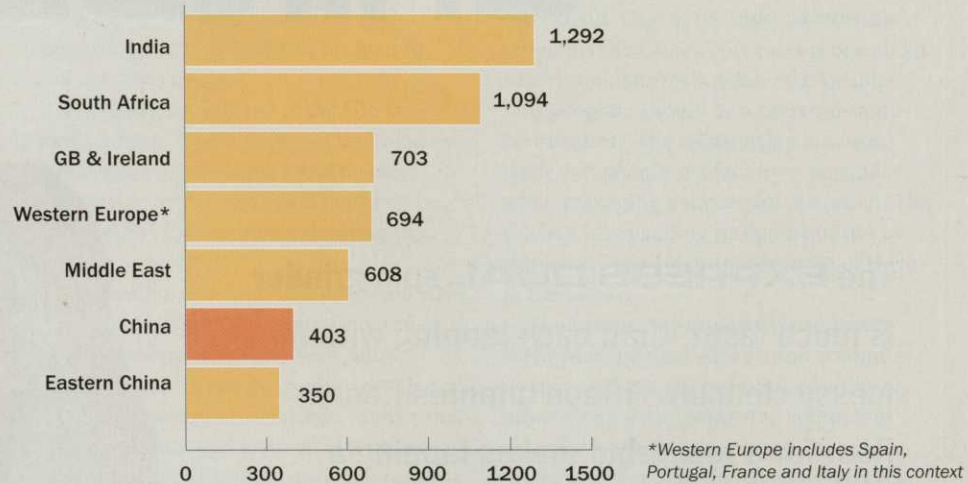
The existing demographic of Chinese golfers is male-dominated – men comprise 87 percent of golf club members.

Average membership at a Chinese golf course is 570, considering courses of all sizes, and about 400 in the case of 18-hole golf courses, which is below the average membership size of most surveyed regions of Europe, the Middle East and Africa. The lower membership reflects the elitists and exclusive image of golf in China and also is a consequence of the extremely high membership fees. Larger facilities tend to have a higher membership base. It's not uncommon for clubs having 45 or more holes to have more than 2,000 members.

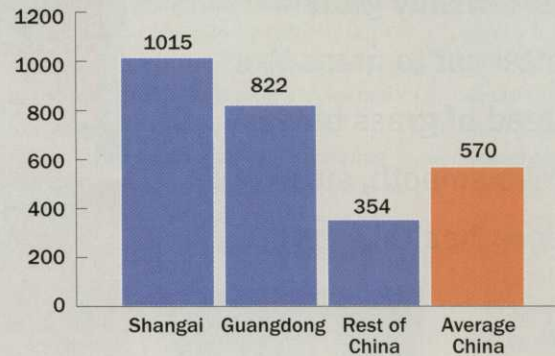
Golf courses in economically dominant cities and provinces attract more members than less developed areas. Courses in Shanghai have the highest average membership base with more than 1,000 members per courses on average, followed by the economically prominent Guangdong province (822). Courses in the rest of the country only reported 300 to 400 members on average.

Source: Golf Benchmark Survey 2008

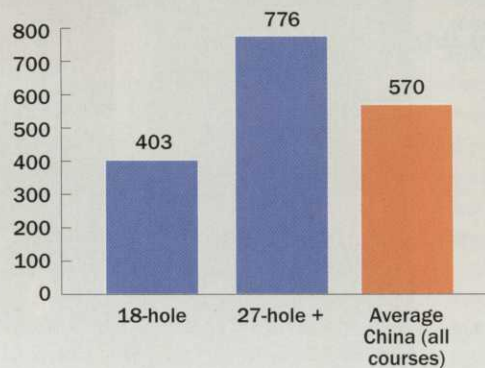
AVERAGE NUMBER OF CLUB MEMBERS AT 18-HOLE COURSES IN CHINA VS. SELECTED REGIONS



AVERAGE NUMBER OF CLUB MEMBERS IN CHINA BY REGION (ALL COURSES)



AVERAGE NUMBER OF CLUB MEMBERS IN CHINA BY SIZE OF GOLF COURSE



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