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Research

izer significantly outperformed the untreated 100-percent fertilizer. (See figure 3.)

There are some advantages to focusing or improving the efficiency of fertilizer use, as the examples above illustrate. That said, the use of meta-catalyzed blends or any other enriched fertilizers isn’t a panacea for undisciplined turfgrass or horticultural management. Sound agronomic practices — including the measurement and management of soil nutrient levels — remain essential to any turf professional’s long-term success.

The use of meta-catalyzed fertilizer can provide several environmental benefits. First, such products can reduce the amounts of fertilizer that must be added to meet plant nutrient requirements. Second, increases in plant and root mass will enable plants to absorb more nutrients from the soil. As a result of reduced application rates and improved uptake, there is less residual material to leach or run off into the water table. A study conducted by Illinois-based Arise Research & Discovery found the use of such meta-catalysts reduced nitrate concentrations at 12-inch depths by 48 percent, and 57 percent at a depth of 30 inches.

SUMMARY
A difficult economy forces many to tighten budgets, and for turf managers, the rising cost of fertilizer is a challenge. Until now, solutions have forced users to trade off — on cost, performance or environmental impact. Microbial-based fertilizer meta-catalysts represent a new product category that may enable users to hold or reduce costs without sacrificing performance or environmental health.

AGRONOMIST’S VIEW

Food for thought

BY JEFF HIGGINS

 Soil microbes serve many functions when growing turfgrass. One of those functions is to make fertilizers and nutrients available in forms turfgrass plants can take up. For example, nitrogen can be taken up by plants only in the inorganic forms of ammonium and nitrate. Therefore, all nitrogen fertilizers have to be converted or applied in one of those two inorganic forms for the plant to use them. The process of mineralization converts organic nitrogen- and urea-reacted fertilizers to ammonium. Nitrification converts ammonium to nitrate. All of these require aerobic soil microbes for the reactions to occur.

There is such a thing as good and bad microbes. Aerobic microbes are required for many of the reactions mentioned above; however, when anaerobic conditions exist, anaerobic microbes survive and cause unfavorable reactions, such as the formation of black layer.

Microbes needed to grow healthy turfgrass already exist in the soil, or else grass wouldn’t grow. If and when microbes are added, the diverse population of soil microbes are at a balanced state already. When new microbes are added, if they’re of the same genus and species, there’s a great chance they’ll survive. If they’re foreign, there’s a great chance they won’t.

However, it’s important to review some basics about soil microbes. The beneficial soil microbes are primarily aerobic, which means they require oxygen. I’ve yet to have any of the soil microbe product manufacturers answer this question for me. If these microbes require oxygen, then what happens to them when they’re vacuum sealed in a jug or package? What is their shelf life? Is this shelf life for alive or dead microbes? What would happen to you if you were submersed in an environment with limited supply to no oxygen? Let’s assume these are superman microbes and can survive without oxygen and are alive when applied to the soil. The soil and soil microbes are a competitive environment, and the ones present are there because of competitive exclusion and survival. What’s going to happen to the newly introduced microbes? More than likely, they’ll get outcompeted or eaten alive by the ones that have been there for many years and become well established under the environmental conditions for a given geography.

What happens with the bugs-in-a-jug type of products is they’re simply food for the existing soil microbial population. More than likely, they’re dead when applied, and they behave as a simple organic fertilizer. Any type of organic material, whether it’s chicken litter, Milwaukee’s finest sewage sludge (Milorganite), or a bunch of dead microbes, they’ll behave as organic fertilizer (material) existing soil microbes will feed on (mineralize), and you’ll see a turf response.

For example, catalyst microbes that are being added are more likely to be dead when they reach the turfgrass. If they’re not, they only serve as a food source for the existing soil microbial population, which makes the soil microbial community more active, and thus, the microenvironment activity is escalated. One may see a positive result from this increased activity. One can get the same catalyst type of activity by applying molasses or sugar water, which many of the old school superintendents did and some still do. Any food source applied to the environment will stimulate microbial activity, whether it’s molasses, sugar water or meta-catalyst microbes.

Jeff Higgins, Ph.D., is director of agronomy for ValleyCrest Golf Course Maintenance.
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Environmental considerations

A public course on Long Island uses organic fertilizers where it can

As golf course superintendent at Bergen Point Golf Course, Deron Snyder cites a number of reasons he’s exploring organic fertilizers. Restrictions, environmental considerations and cost influence his decision to incorporate organics into his nutrient program.

Bergen Point, a links-style layout on Long Island that generated 45,000 rounds last year, features ryegrass tees and fairways and 60/40 Poa/bensgrass greens. Snyder manages the course with a $400,000 budget.

