

Biological fungicide offers four modes of action.

NEW SYSTEMIC PRODUCT CONTROLS SOIL-BORNE DISEASES WITHOUT TENDENCY FOR RESISTANCE.

A good fungicide program manages disease, meets budget restrictions, incorporates IPM standards and maximizes efficiency. A great fungicide program also addresses the demand for environmental stewardship by incorporating softer, greener chemistry.

The increased commitment to sustainability and the demand for more and better biorational products is a trend that is here to stay. Luckily for golf course superintendents, the industry is keeping pace with the introduction of biological fungicides, such as ActinoGrow™ T&O, as well as other plant protection products. These products make it easy to integrate biorational solutions into your turf management program, while continuing to rely on traditional solutions . . . all with no sacrifice of quality.

“ActinoGrow T&O serves as an excellent example of why interest in biorational alternatives for golf course fungicide programs is so great,” George Furrer, national marketing manager for SipcamAdvan, said. “Proven in university trials, ActinoGrow T&O controls soil-borne *Rhizoctonia*, *Pythium*, *Phytophthora* and *Fusarium*. It also promotes plant strength and vigor, enhances root systems and increases nutrient and water uptake. This OMRI Listed® product will be popular not because it is “green,” but because it works.”

As George Stallings, Ph.D., western field development manager for SipcamAdvan, explained, “ActinoGrow T&O contains a high concentration of a patented strain of the beneficial bacterium *Streptomyces lydicus*, which

offers four modes of action in one product. Because of its unique properties and multiple modes of action, *Streptomyces lydicus* is not prone to disease resistance. And as any golf course superintendent knows, a systemic fungicide without resistance issues is a very important disease management tool.”

FOUR MODES OF ACTION OF STREPTOMYCES LYDICUS.

- 1. Exclusionary: Beneficial microorganisms grow around roots and foliage, preventing disease organisms from growing.**
- 2. Antibiotic Production: Produces three unique antibiotics that are destructive to disease organisms.**
- 3. Enzyme Production: Produces chitinase, which destroys chitin found in cell walls of disease fungi.**
- 4. Predatory Action: Attacks and devours certain disease-causing fungi.**

Although traditional pesticides will always have a place in golf course turf management, superintendents who also embrace the use of biorationals will be rewarded with positive results at all levels. That is why SipcamAdvan is committed to promoting success in an environment where “more of the same” is no longer adequate. Giving you the edge

ActinoGrow™ T&O
Biological Fungicide

required to maintain your golf course to top standards by delivering both traditional and biorational product solutions is our number one responsibility.

ActinoGrow T&O Highlights

- Contains high concentration of the patented beneficial bacterium *Streptomyces lydicus* as a 100% water-soluble powder
- Provides four modes of action so disease organisms cannot develop a resistance to *Streptomyces lydicus*
- Controls soil-borne diseases including *Rhizoctonia*, *Pythium*, *Phytophthora* and *Fusarium*.
- Promotes plant strength and vigor, enhances root system, increases nutrient and water uptake
- Tank mixes with most fungicides, insecticides, biological stimulants and liquid fertilizers
- Does not require constant agitation, will not clog application equipment

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Ornamental grass resources

Cooperative extension services have excellent references on ornamental grasses. Check your local office for details on the varieties ideal for your facility.

USGA agronomists can offer expertise on ornamental grass selection and maintenance, too. Check out the "Landscape Restoration Handbook," a publication sponsored by USGA published in 1993 which encourages golf courses to embrace landscape naturalization.

Likewise, nursery Web sites abound with photos and information. In addition, landscape professionals can provide assistance on ornamental grass selection.

David Kuack, editor of *GMPRO*, a Golf Course Industry sister publication, suggests the following books:

- "Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses," by Michael A. Dirr, Stipes Publishing.
- "The Encyclopedia of Ornamental Grasses: How to Grow and Use Over 250 Beautiful and Versatile Plants," by John Greenlee, Rodale Press.
- "Herbaceous Perennial Plants: A Treatise on Their Identification, Culture, and Garden Attributes," by Allan M. Armitage, Stipes Publishing.

(*Erianthus*), perennial fountain grass (*Pennisetum*), switch grass (*Panicum*) and prairie cord grass (*Spartina*).

