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The use of the word “fundamental” permeates our society, from our financial markets to sports. When associated with a downturn like in financials, market fundamentals might be cash flow or asset levels as they correlate to a company’s share price. Losing in sports is often associated with a lack of fundamentals, such as lousy tackling and blocking in football or a bad grip and stance in golf.

The bottom line: When things go wrong or you are losing, it’s because you’ve neglected the fundamentals.

So what are the fundamentals of turfgrass management? Actually, I’m not really sure what encompasses all the fundamentals. However, that won’t stop me from discussing one basic plant fundamental that can be routine, boring and even easy to dismiss. That fundamental — plant classification — is a subject that I don’t really find very interesting to teach. And my students might not find it very interesting to learn. But I teach it, and they learn it because it’s important.

This basic fundamental can have vital consequences in turfgrass management. Plant classification is the morphological and anatomical description that separates turfgrass plants into — and I am not listing all the pertinent classes — family, subfamily, tribe, genera and species. Most of us are familiar and use genera such as *Poa annua* and species such as *pratensis*. Subfamily and tribe are something we might memorize for a test and then forget. But it is the three subfamilies known as *Pooideae*, *Panicoideae* and *Chloridoideae* on which I will focus.

Cool-season turfgrasses fall in tribes within the subfamily *Pooideae*, while warm-season turfgrasses fall either in *Panicoideae* or *Chloridoideae*. Warm-season turfgrasses that fall within the *Panicoideae* (*Paniceae* or *Andropogoneae* tribe) are in general adapted to warm and wet conditions. Seashore paspalum falls in this group. The *Chloridoideae* subfamily (*Chlorideae* or *Zoysieae* tribe) are generally adapted to warm and dry conditions. Bermudagrass falls in this group.

It’s Fundamental, But It’s Vital

BY KARL DANNEBERGER



PROPER PLANT
CLASSIFICATION
MIGHT BE A BORING
SUBJECT, BUT IT’S
INTEGRAL TO
TURFGRASS
MANAGEMENT

From this rather general description at the subfamily level, the competitiveness of seashore paspalum and bermudagrass can be predicted. In hot, dry environments (such as the desert), establishing seashore paspalum because of poor irrigation water quality would initially be desirable. However, bermudagrass, which is more adapted to the climatic conditions, would become a major competitor or weed in the turf over time. Conversely, seashore paspalum would have an advantage over bermudagrass in a warm, wet environment.

Granted, we are just looking at one fundamental. In golf course management, we have a number of tools available to us to manage turf in the most inhospitable environments. We are able to reduce competition through pesticides such as selective herbicides, manipulate the system through cultural programs and state-of-the-art technical equipment, and select for superior species through breeding. In many ways, golf course superintendents have the ability to pound a square peg into a round hole. And that’s a credit to the profession.

Yet, over time and in a situation where the competitor to a certain turfgrass can’t be removed (for example, no herbicide is available to selectively remove bermudagrass from seashore paspalum), the outcome in part is predicated on plant classification.

Yes, the topic might be mundane, but plant classification can be a guide to the ultimate outcome in specie competition.

That’s why the topic is so important.

Karl Danneberger, Ph.D., *Golfdom*’s science editor and a turfgrass professor from The Ohio State University, can be reached at danneberger.1@osu.edu.




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PART 1 Getting Out the **Word**

About This Series

I've heard it and you've heard it: Future wars will be fought over fresh water. People aren't just being dramatic when they say this. They believe it's inevitable.

The golf course industry, of course, uses its share of fresh water to maintain turfgrass for playability and aesthetics as part of a \$65 billion industry. But golf courses are often targeted as water wasters.

Beginning with the following stories in this section, *Golfdom* embarks on a three-part series under the heading of "Water Wise" to delve deeper into this matter and educate superintendents and other industry personnel on several fronts.

Part One, titled "Getting Out the Word," reports on what the golf industry needs to do to get out the message to golfers and non-golfers alike that it uses water wisely. The story details how superintendents can change their image from water wasters to responsible irrigators.

