



There are a number of reasons fertigation may just make sense for your course.

by John Torsiello

Implementing fertigation practices with the use of an irrigation system is becoming quite prevalent among turf professionals.

There are several reasons, the most significant being that the procedure allows superintendents to get bio-stimulants and nutrients to a wide area of the course without time-consuming and labor-intensive methods of traditional dispersal, such as machine or hand application.

“Using irrigation systems to fertigate certainly has become more popular, especially with some of the new guys who feel it is almost like having another assistant superintendent who can make applications where and when most needed,” says Gary Bauman, a partner in the Shelter Island, N.Y., golf industry supply and consulting firm, Island Bio Greens. “You can make applications, albeit sometimes not very precise applications, at

your discretion to areas of the course where a machine sprayer would have difficulty getting to, such as bunker banks and green surrounds.”

Fertigation is the combination of mixing fertilizer and irrigation water and then distributing it through an irrigation system. Typically, small amounts of fertilizer are injected into the irrigation water supply and then distributed.

Brian Vinchesi, owner of Irrigation Inc. in Pepperell, Mass., says using irrigation systems to fertigate just makes sense.

“Having fertigation capabilities allows the superintendent to better time their applications. They do not have to water in a broadcast fertilizer or put down more than necessary to last longer as they have to avoid play. With fertigation, the turf can be spoon fed nutrients. Many superintendents also apply, or only apply, wetting agents through their fertigation systems.”

Rich Silverman of Rain Rich, located in, quite appropriately, Greenlawn, N.Y., chimes in, “(Fertigation) is great for golf courses because turf is always being cut short and the soil compacted from golfers and equipment, so it always needs to be watered. By mixing in small amounts of fertilizer and other turf and soil-enhancing products the turf can better resist problems that plague it.”

Fertigation results in very little waste of fertilizer and studies have shown small amounts of fertilizer distributed slowly and uniformly on a consistent basis

produces healthier plants that are more resistant to disease, Silverman says.

Compatibility of today’s irrigation systems with fertigation procedures are really unlimited, Vinchesi says. “Depending on the amount of money spent the systems can be very versatile, and the more sophisticated systems interact directly with pump stations and central control systems,” he says. “Pretty much anything that is labeled for injection can be applied through an irrigation system. Injection of more than just fertilizer is commonplace. With the proper amount of storage tanks and mixing tanks, odd mixtures and teas can be applied.”

Depending on the fertigation system manufacturer, units can be as basic as a quick coupler system with little or no control, or as sophisticated as any computer-driven control system, giving the user a very precise tool to apply fertilizers calculated in parts per million, says Erik Christiansen, president of EC Design Group, an irrigation consulting firm headquartered in West Des Moines, Iowa.

Brad Sparta, superintendent at Ballyowen Golf Club at the Crystal Springs Golf Resort in Sussex, N.J., is a big advocate of fertilization by irrigation.

“At Ballyowen, our fertigation is on constantly,” he says. “We have our micrometers set very low, so whenever we are watering we are fertigating. It is constantly feeding your turf and you never get that ‘flush’ of growth or that bright neon green flash.”

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When Ridgewood Country Club in Ridgewood, N.J., site of this year’s PGA Tour Fed Ed Cup playoff series The Barclay’s tournament, installed a new irrigation system in 2005 the club added a fertigation system “because it would have been foolish not to when the opportunity presented itself,” says Todd Raisch, CGCS.

“Initially, I refused to entertain the idea of putting nitrogen through the system,” he says. “I was concerned about rates, stuck heads, calibration, leaks, etc. We started out with wetting agents that first year and added phosphate the next year. In the last couple of years we have added nitrogen. At first, it was in the rough only and we were using larger quantities of nitrogen every three to four weeks just to supplement our granular program. As we became more comfortable with the system we eventually added the fairways.

He normally sprayed .35 lb/N/M every month on his fairways, Raisch says, and somewhere between that third and fourth week things would go a bit off color. “An extra tenth supplied through the system was just the right amount to carry us through to the next spray,” he says. “The second half of this past season I went with ultra low rates across the board, .01 lb/N/M, every time we watered. We used ammonium sulfate and have been thrilled with the results. The consistency in color and growth improved almost immediately everywhere on the course.”

The results, Raisch says, speak for themselves. “We held the Barclays and using the fertigation system in the outer roughs has done wonders to help it recover from foot traffic.”

Dustin Riley, CGCS, Oconomowoc Golf Club in Oconomowoc, Wis., injects penetrating-type wetting agents into his course’s irrigation system starting mid-May through

August. He prefers penetrating-type wetting agents because he is more concerned with having the ability to wet the profile and simulate a soaking rainfall than retaining water within the upper four inches of the root zone.

“My irrigation is ground water fed and is very high in manganese,” he says. “During stretches of low rainfall, repeated irrigation cycles continually dump manganese into the soil. As concentrations build the soils tend to seal up and restrict water movement. When the soils reach this state, irrigation becomes less effective and the turf becomes stressed. In the past, I was only able to wet two to three inches of the profile with a 30-minute irrigation cycle (about 0.25”). By injecting a penetrating wetting agent along with my normal irrigation cycle I am able to wet 12 to

18 inches of the soil profile with 50 percent less water.”

Riley’s fertigation processes result in considerable savings.