No fall or winter landscape should be without a tall ornamental grass. Plume grass (*Erianthus ravennae*) is found in zones 4 through 9 and it grows to a height of between 8 and 11 feet with a clump that spreads up to 4 feet. This plant – with its tall, thin shafts and fluffy coiffures – exhibits a delicate structure that lends a touch of charm to a harsh winter landscape. Because of its height, a plant such as plume grass can be used as a focal point in a ornamental bed or landscape setting.

Maiden grass (*Miscanthus sinensis* 'Gracillimus') is a fine choice in zones 5 through 9 for a tall, drought-tolerant ornamental grass, as it reaches a height of 7 feet, with a spread a bit less than that. Maiden grass bears coppery tassels as a seed head in early fall, eventually growing lighter in color and adorning the plant as a "plume." It's advised not to cut the clump's stems back until after the bleakness of winter passes, since the graceful stems and puffy plumes of this plant will provide some visual interest on an otherwise barren December through February landscape.

Blue oat grass (*Helictotrichon sempervirens*) is a cool-season ornamental grass that can be grown in zones 4 through 8 and is effective for deer control. This ornamental grass grows in a 3-foot mound. If you wish to enjoy the signature blue hues of its foliage to the fullest, then grow it in full sun and well-drained soils. The plant also produces spiky, dark flowers with a bluish tint in summer that turn harvest gold in autumn.

Another favorite, northern sea oats (*Chasmanthium latifolium*), is an ornamental grass that grows to a height of 3 feet in loose clumps of green foliage. Its name derives from its seed pods, which resemble oats. This deer-resistant ornamental grass is cold hardy to zone 5. Even after its leaves have died, it provides visual interest to the winter landscape.

For a shorter, deer-resistant ornamental grass, try lilyturf (*Liriope spicata*). Lilyturf ornamental grass can be grown in zones 4 through 10 and reaches about a foot in height. Lilyturf likes water, but also does well in well-drained soil. For best results select an area with partial shade and soil rich in organic matter. This ornamental grass has a spiky flower, ranging in color from white to lavender. In autumn it bears a dark berry. Be warned: You'll want to contain this plant, because it is enviously.

Another short ornamental grass grown in zones 4 through 8 is blue fescue (*Festuca glauca*). The popularity of this clumping, drought-tolerant ornamental grass lies in the blue color of its foliage, which complements any surrounding plants with silvery foliage, such as lamb's ears. The plant resembles a pincushion bristling with blue pins. As with maiden grass, cut back foliage in early spring. Divide every few years to rejuvenate.

CALL TO ACTION

Doing your part in establishing ornamental grass areas on a golf course will help you meet reduced pesticide, fertilizer and water demands.

States such as New Jersey, Florida, Minnesota are considering the adoption of fertilizer restrictions that would impacting golf and other green industry sectors.

If you are in New Jersey visit the New Jersey Green Industry Council Web site: njgic.org/ for more information on this topic. Those outside of New Jersey are encouraged to visit Responsible Industry for Sound Environment Web site: www.pestfacts.org/rise/index.html for an advocacy group in your area.

Your voice is needed to demand sound science guide future laws and regulations. **GCI**

Nancy Sadlon is the executive director of the New Jersey Green Industry Council, a nonprofit organization whose mission is to secure reasonable regulations and laws for golf and other sectors in the green industry.

An ongoing battle

A superintendent in New Mexico experiments with wetting agents to combat localized dry spots

For Steve Campbell, wetting agents aren't a miracle product; they're just another gun in the arsenal of turfgrass management.

"If you know how to use them and what they're supposed to do, they work," says Campbell, director of agronomy at Las Campanas, a 36-hole facility that sits on 5,000 acres of high desert in Santa Fe, N.M. "If you don't know what they do, you won't get good results. There's no 'follow A, B, C and D,' and you'll be successful. Find out what your problems are and figure out how to fix them. If wetting agents work for me, I believe they'll work for everyone if they apply them to their individual needs and situations. Each golf course is different. You don't treat them all the same."

Campbell manages 100 employees and runs the golf course, landscape, public works and revegetation divisions at Las Campanas, a Lyle Anderson development. Budgets are confidential, but Campbell's is more than \$1 million.

