HUSTLER GOLF **BEAUTIFULLY SIMPLE**

PRECISION CUTTING / LOW MAINTENANCE / DURABLE BUILD

HUSTLER 7500/7700
FAIRWAY

HUSTLER

Find your nearest dealer at www.hustlerturf.com

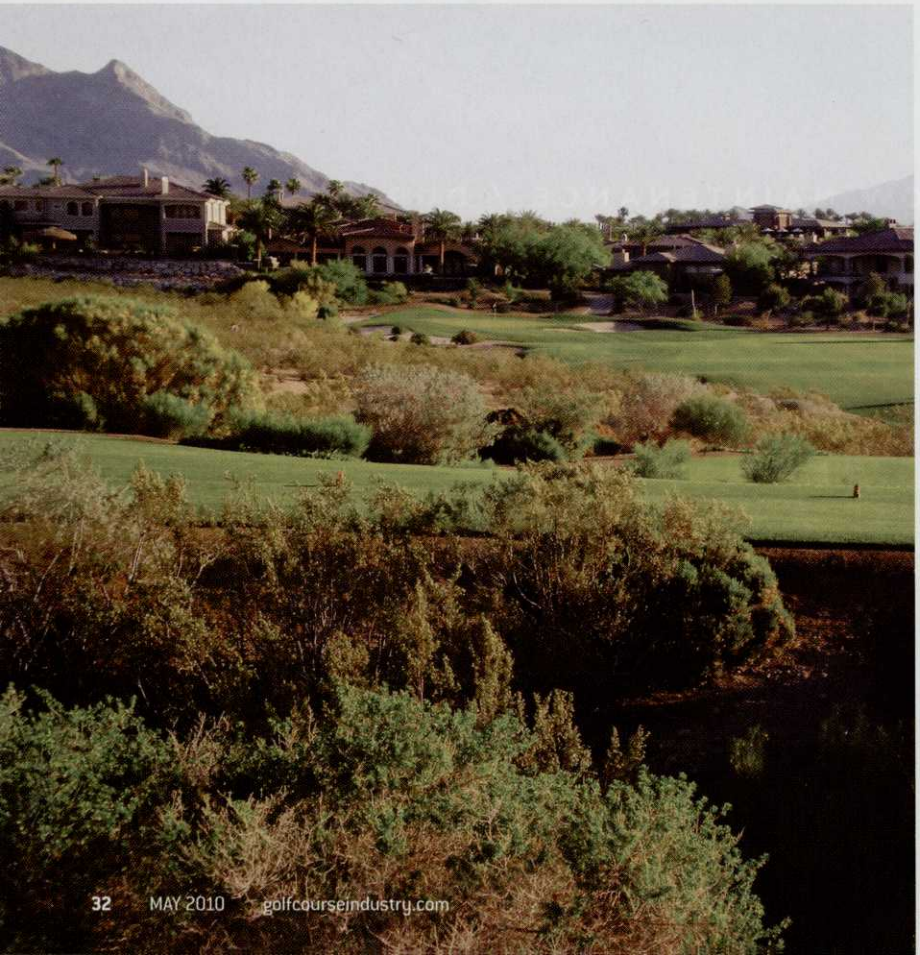
www.golfcourseindustry.com/readerservice - #30

Red Rock Country Club is a good case study of how a variety of methods to manage bicarbonates were combined with great success. The three courses at Red Rock are now irrigated with buffered water and treated biweekly with a direct application of synthetic acid. The courses have reversed their negative trend and are now responding to the management decisions as a typical course would in the Midwest.

By David McPherson

Battling bicarbonates

Superintendents have a number of weapons at their disposal to keep calcium viable in the soil.



Bicarbonate levels are often overlooked in irrigation water analysis. You don't need a Ph.D. in pH levels to manage bicarbonates, but understanding a little about water chemistry helps. The most important thing when dealing with water issues is that the soil takes on the characteristics of the water. So, analyze your water first, then look at your soil.

