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MAY 25 2006

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17 Th Hole

Iron Lakes Country Club

Allentown, PA

Steve Stranzl, CGCS

May will bring us to another southern venue, this time in Allentown at Iron Lakes Country Club. Steve Stranzl, CGCS has graciously agreed to host our May meeting. On Tuesday May 16th, we will have the opportunity to play this 6402 yard, Par 71 layout.

In 2001, the current ownership began improvement to the course that was once known as Twin Lakes. The current name of Iron Lakes is reflected in the water filled quarries that are present on the 18th hole. The course was constructed in two different decades taking shape originally as a nine hole layout in the early 60's then becoming the current layout of 18 holes during the 70's.

Steve served as superintendent at Green Acres CC in Reading for 13 seasons prior to taking the reins at Iron Lakes. Steve's family has ties to the green industry as both his father and brother are superintendents and his son is currently enrolled in Penn State University. Steve manages the property's 155 acres with a staff of 10.

Projects since 2001, have included tee construction, bunker renovation, and the installation of an automated irrigation system.

Dr. Mike Fidanza, Penn State University Berks Campus will speak on the research he was involved in at Rutgers University. The research covered the topic of improving fungicide applications to turfgrass.



President's Message.....

As I sit on the couch and watch "It's the Easter Beagle Charlie Brown" with my three year old son, I am in awe of the writing of Charles Schultz. Many of his videos were written and produced 20 to 30 years ago. The messages he provided us with years ago can still be applied to society and how we live our life today. That is the sign of a good author when his message can stand the test of time.

That brings me into my next thought. With some warmer temperatures and some much needed rain, it is a good time to implement some agronomic practices which have stood the test of time. Performing some good cultural practices like aerification, topdressing, overseeding, taking soil tests and applying a proper fertilization are the only things that can repair the damaged turf from last year's never ending summer.

Our golf season began with our first meeting being held at Whitetail Golf Club on April 18. I would like to thank Jeremy Reph and his staff for giving us the opportunity to enjoy his facility. Our next meeting will be held at Iron Lakes Country Club on Tuesday, May 16. I look forward to seeing many of you there.

Duane Schell

Editor's Notes.....

As spring hits full stride, irrigation systems get charged, and talk turns to drought — not the way I envisioned spring in NE PA. The snow free winter allowed much work on golf courses, which seemed to be a good thing until grass started growing and herbicides and insecticides needed to be watered in and the dry weather continued. I have visited many courses and the dry weather has been a hot topic as the dreaded "D" word reared its ugly head again. Although the crews are now adept at hand watering it is not something that we wanted to have to deal with again.

I would like to thank our meeting sponsors, Finch Services and Harrell's Turf Specialty, for contributing to our meeting at Iron Lakes. Your support is greatly appreciated.

As I put this issue together, I came across an article on auditing irrigation systems that I felt was pertinent. As water is the chemical most applied to the golf course it is often overlooked as it doesn't have a per application price. A simple audit of your greens and tees could show where and why hot spots occur. These are easily done with minimal time and materials. An irrigation consultant could be retained to provide a more detailed analysis and explanation of the results which might benefit your course in the long run. Either way, there's the potential for reduced water usage and decreased labor expense.

Here's to some well timed rain in the near future. Hope to see you at the monthly meetings.

Jim Gurzler



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Jack Frost National Golf Club
Blakeslee, PA

Bryan Nuss, Superintendent at Jack Frost National, is currently preparing the course for a partial opening later this year. Golf Strategies, course developer, and Terry La Gree, Golf Course Architect have retained Robert McNeil of The Northeast Golf Company to manage construction. Jack Frost National had been in the planning stage since approximately 1996. Bryan has been on staff since last year after working at Timber Trails. Golf course construction has many different challenges that have allowed Bryan to experience many interesting management strategies.

