



Figure 1. Example of rain barrel.

Making a Rain Barrel

Brent Clayton,
Billy Kniffen and
Dotty Woodson*

Rainwater harvesting is an old-fashioned yet innovative approach to capturing water. One approach involves directing rainwater from a roof into a storage container for later use. A rainwater harvesting system can be complex, involving the entire plumbing system of a house, or it can be as simple as a rain barrel (Fig. 1). A rain barrel is any small storage container (usually 75 gallons or less).

The water from a rain barrel is nonpotable (not drinkable), but it has several practical uses such as:

- ▶ Hand watering plants
- ▶ Watering plants with drip irrigation
- ▶ Watering pets
- ▶ Filling bird baths or providing water to other wildlife
- ▶ Water features

There are several benefits of using a rain barrel. Capturing rainwater reduces the amount of municipal or well water you need to use and reduces runoff and erosion. Rainwater is best for plants because it is naturally soft, has a pH of about 6, and contains no chemicals.

Rainwater runoff from roofs and other hard surfaces can cause surface erosion, taking sediment and other pollutants into waterways. Harvesting rainwater reduces erosion by capturing the rain before it becomes runoff. Then it can be slowly released into the environment, which reduces pollution and improves the health of waterways.

*Extension Assistant, Extension Water Resource Associate, and Extension Program Specialist, The Texas A&M System.

How much water can I collect?

A large amount of water can be collected from a small amount of rainfall. When 1 inch of rain falls on 1 square foot of catchment (roof) area, it yields about 0.6 gallons of water. Therefore, a 1,000-square-foot roof would yield about 600 gallons of water from only 1 inch of rain.

How do I get a rain barrel?

Rain barrels are becoming very popular. They can be purchased fully assembled and ready to use. You will find them online and at local retail outlets. However, with the right materials it is easy to construct your own rain barrel and it can be a simple, low-cost, and rewarding project (Fig. 2).

Constructing a Rain Barrel

The first step is finding the right container. You may find several kinds to choose from. The best container is a 20- to 50-gallon barrel made of recycled, food-grade plastic. If it is food-grade you can be sure that it is strong enough to hold water. Also be sure it has never contained harmful chemicals. The barrel must be opaque to keep out light (usually blue or black plastic, though it can also be painted). Barrels have various shapes and types of lids. They can have sealed lids with only small openings (Fig. 3) or completely removable lids. The following instructions will explain how to construct a rain barrel when the barrel has a sealed or solid lid. Modify these instructions to fit the barrel you have.

Material list:

- ▶ Barrel
- ▶ ¾-inch outdoor hose bib faucet (Fig. 4)
- ▶ 8-inch round piece of window screen
- ▶ Tube of clear silicone sealer (Fig. 5) or similar adhesive
- ▶ Overflow pipe
 - 2-inch PVC male adapter (Fig. 6)
 - 2-inch electric conduit nut (Fig. 6)
 - 2-inch PVC street elbow (Fig. 7)

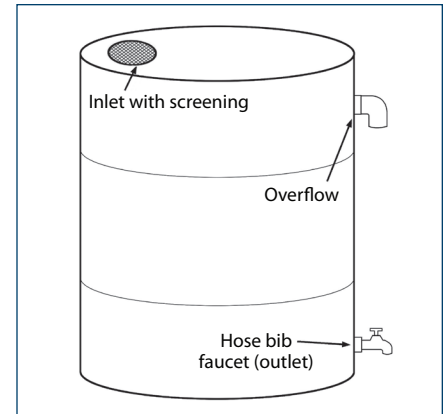


Figure 2. Diagram of rain barrel components.



Figure 3. Barrel with a sealed lid.



Figure 4. ¾-inch hose bib.



Figure 6. 2-inch PVC male adapter and electrical nut.



Figure 5. Caulking gun and sealant.



Figure 7. 2-inch PVC street elbow.

Tools needed:

- ▶ Electric or cordless drill (Fig. 8)
- ▶ 1-inch and 2 $\frac{3}{8}$ -inch hole saw or paddle drill bits (Fig. 9)
- ▶ Caulking gun (Fig. 5)
- ▶ 6-inch hole saw, sheetrock saw or jig saw (Fig. 9)
- ▶ Pliers (optional)

Note that these materials and tools can be changed to adapt to your rain barrel and the way you will use it. Example: A 1 $\frac{1}{2}$ -inch coupling can be used instead of a 2-inch. Always use safety precautions when using power tools.



Figure 8. Drill and 2 $\frac{3}{8}$ -inch hole saw.

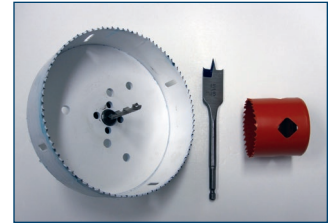


Figure 9. 6-inch hole saw, 1-inch paddle bit, and 2 $\frac{3}{8}$ -inch hole saw.