Campbell, who's been at Las Campanas for 12 years, is a big believer of wetting agents and has used them his entire career. He injects wetting agents into the irrigation system, using $\frac{1}{16}$ to $\frac{1}{4}$ of an ounce per thousand square feet of turf per day.

Las Campanas receives just 12 inches of rainfall a year, so water is king.

"I need to make water wetter to conserve and use every drop," Campbell says. "Wetting agents break the surface tension of the water droplet and force it to go into the soil."

Under water conservation mandates, the most water Campbell can use per golf course per day is 600,000 gallons, even though he says he can use less than that during less stressful months of the year. Determining how much water he uses is a complicated system, he says. He checks water use every morning via a computerized monitoring system and reports

it monthly. Other parties, namely municipalities, can check his water use daily if desired.

The water is high in salts and bicarbonates, which makes it difficult for Campbell to flush the soil. He can flush salts down into the soil profile with the annual 12 inches of rainfall and the wetting agents he uses.

The bentgrass Campbell grows isn't native to the area. He says there has been ongoing talk about changing the turf, but the native grasses (buffalograss, for example) would never be used because they wouldn't survive if cut at turf heights.

"I have bentgrass on greens, tees and fairways," he says. "The temperature will go down to zero degrees Fahrenheit in the winter, and if I don't have snow cover, I irrigate the turf once a week because the plant will freeze dry if I don't because of the high winds and very low humidity. The crown needs to stay wet or it desiccates. We're at 7,000-foot elevation. The Rocky Mountains begin here in Santa Fe."

To treat localized dry spots, Campbell uses eight ounces of wetting agent per thousand square feet every two weeks. No matter how uniform a green is, there will be inconsistencies and localized dry spots, which is compounded with salts, he says.

Campbell says he has tried every wetting agent on the market and started using them in Philadelphia where it was hot and humid with an entirely different set of weather, soil and agronomic conditions.

"Surfside is the best wetting agent I've used," he says. "I use it exclusively."

Campbell uses wetting agents throughout the year and is always looking for a deal. He

buys the 55-gallon drums even though the shipping is expensive.

"I spend a minimum of \$12,000 on wetting agents a year," he says. "There has been no year where I spent less than \$10,000 on wetting agents. The drier the year, sometimes as little as four inches of rainfall a year, the more I need to supplement my irrigation."

Campbell acknowledges there's an uncertainty about wetting agents in the industry, but he says a superintendent has to know his soils, drainage, irrigation and turf problem areas.

"You need to spend the time to experiment," he says. "One size doesn't fit all. What I used in Philly is different than what I use out here. It's no different than any other business. Attention to detail is the key, and versatility is key to success.

You need to make adjustments. You don't just dump a wetting agent in the tank and go."

When Campbell sees a water-related problem, he applies a wetting agent, which alleviates the problem but doesn't eliminate it.

"It will be different for me every year," he says. "It's frustrating, but just because it worked last year, doesn't mean it will work exactly the same way this year. It's an ongoing thing."

Superintendents will always deal with localized dry spots and wetting-agent use, Campbell says.

"Every superintendent should have a wetting agent as part of his arsenal," he says. "They've been around a while, but they must be doing something for someone because they've last a long time. That's somewhat of a testimonial." **GCI**



STEVE CAMPBELL
CGCS



Nathan Jordan is assistant superintendent at Country Club of the Rockies in Edwards, Colo. Contact him at ntjordan@gmail.com.

WE'VE ALL BEEN THERE

College students pursuing the golf course management industry have many internship options – public, private, cool season, warm season. The list seem to goes on and on. Regardless of the facility where you're employed, it's critical to bring value to the internship experience.

Typically, those who are looking to gain more experience will be motivated and driven to succeed. The dedication an intern puts into the work experience should be reciprocated with meaningful education and strategic guidance from the management team, and that includes assistants. Leading interns comes with additional responsibilities, but it also offers a rewarding experience for you and the student.

Due to class schedules, few students have the ability to complete an internship that's longer than three months. Time is limited. Meet with interns at the beginning of their employment to gain a solid understanding of the skills they're looking to learn or improve. A few minutes spent here will allow for adequate planning.

