

## Getting Smarter



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Successful irrigation beyond “smart” technology



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Your iPad can help you quickly find a recipe for just about anything, but it can't cook the meal for you. Your smartphone can help you keep track of your important meetings, but it's still up to you to nail the presentation. Your GPS unit can tell you the best way to get where you're going, but it's still up to you to put gas in the car. In other words, technology can help us do amazing things, but it can't do it alone.

When it comes to irrigation, the term “smart controller” may give the impression that technology is the total solution—just plug and play. “That's not the case. A smart controller is only as smart as the technician running it,” says Dean DeSantis, president of DeSantis Landscapes in Oregon. “It takes a lot of work to get these things dialed in, adjusted and working properly. Once you get all those settings figured out, they're awesome. But it does take some time.”



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PHOTO COURTESY OF DEAN DESANTIS.

You can't just install this technology and walk away, he emphasizes. Rather, you need to be willing to invest the time in getting it set up properly. DeSantis cites one example of a high-tech irrigation system his company installed for a homeowners' association. The first year required frequent visits from the technician to make adjustments, leading to doubts about whether the investment was worthwhile. “But, after the second season, we got a message from the HOA telling us that we were heroes because their water

bill was \$4,500 lower than before the system was installed," he recounts.

Chad Sutton, water resource manager with Gachina Landscape Management in California, says that technology has, in some cases, been presented as a magical solution. "And it can be—it really is the future, but it all starts with the basics," he stresses. "You really have to understand your site, the site conditions, and you really have to be in tune and familiar with the irrigation system before any of the smart technology can work well. Because just putting a smart controller on the wall or slapping in high-efficiency nozzles is not going to give you the kind of results that you can get if you take a step back and look at the basics first."

Sutton's previous job was with an irrigation supply house handling sales, support and training for landscape contractors installing smart controllers in Northern California. "I got a really good first-hand perspective of people just trying to put the controller on the wall and thinking that was it," he says. Many of the calls he received were from contractors who hadn't done the proper site work to collect the right data to program the controller, or who couldn't understand what the controller was telling them once it was operating.

Smart controllers that operate on a "soil moisture depletion model" need information entered about what type of sprinklers are on that station or zone, as well as what efficiency the zone has (the distribution uniformity, as well as how well the system is managed: are there things blocking the sprinklers? Are there heads tilted?). "Basically, it needs to know how good the system is at getting the water where you want it to go," says Sutton. "And all of these controllers have default settings right out of the box. So when you hang them on a wall, they're going to assume certain parameters are typical. And a lot of times, those assumptions are a little too optimistic."

Manufacturers create those defaults in order to maximize water conservation, and if the operator doesn't enter correct site-specific data, the unit may not put out the correct amount of water. "Then you see your landscape burning up and think, 'This controller just doesn't work,'" says Sutton. "So you need to be able to collect good information in the field and do the grunt work and translate that into the controller language." That last part sometimes requires an investment of time to understand the terminology the smart controller is using so that the correct parameters are entered, he adds.

## **Back to the basics**

Technological advances in irrigation have in no way eliminated the need to follow good basic irrigation principles, says Warren Gorowitz, vice president of sustainability with Ewing Irrigation Products. "Smart irrigation is not just about the controller. For an existing system, it's important to review that system and make sure it's as efficient as possible; by doing that, you're going to have the best results with the smart controller," he advises. When time and resources allow, that means conducting a formal irrigation audit. "Or, a more basic irrigation system evaluation can be as simple as turning on the irrigation zones one at a time and checking and inspecting that you're not missing any nozzles; that irrigation sprinkler heads are not

crooked so they're not wasting water or putting it in the wrong spot; making sure there are no leaks in the piping. All of these problems will counteract the benefits of what a smart controller can do."

July is "Smart Irrigation Month," a public awareness campaign conducted by the Irrigation Association to promote efficient water month. That group offers a number of education, training and certification programs designed not only for dedicated irrigation professionals, but also those working in the landscape industry who operate and maintain irrigation systems. Learn more at [www.irrigation.org/Certification](http://www.irrigation.org/Certification).

Gorowitz says that "getting back to the basics" also means using some technologies that have been around for a number of years, such as pressure regulation devices and check valves in the sprinkler heads. "These are relatively simple devices, and often can be somewhat-simply retrofitted," he notes. "People tend to look at the controller first, and I think you need to look at the rest of the irrigation system first."

Dean DeSantis agrees. Rather than focusing just on smart controllers, DeSantis prefers to think in terms of overall smart irrigation, a concept he breaks down into four key areas: the controller, the delivery system, the design (of both the landscape and the irrigation system) and cultural practices.

The controller is obviously an important component, but it takes intelligent choices on the other criteria in order for a smart controller to be effective, he says. For example, when it comes to the delivery system, one relatively new irrigation technology that truly is "plug and play" and can play a vital role in boosting efficiency is the rotary spray nozzle (replacing traditional pop-up fan-spray sprinklers). Unfortunately, these may get overlooked when people focus on the electronic wizardry of smart controllers, says DeSantis. "You can use them on almost any spray head; just unscrew the existing nozzle and screw in your rotator. The design is far more efficient; it has a better distribution uniformity; and we've done some case studies to verify the manufacturer claims of a 30 percent reduction in water use, and we've found those claims to be accurate. That's a pretty quick and easy way to reduce your water use. You can do all the fancy high-tech controller stuff, but start with the low-hanging fruit."