Moving toward mandates?
The environmental oversight of Suffolk County, which owns the 18-hole public facility in West Babylon, N.Y., is the No. 1 reason Snyder’s using organic fertilizers.

“I’ve incorporated more organics into my program because of where I’m located,” says Snyder, who became acclimated with organic fertilizer before joining Bergen Point a year ago when he was an assistant superintendent at Middle Bay Country Club in Oceanside, N.Y. “They’re definitely pushing alternatives to pesticides and synthetics. We’re right on the bay, so I’m very conscious. I don’t spray or fertilize my roughs. I just fertilize the greens, fairways and tees.”

The county already limits the time of year municipal properties can be fertilized (April 1 through November 1). It doesn’t mandate the use of organic fertilizers yet, but considering the county restricts what pesticides Snyder can use, he believes more fertilizer regulation is possible. So, he’s incorporating organic products to stay ahead of the curve.

“I wouldn’t doubt it if there were more restrictions countywide or statewide,” Snyder says. “It’s definitely a concern, especially on Long Island. That’s why I’m trying to go more organic.”

Though some facilities are touting the use of organic materials as “going green” initiatives,

(Product focus continued on page 89)
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ONE YEAR, THREE MAJORS

What allowed you and your staff to navigate three events within a year?

We needed to separate the two organizations’ philosophies about set-up and preparation. Once we understood what each tournament required, we established a team concept for our staff to undertake the enormity of the upcoming year. Teamwork is essential.

We increased our meeting schedule and interaction with the associations’ reps, exchanged set-up outlines and held frequent course walk-abouts with each organization so we didn’t overlook any details. We reviewed video of past U.S. Opens we attended at Pinehurst, Winged Foot and Oakmont for golf course preparation, staffing and efficient use of volunteers. Each operational area had its own team of volunteers. We began this during the 2008 PGA Tour event as a practice round, then transitioned the same crew leaders and their staffs to the U.S. Open. It saved training time for the U.S. Open.

What were the conditioning differences between the two?

The PGA Tour event includes a Pro-Am; the USGA doesn’t. Because amateur players couldn’t handle U.S. Open conditioning, we geared it down in February and increased the difficulty for June. Green speeds weren’t extremely quick for the amateur player. There was a one-foot difference in green speed requirements between the organizations. Each requested smooth, consistent and true surfaces regardless of speed.

The USGA focused on spot tweaking firmness and green speed, so our irrigation became more precise. Our rolling procedures for the two events varied because of attempts to maintain a higher and more consistent green speed for the U.S. Open.

Kikuyugrass can be mown between 3/8 inch and 4 inches. We monitored nitrogen amounts with slow-release fertilizers to avoid disease and puffiness on fairways. Irrigation was tricky, but converting to the turf was a home run.

The PGA Tour had two levels within the primary rough: an intermediate cut 6-feet wide and a primary rough at 3 inches. The USGA had three levels of rough: an intermediate, a second cut and the primary rough at 3 inches and higher.

Bunkers were more penal for the U.S. Open, and the PGA Tour had shot options included in its preparation instructions.

The fairways were kikuyugrass for both events, although there was more perennial ryegrass overseeding for the PGA Tour event than the U.S. Open. As the temperatures climbed, the rye transitioned out. We’ve kept the U.S. Open fairway widths for the PGA Tour in 2009. The only difference is the height of cut, which was lower for the U.S. Open.

The PGA Tour has a long history with Torrey Pines and had an established set-up in mind. Being the first U.S. Open at Torrey, the USGA had more input, opinions, questions and suggestions for us to reach its set-up goals.

Do you have any tips to ease superintendent’s set-up issues during a busy tournament season?

Grass can tolerate less water than we believed. This was established by using moisture-sensing devices and checking for water deficiencies during the day. We determined a watering range and wilting potential with the devices. To accomplish watering effectively, we employed two staffs – one to check moisture and one to irrigate where needed.

There should be transportation and support vehicles for yourself, management staff, mechanics, irrigation staff, golf course set-up folks, association staff, vendors, first-aid staff, food-and-beverage staff and volunteers.

Have a daily meeting with your staff and the staffs of those who will be working, checking and moving throughout the property. We met with our staff, the PGA Tour/USGA staff, security, city staff, vendor representatives and media.

Involve local and state industry vendors to provide a daily uniform and meal for the staff and volunteers. We had a vendor day during the seven days of the U.S. Open to support the staff and volunteers, as well as provide business opportunities for vendors. Most importantly, this daily meeting provided each person an opportunity to exchange ideas, look for solutions for their own golf course concerns and make new friends.

Have an accurate and locally knowledgeable weather service. We prepared for two distinctly different seasons with opposite weather conditions, so daily and weekly weather updates from professionals was key to our course work.