While routine tasks on a golf course must be completed, keep in mind that assigning a variety of duties helps maintain an intern's interest in the profession. Reflect back on your own personal internship experience and create a list of duties you liked and disliked. I doubt mowing the rough for eight hours a day ranked very highly. There's much more to our job description than operating equipment.

Don't forget that learning can still take place without extensive practical experience. For example, understanding how to rake a bunker can be achieved simply by observing another skilled employee complete the job. By the end of the season most interns will be able to explain the process and replicate the procedure.

Foster a learning environment that not only allows for the development of physical skills, but also cognitive functions.

A tremendous amount of thought goes into scheduling daily tasks on a golf course. Few of us show up for work without a plan to accomplish the tasks that have been handed down by the superintendent. An intern should be given the same opportunity to think independently about how he or she will carry out a set of instructions. The ability to process information takes various lengths of time depending on the individual, so you need to have patience and understanding. You may need to explain the directions differently than you are accustomed to.

Foster a learning environment that not only allows for the development of physical skills, but cognitive functions, too.

This shouldn't create a negative attitude toward the intern, but merely accommodate the various styles of learning. When fully comprehended, the outcomes are usually great. It's those times when clear and concise communication is lacking that the end results are less than desirable.

It's also important for the student to begin recognizing areas for concern on the golf course and report those problems to the management staff. It takes a concerted effort from everybody to successfully manage a golf course, and everyone's thoughts and opinions should be considered.

The morning is a fast-paced, high-energy time of day, when daily course

preparations are being completed. We are all moving in different directions, working toward the common goal of preparing the course for play. Encourage interns to be aware of everything that's happening around them. Although they may be assigned to cutting cups, keeping their heads "on a swivel" can be a tremendous benefit.

It takes a diligent effort to minimize the "tunnel vision" that can plague all of us when focused on a specific task. For example, cutting cups requires an intern to drive from hole-to-hole and walk on the greens. Remind them there is a lot they can notice during this time. Emphasize that even though the primary task includes a certain amount of responsibility, much more can come from it.

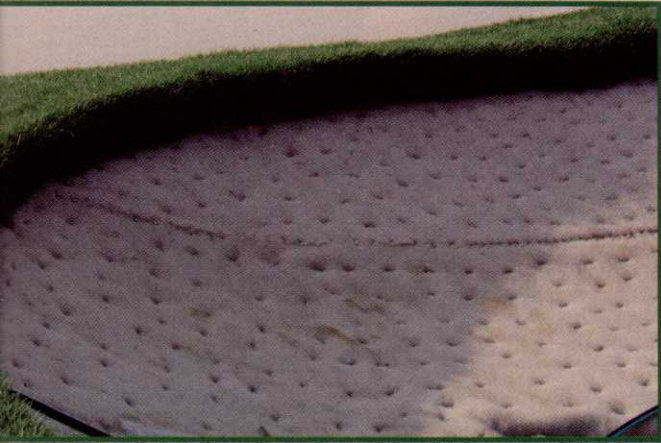
For example, if the intern reports there's an irrigation leak developing before the course opens for play, he could prevent a lot of headaches that would have developed had the problem gone unnoticed until a member reported it later in the day. Instead, course set-up has been completed, a problem has been identified and reported and the intern has gained the feeling that he or she contributed to the team. Learning potential should not be overlooked regardless of the situation or timing of circumstances.

Each facility approaches its internship program differently. The demands vary from one course to another. Despite the differences that exist, one thing should remain constant: We should all work together to provide a positive learning experience for those pursuing a career in the industry.

Don't dismiss the internship experience. Remember, it is a stepping stone in a very competitive market. It's unlikely we would be where we are today without meaningful internships. So take the time to be a positive influence to the next generation of turf managers. **GCI**

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FRAMING THE PICTURE



Ornamentals have nothing to do with the playing surface, but with proper planning and placement they enhance the entire facility. **By JOE WACHTER**

The prime feature of any golf course is the turf that we maintain on a daily basis. Ornamental plantings have nothing to do with the playing surface of our great game

but when planned and placed strategically they enhance our clubhouse/pro shop facilities and the entire course.