Bicarbonates are toxic to the roots and reduce the shoot growth of the turf. High bicarbonates can also affect the effectiveness of fungicides and particularly insecticides you spray because the half-life of the product is often reduced by high pH levels. Bicarbonates also reduce the uptake of phosphorous and many other micronutrients

RED ROCK COUNTRY CLUB

The disease control system that puts you in control. The DISARM® Complete Control System gives you all the options you need to solve every disease control problem. DISARM, DISARM C and DISARM M fungicides provide premier strobilurin disease control performance and value throughout the entire season. Each is specifically tailored to climate region, disease history and turfgrass variety. Alone, in chlorothalonil-based or DMI-based premixes, the DISARM Complete Control System allows you to choose your application – giving you complete control. To learn more, contact Arysta LifeScience North America Support Services at 1-866-761-9397 or visit www.totaldiseasecontrol.com.

Always read and follow label directions. *DISARM and the DISARM logo are registered trademarks of Arysta LifeScience North America, LLC. The "Protection From Tee To Cup" and "Double Protection" slogans are a trademark of Arysta LifeScience North America, LLC. Arysta LifeScience and the Arysta LifeScience logo are registered trademarks of Arysta LifeScience Corporation. ©2009 Arysta LifeScience North America, LLC. DMM-001*

Arysta LifeScience

www.golfcourseindustry.com/readerservice - #31

that grasses need. Bicarbonates react with calcium to form calcium carbonate. Every time bicarbonate hits calcium and magnesium it keeps it in a carbonate form. In a carbonate form, it's hard for calcium to work into the soil.

"Calcium is an important building block in the plant just like it is in our body," explains George Frye, president of TransGolf Inc. "When we break a bone in our body, it's slow to repair. If a plant doesn't have the right amount of calcium, every time we mow or damage that plant, it has trouble replenishing that calcium."

Frye was the superintendent at Kiawah Golf and Country Club in South Carolina for 15 years. While there, he dealt with what he considers the "worst water in the world."

"I didn't know anything about water until I started dealing with it," he says. "I had bicarbonates of 1,100 ppm and a Sodium Absorption Ratio of more than 90. Everything got locked up because of the high bicarbonates. It was a long learning process."

Frye subscribes to the philosophy that for every cause there is an effect. Every situation is different and there is no single solution.

"You really need to have your soil and water tested to make an informed decision," he says. "Look at your circumstances and design your program based on what your infrastructure is.

Right: Before using Burst Turf at Tonto Verde Golf Club, Scottsdale, Ariz., the soils were tight and hard to penetrate. Bottom: After starting the program in June 2008, superintendent Robert Davis reported better moisture penetration, allowing him to water deeply and infrequently. Soil sampling and aerification became easier, too. The photo was taken during overseeding, thus the brown turf conditions.

"Look at your circumstances and design your program based on what your infrastructure is. You **can't answer the bicarbonates issue** in one sentence." *—George Frye, TransGolf Inc.*

You can't answer the bicarbonates issue in one sentence. There are so many other variables – if you have tunnel vision, while addressing it, you could cause other problems."

Mike Huck, owner of Irrigation & Turfgrass Services, and a former superintendent, feels greenkeepers sometimes spend too much time worrying about bicarbonates.

"Everyone thinks when they have bicarbonates, you've got to remove them and that's not always necessarily the case," he says. "The question becomes whether your particular problem is significant enough that you want or need to inject your water with an acid or something, or do you want to take a different approach with your fertility programs. It really is a balancing act. Ask first whether the quantity of bicarbonate you are dealing with can be addressed on a small scale with an acidifier fertilizer application."

Red Rock Country Club is a good case study of how a variety of methods to manage bicarbonates were combined with great success. Steve Swanson, the director of grounds and golf course maintenance at this trio of courses in Las Vegas, recalls the day his problems with bicarbonates began. It was at the same time he switched from potable water to effluent. "From the minute the effluent water began to flow, our turf conditions began to slide south," he says.

Swanson's initial solution – using a sulfur burner to acidify the soil – is a method familiar to many superintendents. This particular acidification method worked well on potable water, he says, but it proved inadequate to treat effluent, especially during the summer months when irrigation cycles increased. "We needed a system that could effectively treat our water no matter the time of year or the amount of water being consumed," he says.

