



**St. Augustine Orchid Society**

[www.staugorchidsociety.org](http://www.staugorchidsociety.org)

## **Rainwater Collection - A Solution for Poor Well Water Quality**

by Linda Stewart, lindstew@hotmail.com

I moved to a home with my very first greenhouse, located in rural Florida, about seven years ago with my rapidly growing orchid collection. You can imagine my dismay during that first year as I saw many of the miniatures and more unusual orchids slowly decline and die. The well water was tested revealing the problem, a pH of 8.0 and 1100 ppm of soluble salts, otherwise called Total Dissolved Solids. The comments section of the written test results noted that "Soluble Salt levels are high enough to affect many plant varieties."



1. I purchased my tanks from a friend, but they should also be available at local farm or irrigation equipment supply stores. Just be careful they didn't originally contain an herbicide or other chemical that could potentially leave a residue that might be harmful to your plants.

Finding an alternative source of water was problematic. There are no public water supplies in the area and the cost to install a reverse osmosis (RO) system to remove the dissolved salts from the well water was cost prohibitive. This left a single option: rainwater. The first step was to figure out how to collect and store the rainwater, and the second was how to plumb it to the automated system in the greenhouse, preferably without having to call an electrician and/or sprinkler company.

*Collection System.* I first purchased a 330-gallon rectangular poly container, also known as an IBC tank, which had already been cleaned. The collection tank was thoroughly rinsed out (just in case) and painted with a grey Rustoleum primer, to help prevent the top coat from peeling from the poly. The tank was then given a topcoat of Rustoleum in a similar shade of grey. Grey



**St. Augustine Orchid Society**

[www.staugorchidsociety.org](http://www.staugorchidsociety.org)

## **Rainwater Collection - A Solution for Poor Well Water Quality**

by Linda Stewart, lindstew@hotmail.com

won't get as hot as black in the summer heat, but will still keep out sunlight and prevent algae buildup in the tank. A short time later, the second tank was purchased. But this time the primer was not used. Instead it was painted using a type of marine paint that was supposed to adhere to plastic. As you can see from the picture above, the shortcut was not a good idea. It is currently covered with frost cloth to help keep out the sunlight. I don't want to take it out of service and it can't be repainted until all of that peeling paint has been removed.



2. Debris catcher



3. Tank Interconnections



3. Pump system

The tanks were placed on cinder block pavers next to the greenhouse as close to the water connection for the greenhouse as possible. Gutters were installed along one side of the greenhouse with the downspout directed into the first tank, with a debris filter to catch debris as it comes out of the gutters. Each tank is equipped with a gate valve at the bottom, so that's where the two tanks were joined together using PVC pipe. A T-connector was inserted in the middle to create one line going to the filter and pump. If there is a need to isolate one of the tanks, it is a simply a matter of turning the gate valve at the base of the selected tank.

If you don't paint your water container and/or it is not completely enclosed, you may tend to have a problem with algae, particularly during the hot summer months. This can be prevented by the addition of an algaecide, such as GreenShield, Physan 20, or pool algaecide, all of which contain quaternary ammonium compounds. The Physan label recommends 1 teaspoon per 52 gallons of water for controlling algae in birdbaths, fountains, etc. I don't have an algae issue, so tend to use less, and then only once to twice per year. Please bear in mind that this algaecide is not recommended to be used on food crops or with fish.





**St. Augustine Orchid Society**

[www.staugorchidsociety.org](http://www.staugorchidsociety.org)

## **Rainwater Collection - A Solution for Poor Well Water Quality**

by Linda Stewart, lindstew@hotmail.com

*Delivery System.* The next step was to get the rainwater into the greenhouse to the orchids. A 3/4" PVC line was installed from the T-connection, first to a water filter to trap any sediment, and then on to the pump. The Shurflo pump has 1/2" connections, so 10" flexible 3/4 to 1/2 reduction connectors were used to connect to the pump. Shurflo recommends that the pump be mounted to a piece of wood, to minimize vibration when the pump is running. It is also recommended that flexible connectors be used to connect directly to the pump. There is no isolation valve, so the pump pulls from both tanks concurrently unless the gate valve at the base of one of the tanks is turned to isolate the tank. The Shurflo pump is a 3.0 gpm, 45 psi, 1/2 npsm, 115 vac with electrical cord. It is housed under a large plastic bin with a screen covered opening cut into the side for ventilation.



5. Pressure Tank and Siphonex System

From the discharge end of the pump, I dug under the greenhouse and installed a combination of 3/4" inch PVC and irrigation tubing along with a T connector to add a faucet for hand watering. The water pressure is sufficient to use a Siphonex system to add fertilizer when hand watering (as long as the hose does not exceed 35 ft. in length). The greenhouse already had an automated mist system over the vandas at the south end, and over the wall containing my mounted orchids on the north wall. A connection was run to tie in via a gate valve just below the existing mist system control solenoid, so no electrical work was required and the existing mist system timer could be utilized. The system can be valved off so the old well water plumbing can again be used, should the need arise during extended dry spells. Once it was up and running, the pump cycled too frequently, so an in-line 2 gallon pressure tank was installed right after the pump and before the faucet and solenoid - problem solved.

Since there already were gutters across the front of the house, I decided to add a rain barrel there as well to have additional rainwater for hand watering, etc. It is a simple system, a completely enclosed, 55 gal. food grade drum on a cinderblock platform. It was painted the same grey primer and top coat initially used on the larger tank. Although there are several brands and types of downspout diverters available in the market today, a *DIY Downspout Diverter* was selected. The diverter kit came complete with spigot, rubber grommets, hole saws, diverter, connection hose and a downspout cover for freezing weather. The diverter was inserted into a small hole drilled into the side of the downspout. Once complete, the system is very unobtrusive and only requires 1/2" of rain to fill the drum. Once full, the rain diverts back to the downspout, so the rain barrel never overflows.



6. Rain Barrel



**St. Augustine Orchid Society**

[www.staugorchidsociety.org](http://www.staugorchidsociety.org)

## **Rainwater Collection - A Solution for Poor Well Water Quality**

by Linda Stewart, [lindstew@hotmail.com](mailto:lindstew@hotmail.com)

My orchids are now happily flourishing again. I love miniatures and unusual varieties, and wish that I had known much earlier just how detrimental poor water quality can be, particularly on varieties that require water purity to flourish.