I have enjoyed working with ornamental plantings on the various golf course facilities that I have managed over the years. All but one of these facilities was managed without the aid of a horticulturist. There are a few keys that I believe can assist superintendents in successfully managing their horticulture programs.

KNOWLEDGE/EDUCATION

Horticulture is a field that is rapidly changing with the development of new plants and designs. There are many ways you can improve your knowledge on this topic.

The Internet is a great reference to use for descriptions of plants and bed design. Photos of plants and combinations of many types and styles of beds are a click away.

Junior colleges, evening adult-education classes, garden centers, state extension services, botanical gardens and regional and or state turf conferences offer classes from one hour to full semesters.

Join a local golf course horticulturist or nurseryman/landscape association. Attend meetings and learn from experts who work

primarily with plant material and have years of experience. Their business requires that they are current with the best new plants and trends in the industry. When you attend local golf course superintendent association outings, check out the planting beds and take pictures. Visit commercial properties for ideas on different plant material and design. Most of these properties were designed by a professional architect and are managed by trained horticulturists. Remember, ornamental plantings are changed on a regular basis.

REMEMBER THE SOIL

The soil is the foundation of a planting bed. A well-drained soil will grow the best plants. A great way to build the soil of a new bed is

“Attitude is everything when working with ornamentals on the golf course.”

by incorporating compost, leaf mold, manure and or peat moss. This material is available from most mulch suppliers or from city or county yard waste facilities. You can also begin the process of making your own compost from leaves that drop on the golf course. Also, do not forget to mulch your beds lightly to prevent weeds from germinating and reduce the loss of water. I like using compost material for my annual beds because it will be tilled under and takes less time to break down in comparison to mulch.

SITE SELECTION

There are a number of factors I try to keep in consideration when planning an ornamental bed. High visibility areas such as the clubhouse, main patio area, teeing ground or near green complexes are the best sites. The first tee and last hole catch a golfer's attention at the beginning and the end of the round. Some club facilities host group functions, such as banquets and weddings, in which the guests do not leave the immediate clubhouse area. These areas provide first impressions for all guests who visit your facility.

Automatic irrigation is important for plant survival and labor savings. Place soaker hoses around clubhouse plantings to reduce building damage and high water bills.

Know the amount and type of sun your planting bed will receive during the day. A full-sun plant in a shaded bed area will result in a weakened plant and less than attractive overall display.

ANNUALS AND PERENNIALS

I've used both plant types over the years together and separately with success. The benefits of annuals include mass plantings with diverse color combinations and less space for weeds. Season-long blooms and plant designs can be changed on an annual basis.

Perennials do not require new plants every year. In fact, multiple plants can be made from divisions after just a few seasons. However, while less overall maintenance is needed for overall plant health, they do require upkeep.

The use of trees, shrubs and ornamental grasses can fill the space of a bed, provide structure and seasonal beauty.

My facility has a number of very attractive perennial beds designed years ago. Some of these beds are in need of rejuvenation which is a part of the required maintenance for perennials. I place a few annuals in spaces near walk paths that provide a little more depth of color for the perennial bed.

We do grow our own plugged products in a greenhouse on the property. Most of the plants are annuals and are planted in the most highly visible areas of the clubhouse, patio and pro shop. The beds are planted with 1,500 tulips each fall and then are tilled under for the annuals in May after the tulips have finished their blooming cycle.

Our plant material is a zero-dollar cash outlay after we have our yearly plant sale to the membership. Also, I utilize plant brokers from our area who have expanded knowledge of plant varieties and have put me in contact with the best growers for purchasing.

BED SIZE AND PLANTING GUIDELINES

I would rather make a few large beds with mass plantings than a large number of small beds with a few plants. Smaller beds create

obstacles for mowing equipment and also get lost in the landscape. Building too many beds that cannot be maintained is a serious mistake. If it cannot be maintained, it should not be built.

Each plant has specific guidelines for spacing. Plants properly spaced compliment one another and will enhance the characteristics of the plant such as its color, form and or texture. Plants not properly spaced look lonely and afraid to show their true color. You see more of the ground or mulch than of the plant, plus it leaves space for weeds to overrun a bed. Use a color wheel to identify plants whose blooms work well in combination.