Jack Frost National will be surrounded by home sites that will provide membership opportunities for the homeowners. Jack Frost will open as a semi-private course until membership grows at which time the course will become private. The course will be a Par 72 layout measuring over 7200 yards from the championship tees. The design calls for 5 sets of tees to accommodate all ages and abilities.

The 11th hole features a waterfall. This will be the signature hole along the entry road from 940 to the ski area and clubhouse entrance. The 8th hole is also a Par three along the entry road and was the first hole to be completed.

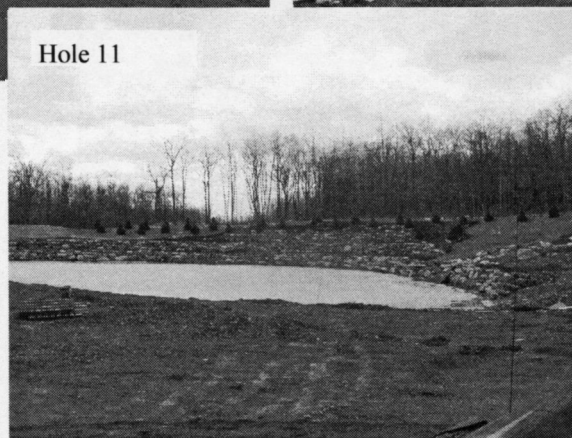
Bryan and his assistant Markus Buetter are awaiting the construction of their maintenance facility, construction which is scheduled to begin in April of 2006.



Hole 8



Hole 11



Hole 11

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Fungicide Application Effects on Non-target Microbial Populations of Putting Greens

G. E. Harman, E. B. Nelson, and K. L. Ondik
Cornell University

Researchers at Cornell University tested the hypothesis that repeated applications of fungicides to putting greens would have major impacts on microbial populations of both foliar and soil-borne microbes. Surprisingly, this was not the case. Their results include:

- The total number of fungal propagules detected was greater in soil at the start of the season than later, but there were no significant effects even after the season-long application of fungicides, regardless of the fungicide applied.
- On leaves, there were no significant effects of fungicide applications on total numbers of fungi, regardless of time or fungicide application. Most of the fungi detected were in the genus *Trichoderma*.
- The relative numbers of filamentous fungi versus yeasts changed substantially on turf leaves as evidenced by both the numbers and plate appearances. However, there was no significant difference in total microbial metabolic activity among fungicide treatments.

It does not appear that repeated applications of fungicides have major impacts on soil microbial communities.

SUMMARY

Scientists from the USDA Agricultural Research Service in Columbus, Ohio and Spectrum Research, Inc. instrumented the Morris Williams Municipal Golf Course in Austin, TX to investigate the nutrient concentrations and loads that might be expected from typical management on municipal golf courses in a semi-arid climate. Surface and subsurface hydrology and nutrient ($\text{NO}_3\text{-N}$, $\text{NH}_4\text{-N}$, and dissolved reactive phosphorous, DRP) concentrations were measured for a 5-year period (April 1, 1998 to March 31, 2003).

Findings include:

Estimated storm flow contributions were 1.2 kg ha⁻¹ yr⁻¹ $\text{NO}_3\text{+NO}_2\text{-N}$, 0.23 kg ha⁻¹ yr⁻¹ of $\text{NH}_4\text{-N}$, and 0.51 kg ha⁻¹ yr⁻¹ DRP. These storm flow amounts represent approximately 3.3% of applied N and 6.3% of applied P over the contributing area for the same period.

The golf course contributes a significant increase in median concentration of $\text{NO}_3\text{+NO}_2\text{-N}$ (+0.46 mg L⁻¹) to baseflow exiting the course. $\text{NH}_4\text{-N}$ concentrations were reduced in baseflow (-0.06 mg L⁻¹), and the course had no significant effect on DRP concentrations in baseflow.

$\text{NO}_3\text{-N}$ concentrations (1.27 mg L⁻¹ at Site 3; 0.32 mg L⁻¹ at Site 4) and load (2.7 kg ha⁻¹) transported through the subsurface drainage water were approximately 1/10th the concentration and load typically reported for tile drainage from row crop agriculture.