The media attention provided an opportunity to promote the message of our game and its values as it relates to the environment, community, family and economy.
Engine protection

At The Silverleaf Club in Scottsdale, Ariz., Bruce Leonard, equipment manager, and Alejandro Garcia, assistant mechanic, designed and built a protective plywood cover over the engine/mechanicals of the Toro Workman 3300, which has a Toro 1800 topdresser permanently mounted on its rear.

Because there are cross braces underneath the plywood for added support, the cover is strong enough for an employee to stand on when scattering topdressing material in the hopper. The cover also protects the engine from stray topdressing materials. A piece of rubber joins the plywood and topdresser, yet it allows required movement. The mechanics also plan to modify the platform by adding a box for the operator to store tools.

Platform dimensions are 34 inches by 18 inches by 6 inches. Materials used include:

- 11 feet of 1-inch-by-1-inch-by-0.120-inch-thick square tubing
- 34-inch-by-20-inch-by-5-inch-thick plywood
- 1-inch-by-1-inch-by-1/8-inch flat tabs
- 34-inch-by-8-inch-by-1/4-inch-thick, flat flexible piece of rubber

The square tubing cost about $12, the flexible rubber mounting cost about $10, and the remaining materials were in stock. Labor took about an hour and a half.

Spill prevention

Bob Pruneau, equipment manager at the Halifax Golf and Country Club (Old Ashburn) in Nova Scotia, Canada, built holders for 1-gallon mixed gas (2-cycle oil/gasoline) cans. The holders keep the cans from falling over and spilling mixed gas when transported in the dump body of John Deere Gators. Moving them to the outside of the dump body also provided more room to transport other supplies. The material used to build the holders is:

- One 3/8-inch-thick piece of flat steel, 5 inches by 24 1/4 inches. Bend each end up 90 degrees six inches from the end
- One 3/8-inch-thick piece of flat steel, 5 inches by 11 3/4 inches. Weld on one side at the top of the U shape.
- Two 1/2-inch rods 22 inches long. Bend them five inches from the end at 90 degree angles to form a U shape.
- Three 1/16-inch stove bolts, 1 1/2 inches long
- Three 1/16-inch lock washers
- Three 1/16-inch washers
- Three 1/16-inch nuts

Assembly tip: Keep the gas can holder bracket closer to the operator seat when drilling for the three mounting holes so the mud flap won't hit the opposite side. The operator raises the dump body slightly, places the gas can in the holder, then lowers the dump body back down. The dump body holds the gas can firmly in place.

After building a prototype, the holders each took about one hour to build. The materials cost about $15, including materials already in inventory.
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Snyder says marketing isn’t motivating his approach. “To be honest with you, I’m not sure the golfers know,” he says. “I don’t promote it. It’s more to benefit the course and environment.

In addition to pressure from the county and an internal desire to move toward organic products, Snyder also uses organic fertilizer because he likes the way it works.

A significant benefit of organic fertilizer is it adds to the amount of organic matter in the soil, and increased organic matter helps soil retain nutrients, Snyder says.

**THE PROGRAM**

Of Snyder’s $20,000 fertilizer budget, about a quarter is spent on organics.

For Snyder’s greens program, the first fertilizer application is a water-soluble synthetic fertilizer, which gets nutrients into the turf quickly, he says.

Snyder waits until right before the summer when the temperature increases and there’s microbial activity in the soil to make an organic fertilizer application. At that time, he uses the Sustane 10-2-10 product.

About 12 weeks later, Snyder soon feeds the greens with Growth Products’ Essential Plus and Company soil amendment.

Snyder’s fall applications include 1) a synthetic fertilizer with a high phosphorous rate when he seeds, and 2) a final application of an 8-2-4 organic fertilizer.

On fairways and tees, Snyder uses synthetics, mainly because of cost, at a rate of 3 pounds per 1,000 square feet for the year.

“I’d like to look into going organic on the fairways, but synthetics last a bit longer – between 12 and 16 weeks,” he says.

**RIGHT THING TO DO**

Aside from preparing for potential restrictions, Snyder believes scrutinizing all inputs is the right thing to do for the environment.

“I wish I could be more like the Vineyard,” Snyder says of the Edgartown, Mass., golf club that’s known for its efforts in developing an organic maintenance program.

At the GCSAA Conference and Golf Industry Show in February, Snyder attended a half-day seminar called “Organic Approach to Golf Course Management” led by the Vineyard’s superintendent Jeffrey Carlson, CGCS, and Frank Rossi, Ph.D., associate professor of turfgrass science at Cornell University.

Snyder learned he could do more to move to an organic approach, but he can’t match the Vineyard’s efforts without a big budget increase.