Part Two, titled "Less Is More," goes on the premise that while most golf courses use water wisely, they can do more to be even better stewards. The story tells what creative things some superintendents are doing to reduce water usage.

Part Three, "Golf Course Irrigation in 2025," reveals what the future holds for golf course irrigation from environmental, technological and philosophical standpoints.

– Larry Aylward, Editor in Chief

Led by superintendents, the golf industry must change its image from water wasters to responsible irrigators. | [See page 28](#)

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■ [Raising Awareness](#) | page 27

■ [Why Superintendents Use Water Wisely](#) | page 33

You Can Make a Difference

By Kathy Conard

Because water use and quality are serious issues facing the game of golf today, Aquatrols, through its Water Impact Alliance, has recently begun to help golf course superintendents and others in the green industry to develop plans of action against negative press and strict water regulations through comprehensive public relations.

As environmental groups, the general public and the regulatory community become increasingly concerned and vocal about water use and quality, superintendents must speak up in order to protect their courses' water rights, ensuring that water regulators give their needs equal representation and consideration before any restrictions or conservation measures are mandated. The question is how do you do this? It is much easier than it sounds. In fact, some of you may already be participating in these water conservation practices, but you simply need to be pointed in the right direction on communicating your efforts.

First, you must prove your commitment to water and environmental stewardship by voluntarily implementing water conservation practices and integrating them into your daily maintenance regime. In addition to displaying your commitment to efficient water use, you are sending a positive message to state regulatory agencies and the general public. When you enhance your reputation as water-use experts and communicate that message, you



increase your chances of having an equal seat at the table when water policy discussions arise.

Second, realize that no matter how conscientious you are about conserving water on your course, golf courses are likely targets for criticism, particularly

during periods of drought when neighbors are being cautioned to restrict water use, and they see sprinklers continuing to fling water across your course. If enough of these

ent to re-evaluate the water management and cultural practices on your golf course with the goal of being able to demonstrate responsible water use while providing quality playing conditions. As golfers and golf course managers, you owe it to the game to be good stewards of the environment and to educate those outside the industry about the importance and benefits of golf and golf turf. If properly done, the public and policymakers may place our industry a little higher on the

“When you enhance your reputation as water-use experts and communicate that message, you increase your chances of having an equal seat at the table when water policy discussions arise.”

neighbors and concerned environmentalists complain to legislators, the legislators can't help but listen—it's part of their jobs. And if the complainant's voice is louder and clearer than yours, it could kill your chances of negotiating a fair deal as water regulations, or any other political mandates for that matter, are implemented.

Third, do not be afraid to ask for help. Solicit the involvement of your general managers and owners as well as members. Good communication is the best tool you have for diffusing any problems. Keep in mind that the members who enjoy your course may be the best connections you can make to protect it.

No one knows what the future holds, but there is no better time than the pres-

ent to re-evaluate the water management and cultural practices on your golf course with the goal of being able to demonstrate responsible water use while providing quality playing conditions. As golfers and golf course managers, you owe it to the game to be good stewards of the environment and to educate those outside the industry about the importance and benefits of golf and golf turf. If properly done, the public and policymakers may place our industry a little higher on the

Conard is Aquatrols' marketing manager for turf and ornamental. If you have questions or want more information on Aquatrols products or the Water Impact Alliance, contact www.aquatrols.com or call Conard at 800-257-7797.



It's Time to Raise Awareness

By Michael Roberts

Rain Bird has built a reputation for delivering effective and efficient irrigation systems. We also feel it's our duty to encourage the entire irrigation industry — and the customers we serve — to use water responsibly. This commitment to The Intelligent Use of Water™ campaign is woven into the very fabric of our company, and it is at the core of our ongoing partnership with the team at *Golfdom*.

Through this three-part “Water Wise” series, Rain Bird and *Golfdom* hope to raise awareness of the issues surrounding the use of water on golf courses — from availability and cost to quality and consumption.

Over the next few months, we'll focus



on how the implementation of water-efficient practices and technologies can help superintendents positively impact the environment while still maintaining beautiful, healthy courses for their customers.

