

Growing a 'Greener' Lawn

TECHNOLOGY, EXPERTISE AND COMPROMISE COMBINE TO MAKE LANDSCAPING MORE ECO-FRIENDLY

Story by Matt Chapuran

“Water is becoming a contested resource, says Mary Ann Dickinson, executive director of the Chicago-based Alliance for Water Efficiency. There is little room for dispute when millions of people in the world suffer from water shortages and nations like China, which boasts nearly one quarter of the world's population, enjoy less than ten percent of the world's freshwater supply.

In the last decade, advances in low-flush toilets, low-flow showerheads and energy rated appliances have enabled homeowners to become better stewards of the water they use inside the home. Dickinson's organization is interested in seeing similar strides made outside the home. "Now it's time to turn to irrigation," she says.

Even as homeowners and real estate developers have focused on reducing water bills through internal plumbing improvements, the recent real estate boom also brought with it an increased investment in irrigation systems that sometimes place additional strain on the local water system. According to a white paper published by the Tucson, Ariz.-based irrigation manufacturer Rain Bird Corporation, "Since 1900 the U.S. population has doubled, but per capita water use has increased eight-

fold. ... On average, residents in the U.S. use 101 gallons per day." A significant portion of this water services lawns and exterior plants.

Unlike interior water usage, which generally remains consistent throughout the year, irrigation places unusual stress on the water table. Its cyclical nature, peaking during the summer, requires that local municipalities invest in larger systemic capacity. "The more capacity," says Dickinson, "the more that the rate payer has to spend," to subsidize the difference between peak and off-season capacity.

Dickinson hopes that the same focus placed on interior plumbing efficiency, where different jurisdictions, manufacturers and testing agencies worked collaboratively to improve fixture efficiency, can now be trained outside. But as manufacturers attempt to build the better water saving irrigation system, some question whether technology is truly the solution or does it enable bad behavior and worsen the problem?

Tuning Your System to the Weather

"Drip irrigation is the Mecca when it comes to saving water outside," says Jennifer Riley-Chetwynd, Corporate Marketing brand manager of Rain Bird Corporation. According to Rain Bird, only 10 percent of the world's total rainfall is available for human consumption and less than half of that amount is actively harvested.



Low volume irrigation systems, including bubbler and drip irrigation systems, parcel out water more gradually, allowing the water to soak to the roots rather than being wasted in run-off, where water spills out onto paved surfaces, or is lost to evaporation. Nozzles and sprayheads have improved to deliver less pressure for a more regulated misted effect. Where traditional sprinkler systems often overwater some sections of lawn while neglecting other areas, improved fixtures provide more uniform coverage.

Riley-Chetwynd claims that oftentimes a homeowner using garden hoses to irrigate their lawn can overwater their grass and plants, which not only has a detrimental impact on the local water table, it can actually prove detrimental to the plant life itself. Plants can be trained to accept less water over time, adapting their needs to the local ecosystem.



Far Left: Landscape Dripline and pressure-compensating emission devices (5-24 GPH), which are ideal for irrigating large shrubs and trees

Left: Reclaimed Water Valve Install



Above: Rain Bird's xeri pressure compensating nozzles offer a precise square wetting pattern – reducing overspray, overwatering and runoff, resulting in up to 65 percent water savings.

PHOTOS COURTESY OF RAIN BIRD CORPORATION

One of the first groups to intensely feel the pressures of water scarcity and the attendant rise in water bills was the owners and maintainers of golf courses. These large swathes of thirsty grass required more intelligent technology to prevent watering during rainstorms, but also to limit the high labor costs in manual water applications.



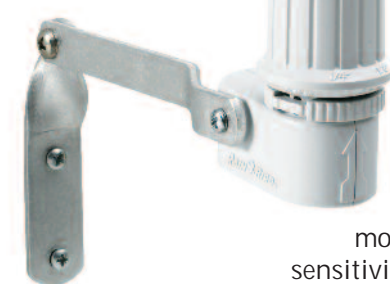
Facts on rainwater supply and China's population/rainwater availability taken from a Rain Bird white paper.



The same innovative weather-sensitive irrigation technology that Rain Bird and like companies developed for golf courses are now finding increasingly popular domestic use. Updated every hour, these systems pull weather data from satellite weather stations to smartly identify when it is raining in the homeowner's town, and halt an irrigation program before it begins.

Rain sensor device automatically measures rainfall and prevents watering in rainy conditions.

