

Irrigation Efficiency, Are We There Yet?

By E. Paul Eckholm, CGCS, Yamaha Golf and Utility



Having been a golf course superintendent for over 25 years, I felt that I had amassed a pretty good depth of knowledge when it came to irrigation systems. I had worked with designers, installers, pump stations, different manufacturers and done my fair share of repairs. All it took to dispel that myth in my mind was a change in career paths.

During the past three months I have participated in over two dozen training sessions in an attempt to attain a number of new certifications associated with my new position. During all of this training I have kept an open eye toward the real world applications of this knowledge and how it will be applied going forward into the future, faced with the environmental concerns we all will deal with on a

day to day basis.

What I have learned is that while I do indeed know a lot about irrigation, there are a lot of things that I never took the time to consider.

Sure, I was well versed in the inner operations of my system and was able to work the system to get the most out of it based on the limited design; however, the systems that exist in the real world are for the most part inadequate for the needs of the modern turf manager. This is not the fault of the designer, or the manufacturers, but rather a function of the changing needs of the turf based on the demands placed upon it. Additionally, the materials used to manufacture modern irrigation systems are perceived to have a limitless life span.

Indeed PVC pipe has been

shown to have a life span well in excess of 75 years, but, the performance characteristics of that pipe do change significantly during that time. Water flowing through the pipe will cause wear on the inside surface and increase friction which will therefore affect the performance of the system as a whole. Likewise the same type of wear will affect the irrigation head and all of the parts associated with it; valves, drives, o-rings, and most significantly nozzles.

When a new system is installed, how many, if any, of us has ever taken the time to do an initial irrigation audit of the system to check on the actual

real world performance of the design? How many of us took the time to go out with catch cans to see what the real precipitation rate was right after the system was installed to know what the real performance data was? Did it actually perform as the charts said it would? I would suspect that number is at or near zero. How then can a person go out now and look at an irrigation audit with catch cans and see if the system has degraded? Without initial data there is no real way.

Yes, you can do an audit and see if the data differs from the performance charts, but this only gives us part of the picture since we do

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not know if the initial performance matched the charts when installed. Your performance may not match the charts, but maybe they never did.

Please do not misunderstand, irrigation audits are a good idea. However, do not assume that changing out the nozzles will restore the system to original design specs. Wear and tear on all of the system parts will affect performance and just as a 20 year old car will require more maintenance than a new one, 20 year old systems also require more maintenance and upkeep than a new one. Even though the pipe will last, the heads and nozzles may not. Changes to the system over time, be it through additions of lines or heads or whatever, will also affect the performance. Additionally, system programming, which is much improved with the current computer automation, will seriously affect head

performance. As they say, garbage in, garbage out. If the time is not taken to properly program the system, coverage and distribution will be different than expected.

Part of the problem lies with the fact that irrigation audits and system evaluations take time. Time is money. Many turf professionals do not feel that the time invested produces a large enough positive result to make it worth the time. So the question becomes, what is the point that it becomes worth the effort? Without the evaluation of the system, the turf manager will never know how much water is actually being applied to the turf and thus how much is being wasted, both in actual water and the system operational cost associated with that application. Plus, there needs to be system adjustments after the evaluation to make the time spent worth it,



but this takes additional time. We can no longer just assume that all of the fairway stations need to water at 15 minutes and all tees need 10. Each station needs to be set for the proper run time based on the evaluation of the system and the turf environment.

Why should you care about any of this? Over watering, under watering, and unnecessary irrigation are all possibilities. Even though we do not directly pay for water now, we will in the future, I can virtually guarantee it. How much time and effort will it take to analyze a small section of your course just to see how far off you really are? You think you put down an inch of water, but how much are you




really putting out. For the relatively small investment of time, corrected system water use rates, extrapolated out over the whole course and over a number of years, you would be surprised how much water and electricity you are using.

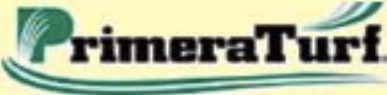
E. Paul Eckholm, CGCS is a former golf course superintendent and is currently an irrigation specialist at Yamaha Golf and Utility. Paul has been working with numerous manufacturers of irrigation products for the past 15 years on product development related to water use reductions. Paul currently holds a number of certifications in irrigation technologies.

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