A strong seasonal pattern was detected. $\text{NO}_3\text{-N}$ was present in greater concentrations in the surface and subsurface drainage water during the winter months (periods of greater rainfall, turfgrass dormancy, and reduced microbial activity) when compared to the spring and summer months.

DRP concentrations in the subsurface drainage water were greater than concentrations measured in tile drains from agriculture and could pose a potential threat of eutrophication to a surface water system.

The timing of $\text{NO}_3\text{-N}$ and DRP movement through subsurface drainage from golf course turf appeared to be dependent on climatic factors (temperature and precipitation) and turf management factors (magnitude and timing of applications).

The magnitude of $\text{NO}_3\text{-N}$ and DRP concentrations was dependent on the frequency and amount of fertility management practices. At the more intensively managed site, consistently higher $\text{NO}_3\text{-N}$ and DRP concentrations were detected in the drainage water than were measured from the less intensively managed site.

The complete report of this research and many other reports can be found at USGA's *Turfgrass and Environmental Research Online* (<http://usgatero.msu.edu>).



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Wasting Water

Do Water Audits save you money?

By Richard Lenti

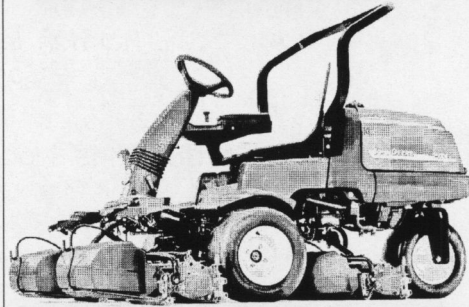
You wouldn't throw money in the trash, but when it comes to maintaining landscaping, many property owners are letting their money go down the drain. With all the pressure from water purveyors and local municipalities to conserve water, there's never been a greater need to inspect every irrigation system under your care to see if they're working at their optimum. If you aren't performing a regular inspection of a property's sprinkler system, there's a good chance you're wasting your client's water, and that means their money. For some in the landscape maintenance business, the concept of conducting a water audit is just taking hold, but it's something professional irrigators and users of irrigation systems have been doing for years.

So what is a water audit? Do you need one? How does it help? How can it save money? Let's take this one step at a time...Water audits involve the inspection of an irrigation system at some point after it's been installed. In essence, it's a snapshot of how your irrigation system is working at a given time.

But how do you know if you need to conduct a water audit? Usually, there are tell-tale signs. Water running onto pavement and into the streets, an increase in a property's use of irrigation water over a period of time, a complaint made to your local water district by a neighbor; all are signs that the property has a problem. If you think you should monitor it, the property probably needs an audit of the water usage.

There are three basic parts of an audit. The first step is an analysis of the property's water use patterns. That involves weather data and the historic water use patterns of the site. Next is a visual inspection of the system while it's running to ensure that each component is operating properly. This is where you'll proba-

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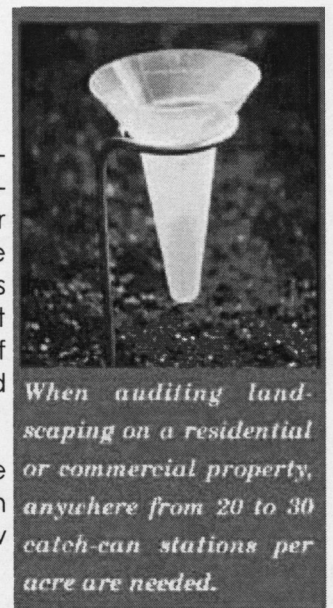


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When auditing landscaping on a residential or commercial property, anywhere from 20 to 30 catch-can stations per acre are needed.



