



## Water saving strategies

[Season by Season by A.M. Leonard](#)

Shortages and drought have forced many growers to adopt innovative water conservation ideas.

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Shortages and drought have forced many states, counties and municipalities to take drastic measures to protect water, one of our most precious resources. While politics and poor planning may play into water shortages, the green industry has the chance to lead by example and execute solid water conservation plans.

Here are a few ways growers can save this precious resource.

### **Harvest the rain**

Rain is nourishing, life giving, cleansing and renewing. And it's valuable. Especially if you're using it to supplement your irrigation. Rainwater harvesting is certainly a viable option for water conservation measures, but it takes planning, good infrastructure and a significant capital investment.

Take heed – make sure your state, county or municipality doesn't prohibit rainwater harvesting. A few years ago, Colorado finally conceded and passed legislation allowing limited rainwater harvesting.

Depending on your area's annual average rainfall, you may be able to use it as a supplement irrigation source or use it to irrigate 100 percent of your crops.

It doesn't take much rainfall to accumulate a significant amount of stored irrigation water.

During a 1-inch rainfall event, a grower can expect to get .623 gallons of water for each square foot, explains John Smith, Texas A&M AgriLife Extension Service program specialist. Calculate an efficiency factor of approximately 90 percent.

Square foot of collection area x rainfall (in inches) x 0.623 x .90 = gallons

"From a 1-inch rainfall event on a 2,000-square-foot roof, you're going to get about 1,200 gallons of water," Smith says. "Nearly all greenhouses, shops or offices can be used as a catchment source. The steepest, slickest roof surface works best."

Texas AgriLife Extension offers a rainwater supply calculator and a pressure loss calculator at <http://rainwaterharvesting.tamu.edu/calculators>.

### **Drought challenges**

David House, CEO of Village Nurseries, says the California drought has presented a set of challenges as well as opportunities. The Orange, Calif.-based wholesale grower has 900 acres of growing facilities in Northern and Southern California, as well as four landscape centers for easier service for their landscape customers.

“It has forced us to think harder about our irrigation practices, even though the latest governor-mandated restrictions and cutbacks did not hit agriculture, we still take it very seriously and are continually looking for ways to reduce the water we use,” House says. “Since the water cutbacks were mandated, it has been hurting demand at the retail level, so the end user, the retail consumer, the homeowner have seen roughly a 15 percent softening of sales. People are concerned about spending their discretionary dollars on plants for two reasons: Will they live? And is it the right thing to do? That is why we are launching a "Save Water, Stay Green" campaign, to get the message out that buying plants and having a beautiful landscape is still easy to do. It's all about the plants and irrigation practices.”

Village Nurseries is converting more of its acreage to drip irrigation systems, which greatly reduces the amount of water used versus overhead irrigation systems.

“There is a capital expense to do that,” House says. “We are moving toward that as quickly as we can. But not everything in the nursery can be monitored via drip. You cannot do it for one-gallon size plants or smaller.” For those irrigation jobs, the nursery is moving to the use of pulse overhead irrigation systems. Pulse systems identify areas with plants, so less water is wasted irrigating areas with no plant material. And we are also watering more at night, so we have more night crews out there, which is the most efficient time to water.

Village Nurseries also is installing a new irrigation system at its Steele Valley facility on 10.6 acres of shade structure. The system is composed of suspended modular sprinklers that allow freedom of activity below them and remain unobstructed by taller plant material. The individual sprinklers put out lower gallons per minute than conventional overhead sprinklers, and the density and uniformity of their output shown in field audits is at least 20 percent more efficient than conventional impact overhead irrigation. Each sprinkler can be turned off individually to allow the nursery not to water open areas. “We’ve found that this type of system allows us to eliminate second cycles most of the year and reduces the need for supplemental hose irrigation needed with other overhead systems,” House says.

Village Nurseries is also using more reclaimed water where it’s available at some of its facilities. House is saying he’s checking into the economic feasibility of a system that would combine water cleaning and irrigation to allow the use of 100 percent reclaimed water at an 180-acre facility. Village Nurseries is also running more night crews to water when it’s most efficient.

### **Runoff control**

As Ray Blew drove his pickup around his family’s Centerton Nursery in Bridgeton, N. J., he recalled the water runoff challenges that his family formerly faced. “We used to have to handle not only our own runoff, but also water draining off the nearby highway and neighboring properties. It was a major flood plain here after every storm.”

The Blew family began recycling irrigation runoff in 2009, and according to Ray, they now reuse more than 50 percent of the water on the nursery’s 230-acre container operation through a tail-water recovery system. Ray is clearly proud of the accomplishment. “Now we have the capacity to hold and utilize all of that water,” he says. The nursery began as a 10-acre operation in 1975 and has been expanding ever since.

“My philosophy has always been that if you’re standing still, you’re dying. If you’re not moving ahead then you’re bringing down the business,” Ray says.

It was this mindset that propelled the growth of his business during the past 40 years. The Blew family now grows 1,200 varieties of plants and ships to 35 states. The nursery’s in-house machinery manufacturing and invention of new technology is a point of pride and has differentiated its operation from other growers. Centerton built the first automated potting machine in 1978, and it is still in operation today. Centerton has been a family affair since the beginning, with children learning the business from a young age and several generations presently involved.

### **Leading the way**

The Blews took the first steps to controlling the runoff from their property in 2009, hoping to design a system that would contain all of their water. They wanted to design and construct a collection system on their own terms and before possible imposition of a deadline by the New Jersey Department of Environmental Protection (DEP.)

The family designed a tail-water recovery system that would feed into a pond at the low point on their property. But it took them several years to get approval for their construction plans. The DEP claimed that the area where the pond was going to be built was previously a wetland. However, the nursery had old maps showing that the area had been used as farmland for generations. The dispute was eventually resolved after Ray sought the intervention and assistance of several New Jersey politicians.

The Blews' basic plan was to reuse the runoff for further irrigation; however they needed to find a disinfection treatment for the runoff. They knew that untreated water could spread disease throughout their operation. They decided that ultraviolet light was the best fit for their purposes after ruling out other disinfection techniques, including chlorine gas.

"One of the things that encouraged us to go with the UV light was the DEP in Trenton. They said they were going to eliminate chlorine treatment in the state and they were adamant about it," Ray says, but adds that to date, the DEP has not taken this step.

The Centerton tail-water recovery system carries runoff from the entire nursery to a pond at the low point of their property. The first step of filtration occurs when larger organic material sinks to the bottom of the retention pond. This water is pumped from the pond, filtered using fine mesh to the 80 micron level, and disinfected. To work properly, a thin film of water flowing very slowly is bombarded with UV light. Approximately 30 million gallons of water is pumped out of this system annually, making up 50 percent of the nursery's total water use.

This type of treatment easily kills bacteria, fungi, and zoospores of water molds. But it can still be difficult to kill certain fungal pathogens and bacteria. Ray insists that "when you're growing containers in the field you can't get away with any pathogens." He believes filtration is the most important step in the disinfection process. Ray recommends building the largest water reservoir possible so that large particles have the most time to settle out before the water goes through filtration and treatment.

"I would make my holding pond as big as possible if I could go back and do it a second time," he says.

Ray strongly encourages other growers to consider recycling.

"A key thing for any grower is to look at two, three, or four operations and see how they operate."

There are many options when it comes to disinfection of recycled water, and each technique has unique costs and benefits. When evaluating the entire investment, Ray believes that water recycling "is not necessarily profitable, but it has to be done and more agricultural operations will be forced to stop their runoff in the future."