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The Challenge Of Poor Irrigation Water

By: Frank S. Rossi, Assistant Professor of Turfgrass Science Cornell University

The recurrent droughts experienced through the US each year have given the turf industry pause. Watershed commissions that cross state lines, water management districts that determine water needs, and municipal water suppliers continue to question the use of potable water for recreational (read nonessential) use.

The Northeast Climate Center reported that the month of April in the Northeast United States was the driest in recorded history. The Southeast United States is in the throes of the most significant drought in the last 100 years. The Florida golf industry may soon be facing phased-in restrictions that will allow watering of fairways once per week, and greens and tees twice per week.

The energy debate that is currently raging - across the United States—and focused in California—pales in comparison to the volatility and politics of water. Water rights stir deep emotions in the Western states," says Bill Bradley, former Senator from New Jersey and member of the Senate Energy and Natural Resource Committee, in his 1996 memoir *Time Present, Time Past* (Knopf Publishing, NY). "Disputes over water in Western history have affected sovereignty and influenced borders," Bradley alludes, "where many say whiskey is for drinking, water is for fighting."

With less than 1% of the world's water available for human consumption and 80% of the fresh water consumed for agriculture, concern is growing over water used for maintaining greenspace, such as golf courses. Jim Watson, Ph.D., in the opening chapter of the 1994 text *Wastewater Reuse for Golf Course Irrigation* (Lewis Publishers, MI), proposes six areas that will increase water availability. Along with conservation and development of plants that use less water, Watson suggests that the use of wastewater and desalination of seawater offer two important options. As salt-water intrusion into Long Island wells increases, desalination may soon be required.

Wastewater

With population growth and the demand for potable water expected to increase, the turfgrass industry can no longer take a passive approach to water use issues. The Western US receives only one third of the nation's rainfall, yet uses 80-85 percent of the nation's fresh water.

A 1999 survey conducted by the National Golf Foundation reported that 34% of golf courses in the Southwest US use effluent water (recycled, non-potable, wastewater, reclaimed). Nationally about 13% of all courses use effluent. Where irrigation water costs can range from \$100,000 to \$1,000,000, effluent is a viable option. Still, should every course use effluent? Is all effluent created equal? Does effluent create other challenges?

Effluent wastewater can be delivered following primary secondary or tertiary treatment at a wastewater treatment facility. Primary treatment mechanically removes the majority of the solid waste with screens, grinders and settling tanks. While primary treatment involves mechanical removal of solids, secondary treatment engages biological processes to remove the majority of the remaining solids. Secondary treatment may also involve chlorinating prior to discharge. Water for turf and landscape uses must have at least experienced secondary treatment.

Several processes may follow secondary
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President's Message.....

Pecking Order? Participation!

While reading this, please keep in mind, these are my opinions. I am trying to keep the best interest of the Pocono Turfgrass Association while I am President.

Let me start by issuing an apology to all PTGA members, who may be members of one or more of our neighboring associations, because I take full responsibility for the overlapping of meeting dates. I can guarantee next year a more conscious effort will be placed on joint meetings, and when possible, meetings scheduled when others are not. I've noticed one thing that sticks on me like a thorn in my side. When meetings overlap with another association we see the same commercial faces. Which I'm glad to see, but where are some of the others? I would guess at the other meeting. Which is okay, but like this year we had 3 meetings overlap. Why not attend one of ours and two of the others? I do not want to hear, "because I make more money down in Philly." It offends me! If my budget isn't big enough for you to be concerned about this Association, I'll give my patronage to the commercial guys who do enough.

Okay, I'm stepping off my soapbox, but one last thing. I've noticed superintendent participation for meetings is down. I think the meetings have been really great. The format is different. The service at the clubs has been good. And the courses have been in great condition. If you have some suggestions, please contact me or any other board member and we will be happy to discuss them with you.

Have fun blowing leaves!

Gene Huelster

From the Editor's Desk.....

It's been a hectic late summer/early fall. And *Chips & Putts* is getting out a little late (again!). Oh well, I hope you enjoy the content. The lead article is a good background for all of us about irrigation water and the Powerful Presentation (on page 5) article gives us all good tips for those budget, interview and miscellaneous presentations much of us give during the off season. GOOD LUCK!

