

# Ornamental OUTLOOK

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# IRRIGATION INNOVATION



*Holloway Tree Farm's flood-plain irrigation and recycling system provides reliable, uniform delivery of rainwater while helping to protect the environment.*

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Electrical shortages, iron accumulation, uneven distribution of water, sand and algae buildup, broken lines ... the problems associated with micro-irrigation systems can sometimes be stressful. It was exactly these types of daily headaches that inspired Dr. Rufus "Dick" Holloway Jr. and his son Michael to develop a more simplistic approach to watering — Holloway Irrigation Systems' flood-plain irrigation and recycling system. The idea of flood irrigation is not new, nor is the concept of irrigating with reclaimed water. But what is new, explains Dick, is the combination of flood irrigation with reclaimed water on a large commercial scale.

Dick grew up in an agricultural family, producing primarily citrus and some cattle, in Leesburg, FL. At an early age, he decided he wanted to be a physician. After receiving his degrees from the University of Florida (UF) and Duke University Medical School, he became an ear, nose, and throat surgeon, all the while maintaining his interest in agriculture. Shortly after his father died in 1971, his family decided to pare

down its large citrus operation. In 1982, the Holloways began an ornamental nursery (Holloway Tree Farm) on part of their property that was previously used for citrus. The severe freeze of 1983 virtually ended the citrus industry in the area; however, the tree farm continued to thrive and grow. Today, Dick still practices ear surgery while balancing his ownership duties at Holloway Tree Farm and taking Holloway Irrigation Systems to the next level. Providing valuable assistance is Michael, who joined the family business as co-owner in July. Like his father, Michael has his medical degrees from UF and Duke.

### Simplification Is The Solution

About five years ago, Dick and Michael started think-

ing about a way to simplify the application of water, and a way to cut the costs and labor associated with maintaining a micro-irrigation system.

"Efficient distribution of water without all the burdens of tubing was our driving force," says Dick. "What we came up with was a method of very simply raising the water level much like you would on your back porch by putting water in a saucer under a plant."

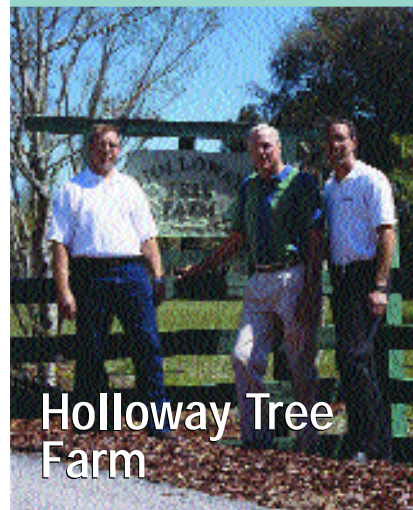
The father-and-son team dubbed their invention the flood-plain irrigation and recycling system. Two grants from the St. Johns Water Management District and the skills of a senior research chemist, Dr. Grant Proulx, helped turn the concept into a reality. In a prototype at Holloway Tree Farm, water is moved in a very high-volume, low-pressure pump to a half-



*Crape myrtles are irrigated evenly and efficiently with recycled rainwater on the flood-plain system.*

## Regulations

acre area on which 16,000 5-gallon trees sit. On one of the flood plains, water rises 10–12 inches in less than 30 minutes. During this time, the



Holloway Tree Farm

wish,” says Michael. “Although we only have 5 acres currently under flood-plain irrigation, we’re planning to tap into our reservoirs with a

**Owners:** Dick and Michael Holloway  
**Location:** Leesburg, FL  
**Acres:** 40 in production  
**Employees:** 17  
**Crops:** Oaks, crape myrtles, magnolias, ligustrums, hollies, wax myrtles, bald cyprus, and maples.  
**Annual sales volume:** 1 million+  
**Market:** Landscape architects, installers, and brokers throughout the Southeast  
**Web sites:** [www.hollowaytreefarm.com](http://www.hollowaytreefarm.com) and [www.hollowayirrigationsystems.com](http://www.hollowayirrigationsystems.com)  
**Business philosophy:** Growing trees of the highest possible quality while developing the best possible business relationships with customers. The closer we can get to perfection in both of these areas, the happier we are.

water comes up in the pots to saturate the soil. Water then drains off after 30 minutes and is reclaimed into a holding pond.

The flood-plain irrigation system can be designed in two fashions: sloped or flat, to accommodate any type of growing space. And that’s the beauty of the flood-plain irrigation system: total flexibility. There is no set size reservoir or predetermined number of flood plains. Everything is custom created to the individual grower’s needs.

At their tree farm, the Holloways have both a sloped and a flat flood-plain irrigation system in operation. Water is pumped from a reservoir to a given flood plain. A simple series of valves controls the flow of water to individual plains. In the sloped system, water is pumped to the top tier and flows down by gravity to each level. Although a pump must be turned on to move water to different plains in the flat system, the energy costs to run the pump are minimal.

