

Sure Thing #2:

CHILDREN WALK THROUGH PUDDLES.

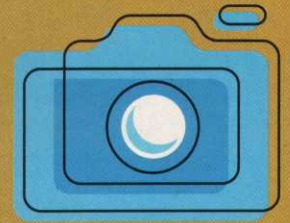


Picture This

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Disposable Images

By Geoff Shackelford



The following four images demonstrate the range of photographic possibilities, from a single-use camera to high-end digital. A quick glance makes it hard to detect significant differences. On closer inspection, our informal test of disposable cameras shows that you do get a better image from a name-brand model by Fuji or Kodak.

Image A – Kodak's black-and-white, single-use camera. Retailing for \$11.99 but generally sold for around \$7-8, the Kodak throw-away is the best-kept secret in photography. It takes crisp images and gracefully handles tricky lighting situations. Best of all, the Kodak black-and-white film uses color processing, so there is no extra charge to have rolls developed. Just hand over the camera when you're done. The Kodak is great for capturing timeless images of the family, too.

Image B – Staples 800-speed indoor/outdoor ready-to-use camera. Retailing for \$3.99, the Staples camera did a decent job, but a close inspection reveals not-so-crisp edges and an odd blurring effect on the outer portions of the image (note the oak tree and compare it to Image C).

Image C – Fujifilm's QuickSnap indoor/outdoor camera. Retailing for \$8.99 but often discounted aggressively, the Fuji takes an incredibly good photo using all-purpose 800-speed film. Note the all-around sharpness and vivid color. The images appear just as great on CD when using the higher-end disposable from Fuji.

Image D – Canon Rebel 6.1 mega-pixel digital image using a polarizing filter. Retailing for about \$1,600 with a high-end Canon lens, the same view as seen through a high-end digital camera obviously shows more clarity and crispness, particularly as the image is blown up. The filter helps capture the bunker depth and adds overall warmth to the light-colored sand. That's all great if you're shooting for a glossy magazine, but you can't beat a single-use camera for the purpose of a PowerPoint demonstration, emailing or documentation.

Thanks to Woodland Hills Country Club superintendent Steve Sinclair for allowing Golfdom to photograph the club's par-4 eighth hole.

Contributing editor Geoff Shackelford can be reached at geoffshac@aol.com.

Image A



Image B



Image C



Image D



Sure Thing #3:

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Going High-Tech on Tees and Greens

By blending high-tech capability and detailed low-tech artistry, designers and owners can deliver more interesting courses

By Jerry Pate

Over the past 20 years, technology has revolutionized golf. Equipment companies may be receiving the lion's share of the attention, but new technology has also transformed golf course construction, particularly in the renovation of tees and greens. New technologies can reduce project delivery time, provide long-term economic benefits, and improve a course's environmental stewardship.

New technologies affect all phases of renovation projects, from substrata development to irrigation to turfgrass. In today's competitive golf business, designers, contractors, superintendents and owners must be aware of these constantly improving technologies.

Assessing your needs

There is no one-size-fits-all method to golf course renovation. Every property and project is unique.

Therefore, you must ask the question: What is driving the project? Often, chronic agronomic problems develop over time. Drainage systems become less efficient, causing the saturation of tees and greens. Maturing trees block sunlight from certain parts of the course. Maintenance programs and costs change over the years. Environmental concerns or requirements arise. And, of course, playability and strategic values evolve.

Only after assessing the needs and goals of

the project can you begin to explore how new technologies might provide benefits during the renovation.

New in drainage

Green construction developments include the acceptance of new flat pipe drainage systems. Noted architect and author Michael Hurdzan has long advocated flat pipe drainage, and the USGA recently incorporated the option of flat pipe drainage into its *Green Section Recommendations For A Method of Putting Green Construction*.

For green construction, this system can provide savings up to 50 cents per square foot over traditional drainage implementations. Flat pipe drains have also proven successful in helping to remove water from problem areas, especially fairways dampened by subsurface springs or ground water.

Stronger than dirt?

Water conservation is imperative and must be a goal that design and construction teams pursue. Some companies now offer mixes of sand and ceramics instead of traditional sand/peat greens mix. The goal of sand/ceramic mixes is to retain moisture more effectively than traditional peat mixes. Ceramics may help conserve water in arid climates and enhance turf growth.