See you at the meetings,

Darrin Batisky



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treatment, including using chemicals to flocculate remaining solids followed by more sediment removal, and various methods of filtration. A reverse osmosis process or chlorinating that can occur prior to release produces highly purified water. In the end, the water will likely contain a variety of nutrients (from the waste) metals (from the flocculation) and salts (from the purification) that will require careful management to minimize their impact on turf quality.

Interestingly, golf courses often involved with real estate development are constructing their own wastewater or desalinization treatment facilities. Several Audubon International Signature Properties are leading the way with small facilities that utilize ultra filtration and biological reactors to treat wastewater before reusing it back on the course. Jupiter Island Country Club in Florida recently installed its own reverse osmosis facility to desalinate salty ground water. Estimates are that the \$500,000 price tag can be recovered in a few years based on the increasing cost and restrictions placed on irrigation water in south Florida.

Be Aware

Dan Quast, the former golf course superintendent at Medinah Country Club outside Chicago, IL, discussed his preparation and challenges from the 1999 PGA Championship at the New England Turfgrass Conference. The summer of 1999 will be remembered for its drought; Dan will remember it because of his high salt content irrigation water. Dan indicated that salt levels increased 5 to 10 fold during the summer months. He then asked how many superintendents regularly monitor their irrigation water quality. Less than 10 hands were raised in a room of 500 attendees!

Golf course superintendents who manage with effluent water cannot afford such ignorance. Effluent water quality can be variable and will always have a variety of "contaminants" that will require specific management practices.

Professors Bob Carrow and Ronny Duncan from the University of Georgia authored Salt Affected Turfgrass Sites (Lewis Publishing, MI) in an effort to bring together the best thinking on managing turfgrass with poor quality water. The title of the Carrow and Duncan book clearly identifies the major challenge with effluent irrigation water—high salt content—but it is not the only issue.

The March/April issue of the USGA Green Section Record included an article by Mike Huck, a USGA agronomist in the Southwest Region with Carrow and Duncan, on effluent water. The article outlines the major agronomic and environmental issues and suggests that the first step to using effluent water is to establish a regular monitoring program. In fact, even if your effluent provider offers periodic lab results on the water, Huck et al indicate that this will often not be sufficient for assessing irrigation water quality. A reputable agricultural soil and water lab is preferred.

Salty Turf

In a presentation at the 2001 USGA Florida Regional Conference, Bob Carrow stated that "the three most important aspects of managing high salt content irrigation water are leaching, leaching, leaching." This is not simply a matter of copious amounts of water that keep salts moving downward; the superintendent must know the type of salt that must be leached, rainfall amounts, turf species tolerance range, and time of year.

Sodium salt can have a direct influence on plant growth in a manner similar to how dog urine burns leaf tissue (although dog urine is a different

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Bob Eichert

Bill Rahling



(Continued from page 3)

salt). However, while the direct burn from high salt content irrigation water is rare, high sodium content soils often produce plants that have restricted rooting and develop drought stress symptoms. Depending on the water source and rainfall pattern, the long-term effects of sodium on soils is well documented. As sodium content increases in the soil, the vital process of aggregation is disrupted.

Sodium molecules absorb large amounts of water and swell. The swelling prohibits finer silt and clay particles from making larger aggregates that offer a variety of pore spaces for water and nutrients. In other words, as described by Nick Christians in his 1998 book, *Fundamentals of Turfgrass Management* (Ann Arbor Press, MI), soils with high sodium content have the appearance and behavior of fine talcum powder. This slows the infiltration of water and renders the soil unsuitable for plant growth.

As suggested above, moving the sodium downward via leaching is the key. However, the leaching water should include a soluble calcium (Ca) source. The Ca literally pushes the sodium off the soil particles and leaves it vulnerable to leaching. Of course, the Ca content takes on more importance if the leaching water is already high in sodium.

Salt Management

There are a variety of other water quality issues that are addressed in the USGA Wastewater text, the new Duncan and Carrow text, and several articles in the Green Section Record in 2000-2001. These issues include heavy metal toxicity, other nutrients, total suspended solids, and low pH. All of these factors will require specific management practices in an effort to minimize the impact on turf quality.

