

Rainwater Collection

Collect 0.6 gallons per sqft roof per 1" rainfall
2,000 sq. foot roof X 1" rain = 1,200 gal. water
1,200 gal. X 32" rainfall per year= 38,400 gal/ yr



Water Pressure From Rain Barrel

- .433 psi per foot of water column
- Rain Barrel 3' x .433 = 1.3 psi
When barrel is full
- Elevated 12"-18" increases to about 2.6 psi
When barrel is full
- Drip tubing works best with 15 to 25 psi
- At 15 psi water comes out at .6 gallons/hour
- At 25 psi water comes out at .9 gallons/hour
- Drip and soaker hose will work but not at manufacturer's specification



Catching Rain with gutters or a roof valley

Special points of interest:

- Why Rainwater Harvest
- What is Rainwater Harvesting
- Developmental Impacts
- Water Quality Issues
- How to Make a Rain Barrel

Rainwater Harvesting

“Saving from a Rainy Day”

Why Harvest Rainwater

Rainwater Harvesting is the process of diverting, capturing, and storing rainwater for future use.

Why Harvest Rainwater?

- ◆ Reduces demand on municipal water supply
- ◆ Makes efficient use of a valuable resource
- ◆ Reduces flooding, erosion, and contamination of surface water
- ◆ SAVES YOU MONEY!!



Rainwater Harvesting
 “Saving from a Rainy Day”

Texas A&M AgriLife Research and Extension Center at Dallas

17360 Coit Rd, Dallas, TX 75252

(972) 952-9671 Office

(972) 952-9216 Fax

Email: urbanwater@tamu.edu

<http://dallas.tamu.edu>

What is Rainwater Harvesting

Rainwater Harvesting is the process of diverting, capturing, and storing rainwater for future use.

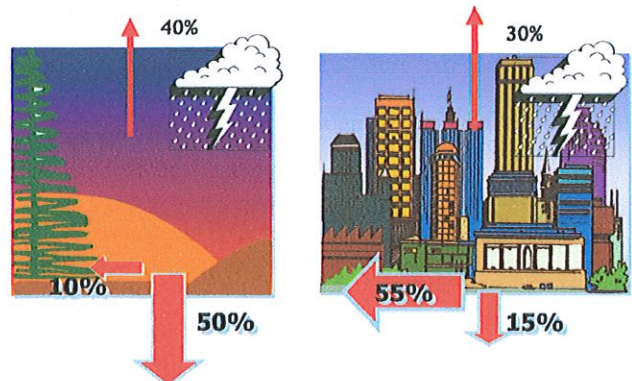
Implementing rainwater harvesting is beneficial because it reduces the demand on the water supply, and reduces run-off, erosion, and contamination of surface water.

Rainwater can be used for any purpose that requires water.

These include landscape use, stormwater control, wildlife and livestock watering, in-home use, and fire protection.

Developmental Impacts

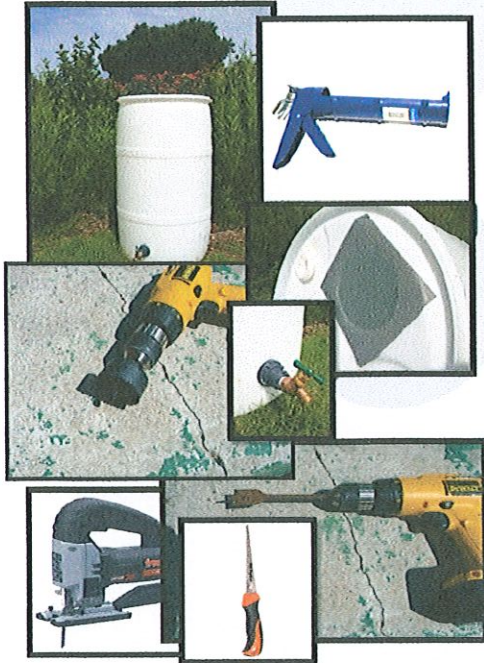
When it rains in a natural environment (still forested and barely touched by humanity) 50% of the rainwater will soak into the ground and 10% may run off the land slowly to end up in local streams. The rest of the percentage evaporates before it hits the earth's surface or lands on vegetation to be absorbed by the plants or evaporate. In a typical urban environment, the rain has less vegetated area to fall and infiltrate so 55% runs off the concrete and other hard surfaces. It is allowed to pick up speed and erode the land.