By 2008, Swanson's bicarbonate problems reached a boiling point. Turf loss was prolific and rampant and large areas on the three courses were void of grass and crusted over with either a calcium or sodium bicarbonate layer. It took him six months of intense investigation and testing before determining a two-pronged plan. First, he attacked the water at the point of delivery. Second, he addressed the problem in the field with direct applications.

"Our first, and most significant decision, was the installation of a sulfuric acid injection system," Swanson says. "After doing countless titration tests with our Brookside Laboratories consultant, Corey Angelo, we found sulfuric acid was by far the most effective means to attack our alka-

Swanson

TOP: TONTO VERDE GOLF CLUB

LebanonTurf

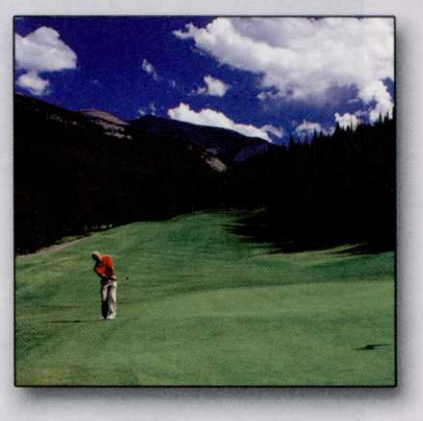
For all your golf course needs

The **ROOTS**® brand of biological solutions merges nature and technology to offer unlimited possibilities in the care and feeding of plants.

Emerald Isle True Foliar® products promote turfgrass physiological fitness through a precise combination of nutrients, seaplant extract, and other growth stimulants which are beneficial to turf.

How can something that works so fast...last so long? **MESA**® provides brilliant green color, quick response and extended feeding, all in a single granule.

EXPO® is a premier slow release N & K source that feeds up to sixteen weeks. EXPO provides beautiful color, disease resistance, and is available in both 145 SGN and 195 SGN.



LebanonTurf

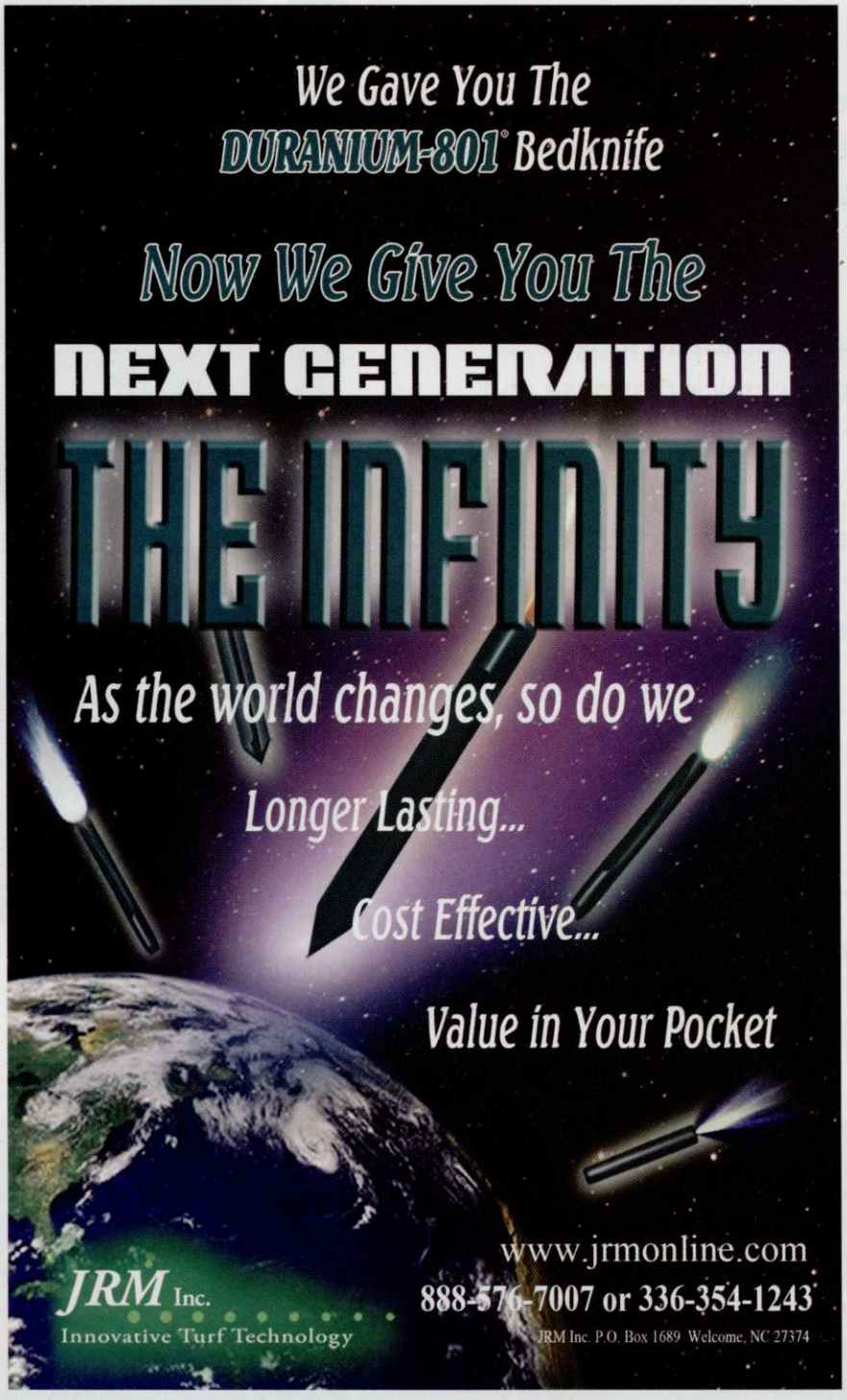
For more information about all our technologies, brands and products, please visit our web site at LebanonTurf.com or call 1-800-233-0628.

