

## **Rain Water Harvesting**

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(Source: <http://www.arcsa-usa.org/>)

Remember the Butch Cassidy movie and its theme song “*Raindrops are Falling on your Head*”. Well, grab those rain drops when they fall! Who knows when it will rain again, as we have seen over and over again out here in West Texas. Rainwater is a free source of nearly pure water and too valuable to waste.

### **Who harvests rainwater?**

For thousands of years the world has relied upon **Rainwater Harvesting (RWH)** to supply water for household, landscape, and agricultural uses. Before city water systems were developed rainwater was collected (mostly from roofs) and stored in **cisterns or storage tanks**. Bermuda is totally on RWH.....Hawaii has a lot also, as does India.

In south Texas and the Rio Grande Valley the central plazas of towns were not only gathering places, but also the collection surfaces for underground tanks where water

was stored for use by adjacent shops and homes. Historic structures like the Stillman House in Brownsville, the Fulton Mansion near Rockport, the Freeman Plantation near Palestine and the Carrington-Couvert House in Austin collected rainwater from their roofs for household use. These systems may no longer be in use, but they are clear evidence of the reliance placed on



rainwater by early Texans. Unfortunately, as Texans bought windmills or REA provided electric power for wells, the earlier home rainwater harvesting systems were dismantled and then forgotten by younger generations.

Today, many Texans are becoming interested again in rainwater harvesting – sometimes out of necessity due to overstressed aquifers and drought-plagued surface water supplies. Several cities in Texas have begun programs to educate the public on RWH. The Lady Bird Johnson Wildflower Research Center at Austin has a large system used for inside potable uses and to irrigate research plots and grounds.....this is a “Cadillac” system and was designed into their buildings. It is another great reason to visit this interesting wildflower center other than to check out many of the great Texas native plants grown there for use in landscaping.

Many parts of the world, including Hawaii and the entire continent of Australia, promote rainwater as the principal means of supplying household water. On many Caribbean islands where rainwater is the most viable water supply option, public buildings, homes, and resorts all collect rainwater to supply their needs. In Hong Kong, rainwater is collected from skyscrapers to supply water needs. Rainwater harvesting can also be used to supply **potable (drinkable)** water. **For potable uses, rain\_water must be treated** to remove or kill disease organisms that may be present.

For **non-potable uses**, like watering landscapes or home gardens and orchards, it is ready for use as it falls from the sky. Take a look sometime at the old system on the patio at the Grey Mule Saloon at Fort Stockton. Wouldn't be hard to put something like that at your home, farm or ranch would it? Or even your business, church or school.

**For livestock**, larger systems can be designed to provide supplemental water in a pasture or in some instances, all of the water required by stock. In Arizona and many of the Western and Rocky Mountain states RWH systems for livestock are in use on Indian reservations, Forest Service or Bureau of Land Management rangelands where groundwater is either too deep for windmills or non-existent and surface water is either rare or of poor quality.

Many years ago, I was Range Manager on the huge Papago (now Tohono Oldham) Reservation in southern Arizona and we watered entire cattle herds on rainwater catchments of an acre or two in size, then stored water in large concrete tanks with troughs. A great conservation idea to save water on already dry ranches!

**For wildlife**, small systems often called “wildlife guzzlers” can be constructed to promote quail and other wildlife species in water-short areas. Texas Parks & Wildlife Department has many across West Texas – they work! See one at the Chihuahuan Desert Research Center near Fort Davis. The Center also has two landscape catchment systems for landscape irrigation.

### **What are the advantages of using rainwater?**

- Rainwater harvesting promotes self-sufficiency and an appreciation for water resources. It promotes water conservation, providing a “**new**” water resource
- Rainwater harvesting saves energy as the energy input needed to operate a centralized water system is bypassed. Many systems require only a small pump or operate gravity flow
- Rainwater is one of the purest sources of water. Its quality almost always exceeds ground or surface water
- Rainwater often has a nitrogen content which provides a slight fertilizing effect for plants
- Local erosion and flooding from impervious cover associated with buildings is lessened due to capture of rainwater



- Rainwater is soft and many people prefer that to hard groundwater

### **Rain Water Harvesting for Your Home**



A few commercial rain barrels and a hose will work! Or clean 55 gallon drums will also, doesn't have to be big, fancy or expensive. Your local county Cooperative Extension office is planning demo sites in Alpine, Sanderson, Van Horn and Sierra Blanca and will be happy to assist you and get you more information. Check the Texas Water Development Board website at:

[http://www.twdb.state.tx.us/assistance/conservation/Alternative technologies/Rainwater Harvesting/Rain.asp](http://www.twdb.state.tx.us/assistance/conservation/Alternative%20technologies/Rainwater%20Harvesting/Rain.asp)

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### **“New” Water Source: Harvesting the rain can help West Texans save water and money**

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Rainwater is the cheapest and one of the purest sources of water available. Water is often scarce in West Texas and residents in this arid land need to use all available methods of saving water. Rainwater harvesting, which was a common water conservation method in pioneer times up to the early 1900's, is one such option that is getting a second

look by numerous Texans. Newer Texans and younger ones too, often have never seen cisterns or had a pure, cool drink of rainwater. A common comment is “Doesn’t water just come from the faucet or the grocery?”

Texas Water Resources Institute (TWRI) and Texas Cooperative Extension (TCE), working with various partners, are planning and constructing rainwater harvesting demonstrations in West Texas to educate the public about its potential as a cheap source of high-quality water. Rainwater harvesting will also reduce demands upon stressed aquifers and surface waters.