Developmental Impacts on Water Quality

- Fertilizer
- Pesticides
- Pathogens
- Sediment
- Toxic Contaminants
- Debris
- Thermal Stress

Putting the Barrel together



Supply List

- ◆ Barrel
- ◆ Insect netting
- ◆ Faucet
- ◆ Bulk Head Fitting
- ◆ Drill-with hole saw bit
- ◆ Saw – jig or small hand saw
- ◆ Silicone Caulk
- ◆ Optional
 - ◆ Bungee Cord
 - ◆ Cinder Blocks

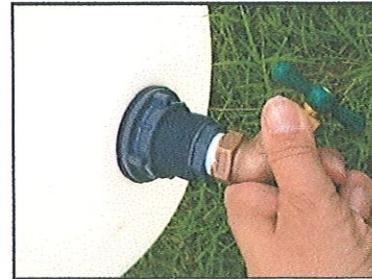
Drilling Collection Hole

Create a 5" – 6" hole on the lid using drill & paddle bit for a pilot hole and Jig saw or drywall saw to complete the large hole for collection.



Drilling the Faucet Hole

Create a 1 3/4" hole on the side of the barrel for the faucet, opposite of the collection hole, using a hole saw bit.



Installing Netting

Apply caulk around lid hole and place netting over hole working caulk outward spreading all over netting in contact with lid.

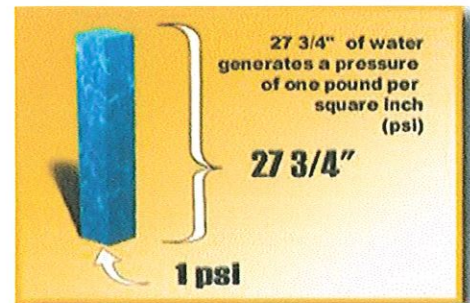


Installing Bulk Head & Faucet

Add a piece of duck tape to end of a yard stick and place bulk head male threaded piece through 1 3/4" hole on side of barrel. Place washer and female piece of bulk head on male end and tighten. Apply pipe tape to faucet thread and insert faucet in the bulk head. Use a pair of pliers to hold the bulkhead in place and turn faucet clockwise. As you tighten the faucet the bulk head should tighten making the connection water tight.

Pressure

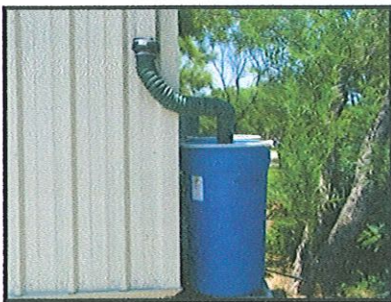
Elevating your barrels increases the available pressure from the faucet.



You can harvest 660 gallons of rainwater from a 1000 square foot roof with 1 inch of rain

Connecting to Downspout

Reduce length of downspout as needed. Downspout fittings may be necessary to divert rainwater into barrel.