Despite all the innovation coming from

top materials laboratories, some advances are as simple as finding a new way of looking at old things. Studies testing crushed rubber in the intermediate layers of greens and tee boxes have shown enhanced nutrient retainage and reduced leachate runoff. As owners, communities and regulatory agencies place a larger emphasis on environmental sensitivity, crushed rubber may serve as a poster child for recycling and creative application of materials.

Finally, advancements in soil-amendment technology have made it possible to tailor the soil conditions of specific microclimates on a golf course to the agronomic requirements of the selected turfgrass. Adding specific nutrients to provide a healthier growing environment for the turf can reduce maintenance costs and improve environmental conditions by decreasing the number of fertilizer and pesticide applications on the course.

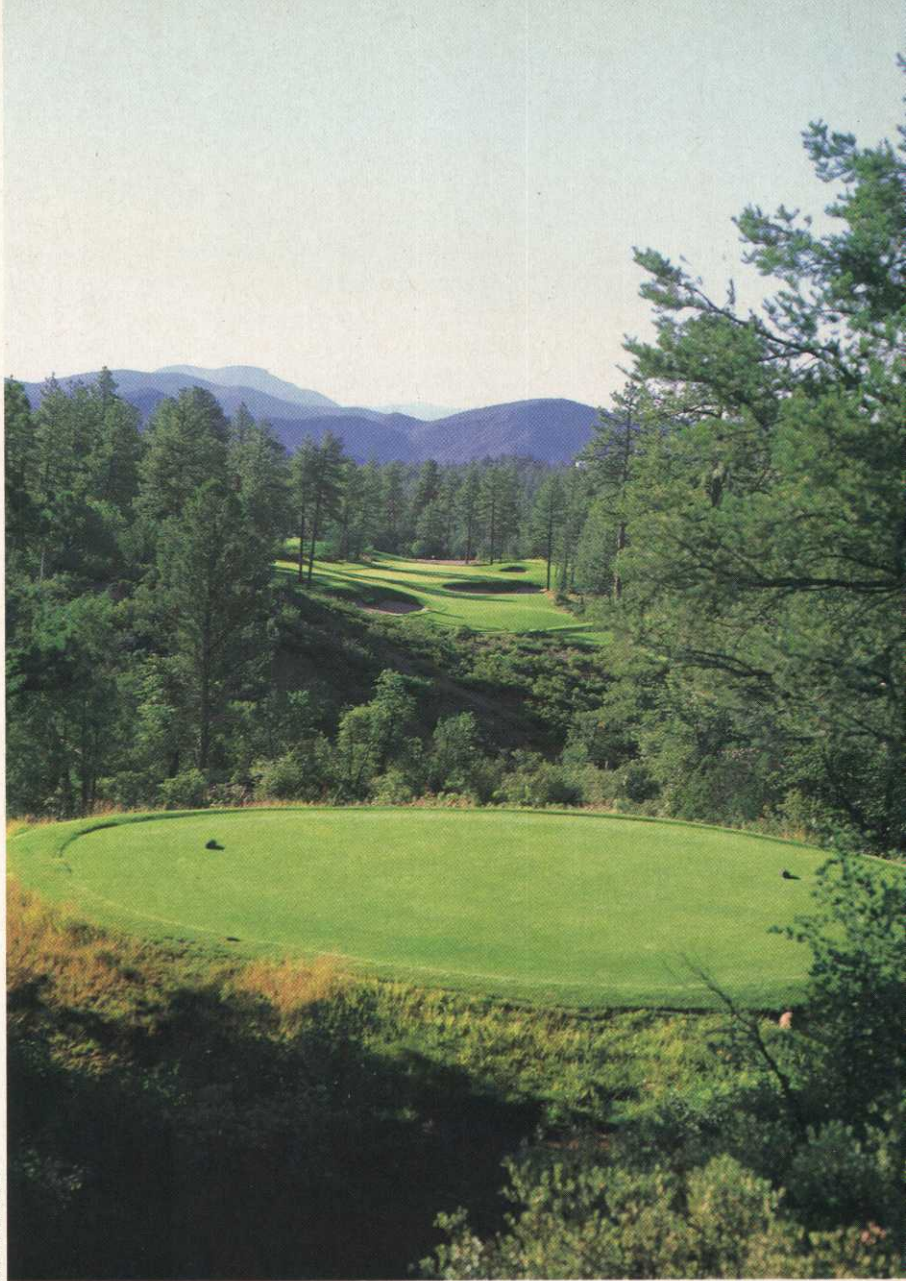
On the level

Remember when lasers were the stuff of science fiction? Today they are part of everyday life in golf course renovation. In restoration projects, where the goal of the project is to modernize green subsurface profiles for easier and more economical maintenance while maintaining the contours of the existing design, lasers allow us to easily record the pre-existing contours and rebuild the greens to their precise elevations. We also use laser levels to insure that pinnable slopes on greens do not exceed 2 percent. At today's green speeds, we believe anything more than that can be too fast and, ultimately, detract from playability.

Right as rain

If there is one aspect of design that has gained the most from technology, it's irrigation. We've come a long way from the center-pipe systems that courses employed for years, and irrigation improvements should be considered for every renovation project.

Modern irrigation systems provide precise coverage, allowing tight control over water dispersal. Technicians can tune each head to deliver only the water needed for its coverage area, resulting in water conservation. Greenside rough can get more water while swales and chipping areas get less. The



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financial and environmental benefits of improved irrigation systems can go a long way toward paying off the cost of the renovation project itself.

Turfgrass trends

University-level turf management programs are pushing the envelope in turfgrass sciences. New varieties of turfgrasses can reduce maintenance costs greatly.

Seeded bermudagrass may provide an efficiently manageable playing surface in the transitional climate zones where traditional bentgrasses and bermudagrasses struggle. Roundup Ready bentgrass, with its immunity to certain herbicides, may allow for the effective control of *Poa annua* invasions. And paspalums can tolerate high levels of salt in irrigation water, allowing for greater use of brackish, effluent