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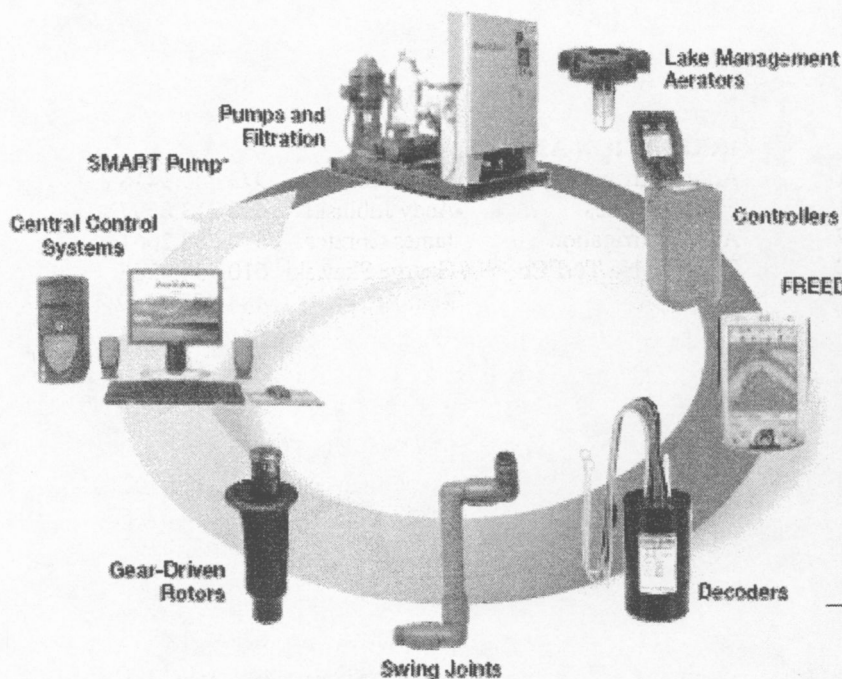
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bly find the source of many of the system's deficiencies. Often, the repair is simple: a misaligned sprinkler head or one with too much range; the wrong nozzle; a blown riser. It's imperative that these maintenance problems be addressed before performing the third step, which is a performance test. If the system isn't working properly, a performance test is really a waste of time, defeating the whole point of an audit.

Once the irrigation system's deficiencies have been addressed, it's time to check and see if the sprinklers are providing uniform coverage. The easiest way to see how uniformly the sprinkler system is working is to use catch-cans within the coverage area. These catch-cans are placed throughout the zone that's being evaluated. The water is turned on, let's say for five minutes; then the amount of water is measured in each catch-can. If there are big differences in the amount of water in each catch-can, then there is a problem somewhere.

Now you may be tempted to do this on your own instead of hiring an expert. But that could prove to be penny wise and pound foolish. There's more to evaluating an irrigation system's efficiency than looking at water in a cup. And creating an efficient watering schedule that conserves water takes some training in how to interpret the data you've collected.

It's those watering schedules that Brian Vinchesi, of Irrigation Consulting, Inc., Pepperell, Massachusetts, says are the greatest benefit of a water audit. He describes a water audit as a scheduling tool, a field test of an irrigation system that's designed to show its distribution uniformity and precipitation rates. From the data collected, a base schedule for the system is derived.

Another firm believer in the effectiveness of water audits is Tim Wilson, of H2O Stewardship Solutions in Cheney, Washington. He's done hundreds of audits and says the goal is to correct the system by looking for weak spots and fixing them. After correcting the system, he also recommends creating detailed watering schedules and then keeping things watered evenly. In simple terms, a water audit should teach people how sprinklers apply water. Incredibly, even after conducting an audit that shows where improvements can be made, saving water and money, there's a tendency for both property owners and landscape contractors alike to fall back on old habits and start wasting water again. "They mean well," says Wilson, "but don't follow through because of budgetary restraints. They don't have the capital."