Additional Storage

Connecting multiple barrels together using allows you to capture more rainwater



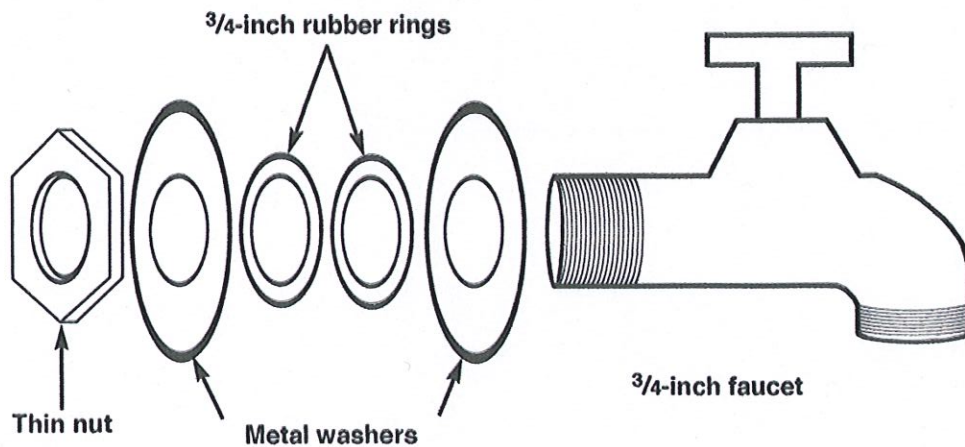
Trash Can Rainwater Collection System

Supplies

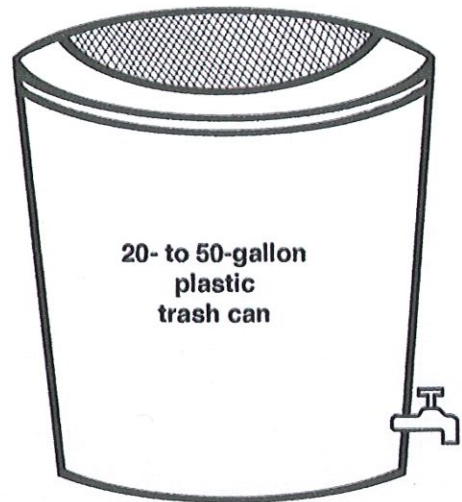
- 20- to 50-gallon trash can with lid
- Thin $\frac{3}{4}$ -inch nut
- $\frac{3}{4}$ -inch faucet
- 2 $\frac{3}{4}$ -inch rubber rings
- 2 $\frac{3}{4}$ -inch metal washers
- 16 $\frac{1}{2}$ -inch-long bolt and wing nut
- Screen wire
- Silicone

How To Build

1. Take a 20- to 50-gallon plastic trash can with a lid.
2. Cut a hole near the bottom of the trash can to fit the $\frac{3}{4}$ -inch faucet.
3. Place the nuts, washers and rubber rings in the order indicated the following illustration:

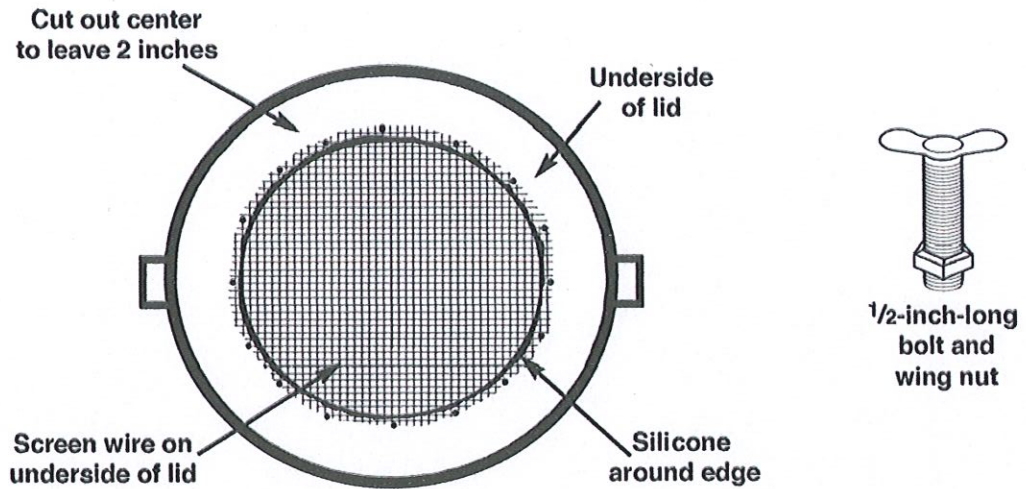


4. Next, cut out a large hole in the lid, leaving 2 inches around the circumference of the lid.
5. Cut the piece of wire screen to be slightly larger than the hole.
6. Drill about 16, $\frac{1}{2}$ -inch holes around the lid. Use more or fewer holes, depending on the size of your lid.