There are financial as well as ecological benefits to the responsible use of water. Simply put, promoting water efficiency is smart business for anyone who manufactures, installs, services or uses the products that rely on the Earth's limited water supply.

Irrigation is Rain Bird's only business. Every day we leverage state-of-the-art technologies to innovate and develop products and systems that exceed customer expectations by applying water in the most effective and efficient manner possible. Our efforts

“Promoting water efficiency is smart business for anyone who manufactures, installs, services or uses the products that rely on the Earth's limited water supply.”

have earned us not only the respect of the industry, but also the confidence and trust of our customers. That's why we support The Intelligent Use of Water in everything we do.

We hope that you benefit from the “Water Wise” series — and that you are inspired to educate consumers and your fellow irrigation professionals about our shared responsibility to use water wisely.

We welcome your feedback and comments.

Michael Roberts is director of golf irrigation for Rain Bird. For more information on Rain Bird's products or the Intelligent Use of Water campaign, contact www.rainbird.com.

RAIN BIRD





Getting Out the Word

Led by superintendents, the golf industry must change its image from water wasters to responsible irrigators **BY LARRY AYLWARD, EDITOR IN CHIEF**

It doesn't matter if Mark Jarrell is in a deep sleep or his body begs him not to rise from his bed at 3 a.m. If a thunderstorm awakens Jarrell in the middle of the night, he will get up, put on some clothes and make the short drive to the maintenance facility to shut off his golf course's irrigation system. The last thing Jarrell wants to do is squander water on his golf course, the Palm Beach National Golf and Coun-

try Club in Lake Worth, Fla., where he is the certified superintendent.

"I'll drag my butt out of bed to come over and turn it off," Jarrell says.

Nobody would know if Jarrell elected to stay in bed. But he would know, and it would bother Jarrell if he didn't do the right thing.

Jarrell realizes that the freshwater supply is dwindling in this world, and he wants to do his part to conserve what is now being called a "precious commodity."

Jarrell is not alone. Not only do most golf course superintendents believe that it's environmentally wrong to waste water, they also know that applying too much is not good for the health of their golf courses or their maintenance budgets.

Ironically, just as nobody knows that superintendents like Jarrell will get out of bed to turn off the water in the middle of the night, few people outside the golf industry realize that superintendents strive to be responsible water users. In fact, many non-golfers believe that golf courses just turn on the sprinklers and let them run, not caring how much water they use as long as their courses are lush, thick and vibrant green.

"We're just too visible," Jarrell says.

Superintendents are bothered by the water-wasting perception, and they

realize it's time to fight the stigma. But what can they do? And where should they start to convey the message that most golf courses and their superintendents use water wisely?

There are several avenues to pursue to communicate the message. But superintendents believe that getting out the message should not fall squarely on their shoulders. They say they need help from their professional peers — including owners, pros and general managers at the local, regional and national levels — to spread the word.

Shawn Emerson, director of agronomy at the Desert Mountain Club in Scottsdale, Ariz., believes people in the golf industry shied away from talking about water use in the past because they didn't want to bring up the issue for fear of being attacked by environmental groups. But now it's time to step up the message. "I think we need to be a little aggressive," Emerson adds.

And the message needs to be consistent — that is, superintendents, owners and pros need to be on the same page, says Greg Lyman, director of environmental programs for the Golf Course Superintendents Association of America. "[The message] also needs to be communicated to many different segments of our community — golfers, non-golfers, legislators and environmental advocacy groups," Lyman adds.

Plenty to say

Superintendents have a variety of material to communicate their message that they are efficient irrigators. It's just a matter of organizing that material and executing a plan.

Mark Esoda, certified superintendent for the Atlanta Country Club, says it's high time that superintendents step up to execute that plan.

"Superintendents are really good at the group hug and patting themselves on the back," Esoda says. "But we're not good at standing up and saying, 'Do you know what? We were green before green was even popular.'"