“Rainwater harvesting is of special interest in the drier half of Texas. It is being promoted through the *Water for West Texans* program, headquartered at the Fort Stockton Extension Center,” said Mike Mecke,

Water Program Specialist with the Texas Water Resources Institute in far West Texas. Mecke is promoting many aspects of water conservation, water planning, education and water resources management in towns from El Paso to San Angelo, with the aid of County Extension Agents and others.



“Rainwater harvesting can be very versatile,” Mecke stated, “and can provide water not only for landscape irrigation and drinking water, but for livestock, wildlife and even fire protection”. The Lubbock Agricultural Research & Extension Center is currently planning capture of rainwater from their many greenhouses to irrigate greenhouse plants. Currently, the poor quality groundwater must be treated by an expensive reverse osmosis (R-O) filtering system prior to use. This will not only provide a pure source of water for research projects, but can provide an alternative to more expensive water costs such as R-O treatment. R-O, other filtration methods and Ultra-violet light treatments can purify rainwater to surpass drinking water standards.

Most rainwater harvesting systems in the past were for personal use, but some businesses, industries and public institutions are beginning to use these practices as well. Other Texas rainwater harvesting demonstrations include the Chihuahuan Desert

Research Center near Ft. Davis, Lady Bird Johnson Wildflower Center in Austin, Wells Branch Municipal Utility District in North Austin, the Grey Mule Saloon in Ft. Stockton, Advanced Micro Devices fabrication plant in Austin, and Reynolds Metals in Ingleside.

In Culberson County demonstration partners include the Rio Grande Basin Initiative through TWRI, Extension, International Boundary and Water Commission (IBWC), Culberson County Underground Water District and Culberson County, including inmate labor provided by the Sheriff's Department.

Bill Teague, County Extension agent in Van Horn, recently received an award from the IBWC for the progressive use of Rainwater Harvesting at the Culberson County Courthouse. The rainwater harvesting demonstration site, installed in August, is nearly full of rainwater already. Teague and others will develop a low-water use landscape around the tank this spring to utilize this new water.

The project team installed a 2,500-gallon rainwater harvesting tank at the Culberson County Courthouse. In the near future, Ward County 4-H Center at Monahans and the Hudspeth County Extension Office in Sierra Blanca will both have rainwater harvesting demonstrations. At the Ward County 4-H Center, 2,000 and 3,000 gallon tanks are planned. These will be some of the first rainwater harvesting demonstrations in this arid region.

At Sierra Blanca, just east of El Paso, the Hudspeth County Extension Office demonstration, with 1,000 and 3,000 gallon tanks, will be used for drinking water as well as landscape irrigation. "The drinking water use somewhat complicates installation and raises the cost," Mecke said. "But the Hudspeth County Agricultural-Natural Resources Agent, Cathy Klein wants a demonstration of the viability of drinking rainwater to her many residents who currently must either haul water for many miles or buy expensive bottled water."

Mecke has more demonstrations tentatively planned for the West Texas region including Alpine, San Angelo, Alpine, Ozona, Sanderson, Midland, El Paso and several locations in Fort Stockton.

The largest planned project is for Baptist Memorials Center, a retirement center in San Angelo. Mecke assembled a team to develop a long range plan to install a rainwater harvesting system, drip irrigation, inside water conservation and low water-use landscapes at the request of Bob Knox, Plant Manager at Baptist Memorials, and his Director. The City of San Angelo, TWRI, Extension and Texas Agricultural Experiment Station scientists, along with engineers from College Station compose the Baptist Memorials team providing input, local advice and economics planning.

"Billy Kniffen, Agricultural-Natural Resources Agent for Menard County, is the real expert on rainwater harvesting in Extension," Mecke said. "Kniffen guided installation of the Van Horn site and is a crucial member of the San Angelo team." John

Begnaud, Horticulture Extension Agent in San Angelo is Mecke's co-team leader. "John Begnaud, a widely recognized leader in horticulture and landscape conservation, is guiding the planning and installation of water efficient drip irrigation and landscape plantings" said Mecke.

"Water Specialist Janie Harris, from College Station, is working with Tom Green County Family & Consumer Sciences Agent Kathlene Aycock to set up an inside water conservation demonstration to complement other efforts and to monitor cost-effectiveness," Mecke said.

Reportedly, the nursing home rainwater harvesting project will be a three- to five-year project.

"San Angelo, Abilene and surrounding areas are prime candidates for extensive rainwater harvesting, as are several small towns in the vicinity" Mecke said. "Total reliance on surface water and smaller aquifers in drought-prone regions requires multi-source water programs. If you recall, just a few years ago lakes on the upper Colorado River and Concho Rivers were very low. The towns of Bronte in Coke County and Miles in Runnels County ran completely out of water and had to install emergency water resources. However, these types of problems have not been limited to the San Angelo region. I remember Blanco and Throckmorton also running out of water in the droughts of the 1990's. Other towns and regions have also experienced either dry or dropping wells and rivers and this may become more common as our population explodes – if, we do not learn to respect our water resources, live water conservation and diversify our resources, such as by using rainwater harvesting."



More information on designing and constructing rainwater harvesting systems is available in a new Rainwater Harvesting Extension publication is available at <http://tcebookstore.org/tmppdfs/10000570-B6153.pdf> (*Rainwater Harvesting: Homeowners and landowners can construct systems to capture, store and use rainwater to water their landscape plants*). The Texas Water Development Board has recently produced the *Texas Guide to Rainwater Harvesting - Third Edition*. This publication can be downloaded free of charge from either their web site [http://www.twdb.state.tx.us/publications/reports/RainwaterHarvestingManual\\_3rdedition.pdf](http://www.twdb.state.tx.us/publications/reports/RainwaterHarvestingManual_3rdedition.pdf).