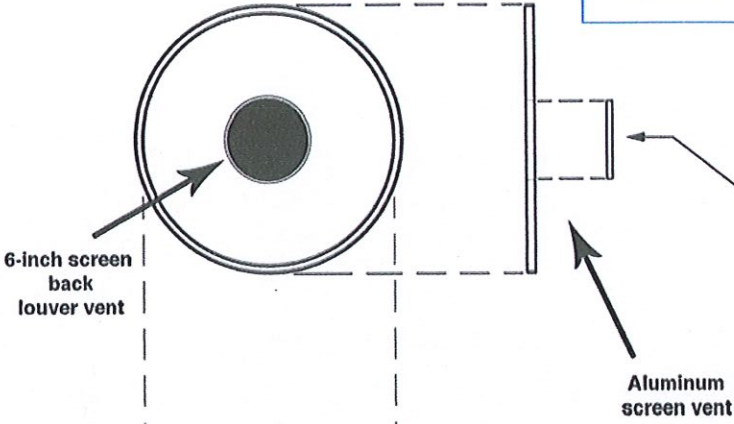
Side view of trash can

7. Starting from the top of the lid, string the 1/2-inch-long bolts through the lid and the screen. Secure the screen with the wing nuts on the bottom of the lid.
8. Use the silicone around the edge of the of the wire screen on the bottom of the lid for added security and to prevent debris from entering the trash can water supply.



Caution

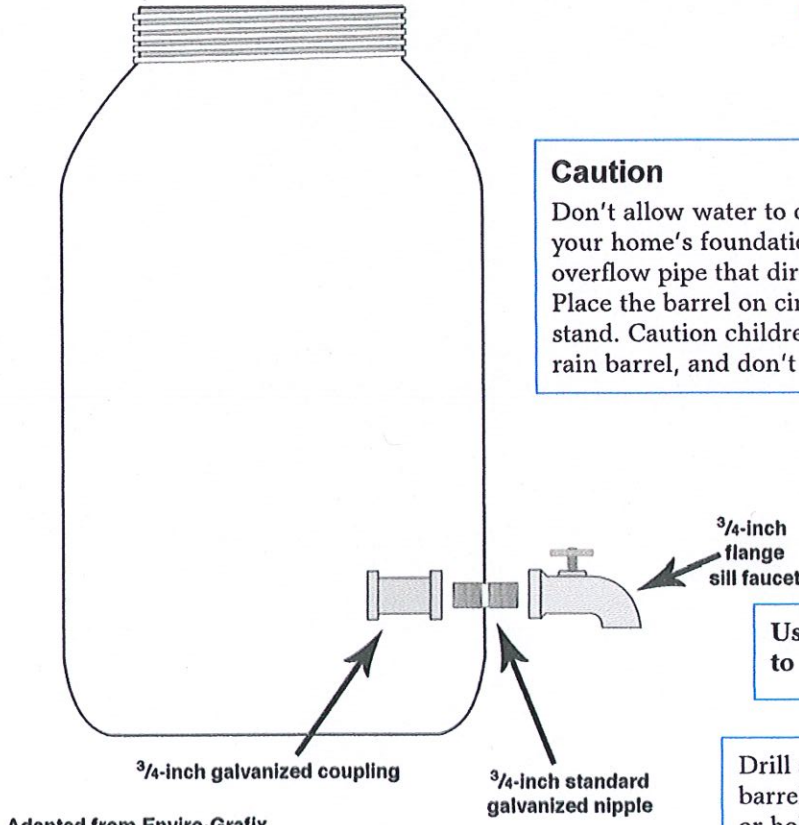
It is a good idea to scrub the inside of the barrel with a household cleanser. A kitchen scrub mop will work well. Be sure to rinse well. It is also a good idea to put a sign on the barrel stating that: *Contents of this barrel are not for human or animal consumption.*



Cut a 6-inch-diameter hole in the top with a saber saw, keyhole saw, drywall saw or sharp utility knife.