Another important tool to consider when planning the delivery system is the use of drip irrigation, adds DeSantis. "You're putting water directly at the target," he explains, noting that his company relies almost exclusively on drip irrigation when designing systems for residential planting beds.

Even in a high-tech era, good old-fashioned design principles play a huge role in how efficient—and effective—an irrigation system will be. "Zoning is critical," says DeSantis. That means not only separating lawns from shrub zones, but within shrub zones ensuring that plants with similar water needs are planted close together. That's basic design theory, but it's still important, even in an era of high-tech irrigation. "And it doesn't get

practiced enough, because many designers are just thinking about how the planting beds are going to look, and where the different colors and textures are going to be; they're not thinking about the water needs of the beautiful combinations of plants that they're putting together," he observes. DeSantis also advises that when non-native plants are used for color or other aesthetic reasons, that they be grouped in high-visibility locations, around the perimeter of a home or office, for example. Then, further from the building, more native plants with lower water needs can be used.



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A "smart" irrigation system is only as smart as the people who design, install and manage it. PHOTO COURTESY OF RAIN BIRD.

Culturally, mulch is invaluable, he emphasizes. "You have to keep a good layer of mulch on the planting beds; that's what is going to hold and retain the moisture. If you're just irrigating onto hard-pan dirt, the water is just going to run off." Again, he says, no matter how high-tech a controller is, it still comes down to decidedly low-tech mulch in order to ensure the irrigation system can do its job properly.

## **Adapting to technology**

Irrigation controllers started off as basically just on/off switches, then were made more efficient through the use of rain and moisture sensors. "If you look at what's being paired with controllers today—with ET and soil and flow sensors—that's really the evolution of being a smart controller," says Troy Leezy, marketing manager with Hunter Irrigation.

The landscape industry increasingly is starting to understand the benefits these latest-generation technologies can offer. More so in parts of the country where water is at a premium, says Leezy. "The higher the water cost, the more people seem to pay attention to water usage." He notes that, like other technologies, smart controllers have become easier to use and less expensive. For example, weather stations used on golf course 20 years ago that might have cost \$25,000 eventually entered the commercial landscape market. "And, within about the past five years, that technology has become applicable and affordable to residential applications. And the technology is definitely more simple for the irrigation lay person to use," he states. Plus, says Leezy, there are many different rebate opportunities available these days. "In California, for example, there are rebates for retrofitting systems to be 'smart' or higher-efficiency, and those incentives help quite a bit," he explains.



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Don't forget the basics, even when using "smart" technology. Basics include checking to make sure sprinklers, valves and other components are working as they should. PHOTO COURTESY OF RAIN BIRD.

Hunter's Solar Sync, for example, is designed to be paired with any of the company's controllers and offers a much simpler interaction for users who may not be certified irrigation professionals or experienced in operating more complex ET-based irrigation systems. "Solar Sync allows users to set up their own run times, but it looks at the weather. You set it up for the hottest month, and the controller looks at temperatures and solar radiation, so as it starts warming, it starts ramping up those run times to the peak month, and then as you head into fall, it starts ramping down," says Leezy. While it may not offer the highest efficiency possible that could be obtained with an ET unit, this system offer a way to boost efficiency given the reality that most residential controllers are only programmed once or twice per year. The lesson, says Leezy, is that for an irrigation system to be "smart," it has to be usable and effective in the real world. After all, the most efficient system in the world doesn't do any good if it isn't understood or used.

Sutton with Gachina Landscape Management says that high-tech irrigation systems can sometimes cause confusion in real-world applications. One example is the alerts that many new smart controllers send out. "The alerts from smart controllers are giving you information, but you have to interpret it for what it really means in the real world. So you have to be as smart as, or smarter than, the controller," says Sutton. For instance, many controllers will calculate how many hours are needed to apply "the perfect program" and send an alert that there's not enough time available in the watering window. But, especially on large commercial sites, with 36 or 48 stations, there may not be enough time to put down the amount of water desired in the window that's provided. "But we have to be smart enough to say, 'Look, Mr. Controller, I respect your opinion, but I've talked to the property manager and I have given you all the hours that are available,'" jokes Sutton. "We have to be able to distinguish which alerts are critical, and which are just giving us information. We either need to react or we don't need to react, and we need to know which is the correct course of action, the controller can't tell us."



Gorowitz with Ewing says that ever-evolving technology elsewhere in people's lives is changing the definition of what a smart irrigation controller is. "The consumer today thinks about 'smart' today as something they have access to and can make adjustments to from their smartphone or tablet computer," he observes. Similar to the advent of home thermostats that can be easily accessed and controlled remotely, there are a number of new products, some from new start-up companies, coming on the market designed to offer that same functionality with irrigation controllers. This approach will likely continue to become more and more common in the future, and new technological advancements will certainly follow to help make irrigation more efficient and system monitoring more convenient. "But I still think all this smart technology doesn't replace a properly trained and knowledgeable landscape irrigation professional," states Gorowitz. "You still have to have that."

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