The first step, as previously stated, is a regular water quality monitoring program. The next aspect of leaching is critical for long term turf performance. Additionally, core aeration creates channels for water to infiltrate when leaching. Also, less destructive techniques such as high pressure water injection, slicing, spiking, etc. can be implemented. Finally, one must recognize the species tolerance of poor

quality water and realize that a biological system cannot just shift to poor quality irrigation water use without a noticeable reduction in quality. Specifically, cool season grasses are significantly less tolerant of high salt content and will decline rapidly, especially in warm summer months.

Regulatory as well as 'hidden' costs can consume any savings realized from utilizing less expensive wastewater. Significant costs can be incurred for contamination protection devices and employee training as well as to meet specifications for wastewater storage. Other management costs could include water amendments that will need to be injected into the irrigation system as well as the deterioration of equipment regularly exposed to high salt content water. There can be revenue impacts such as having to close a course during the day to irrigate overseeded turf.

A 2003 Anniversary

The 1993 Golf Course Wastewater Symposium was an important contributor to raising awareness nationally on what was up until then viewed as a regional concern. Twenty two states had golf courses using wastewater irrigation, with over 70% of them coming from the Southwest and Florida. What will those numbers look like in 2003, the 10 year anniversary of the Symposium? How about general poor water quality experienced by people such as Dan Quast in IL?

Most superintendents, especially in areas with adequate rainfall, take their high quality irrigation water for granted. If the population continues to grow, the leadership effort by the turf industry in using effluent could be viewed as facilitating "smart growth." In other words, communities will need golf courses as outlets for society's waste, whether it is water or compost.

- Adapted for Cornell University Turfgrass Times; Volume 12, Number Two (Summer 2001)

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Tips on How to Make a Powerful Presentation

"You must know your audience. If you're not already an insider, find out everything there is to know about the group and tailor your remarks accordingly. If that's not worth doing, the speech isn't worth giving." — Ed Wohlmuth



1. Define your listeners – who are they? What do they hope to gain from your presentation?
2. Define precise limits of your topic. Is it a sales presentation? Is the purpose to explain, enthuse, or report on a project's progression?
3. Have a clear sense of purpose in speaking. Use the six (6) journalist's questions to assist you in framing your presentation: What?, Why?, When?, How?, Where?, and Who?
4. Structure your communications with a clear beginning, middle, and end. Bring in the main points early. Allow time for questions. When you're presenting, get on the schedule early.
5. Rehearse your delivery to the point where you appear natural and relaxed. Know your subject matter thoroughly and over-prepare! If you're scheduled to speak for 30 minutes, prepare at least an hour's worth of material.
6. Start your presentation by indicating that you have brought interesting things of special relevance to your listeners; then deliver them! Never begin or end with an apology.
7. Converse naturally with your listeners rather than reading from your notes or "lecturing" to them. Your role is that of a teacher – to bring interesting and useful information to them. Be well-supplied and enthusiastic. Establish eye contact with as many listeners as possible and don't hide behind the lectern!
8. For emphasis, or self-protection when you are not sure what to say, use the "two-second" pause. Two seconds are long enough to be noticed and short enough so you appear in control and thoughtful rather than unsure. Speaking without pauses makes you appear rushed and doesn't let your ideas sink into your listeners' minds. Pauses of longer than two seconds can be distracting and make you seem unsure of yourself.
9. Demonstrate and quantify the extent of your research, but use statistics very sparingly and carefully. Statistics are more interesting if you reveal them one at a time in a sequential buildup. Visually, they are more understandable if you translate them into bar, line, or pie charts.
10. Focus the conversation on how your analysis, knowledge, and product line and services will benefit others. Use evocative visual and verbal examples so that your listeners will understand and envision your points.
11. Anticipate and address objections before they are raised. Be prepared for and anticipate what others are really asking. Welcome questions and know how to answer even the most dreaded ones well. When responding to questions, be specific; give the same enthusiasm to tough ones that you would to easy ones. Use the name of the person asking the question when you respond. Remain silent once you have responded.
12. Respond to questions from the other person's perspective:
Examples:
"Your need for a detailed breakdown of equipment costs is important to us, and here is how we propose to address it _____." or "It appears that you are inquiring about..."
13. Graciously accept praise, compliments, and kudos from others! Welcome feedback.

— Adapted from: Lisa Micunek's, *Enhancing the Image of the Golf Course Superintendent and Golf Industry Professionals Part I.*

(The author is a GCSAA seminar instructor and the president of Accent on Success, a firm specializing in etiquette & protocol.)