Caution

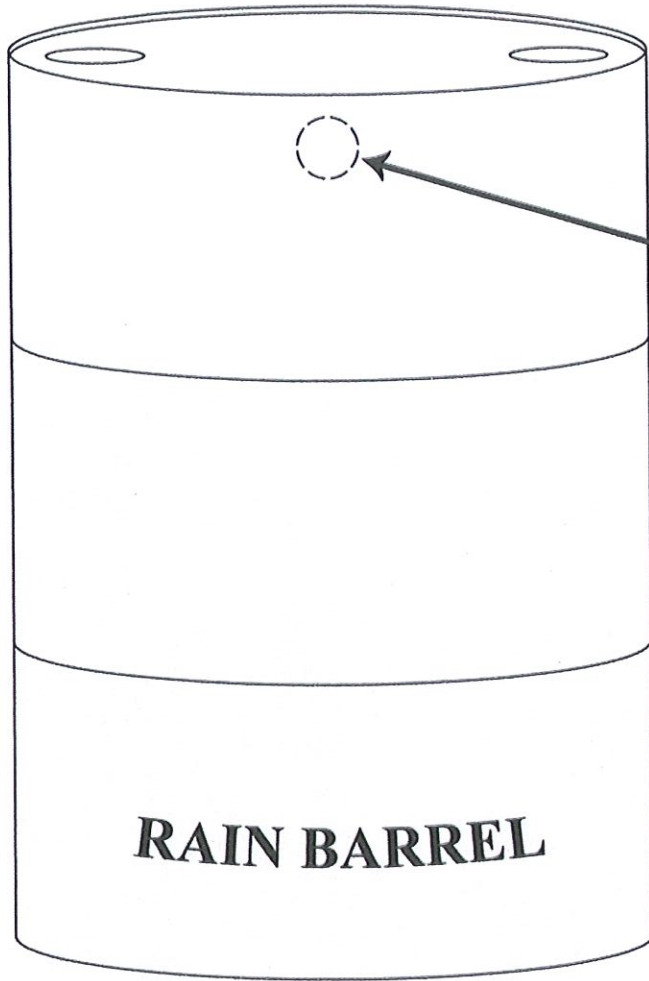
Don't allow water to overflow and saturate ground around your home's foundation. Use an adjustable diverter or an overflow pipe that directs water away from your home. Place the barrel on cinder blocks or an outdoor wood stand. Caution children not to drink the water from the rain barrel, and don't use it for pets.



Use an all-purpose adhesive caulk to assemble the hose bib assembly.

Drill a 1-inch-diameter hole in side of barrel with a standard twist bit, spade bit or hole saw. If you are careful, you can even use a sharp utility knife.

Adapted from Enviro-Grafix

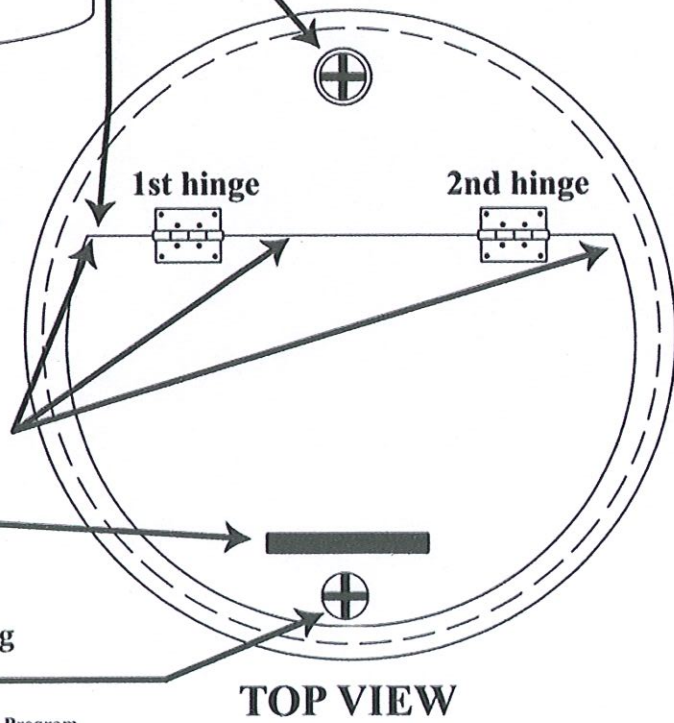


PLEASE NOTE: These barrels are not intended for drinking water storage. Also note that rain-water from roofs that have been chemically treated for moss may harm some plants. Barrels can be painted to match the house color or to blend in with the shrubbery.