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New technology, such as lasers and modern irrigation, has transformed golf course construction, particularly in the renovation of tees.

Today, thanks to improved construction processes, we can often keep much of the golf course open during renovation.

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or even seawater. The costs for supplying cleaner irrigation waters, such as usage fees or drilling deep wells, can be reduced greatly.

Construction processes

Nobody likes to see huge dump trucks rumbling up the fairways and around the green sites of their golf courses. Even a targeted renovation project is going to require some serious construction work on the golf course. To undertake a project that addresses all the tee boxes and greens formerly required closing the entire course for a season or more.

Today, thanks to improved construction processes, we can often keep much of the golf course open during renovation. Rather than using heavy, two-axle trucks to haul materials, we can use light trailers and conveyors to load mix into greens and tees, reducing damage to the golf course and the inconvenience of the project to members and golfers on other parts of the course.

When properly applied, technology saves time, money and helps produce long-term re-

sults that may have previously been unobtainable. But technology alone will not create a successful renovation. A skilled designer must combine new systems, materials and methods with a keen eye for aesthetics and playability.

Perhaps the best benefit that technology offers during golf course renovation projects is the ability to save money and free up resources to do the detail work around tees and green sites. And no matter how advanced we may become, the best detail work is done by hand with rakes and shovels. Those are the touches that make a golf course memorable and special.


By blending high-tech capability and detailed low-tech artistry, designers and owners can deliver fun and interesting courses that will make money and keep golfers coming back for years. ■

Author Jerry Pate, a PGA professional, has several victories, including the 1976 U.S. Open. Pate has also been active in golf course design for more than 20 years and is president of Jerry Pate Design. In addition, he owns a wholesale distributorship that services seven Southeastern states.



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Certain modern course designers have grown tired of the praise heaped on the famous old architects. Surely, some of the old architect worship is overblown. Aficionados come up with intense theoretical explanations for bunker placement or green complex features that just as easily could have happened by accident.

But it's no accident that most undisturbed 1920s courses drain more efficiently and artfully than a majority of modern designs. How so?