PHOTO COURTESY OF RAIN BIRD CORPORATION



The system can also be calibrated to engage water applications for ideal times of day, typically in the early morning before intense sunlight can evaporate a majority of irrigated water. "All of this high technological data is becoming more accessible to the average homeowner," Riley-Chetwynd says. Even more sophisticated evapotranspiration (ET) managers can measure multiple factors, including wind, solar exposure and even display programmed sensitivity to the particular plant forms incorporated into the landscape design. Adding a moisture sensor can heighten the system's sensitivity to immediate conditions.

Vickers says. "Many are jumping to [weather-based controllers] as a panacea, but you can't put a smart controller on a dumb irrigation system and expect to save water."

Vickers blames the recent spike in exterior water usage on frequent deployment of improper heads, ill-managed systems and overly optimistic faith in weather-based controllers, not to mention elaborate systems designed to service 'postage-stamp' sized lawns. She added, "Most new and many existing single family homes are equipped with automatic irrigation systems — set to 'on' — whether people want them or not. Just like their DVD or VCR player, most Americans don't know how to program an irrigation controller. The controller, combined with a poor irrigation system design, sets them up to over water their lawn until a drought or water cop enters their emerald oasis and calls a halt to the nonsense."

Dickinson argues that automated systems, no matter how sophisticated, "are often not programmed correctly." Or systems are employed with factory settings that haven't been recalibrated to the local environment or plant life. Even if a lawn care professional with intimate knowledge of the local climate calibrated the settings for property specificity, if the homeowner hasn't been properly trained on the system, small changes can send the system out of whack.

Riley-Chetwynd acknowledges that smart technology is not infallible. "They're not fool-proof," she says. "You have to manage them." Rain Bird urges homeowners to work with irrigation experts to set the initial settings and maintain the system. "You need it installed correctly and you want to make adjustments based on the type of plants you have and your environment," Riley-Chetwynd says. "Monitor and adapt it so that it's working well based on your needs. It can liberate you, but it's more complex than a low flush toilet or showerhead. It's dealing with weather. How much more of a question mark can you have than weather?"

To underscore the importance of using qualified contractors in a green sensitive landscape design, Riley-Chetwynd notes that when the U.S. Environmental Protection Agency's Office of Water's Water Sense program initiated a more comprehensive focus on irrigation, "The first thing they did was certify contrac-