A study in the Contra Costa Water District in Northern California found that many audited sights eventually deteriorated to pre-audit levels because they didn't maintain the improvements. "In theory, if someone has fully implemented the schedule, it will save water," says Wilson. "The problem is in the implementation... they use parts of the audit, but ignore others." Often, the problem is just a question of maintenance. Chris Willig, of Environmental Water Management, Agoura Hills, California, says that over 80 percent of the changes, repairs and maintenance he recommends after an audit are relatively small. He feels that if landscape contractors do their systems checks frequently, they would run across these deficiencies before they become problems. "I think those systems checks are critical in keeping the number of problems relatively low."

It's also important to realize that a water audit is not the "end all to be all," and that it should be part of a comprehensive plan. "Put together a site management plan," says Wilson. "In the long run, it will save money and there will be a payback, a return on the investment." And while a site management plan is usually developed before construction begins, it can be done on a pre-existing structure. A water audit should be one piece of that site management plan.

A complete irrigation system audit should also include the evaluation of plant material within the area that's being watered. The depth of active roots, soil consistency, and evapotranspiration rates are also factored into the equation to ultimately determine how many gallons per minute are being used by the sprinkler system, and the water usage in each zone of coverage. Those are all factors a certified auditor will take into account.

It is important that the person who does your water audit be certified. There are many variables facing an auditor of a landscape irrigation system, as opposed to the uniformity found in most agricultural systems. "When you get into landscape," says Willig, "you now have variable spacing, different heads, and variable plant materials."

Continued on Page 7



Average Rainfall This is the mean monthly precipitation, including rain, snow, hail etc.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
mm	56.8	58.6	64.2	79.7	97.5	102.8	105.6	92.9	94.9	76.7	81.0	68.0	979.4
inches	2.2	2.3	2.5	3.1	3.8	4.0	4.2	3.7	3.7	3.0	3.2	2.7	38.6

Source: WILKES BARRE, LUZERNE COUNTY data derived from NCDC TD 9641 Clim 81 1961-1990 Normals. 30 years between 1961 and 1990

Continued from Page 6

For example, usually five or six catch-cans per acre are sufficient for auditing water use on a large turf rotor system. When auditing landscaping on a residential or commercial property, anywhere from 20 to 30 catch-cans stations per acre are needed. To accurately determine how well a sprinkler system is working, Wellig says it's essential that an auditor take representative samples from all the irrigation zones, and take into consideration the sprinkler heads being tested. Different heads will perform at different rates.

Even the experts can have a hard time with all those variables. Currently there aren't any uniform guidelines for auditors to follow. Consequently, there's a lack of uniformity in the results that can be derived from auditing the same property. "You might have three different audits on the same site," says Vinchesi, "and you won't get the same results because each audit was done differently." The Irrigation Association has developed guidelines that are currently under review. Once a standard is in place, there should be more uniformity as to how audits are done. So now that a water audit has been conducted, what's next? Often the fix is relatively simple; occasionally, it involves more costly and time consuming repairs like replacing parts of the irrigation system. Unfortunately, the desire to save money, which leads property owners to conduct a water audit in the first place, often motivates them to ignore implementing the changes necessary to make the audit cost effective.

As budgets tighten, property owners and managers have to make hard choices. That often translates into a more "bang for your buck" mentality. With rising energy costs, water conservation is not always a priority. Especially on commercial properties, where the emphasis tends to go towards energy conservation, and there seems to be a greater savings by cutting back on a huge electric bill versus the smaller savings found in efficiently irrigating that property.

However, there could prove to be folly in that thinking. Water sources don't always remain constant. Aquifers can become depleted. Drought can quickly ravage regions where water was once abundant. And the price of water is always going up. The long-term benefits of water conservation far outweigh the short-term savings found in putting resources elsewhere. There are also lots of other problems caused by wasting water that could cost a property owner much more than the initial price of repairing an irrigation system. Things like the destruction of wood fences and supports, asphalt deterioration, paint damage and building settlement. Avoiding those potential consequences of not maintaining the system should be reason enough to conduct an audit.