The old guys and their construction teams weren't in such a hurry. They were on site and took the time to contemplate subtle ways to move water off the player surface. Drainage was vital to firm- and fast-playing conditions and better turf.

However, their equipment was rudimentary. They had to be judicious in their use of earth moving. They took the time to consider the effects of changing the land and took note of what happened to their sites after a big rain. Contrary to what skeptical modern architects will tell you, the old guys put drainage at the top of their list of concerns.

But it was kind of tricky to dig a sump with a horse-drawn scraper. That's why they turned to intricate surface drainage.

Engineers had yet to become obsessed with the idea of catching water and sending it underground. Furthermore, environmentalists didn't exist back then to complain about drainage flows into sensitive wetlands.

Surface drainage is barely part of the modern architect's pallet. Fueled by the McArchitecture pace that will forever haunt the 1990s, the task of moving surface water is addressed on blueprints, with adjustments left up to shapers and contractors to sort out. When drainage issues come up during construction and the architect is not around to sign off on a change order, catch basins are created so that everyone can move on to the next task.

It's the safe, expensive and unsightly solution.

Flush outs, sump wells and catch basins were also not part of the old design vocabulary. This is yet another reason why the old courses look just a little easier on the eye. In

In Praise of Surface Drainage

BY GEOFF SHACKELFORD



FLUSH OUTS, SUMP
WELLS AND CATCH
BASINS WERE
NOT PART OF THE
OLD DESIGN
VOCABULARY

old photos you don't see caps surrounded by impeccably circular catch basins dotting the fairway landscape. Golfers never had the privilege of watching their balls do a slow toilet-bowl circle flush down the chipping area basin, where they would be greeted by a sea of divots and a free drop.

With modern environmental restrictions often controlling how golf courses deal with their excess water, catch basins do provide an alternative for layouts that otherwise would not have been built if they were draining runoff into a natural body of water.

But there is no excuse for the excessive overuse of the "capture and send underground" approach today.

Of all the old guys, Billy Bell was the master of surface drainage. Seth Raynor was pretty good, too. Both came from engineering backgrounds, yet neither lost sight of the task at hand: creating attractive, interesting golf holes.

Bell dealt with tricky sites in flood plains or near steep hillsides, yet managed to use the best components of his engineering and green-keeping background to cleverly move water off the primary playing surface. Bell took advantage of this functional dilemma to inject design character via swales, barrancas and clever slopes effecting strategy. Raynor typically dealt with flat meadows but always ensured that his complicated greens drained well.

Remember surface drainage next time you undertake a renovation or simply analyze the components of a design. And when you hear someone going on about those "so-called" master architects, just remember that they dealt with a key functional need much more cleverly than today's architects.

Contributing editor Shackelford can be reached at geoffshackelford@aol.com.

TURFGRASS TRENDS

TURF BREEDING

What Will Future Turfgrasses Bring?

By Doug Brede

Imagine trying to predict what people's likes and dislikes will be in 10 years. By 2014, pundits might forecast that America will have a permanent base on the moon, that people will watch feature-length movies on cell phones, and that computers will be as fast and powerful as the human brain (though they'll still crash when under stress).

Welcome to my world. I'm the turf breeder for a major West Coast seed company. My job is to anticipate what people will want a decade from now. That's how long it takes to develop a new turfgrass variety from the point of conception to full seed production. Varieties I'm designing today won't be in your hands until 2014.

In this article I'm going to give you a taste of what's likely to come your way in turfgrasses over the next decade. As your guide to the future, I'll point the way with a sprinkling of bold prognostications. Then, after each prediction, I'll explain why each is likely to come true. So let's get started — the future's wasting.

Prediction: Creeping bentgrasses will get even denser.

Shoot density is a tally of the minuscule creeping bentgrass plants on 1 square inch of putting surface. Some folks clock shoot density on a "square decimeter" basis (a square decimeter equals 15.5 square inches), but I prefer the more familiar square inch.

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Putting green plugs of (left to right) T-1, Penn A-4, Penncross and Poa annua from test plots mowed at five-thirty-seconds of an inch and fertilized with 3 pounds of nitrogen per 1,000 square feet per year. These varieties show the progress in shoot density and upright growth from older bentgrasses

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