roots Emerald Isle Solutions™ MESA expo

linity and bicarbonate problem."

Swanson says this decision did not come easy since sulfuric acid is very corrosive and dangerous. But, after weighing the options, they settled on the Werecon acid injection system for all three courses, which proved to be very safe. "Its effectiveness is astonishing," Swanson says. "The system is essentially a self-monitoring system that adjusts on the fly without human contact. The rate of acid injection is not based on flow, but rather on pH by continuously monitoring pH sensors installed downstream to determine sulfuric acid injection needs.

"This option was very important as our water quality varies hour-to-hour and season-



www.golfcourseindustry.com/readerservice - #33

Troubleshooting bicarbonate levels

There are a number of ways a superintendent can address the bicarbonate levels at their facility. Mike Huck, owner of Irrigation & Turfgrass Services, offers some of the methods to manage bicarbonates.

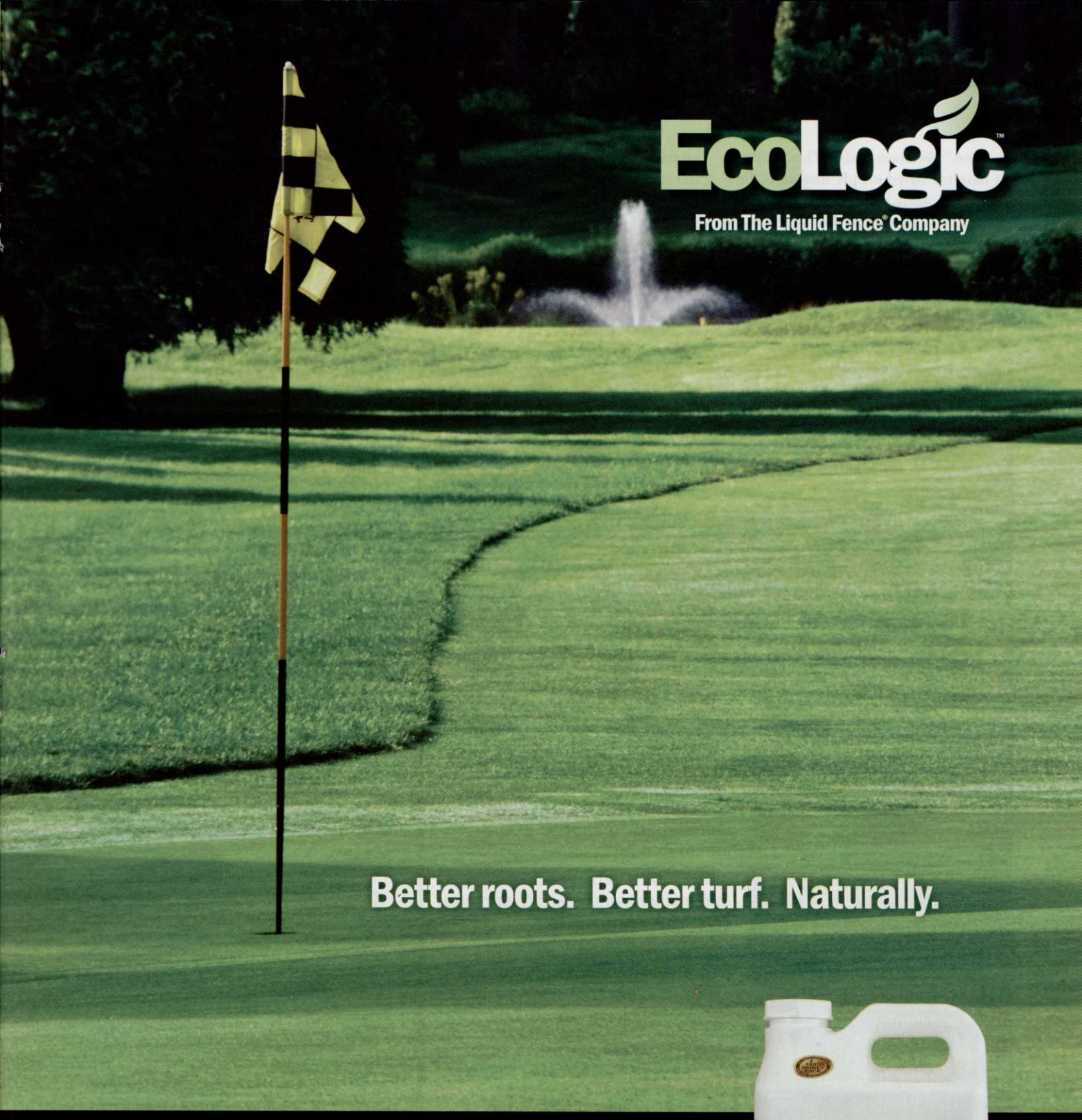
An acid injection of sulphuric acid. You usually have a company that comes in and services it, so the greens crew doesn't touch the product other than adjusting the microprocessor on the injection equipment to fine-tune the pH output.