"What we try to do is identify the dollar savings that we think are available on the site," says Wellig. "That allows the customer to evaluate the bids they may get on these upgrades and maintenance issues. So getting a handle on the potential savings in dollar terms is critical. The objective is to allow the customer to understand the water use and make better decisions on how they want to spend their landscape maintenance dollar. And that's really what a water audit is... a mechanism for the customer to really understand how they're using their water."

In many instances, the costs for minor repairs should be included in the landscape maintenance contract. When the costs for repairs are more significant, that's when the landscape contractor needs to be proactive. A well-done audit will help you convince the property owner that the savings in water conservation will far outweigh the initial outlay of capital.

A good place to find a qualified auditor is the Irrigation Association. They are responsible for certifying auditors,

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and they maintain a list of who's qualified to do audits in your area. Some irrigation contractors also do water audits, but there could be a conflict of interest if the person you hire to repair the irrigation system is also the person telling you what's wrong with it.

To avoid that dilemma, it's probably best to hire an independent, certified water auditor. Wellig says his company does not do design or repairs to avoid the implication of a conflict of interest. "All we do is go out to a site, evaluate the water use, look at the system, and prepare a report that would help the customer make a decision. They hire somebody else to deal with repairs to the system, the redesigns, whatever it entails as a consequence of the inspection and the testing."

More often than not, a water audit should pay for itself. But for the audit to work, it's important that it be done right, and that the recommendations made are implemented and maintained. "If someone does an audit," says Wilson, "and makes improvements so water is distributed evenly, if they develop detailed watering schedules, if they implement those watering schedules, and if they update those schedules according to weather changes, and then if they keep regular maintenance on the system to keep it watering efficiently... then yes, water audits work." In the long run, that will save your client money, and that makes you look good.

Reprinted with permission from Irrigation & Green Industry Magazine.

Interseeding Roundup-ready Creeping Bentgrass into Established 'Penncross' Creeping Bentgrass

*Travis W. Gannon and Fred H. Yelverton
North Carolina State University*

With the forthcoming registration of Roundup-ready creeping bentgrass (RRCB), optimum means of establishment must be determined. Research trials were initiated to determine if an existing bentgrass fairway could be transitioned to RRCB utilizing sublethal rates of Roundup and various seedbed preparation techniques. The idea to be tested was that sublethal rates of Roundup could be utilized along with seedbed preparation to allow RRCB to establish while maintaining an acceptable playing surface allowing a course to remain open for play during the transition. Sublethal Roundup rates were also staggered at various timings around seeding to determine if the initial application timing was crucial. Additionally, seedbed preparation techniques included vertical mowing in two directions, vertical mowing in two directions in combination with core aerification, and no seedbed preparation. The results included the following:

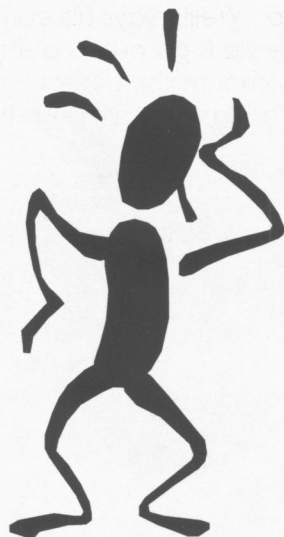
- Establishment of RRCB by interseeding into existing creeping bentgrass did not allow for a timely transition to RRCB.
 - Researchers were unable to maintain an acceptable playing surface during the transition to RRCB utilizing sublethal Roundup rates and various seedbed preparation techniques.
 - Interseeding new and improved bentgrass cultivars into existing bentgrass is most likely not a successful practice, regardless of seedbed preparation.
- RRCB establishes similarly to non-transgenic bentgrass cultivars when seeded into conventionally prepared seedbed.

The complete report of this research and many other reports can be found at USGA's *Turfgrass and Environmental Research Online* (<http://usgatero.msu.edu>). The specific URL for this report is <http://usgatero.msu.edu/v05/n04.pdf>.



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