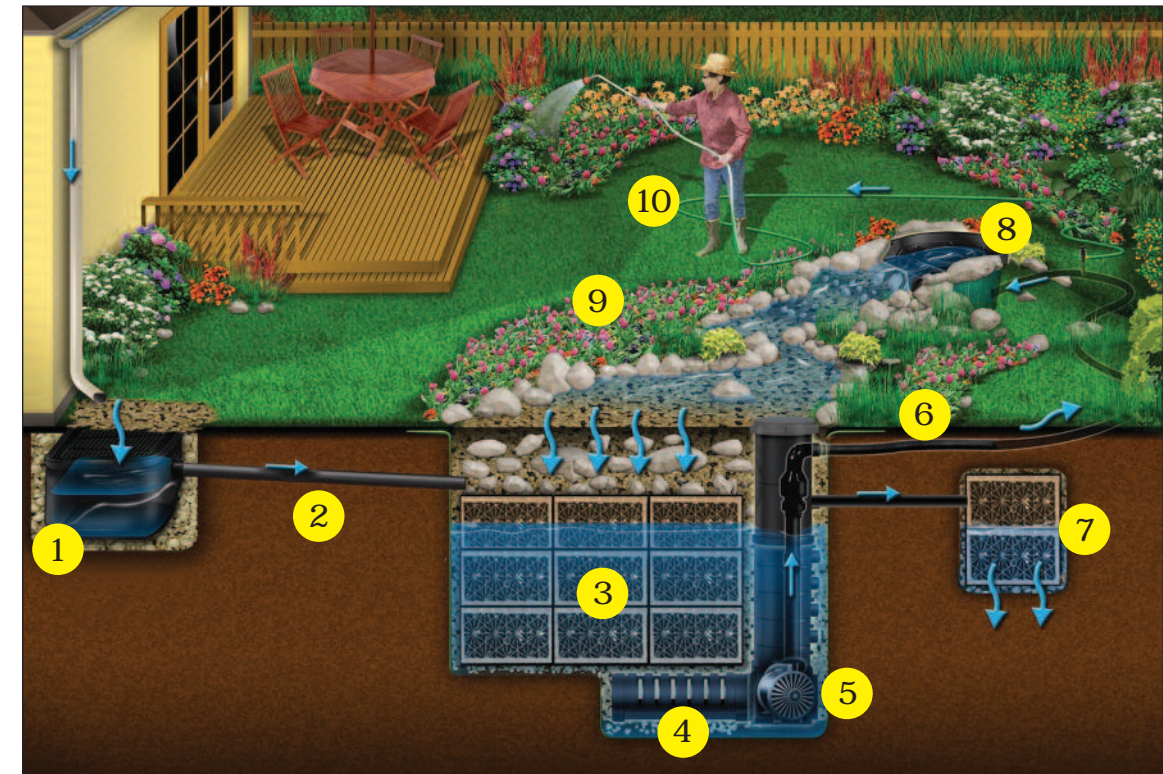


Above: Weather station monitors and stores daily evapotranspiration (ET) parameters, including air temperature, solar radiation, relative humidity, wind speed and rainfall.

PHOTO COURTESY OF RAIN BIRD CORPORATION

The Flaws in Technology

The problem according to Amy Vickers, an Amherst, Mass., engineer and water conservation consultant and author of *Handbook of Water Use and Conservation* (Waterplow Press), there is a lack of standardization and default settings that frequently don't apply to the real-world conditions of the homeowner's yard. "If properly designed and properly managed, you can have water efficient irrigation,"



tors." In addition to well-designed irrigation systems, homeowners and irrigation specialists should work to develop a well-designed landscape, including flowerbeds, shrubs and trees, each in their own ecosystem.

Other Alternatives

One alternative means of efficiency is to employ non-potable water solutions, including the use of graywater to offset potable water usage. By reclaiming shower, faucet or washer water and using this water to irrigate outdoors, the stress on available drinking water is reduced and the need for heightened efficiency drops. Unfortunately, "there are no uniform standards to make it easier for developers and homeowners to know how to do this," Dickinson says. Because graywater will incorporate bacteria and other human waste, different municipalities have differing regulations and standards, another obstacle to widespread graywater usage.

One solution is the implementation of retention basins. Ted Byrne of Ewing Irrigation Products Inc.'s Irrigation Sales in Southern California describes an underground system of plastic cubicles that can be hidden beneath turf, patios or paver stones. The system can collect water from roof top run-off. A 3,000-square-foot roof top capturing one inch of

rain an hour can harvest as much as 1,900 gallons of water. The cubicles direct the water to a 5,000-gallon tank, which can be pumped to provide lawn irrigation. "The homeowner will be helping himself, the neighborhood and the community," Byrne says. Byrne envisions backyards replaced with concrete patios accented with paver stones, which provide a more aesthetic cobble stone look. "You get a better looking patio and you're saving water right from the rooftop," Byrne says.



This example of Xeriscape gardening includes a minimalist look with ornamental grasses, arid type small shrubs and succulents. Natural boulders, wood bark/mulch and gravel are also added for appearance. Its benefits are water conservation and an easy to care for garden.

HOW IT WORKS

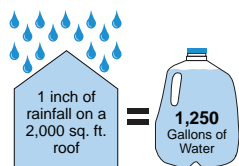
Stages of Rainwater Harvesting

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- 1 DOWNSPOUT FILTER**
Captures and removes pollutants flushed into the system during a rain event. Course filter screen removes leaves, twigs and seeds. Smaller suspended particles are captured in a fine mesh which can easily be removed for cleaning.
- 2 CONNECTING PIPE**
Carries the water via gravity to the main storage chamber.
- 3 MODULAR STORAGE BASIN**
Modular design can be configured to fit a wide variety of applications and settings. The storage basin consists of modular plastic tanks that are assembled on-site. EPDM rubber membrane creates a water-tight basin.
- 4 SNORKEL™ VAULT AND CENTIPEDE™ MODULE**
Optimum water utilization within the system and a convenient access point for yearly maintenance and cleaning.
- 5 HIGH EFFICIENCY PUMPS**
Submersible re-circulation pumps function 24 hours a day and can be utilized for the delivery of water to your landscape.
- 6 FLEXIBLE PVC**
Easy installation with minimal head pressures, which equates to overall efficiency.
- 7 OVERFLOW INFILTRATION**
Excess rainwater is sent to a storage area that facilitates the infiltration of water into deeper soils and aquifers.
- 8 BIOLOGICAL FILTER**
Beneficial bacteria and enzymes reduce organic wastes and pollutants to less toxic substances that can be absorbed by plants, thereby creating a perfect cycle of nutrient re-use.
- 9 AQUATIC PLANTS**
Providing food and shelter for a great number of birds, insects and amphibians and the cornerstone for maintaining our biodiversity.
- 10 IRRIGATION SYSTEM**
Natural water is loaded with micronutrients and compounds that will make your plants flourish. A healthy garden consumes more greenhouse gasses and properly irrigated soils allow for greater water infiltration and better overall soil profiles.