Attitude is everything when working with ornamentals on the golf course. It is obvious when visiting a facility where the superintendent understands the importance of maintaining an ornamental program to the highest level. Great turf along with well-maintained ornamental plantings compliment one another and can set you and your facility apart from the competition. **GCI**

Joe Wachter, CGCS, is superintendent at Glen Echo Country Club in St. Louis.

Author Joe Wachter has used both plant annuals and perennials over the years both together and separately with much success at Glen Echo Country Club.



Quality treatment

A trio of facilities try out waterless on-course restrooms in lieu of Porta-Potties. BY ALYSE LAMPARYK

Watching his courses' turf being torn up by waste management trucks twice a week was just too much for superintendent Russ Chamberlain, so he started looking for alternatives to the 50-gallon Porta-Potties. "You get about 90,000 rounds of golf and you've got to keep them clean," Chamberlain says of the required frequent cleaning for the portable waste units.

Chamberlain supervises Brae Loch Golf Club in Grayslake, Ill., and Countryside Golf Club in Mundelein, Ill., which is made up of the Prairie course and the Traditional course. All three are public, 18-hole courses located in northern Illinois.

After picking up a tip about possible companies from another employee, Chamberlain began researching several different options. Eventually the choices were narrowed down to a Biological Mediation Systems (BMS) facility or comparable waste system.

What it came down to was the composting system, and the BMS unit required much less maintenance than (other similar systems) available at the time. "I talked to three or four golf courses that had it and they just were thrilled by them," Chamberlain says of his decision to purchase from BMS.

The unit he decided on did not require water or electricity and was able to decompose naturally. In addition, the decomposing exhaust system runs on solar power making it even more environmentally friendly.

Unfortunately, because of budget concerns, Chamberlain was only able to revamp the restrooms at Countryside. In spring 2006, he bought two restrooms at \$21,000 each, and two years later purchased one more for \$24,000, due to cost increases over time.

"We do plan in the future to do them at Brae Loch, but right now it's not the top priority with the economy right now and how the golf courses are doing," Chamberlain says.

Brae Loch is much smaller than Countryside and its restrooms are more accessible, making it easier for the waste management



The Biological Mediation Systems facility composts without water or electricity and operates a ventilation fan via a solar power unit on the roof.

trucks to maneuver through the course and less of an immediate concern for new restrooms. "We don't have as many rounds out there so we never had a situation," Chamberlain adds.

Once the restrooms were ordered from BMS, the prefabricated 500-gallon concrete structure and building were shipped by semi-truck from Colorado where they were built.

Chamberlain worked with his staff and an employee of BMS who was flown out to assist and together they finished the project in about a day.

The layout was set up so that for every nine holes a restroom was made available. The Prairie course has one and the Traditional course has two, one of which is located where it can be shared by both courses.

The facilities only require a small amount of attention that is easily performed given

that there are 10 maintenance employees per course and an annual maintenance budget of \$500,000. Each course has one employee responsible for cleaning the restrooms every morning and checking for vapors and garbage. With a 500-gallon tank, an outside source is hired once a year to clean out the tanks.

If Chamberlain wanted to, he could wait even longer than a year for the tank to be cleaned. It is only truly necessary every two or three years but he prefers to have it done more frequently.

The on-course restroom's lack of maintenance and repair have left Chamberlain very happy with his purchasing choice. "You just kind of monitor it and it's really easy and there are cost-savings in the long run." GCI

Alyse Lamparyk is a freelance writer based in Athens, Ohio.



Precision pumping

Preston Trail Golf Club relies on local companies for pump station needs. BY ALYSE LAMPARYK

The consistency of Flowtronex pump stations has provided assistant superintendent Chris Rick more time to focus on other issues, both at his current job and at previous places of employment.

Rick, who has worked in the golf industry for 18 years, still maintains the opinion he formed when he first came across a Flowtronex pump station in 1998 at a Seattle course he previously worked at. "It was a solid system and ever since then I've always felt that they were a good pump," Rick says.

The course Rick is presently at, Preston Trail Golf Club in Dallas, underwent renovations involving the installation of a brand new Flowtronex pump station in 1999. Rick was not on board for the initial installation, as he began working at the 18-hole private course 5 ½ years ago, but was involved in decision making when the Silent Storm system needed an update last year.