- Cut or drill a hole large enough to accept PVC plumbing pipe to link barrels in series. Make sure to have a tight fit so caulking or PVC cement can seal the joint.
- Drill a 3/8-inch-diameter hole for sabersaw blade.
- Cut a round or square hole around bung, large enough to accept downspout.

- Cut across top of barrel with saber saw just past where the first hinge will be located. Install hinge using wood screws provided with hinge. Proceed with cut just past where the second hinge is to be located. Install second hinge and proceed with cut around barrel to form lid.

- A handle can be installed.
- Install a pan head screw or some type of stop to keep lid from falling through hold.



TOP VIEW

Adapted from Covington Water District Water Conservation Program

Other Types of Rain Barrels



Rainwater Birdbath

Supplies

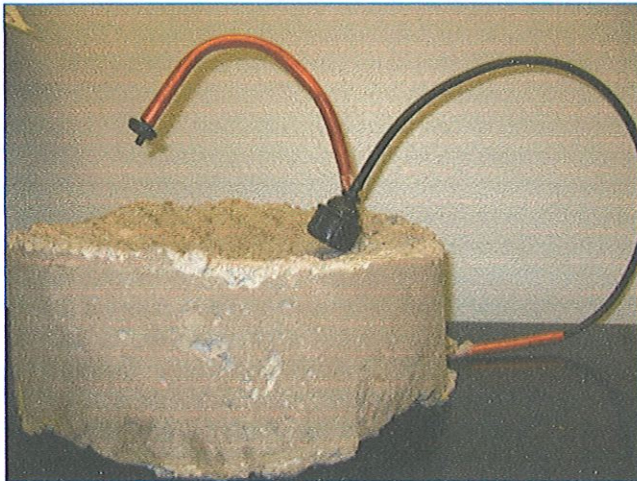
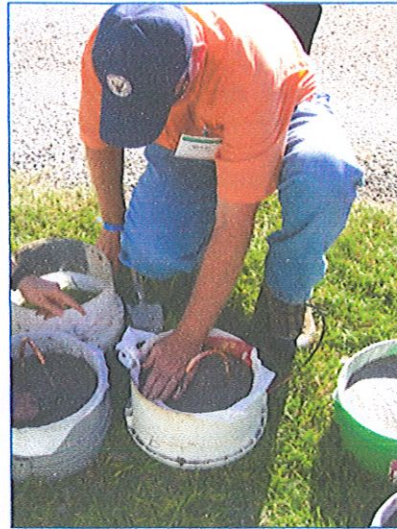
- 1 plastic grocery sack
- 1 5-gallon bucket
- 1 bag of sack-crete
- 1 20-inch piece of $\frac{3}{8}$ -inch copper tubing
- 1 30-inch piece of $\frac{1}{4}$ -inch rubber tubing
- 1 gardening hoe
- 1 faucet hose adapter
- 1 adjustable drip emitter
- 1 wheelbarrow
- 1 small gardening shovel
- water

How To Build

1. Remove the handle from the bucket.
2. Cut the top 10 inches off of an open 5-gallon bucket.
3. Insert the rubber tubing into the copper tubing and bend the tubing to form an "S" shape.
4. Place the cut portion of the bucket on a firm, flat surface and place the plastic sack inside the cut portion of the bucket.
5. Place a small hole in the plastic bag near an edge and put the copper tubing assembly through it.
6. Mix the sack-crete with water in the wheelbarrow, using the gardening hoe to mix; make a very dry mixture so that you can mold the concrete with your hands and keep its shape.



7. Using a small shovel or your hands, fill the mold with about 4 to 6 inches of concrete.
8. Using your hands or small shovel, mold the birdbath to your liking; create a small depression in the center to hold water.
9. Firmly pack the concrete in the mold, making sure that your copper tubing is vertical.
10. Allow the birdbath to dry. Drying time will depend on the water content of the concrete and the air temperature and humidity.
11. Once the birdbath is dry and firm, carefully remove the birdbath from the mold.
12. Next connect the adjustable dripper to the end of the rubber tubing that hangs over the birdbath.
13. Connect the other end of the rubber tubing to the faucet hose adapter.



Rainfall Simulator