Did You Know?



- 1 inch of rainfall on a 2,000 sq. ft. residential roof generates 1,250 gallons of water that can be reused.
- That same roof in a region receiving 30 inches of annual rainfall generates 41,000 gallons of reusable water.
- The average US household with a 10,000 square foot lot uses 5,000 gallons of water weekly for landscape irrigation.
- Running a sprinkler for 2 hours can use up to 500 gallons of water.

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“On average, residents in the United States use 101 gallons per day. A significant portion of this water services lawns and exterior plants.”

RAIN BIRD CORPORATION



Rain Bird also notes that xeriscaping can significantly improve water demands. Xeriscaping requires the homeowner to install primarily local plant life and/or plant forms that require less water. A qualified landscaper will assist the homeowner in segregating the landscape into zones so that exotic plants don't share soil with local plants as the thirstier plants will cause the native plants to be overwatered, undermining the xeriscaping project. Incorporating stones or other non-organic elements can further cut the water demands of the environment.

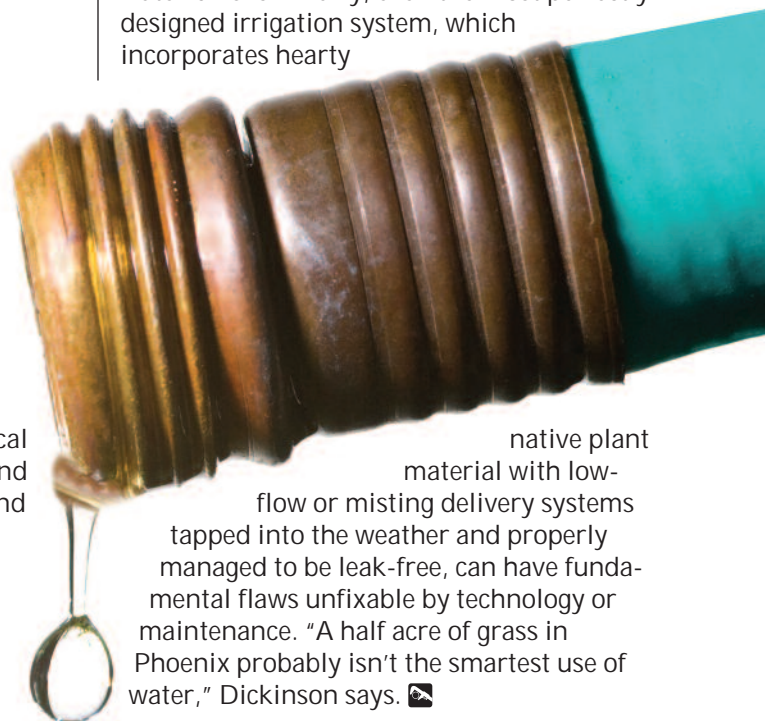
Shifting from Technology to Behavior

In contrast to the industry, Vickers and Dickinson praise the low-tech solution of manually watering the lawn with a garden hose, or 'hose dragging' as Vickers puts it. "Hose draggers use a lot less water," Vickers says, arguing that the consumer can best recognize when grass or plants have been watered properly or can observe sidewalk run-off.

According to Vickers, of even more critical importance is the need for individuals and communities to evaluate their current and future water supplies to determine if thirsty grass lawns are necessary. "Not every community in America has the resources to satisfy the lawn irrigation needs of every homeowner." Vickers believes that municipalities need to begin

certifying contractors, but more importantly determine if their limited resources necessitate limiting or denying irrigation. "We need realistic discussions with the American public about what resources we have to spare for non-essential use."

"My mother used to use the toilet as a garbage can for her Kleenex," Dickinson says, noting that it took her years to train her mother that throwing trash into the toilet was harmful to the environment, wasteful of water and ultimately cost her money in the form of higher water bills. Similarly, even the most perfectly designed irrigation system, which incorporates hearty



native plant material with low-flow or misting delivery systems tapped into the weather and properly managed to be leak-free, can have fundamental flaws unfixable by technology or maintenance. "A half acre of grass in Phoenix probably isn't the smartest use of water," Dickinson says. 📌