"We had Flowtronex give us a price to retrofit the pump station and it was a lot more reasonable than buying a new one," Rick says, adding that cost was a definite factor. The decision to retrofit the pump station cost about \$130,000 and involved a new flow meter, computer, pumps and motors.

While Rick says he wasn't dead set against specific bells and whistles, there were certain features that appealed to him.

The computer-based pump log is an element that he has been particularly pleased with because it enables constant monitoring of the amount of water running through the pump posts. In addition, the log feeds a signal up to the office computer making it easier to supervise.

Ultimately, Rick was pleased with the process and the results the company produced. "Exactly what they told us they were going to do is what we got and it was a pretty flawless

transition," Rick says of the retrofit.

Since the retrofit there has been no need for repairs. Conveniently, if anything malfunctions on the pump station, the Flowtronex main office is located in Dallas, as well.

However, Rick does his best to stop any problems before they can occur by employing Monroe Pump Service to perform preventative maintenance. Once a year the local company inspects everything to make sure it is running properly. "By doing that we can

two other assistants every really touch the pump station. With an annual maintenance budget more than \$1 million, Preston Trail has 31 maintenance employees taking care of the golf course.

Should something change and he would require more help with the system, Rick believes it would be fairly easy to train his employees to use it. The touch screen control panel places everything out in the open, making it simple to modify the system as needed.

"It's all about reliability. It's all about not having to worry about it and having it work all the time."

— Chris Rick, assistant superintendent, Preston Trail Golf Club

anticipate any problems if they do notice something," Rick says.

Prior to the recent retrofit, Monroe Pump Service came to their aid when a pump broke down. Rick says the company arrived quickly and the machine worked well after the repair.

Besides during inspections, only Rick and

When it comes to pump stations, Rick simply wants the product to be hassle-free. "It's all about reliability," he says. "It's all about not having to worry about it and having it work all the time." **GCI**

Alyse Lamparyk is a freelance writer based in Athens, Ohio.



Flowtronex's Silent Storm Vertical Turbine system with touch screen.

BY DAVID M. KOPEC, PH.D. UNIVERSITY OF ARIZONA

Sodium and Salinity

Both minerals effect successful turf irrigation, Part I: Sodium.

Sodium (Na^+) as an individual element is commonly found in irrigation water, along with many others (like calcium, magnesium, potassium, sulfur and iron, etc). Salts are actually the dry form of two or more several elements combined. When salts come in contact with water, they dissolve into their component elements once again, but now when in

water, they now have a “charge.” The sum charges of dissolved salts constitute the total salinity of the irrigation water, or any other body of water, for that matter.

Salinity will be addressed as a separate topic in the next article series. This article addresses the topic of sodium, and its importance in turf and landscape management.

In addition to being one of many mineral elements that dissolve in water, sodium has other effects on plants and soils, so much so, that sodium interpretation and sodium management warrants its own “topic” on soil and water quality test reports.

SOIL ASPECT

Sodium is actually a critical part of soil stabilization. Most people first think of sodium as an “irrigation salt” problem first and foremost. But the effects of sodium on soil are especially important.

Sodium can be problematic in turf and landscape soils because (in a nutshell) sodium can disrupt the important formation of soil clods which are critical for soil aggregation. It is highly desirable for soil particles to “stick together” to form larger soil particles. Large particles usually result in lots of air spaces between them. The result is room for soil oxygen (for root growth) and water penetration and movement.

The problem with sodium is it’s a very small molecule. When it gets “wet” with water, it retains a large bubble of water around it. This is called the radius of hydration. Small-sized elements have a large bubble around them, while larger elements (like calcium and magnesium) have “smaller” water bubbles surrounding them.

When sodium is attached to the soil particles and the soil is “wet,” the large bubbles of water surrounding each sodium molecule

[What You Need To Know]

- Sodium is a critical part of soil stabilization.
- In turf, sodium can be problematic because it can disrupt the formation of large soil particles, which are essential for water and oxygen penetration.
- To manage soil sodium, gypsum is a popular source for calcium, which will remove sodium from the soil particle.