Urea sulphuric acid. This is sold under the trade name n-PHURIC acid. One example is pHirst from Your Growing Solutions (www.yourgrowingsolutions.com). President Warren Shafer says his company designs and builds the injection systems. "We install and build a storage tank, so whenever the superintendent gets low, we go back out and fill their storage tank; the superintendent doesn't even need to touch the product."

Soil sulphur applications. An old standby, says Huck, but you need to get the right amount down at a safe rate that won't burn the turf. Typically, between 50 and 200 pounds per acre. This needs to be timed properly and put down in the right season. It's typically applied during the fall or spring because it converts into raw sulfuric acid in the soil. As soils warm, it slowly converts. If you put it down in the middle of July and August when soils are warm, it can convert too fast and can cause burning of the turf.

Acidifying fertilizers. "If you only have a small amount accumulating over the year, you can attack them with acidifying fertilizer and convert them to calcium carbonate, sodium carbonate or magnesium carbonate," says Huck.

Synthetic acids. While Huck says these newer products may be the greatest thing since sliced bread, the companies do not label what are in them, so you have no idea what the chemistry is in these products. "Their rates for application on the label make no sense because they are not based on anything other than the acreages," he says. "With any acid products you are going to inject in water, the only proper way to determine your rate is through a laboratory titration."



