

# Architectural cooperation yields advances in irrigation technology

By J. MICHAEL POELLOT

Management and distribution of water is one of the more challenging issues of our time. And, since working with large parcels of land is at the core of golf course design and maintenance, the golf industry is inextricably connected to it.

Golf course designers are continually faced with two questions. First, what to do when there's too much water. Secondly, what to do when there's not enough. The decisions we make regarding irrigation, drainage and collection of water have a powerful impact on the environment and the allocation of one of our greatest natural resources.

The government is exerting increasing control over the golf industry. More than ever, we're being held legally and ethically responsible for the results of our design and construction choices. I see this as a positive step toward redirecting the overall efforts of the golf course industry in a more environmentally conscious direction.

Over the last 20 years a schism developed within the ranks of golf course architecture. On one side, there was the designer-label breed of golf course designers. They were often more concerned with outdoing each other and building signature courses that attested to their unique styles than they were with protecting the environment.

On the other side, there were the golf course architects with landscape architecture degrees. Schooled in the principles of harmonizing with the environment, they sought to allow the site to dictate the course design and to protect the land as much as possible.

Pressing environmental issues have brought these two factions together. The efforts that the golf industry as a whole has made to deal with the complexities of water-related issues have resulted in many positive technological strides. These advances are likely to enhance our ability to protect and even improve our water supply.

Examples of progress include:

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## Hurdzan on TRACS

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suppliers." This seems to me to border on restraint of trade for firms not on the USGA list.

Clearly this issue of the TRACS program has incensed me to my professional core. I believe that this goes beyond USGA's charter, expertise, and common sense. Just when it appears the USGA is going to shed its legacy of agitation over the USGA green specs, it proposes a consultant program that is irritating to practicing professionals. It seems to me the USGA is either trying to fix something that 'ain't broke,' or is trying to justify its existence. But, whatever the motivation, the results will be disastrous and long term.

I hope the USGA convenes a steering committee on this subject and it invites some outside opinions. I have already briefly given mine here, but would be glad to elaborate if asked.

Dr. Michael Hurdzan  
Hurdzan Design Group

•Taking a team approach: In order to insure that the integrity of the land and its water supply is protected, today's golf course architects and builders are using the expertise of specialists from a variety of fields.

Complex technological issues require input from civil, soil and hydrological engineers as well as specialists in agronomy, turfgrass management, land planning and irrigation. Their skills are combined to create golf courses which are not only beautiful, but environmentally sound.

•Pesticide/fertilizer safety: Ground



J. Michael Poellot

water accounts for 50 percent of our drinking supply. So, naturally we're all concerned about maintaining its purity. Over the last several years there's been a great deal of negative publicity about the dangers that pesticides and fertilizer runoff from golf courses pose to the potable water supply.

In reality, there's little scientific evidence to support these assertions. Certainly there have been isolated incidents where a superintendent has made a mistake in administering

pesticides, and wildlife has suffered. Overall, however, this has been the exception, not the rule.

Relative to the amount of acreage involved, the quantity of fertilizer used to maintain a golf course isn't that great. Of 150 acres, six to seven acres are greens and tees, requiring the largest amounts of pesticides and fertilizer. Beyond that, about 90 acres are fairways, requiring some fertilization. The balance of the land needs very little pesticide or fertilizer.

If you compare the amount of fertilizer used on golf courses to that used on

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# Advances in irrigation technology

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farmland, the quantity used on golf courses seems minimal.

We now have the technology and know-how to cut down considerably on pesticide usage. New products aimed at minimizing the need for pesticides and fertilizers are constantly being developed. And, in recent years, we've found out that turfgrass actually serves as a filter for fertilizer runoff.

As an industry we're continually seeking better ways to monitor and reduce, or eliminate pesticide and fertilizer runoff on golf courses. Over the next few years we can look forward to a dramatic reduction in pesticide use on golf courses.