August Meeting Superintendent Profile:

Gene Huelster, Golf Course Superintendent, Pocono Farms Country Club

The host course for the Pocono Turfgrass Association August meeting is the Pocono Farms Country Club. The course is located in Tobyhanna, Pennsylvania with nine holes initially being established in 1970 and the second nine a few years later. The architect of the course is Mr. Art Wall, a former Masters champion. This layout covers over 60 acres and is bordered by a community development, which totals 55 square miles. To tour the entire course takes some time, with the total mileage of a round-trip being 7.5 miles. The layout is exceptional and is enjoyed by 330 golfing members of the club. The greens and tees are the average cool-season turf types of a bentgrass & Poa annua mix, with fairways and roughs being a blend of ryegrass and bluegrass. The fairways will be undergoing a conversion to all bentgrass with a five-year plan, in hopes of producing an 80-90% stand of bentgrass.

Mr. Gene Huelster is the superintendent of Pocono Farms and is also the current president of the Pocono Turfgrass Association. Gene is a 1993 graduate of the Two-year Technical Program at Rutgers University and has worked at the course for 10 years. He has been the superintendent for 6 years and is currently working towards his certification. With his length of history at Pocono Farms, Gene maintains a close relationship with his membership and staff by having a solid work philosophy. This simple but reliable philosophy of "working hard with good things to follow" is the core of his success. By allowing his employees to make their own quality decisions - promotes crew morale amongst his 3 full-time, and 12 seasonal/part-time employees. When Gene is busy with staff meetings, his more than capable assistant of 3 years, Adam Herman, an Allentown native, manages the course. And when Gene isn't fulfilling his professional duties, he enjoys scuba-diving, playing golf, working out, and riding his motorcycle.

- by: Jeff Koch



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A message from your golf course superintendent and GCSAA



Winners of the July Meeting: Stonehedge GC (Partner Scramble)**1st – Score: 67**

Darrin Larkin/Bill Webster

2nd – Score: 69

Duane Schell/Chris Schuster

3rd – Score: 72

Tom Wilchak/Lee Kozsey

Closest to the Pin

Darrin Larkin

Longest Drive

Bill Webster

**Winners of the August Meeting: Pocono Farms CC (Scramble)****1st – Score: 59**

Huelster/Basile/Esposito/Whelan

2nd – Score: 60

Schell/Zimich/Hopeck/Cussat

3rd – Score: 60

Penny/Stranzel/Batz/Vail

4th – Score: 62

Eisele/Hugaboom/Appel/Zaleski

5th – Score: 62

Garrison/Greico/Chassard/Kressler

Closest to the Pin

#3 – Scott Seidel

#11 – Ian Larsen

Longest Drive

#6 – Jeff Hopeck

#13 – Jeff Wambold

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POCONO ROUNDUP

NEWS AND VIEWS FROM THE POCONO
TURFGRASS ASSOCIATION

September Meeting Superintendent Profile

Keith Snyder, CGCS **Great Bear Golf & Country Club**

In the heart of the Pocono region of Pennsylvania lays the Great Bear Golf & Country Club. Located in Shawnee on the Delaware, Pennsylvania, this Jack Nicklaus signature design offers one of the foremost challenges to any golfer. The course hosts over 19,000 rounds per year and boasts a length over 7,000 yards from the championship tees. This par 71 course is spread out over 130 acres, has 52 bunkers, and has Southshore bentgrass tees, greens, and fairways.

The course opened in 1997 and the superintendent has been Mr. Keith Snyder, CGCS. Keith is a graduate of the two-year technical program at the Pennsylvania State University and has been in the golf course industry for 21

years. He has been certified for 12 years and was previously the superintendent of the Dupont Country Club in Delaware, where he had hosted an LPGA Championship tournament. Mr. Snyder is assisted by Ian Larson, assistant superintendent, and has a peak crew of 16 during the growing season. The work philosophy Keith instills in his employees promotes ideas that "quality counts, and not quantity."

When away from the golf course, Keith is a dedicated husband and father. He and his wife, Judy, have raised two daughters, Jennifer and Jessica. Jennifer is currently enrolled at the Northampton Community College and is in her junior year while Jessica is a freshman at Kutztown University. Keith's other interests include spending time in the outdoors, fishing and hunting.

- by: Jeff Koch



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