New Ecologic SG's organic Ecklonia maxima Kelp formula naturally increases root volume and root tips.

- Increases turf's natural ability to uptake moisture and nutrients
- Improves turf's natural resistance to the stresses of drought, nutrient deficiency and salinity
- Can reduce the amount of traditional fertilizer applied
- Saves time and money: No extra application steps necessary – in most cases SG can be co-applied with existing fertigation programs

LIQUID FENCE® PRO DIVISION

Environmentally Responsible Professional Turf, Agricultural & Landscape Products
All-natural, Guaranteed-effective Animal & Insect Repellents

(800) 923-3623 www.liquidfencepro.com pro@liquidfence.com

to-season," Swanson adds. "This ability to self-monitor based on pH instead of flow rates significantly reduces potential corrosion problems that could develop from the over application of sulfuric acid into your irrigation system."

Swanson says they now consistently and accurately apply sulfuric acid treated water on their courses at a consistent pH reading of 6.0 to 6.5, which is a big improvement over the 8.0 to 9.0 pH untreated water that was previously used.

The second approach Swanson applied was the use of a synthetic acid, settling on applying and spraying applications of Aquatrols Burst Turf wall-to-wall biweekly. Burst is strictly a pH adjuster; it drops the bicarbonates. In that process it is neutralized like a normal acid. After it does its work, there is no longer any acid left. "This was a daunting and labor intensive task considering the economy was at the start of a severe contraction and labor resources were being scrutinized in all departments," Swanson says.

The Werecon computerized pumping system Red Rock installed. This system utilizes a vacuum technology to eliminate the delivery of sulfuric acid at high pressures into the irrigation system.

To overcome this economic labor "hiccup" Swanson completely changed their fertilization program – abandoning the traditional granular programs and fertilizing the entire course biweekly via a sprayer. "Taking this approach has increased our labor needs, yet those expenses have been offset through reduced fertility costs," he says. "Expensive poly- and sulfur-coated granular fertilizers have since been replaced by inexpensive raw materials such as ammonium nitrate, potassium nitrate and ferrous sulfate."

With all the changes in place, the three courses at Red Rock Country Club are now irrigated with buffered water (bicarbonates in check) and treated biweekly with a direct application of synthetic acid. "These are by far the best changes I have ever implemented on a course," Swanson says. "The return on investment has been amazing. The courses have reversed their negative trend and are now responding to our management decisions as a typical course would in the Midwest." GCI

David McPherson is a freelance writer based in Toronto.

STEVE SWANSON, RED ROCK COUNTRY CLUB

MAIN EVENT™
Plant & Soil Nutrients

Main Event
Dry Iron 6-0-0
10% Fe 8 %S 2% Mn 1%
Mg 0.5% Zn

Main Event
Dry Manganese 6-0-0
10% Mn 8%S 2% Fe 1%
Mg 0.5% Zn

100% Chelated * Non-Staining * VAM Sustaining

* Longer Lasting
* 5 Different Chelating technologies
* Dry Powder 100% soluble & chelated
* Non Staining
* VAM Sustaining food source
* Foliar and soil bilateral surfactants

Main Event Plant and Soil Nutrients are designed for an initial quick response and a sustained release.

Main Event products use a proprietary blend of short-term and long-term chelating technologies.

This technology has been developed and proven through years of technology testing on a variety of golf courses.

For use on:
Tees, greens, approaches, landing areas, fairways and sports turf. General nursery and greenhouse plant application and soil injection for trees.

Quest Products Corp.
Finding New Ways to Improve the Treatment of Trees and Plants.

For additional information on products or programs contact:
Quest Products at **(785) 542-2577**
or visit our website at:
www.questproducts.us.

www.golfcourseindustry.com/readerservice - #35

In 2005 we made history introducing them.

Now, they're starting to make other mowers history.