“They definitely have more money there,” he says. “I only spend about $60,000 on pesticides and fertilizer a year, so it’s tight, but if I can use organics, I will.” GCI
FEAR AND SCRIBBLES

For 15 years, I’ve returned from the Golf Industry Show and penned a column about how my recollections of the event may have been slightly blurred by the copious amounts of beer constantly being handed out and how, usually, I had to spend weeks reconstructing the notes I’d jotted on the back of cocktail napkins, business cards or whatever happened to be at hand. I’ve always called the piece, “Beer and scribbles.”

This year, though the beer was just as plentiful as ever on Bourbon Street and elsewhere around New Orleans, I decided the more appropriate theme was “Fear and scribbles.”

For the record, I still scribbled plenty. I came home with hundreds of notes and quotes jotted illegibly on my shirt cuffs, forearms and even the soles of my shoes. Thankfully, my nephew works for the CIA, and he used one of the agency’s cryptology supercomputers to decipher my ridiculous scrawls. Here’s what I found once my notes and hazy recollections had been translated back to English:

Almost everyone I talked to, from newbie assistants to seemingly well-established superintendents at top 100 courses, expressed some sort of concern about their economic well-being. In short, if I feel anyone a couple of beers, they admitted that they’re scared right now. Why?

They’re scared because of the general perception golf is in the tank. Everyone says the economic health of the golf industry is lousy, so that must be true, right? They often said they thought even if their facility is OK, golf as an industry is crashing around them.

They’re scared because they believe their facility – like so many – is so hopelessly mismanaged they can’t possibly survive a downturn. “My GM is an idiot,” was one common refrain, “Our owner is close to bankruptcy, and he couldn’t care less about what happens to the course,” was another.

They’re scared because their facility is tied closely to a particular industry that’s really sucking wind (e.g., banking, automotive, etc.) so badly they feel like they’re standing on the beach watching, transfixed, as the massive tidal wave of destruction inexorably roars in.

They’re scared because the housing development their course anchors is struggling, and the developer is trying to sell lots and spec homes when there are no buyers.

Welcome to Darwinian golf... survival of the fittest courses and the fittest superintendents. Don’t fear the challenge, embrace it.

They’re scared because they work for a government entity (city, county, etc.) that’s cutting budgets or even trying to dump their money-losing courses. Municipalities have no pity and no particular fondness for red-ink recreation right now.

They’re scared because they’ve grown roots in their current job and have no idea how, or where, to find a new one if things head south.

They’re scared because everyone’s scared, and no one knows how this thing will come out.

Fear was the predominant theme for the meager 2,900 or so superintendents who came to the Big Easy. I won’t even get started about how the suppliers and distributors felt while staring blankly at an empty show floor in the New Orleans Convention Center Friday afternoon and Saturday. Their fear was palpable as they looked around and realized there was no one to sell to.

(One aside: The lack of attendance on Saturday was a fitting funeral for the terror of the show was, “Who wins? Who loses?” All I can do is ask those questions. It’s up to you to answer them... fearlessly.)

The half-day on Saturday has been on its deathbed for years. Attendees simply couldn’t justify wandering around the show that long. Most meandered and saw a few key suppliers for a few hours. Frankly, the last day in New Orleans was the worst I’ve seen in the 23 shows I’ve attended. But, hallelujah! Beginning next year, GIS will go to a new schedule that will feature education on Monday and Tuesday, exhibits on Wednesday and Thursday, and education on Friday. The theory is that buyers will stay over and walk the show floor if tempted by good educational offerings on Friday. I’ll leave it to you to be the judge of whether or not the new schedule will work.

This is an appropriate time to quote Franklin Delano Roosevelt: “We have nothing to fear but fear itself.” Facilities are failing, but many needed to fail. Most were badly conceived, overfinanced daily-fee facilities or private courses that never came to terms with new competition and the new reality clubs need to operate differently in the 21st century. Don’t fear failure, recognize it’s an opportunity to position yourself for the future.

Budgets will be cut, but welcome to 2009. Don’t fear reality, deal with it.

Jobs will be scarcer, and raises will be few and far in between. The truth is we have oversupplied a finite number of good jobs with far too many good candidates. The fact is we have more people than jobs and more courses than golfers. Welcome to Darwinian golf... survival of the fittest courses and the fittest superintendents. Don’t fear the challenge, embrace it.

Whether or not the GIS was a success isn’t the issue. The real point is you can’t let fear dictate your career and life. Now’s the time to take action to ensure you’re not a victim. If you allow yourself to be crippled by the idea something bad may happen to your facility or career, it surely will.

One of the last things I scribbled on a cocktail napkin during a “research” trip down Bourbon Street on the last night of the show was, “Who wins? Who loses?” All I can do is ask those questions. It’s up to you to answer them... fearlessly.