### Wiping Out Water Waste

Perhaps the greatest advantage of the system is extreme water savings. The two patented flood-plain systems use 100%-recycled rainwater. In the time the systems have been operational (three years for the sloped system and one year for the flat system), they’ve used zero aquifer water.

“Through rain harvesting, we’ve collected a surplus of water that we can choose to use however we

wish,” says Michael. “Although we only have 5 acres currently under flood-plain irrigation, we’re planning to tap into our reservoirs with a

tion, but only 700,000 gallons (which is the amount of water that actually leaves the system through soil absorption and daily evaporation) if flood-plain irrigation is used. Significant water savings are also achieved because during the hottest part of the summer, the flood-irrigated trees only require water about every other day. In the winter-time, they’ve gone as long as two or three weeks in between waterings, says Michael.

### Additional Advantages

Because the system is completely sealed with a polyethylene membrane, there is no runoff or chemical leaching into the soil. And since the system has been contoured in a level way, there’s no question that every plant is getting watered equally.

“The flood-plain irrigation system provides us with the peace of mind that comes with knowing our trees are watered both accurately and effi-

ciently,” says Michael.

“The system is all about water and how to use it most efficiently,” agrees Kevin Dellinger, Holloway Tree Farm’s general manager. “You have to see it to believe it.”

As for water quality, the Holloways report no instance of disease from using recycled rainwater. And algae-eating fish take care of consuming any excess fertilizer.

### Moving Toward Marketing

The Holloways are now ready to begin marketing their invention worldwide. The two men are currently working with the University of Florida’s Institute of Food and Agricultural Sciences (UF/IFAS) to organize a field day to show their system off to interested growers. And a proposal has been submitted to evaluate the system in terms of water efficiency and plant-growth rates as compared with micro-irrigation and sprinkler systems.

“We’re very interested,” says UF/IFAS professor Dorota Haman.

“The flood-plain system shows extreme promise for the Southeast region where there are low evaporative rates.”

“We’ve spent five years in the research and development phase,” Dick says. “We’ve made all the mistakes that we think we need to make. We now have a system that’s extremely efficient and very practical.”

Since the system is more difficult to retrofit, the ideal customer would be an experienced nursery grower who is looking to expand their operation. While flood-plain irrigation does involve more capital costs up front per acre, it provides long-term savings in the form of reduced labor, maintenance, and repair costs, says Michael.

Bill Bartnick, environmental administrator of Florida’s Department of Agriculture and Consumer Services’ Office of Agricultural Water Policy, is interested in the Holloways’ system from both a water-quality and a water-quantity standpoint. Bartnick

supports a grant proposal (in EPA Section 319) that would provide money to growers wanting to install the Holloway system. “All indications are that the grant proposal will be funded,” says Bartnick.

Bartnick believes that areas suffering from both water-quality impairment (high nitrates) and stressed aquifers (due to drought) stand to gain the most from the Holloways’ system. In the long term, adds Bartnick, his department is looking at the irrigation system in terms of best management practices (BMPs) since it is working with the Florida Nurserymen & Growers Association to develop a statewide nursery BMP manual.

In the midst of drought conditions both at home and abroad, Dick and Michael Holloway are confident that their water-saving system will catch on commercially.

“Any way you can save water, whether it’s drinking water or agricultural water, is a great advantage,” concludes Dick. ■

## Flood-Plain System Shows Promise

The flood-plain irrigation and recycling system potentially offers:

- **Dramatically reduced water usage.** The system uses 100% recycled rainwater. Zero water is drawn from the aquifer.
- **Consistent and uniform delivery of water.** A level design assures that all plants receive equal amounts of water.
- **Increased plant-growth rates.** Supersaturation and reflective heat coming off of the white polyethylene membrane can help speed up plant growth.
- **Lower labor, maintenance, and repair costs.** There are no spitters to check and there is no need to make sure pots are fully wet. The simplification of the system means fewer parts and fewer repairs.
- **Elimination of chemical leaching.** Soil and groundwater are protected from pesticides and fertilizers due to the system’s polyethylene lining and closed-loop design.
- **Less weed and insect problems.** The tops of plants only get wet when it rains, so weed germination is reduced. And insects seem to be repelled by the reflected light.
- **Minimal electrical costs.** Pumps are only activated to transport water to the top flood plain in the sloped system and to move water from plain to plain in the flat system. Although the flat system uses more energy, it only costs the Holloways about \$100 per year to irrigate 16,000 trees.
- **Efficient land usage.** The flood-plain irrigation system can be custom-designed to accommodate sloped or flat nursery terrain.
- **No well or water-usage permits necessary.** A bank of reusable rainwater is created, thus eliminating the need for permitting.