“I spend approximately \$3,000 a year on injected wetting agents. This is a tremendous savings if compared to a 90-day type of wetting agent,” he says. “By injecting the wetting agent through the irrigation I do lose the ability to specifically target a confined area, such as a tee surface or fairway turf, like I would with a dedicated sprayer application. On the flip side, injecting the wetting agents directly into the irrigation system allows some product to reach the perimeters of the playing surfaces, such as green surrounds or immediate roughs covered by irrigation.”

Mike Swing, CGCS, Visalia Country Club in Visalia, Calif., plans to include fertigation capability in the course’s new irrigation system scheduled to be installed within the next two to three years.

“At my past three golf courses I had fertigation installed and found it to be very beneficial in our fertilizer program,” he says. “The first two were grow-ins. In this situation – new



Fertigation distributes small amounts of fertilizer and other turf and soil-enhancing products enabling it to better resist problems.

irrigation, good spacing and excellent coverage – it really helped address our poor soil conditions (high calcium bi-carbonate) and push our Bermuda grass fairways to quicker maturity. Because we were in a grow-in situation time was of the essence to meet a grand opening that was in step with the housing market. This is where fertigation really pays off in faster maturity and early mowing to develop that playability density. In conjunction with traditional granular fertilizers we were able to inject sulfuric acid to offset our high pH water and calcium bi-carbonate soils. We also used wetting agents to help the germination and soil percolation issues.”

For a new course grow-in, Swing believes fertigation is an essential tool in addressing many issues that face a golf course superintendent and the high expectations of the owner and soon-to-come golfers.

Moving past grow-in, he says, fertigation can spoon feed a course to avoid growth surges commonly associated with granular fertilizer.

“Of course, you can use granular fertilizer in small rates and repeat several times,” he

says. “But then that’s where fertigation excels. You can be fertilizing at night when you and your crew are sleeping, a huge labor savings, and have controlled growth. In many parts of the country, golf courses are over seeded. Again, fertigation is a great tool to get your rye grass up and going for that all important first cut.”

When it comes to purchasing equipment for fertigation, Swing advises superintendents to do their homework.

“Choose only high quality injectors,” he says. “Liquid fertilizers are very corrosive and you really don’t want to have issues. Control packages that produce variable injections to match your pump station output are also critical. Double wall tanks may not be necessary in your state but you’ll sleep better with a double wall tank. That also goes for high quality fittings. Also, spend time traveling to a golf course that is known to have a good system and management program.”

Superintendents should first understand that fertigation systems are tools and as such can perform some tasks very well and others not as well, Christiansen says. “The superintendent should analyze the maintenance program to determine the potential uses for injection technology in their concept of course management,” he says. “Some of the best uses of nutrient injection are color and growth management, particularly with materials that require frequent application at low rates; micro-nutrients for example. Water quality adjustments also fit well with injection.”

The true benefit of fertigation is better sustained growth rates, addressing soil conditions in a very deliberate and consistent manner and the labor saved in applications that now can be scheduled for other course improvements, Swing says. “Fertigation will only perform to the level of your irrigation system,” he says. “Poor coverage and station control will not live up to your expectations or monies spent.”

Injecting wetting agents through his irrigation system has improved irrigation efficiency and playing conditions, Riley says, adding he highly recommend this option for wetting agent application.

While proven effective, using irrigation systems for fertigation may not be for everyone. Mark Mansur, superintendent at Wintonbury Hills Golf Course in Bloomfield, Conn., has considered using his irrigation system for fertigation, but he found it to be

cost prohibitive for his small budget. A more targeted approach with a sprayer or spreader is in line for Wintonbury for more controlled nutrient management. “I’m sure it is a valuable tool for some golf courses,” he says. “It probably depends on the layout and other topographical issues.”

Many superintendents do not have fertigation and those that do utilize it in varying amounts, Vinchesi says. Some use it judiciously, while others use it for simpler applications, such as wetting agents or have abandoned them over time. Many times, non-use is due to a superintendent change. “Fertigation systems require a level of knowledge and maintenance that is different than just using a sprayer,” he says. “For one, it is not at the maintenance facility it is at the pump station, which makes it less convenient. It also requires liquid products or dissolving other products.”

To fertigate through an irrigation system, superintendents need a versatile, quality system, which is not cheap, Vinchesi says. “Inexpensive systems many times require that you apply large amounts of water to get down the desired application because the fertigation pump is too small,” he says. “As a result, the golf course is over-watered to apply the fertilizer. There are drift concerns also. A golf course that is completely surrounded by residential homes may not be good for fertigation application. Some products are hazardous and require special handling, especially with acid inject systems.”

For superintendents new to the concept of fertigation fear can be an overriding factor, Christiansen says.

“If they would start by trying a product that has low cost, low risk and high reward they would develop a trust,” he says. “Magnesium sulphate is one such product. It used to be applied as often as iron for its greening ability but has gone out of favor. Many of the best injection products are more ‘old school,’ while the industry is pushing constantly to newer, more cutting edge technologies. What gets lost is the fact that the modern computer driven fertilizer injector is a very modern and sophisticated product.”

While it may not be a panacea for best practices turf management, irrigation-based fertigation nonetheless can be a valuable tool in any superintendent’s arsenal. **GCI**

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