E-Cut™ Hybrid Fairway & Greens Mowers. It's the fifth anniversary of E-Cut™ Hybrid technology. And the honeymoon's still not over. No wonder: they offer a flawless consistency of cut only electricity can deliver. Save up to 30% on fuel. And banish hydraulic-leak anxiety forever.

First gaining recognition on greens and next on fairways, our latest models, the 7500/8500 E-Cut Hybrid Fairway mowers, won the prestigious AE50 award.

But that's nothing compared to the reward of winning the confidence of so many courses, whose trust has transformed this revolutionary technology into a routine choice the world over. Have a spot open in your fleet? Try one on your course. See what all the buzz is about. **Consider us part of your crew.**

JOHN DEERE
GOLF

OFFICIAL GOLF COURSE EQUIPMENT SUPPLIER

1-800-537-8233 • JohnDeere.com/Golf

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.

SPRING TUNE-UP

Without question, spring golf has to be one of the favorite seasons – especially for the northern market coming out of this year's brutal winter. Golf clubs are filling up like anthills – diehards are joined by recreationalists at these collection points for the masochistic masses.

For golf courses, springtime first impressions can set the tone for summer traffic. For many turf managers, this is the time to invigorate your turf, while preparing for summer's challenging conditions. And irrigation plays a critical role in both early spring turf establishment and peak-heat season resilience.

Under summer's searing stress, an irrigation system needs to be operating at maximum performance. Better to have crews jump on the tune-up process now with a thorough inspection of the irrigation system operating under "normal" conditions. This will help to ensure good performance throughout the potentially stressful growing season.

All over the country, superintendents and irrigation technicians (who are worth their weight in gold, by the way) have made their initial spring system start-up and evaluations, with programmed irrigation schedules to get turf growing. Now's definitely the time to revisit each zone/sprinkler more intensively, look at system performance in greater detail and correct wayward irrigation operations. Any indication of turf stress this early in the season should be noted – especially around tee boxes and aprons where hot spots tend to surface.

The sprinkler is the most important part of any irrigation system. It flexes the hydraulic muscles. So let's start at the heads – they're the most visible and vulnerable part of the system. It's important that conditions for good sprinkler performance are in place, including the right heads with matched precipitation nozzles as specified in the original design – not replacement heads that don't match (you know, the one that gets slapped on a zone in the heat of the battle or after an aerification incident).

A good, inquisitive irrigation technician also should be checking for proper pressure at the nozzle; worn or mismatched nozzles; and proper, even head spacing and alignment. With spring rains and emerging growth, the slightest turf discoloration today will only turn ugly later.

Frontline crews should be out activating sprinkler zones and checking the operation of specific components. Pressure at the nozzle is essential to sprinkler performance, and too often ignored. Arm your crews with manufacturer's specifications for the appropriate sprinkler operating pressure range and a pilot tube (your handy diagnostic tool) with a pressure gauge. Then, under full station flow, have them gauge and record pressure at each nozzle, while looking for worn or damaged parts. This proactive step will save you from scratching your head while looking at dry spots 10 feet from a sprinkler during the summer months.

If pressure is either excessive or inadequate, have the necessary changes made to bring each head back to spec – like moving or removing heads from overburdened zones, or installing pressure regulation at the valve. Pressure regulators can restore hydraulic balance and are pretty simple and relatively non-invasive to install. Easy procedures that improve the performance of individual sprinklers and the overall system are our best opportunities.

> Under summer's searing stress, an irrigation system needs to be operating at maximum performance.

Activated sprinklers also should be observed for rotation time – closely matching one another – because crews have already ensured that each head on a zone is of the same make and model. Crews also should be paying attention to any mushy turf around sprinklers for weeping valves or low-head drainage.

Furthermore, they might as well make sure each head is flush and perpendicular to grade, as the slightest disruption from hitting the turf will destroy the best of patterns. Heaved heads invite damage and can require springtime arc adjustment. All of these sprinkler tweaks actively drive accurate precipitation rates – and that's what it's all about!

By the end of May, staff should have inspected, detected and corrected sprinkler performance for great springtime conditions and the upcoming summer stress.

Use your crews and get your heads in the game, then plan any major upgrades from there. **GCI**