•Using nature to conserve water: At the front end of each project, before construction begins, architects should conduct research to select the materials (such as sand, gravel, soil conditioners and turfgrasses) that will be best suited for a particular course. They should advise their clients as to which materials and systems will require the least amount of pesticides, fertilizers and waters.

By using native grasses which are

suitable to the environment we can cut down on the amount of water needed for irrigation. Native grasses grow easily and require less water and chemicals than more foreign strains. In dry climates, for example, drought-resistant grasses work best. They're used "as is" in the out-of-play areas.

Researchers are in the early stages of introducing modified versions of these same native grasses into the in-play areas. Both in-and out-of-play area grasses are being developed to become more drought-and disease-resistant. Soil structures and irrigation systems can also be designed to store the water and allow it to be used more efficiently by the grasses.

•Using technology to conserve water: Golf courses can be designed so that the sub-surface drainage systems collect and recycle the unused water. At Gainey Ranch, in Scottsdale, Ariz., we designed a closed system, where drainage ponds collect unused water for later reuse. A drainway runs through the entire course. Every morning and evening when the course is watered all of the runoff from the greens and the

fairways flows into the drainage channel. It's collected at the lower end of the course where recirculating pumps send it back up to the major irrigation lines to be used again.

It's also now possible for us to collect rainwater more effectively. By retaining the water that falls on golf courses we can control run-off and keep it out of the public reservoirs.

•Recycling effluent: Treating wastewater enables us to put a minimal drain on municipalities' water supplies. At the Gainey Ranch we built a sewage, or grey water treatment plant, at the golf course site. It accepts effluent which is delivered from the city's sewage lines.

The treated wastewater is used to irrigate the golf course. It's a win/win situation because the city can dispose of much of its effluent at no cost. And the golf course saves between \$150,000 and \$200,000 a year by recycling the effluent water instead of having to buy potable water.

This process is being used at sites throughout the country, not only to irrigate courses, but also to water the landscape in the common areas of golf resort developments. This includes roadways, walkways, parks and public areas.

•Protecting the wetlands: Because many golf course sites have wetlands located on them, we must take responsibility for making sure that these pristine areas are preserved. When architects take care to design courses to circumvent wetlands areas, the projects are likely to have a smoother approval process.

•Educating the golfing public: One of the biggest long-range solutions to the water challenge is a re-education of the American golfer. The task of protecting the environment lies not only with the industry, but also with golfers. It's critical that they develop a clear understanding of what environmentally sensitive golf course design entails. With this knowledge they can take a supportive role in ensuring that our beautiful

land is enhanced, rather than destroyed by the game.

Televised golf, played on green, perfectly immaculate carpets, fostered a preference for playing on vast, manicured courses. However, creating such vast green lawns requires a great deal of watering, even overwatering, and that's not environmentally sound behavior.

Overwatering the greens creates less healthy grasses. The more you water, the shallower the root system becomes. Over the long term, less watering creates a healthier grass. It may not look as perfect on a day-to-day basis, but holding back on water deepens and strengthens the root system, causing the grass to reach further down for water. And this greater root-depth conserves water and makes the grass more drought-tolerant.

The focus on bright green, overwatered golf courses also runs contrary to the classic golf tradition. At the great courses, such as St. Andrews in Scotland, the emphasis wasn't on color, but rather on texture and the quality of the shotmaking.

Golf was originally played on native linksland grasses brown with bumps, hollows, bumps and sand dunes. I'm not promoting a return to unkempt courses. However, it was every bit as much fun as it is today. This more natural environment for golf courses also requires a lot less water, pesticide and fertilizer application.

Educating the general public: One of the reasons golf has taken such a bad rap over the last several years has been our lack of commitment to communicating our successes to the public. In order to ensure our survival, the golf industry must become more proactive in letting the public know about our dedication to environmental safety. By stepping up our public relations efforts, while continuing to take steps to protect the environments we work in, we'll be ensuring the future of this great game.

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