Esoda is doing his part to get out the message. Thanks in part to him, superintendents are considered irrigation experts in Georgia. Esoda spearheaded an effort by the Georgia Golf Course Superintendents Association to enact Best Management Practices for irrigation, a move that has benefitted the golf industry's image statewide. It wasn't an easy task and it took several years to accomplish, but 246 of the 256 Georgia GCSA member properties stepped up to participate in surveys that documented their water use and irrigation-reduction practices.

Participating golf courses disclosed how they effectively used irrigation systems, new grass varieties, wetting agents and plant growth regulators to use less water. They also documented

their usage patterns and areas where they decreased irrigation during the 2007 drought, including how they discontinued the practice of overseeding to save water resources.

The Georgia GCSA partnered with the Georgia Environmental Protection Division (GEPD) in the project, and their relationship has blossomed into one of respect. So much so that during the 2007 drought throughout the Southeast, Georgia superintendents were given leeway during a level-four water restriction. The GEPD knew enough about superintendents and their irrigation practices to realize that superintendents would use water as sparingly as possible.

"[The GEPD] has realized we were not the water abuser they thought we were," Esoda says.

Word of the Georgia GCSA's effort made it to the mainstream media. Under the headline, "Water Conservation Par for the Course," The Atlanta Journal-

Continued on page 30



Mark Jarrell is one of many superintendents bothered by the water-wasting label.



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Constitution reported on the Georgia GCSA receiving a commendation from the governor for the organization's water conservation efforts.

Esoda and the Georgia GCSA continue to take their message to the public. Esoda says the Georgia GCSA is telling its story to water councils, environmentalists and the general public.

"We're targeting them with a public relations campaign," he says. "We want to bring them out to golf courses to show them that we don't waste resources like water."

Esoda says the association also wants to hire a public relations firm in Georgia to create "a fun and edgy message." The Georgia GCSA also plans a Georgia Golf Saves Water Day next year to promote golf courses as efficient water users.



Superintendents shied away from talking about water use in the past, says Shawn Emerson, director of agronomy at the Desert Mountain Club. They can't afford to be shy now.

“The mainstream media in Southern California has printed more stories about more golf courses using reclaimed water for irrigation, which has helped educate the public.”

Lyman says the Georgia GCSA has created a meaningful best management practice document for other chapter associations to adopt. "It's a fantastic template for all of us to follow . . . and should be energizing to other states," he adds.

Other golf courses have solid environmental stories to tell about their water use. For instance, the Broken Sound Club in Boca Raton, Fla., is implementing a massive \$13.5 million reclaimed water project, paid for by the city. For years, the city of Boca Raton has been dumping about 6 million gallons of treated wastewater into the ocean, which has been a waste of money and resources, says Joe Hubbard, the club's director of golf course maintenance. Much of that water will now be directed to Broken Sound and used for golf course irrigation, among other things.

"This means we won't be pulling water out of the aquifer anymore," Hubbard says. It also means the golf course is using wastewater that was previously dumped on the ocean's coral reefs. "The environmentalists should love that," Hubbard adds.

In parched Southern California, regulatory agencies have newfound

respect for superintendents as wise water users, says David Davis, an irrigation consultant based in Crestline, Calif., and immediate past president of the American Society of Irrigation Consultants. But superintendents have helped their own cause by educating regulatory officials about golf course irrigation, Davis adds, noting that those same officials are also participating in educational sessions at various conferences to learn about golf course irrigation.

The mainstream media in Southern California has printed with stories about more golf courses using reclaimed water for irrigation, which has helped educate the public about their water use, Davis notes.

"Superintendents are like farmers — they won't use any more fresh water than they have to because it comes out of the profit picture," Davis says.

Going local

If the message of superintendents as responsible water users is going to be successful, it must be pitched at the local level, says Chuck Green, director of golf operations at Sage Valley Country Club in Graniteville, S.C.

Going local with the message means that superintendents are at the forefront of communicating it, Green says. They could do this locally by holding media days at their courses or making presentations at local government meetings.

"People will listen to you more if you're right there with them," Green says.

Green likes the idea of a media day, where reporters can talk to "the people who are pulling the trigger on letting the water fly," he says. But depending on which medium they're addressing, superintendents would have to make their message succinct. For instance, that message would have to be brief