Barrel preparation:

1. Wash the barrel inside and outside to remove any residue.
2. Construct the water outlet:
 - a. Drill a hole for the hose bib with the 1-inch drill bit (the hole should be at least 4 inches up from the bottom of the barrel) (Fig. 10).
 - b. Place sealant around the hole (Fig. 11).
 - c. Thread the hose bib into the hole (this may require significant force to thread) (Fig. 12).
3. Construct the rainwater inlet and overflow:
 - a. Cut the inlet hole on the top of the barrel with the 6-inch hole saw or jig saw (Fig. 13).
 - b. Drill an overflow hole with the 2 $\frac{3}{8}$ -inch drill bit (for a 2-inch pipe) (Fig. 14).
 - c. Thread the 2-inch male adapter through the 2 $\frac{3}{8}$ -inch hole (Fig. 15).
 - d. Attach a 2-inch electrical nut inside the barrel to the 2-inch PVC male adapter. Use pliers to hold the fitting while tightening
 - e. Glue the 2-inch PVC street elbow to the male adapter.
 - f. Place adhesive around the 6-inch inlet hole with the caulk gun and place the 8-inch screen over the hole (Fig. 16).

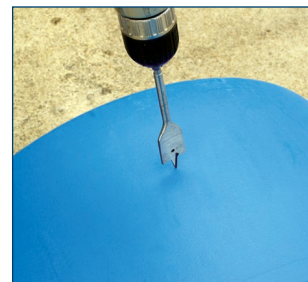


Figure 10. Step 2a.



Figure 11. Step 2b.



Figure 12. Step 2c.



Figure 13. Step 3a.



Figure 14. Step 3b.



Figure 15. Step 3c.

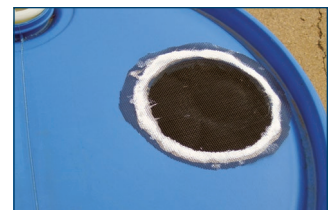


Figure 16. Step 3f.

Other steps to consider:

- ▶ Remember to allow the sealant to dry completely, according to label instructions.
- ▶ The hose bib can face any direction as long as it is screwed in tightly. Many people prefer that the hose outlet face to the side for easier access (Figs. 17 and 18).
- ▶ Paint the barrel with latex paint after finely sanding. Spray paint for plastic also can be used. This improves aesthetics and can extend the life of the plastic.
- ▶ Decorative coverings can be made from wooden pickets and metal flashing (Fig. 19).
- ▶ Instead of covering the inlet hole with screen, place a used, 1-gallon planting pot into the hole. This can be filled with screen or rocks to prevent mosquito entry.
- ▶ In addition to screening the inlet, the overflow also should be screened.



Figure 17. Hose bib facing down.



Figure 18. Hose bib facing to the side.



Figure 19. Covered rain barrel.

Uses and Maintenance

Place the rain barrel near a downspout or where a roof valley drains a large amount of water (Fig. 20). Locate the barrel near its intended use. (If watering wildlife, this may mean a remote location with a roof built specifically for the rain barrel.) For easy access and increased water pressure, place the barrel on blocks (wooden or cinder). Be sure that the blocks and the soil base are sturdy because 50 gallons of water weighs about 400 pounds.

Safety

Consider safety when determining where to place the barrel. Though raising the barrel provides better water pressure, it also creates a tipping hazard. The barrel should be secured to keep children safe and prevent the barrel from being blown or knocked over by wind or heavy rain. Be sure that lids are secured to keep children and animals out.

Any opening larger than window screening can allow mosquitoes to enter the barrel and breed. Be sure all openings, including the overflow, are covered in screen.

Be sure everyone knows that the water in the barrel is not safe to drink. Put a non-potable label on the barrel or remove the faucet handle when not in use.



Figure 20. Ideal placement of a barrel.

Connecting multiple barrels (optional):

You can increase water storage capacity by connecting two barrels. Attach 2-inch PVC pipe to the overflow connector on the first barrel and then to the overflow of the second. Once the first barrel fills with water, the overflow will fill the second. The barrels can also be connected at the bottom so that they fill up at the same time (Fig. 21).

Other changes/additions

Every barrel and its location are unique, so the best way to successfully harvest rain is to adapt the system by trial and error. You may need to make modifications based on the amount of rainfall you get, the amount you use, or the quality of the captured rainwater.

You may also want to adapt the barrel for special uses.

- ▶ **Pet or wildlife watering** – Attach a hose to the tank outlet and extend it to a sturdy, metal watering dish. These can be bought with an internal float that keeps the dish properly filled (Fig. 22).
- ▶ **Bird bath** – To provide water for a bird bath, add a drip emitter to the end of a tube/hose running from the rain barrel. This emitter, positioned over a bird bath, will provide enough water to give birds a constant supply. The dripping discourages mosquitoes from breeding (Fig. 23).
- ▶ **Hand watering plants** – This is one of the most common uses of a rain barrel. The main requirement is to have the barrel raised off the ground enough for easy access to the hose bib.

Maintaining a Rain Barrel

Regular maintenance will keep your rain barrel functioning properly and extend its life. Be sure that the gutters, downspout, and screen on the barrel are clear of sticks, leaves, and other debris. This organic matter can encourage the growth of algae in the barrel, so it must be removed. At least once a year, empty and wash out the barrel. Also, be sure to check the seal around the hose bib and apply more caulking if you spot any leaks.

For more information on water conservation practices for your home and landscape, as well as information on larger rainwater collection systems, visit the Texas A&M AgriLife Extension Service rainwater harvesting website at <http://rainwaterharvesting.tamu.edu>.

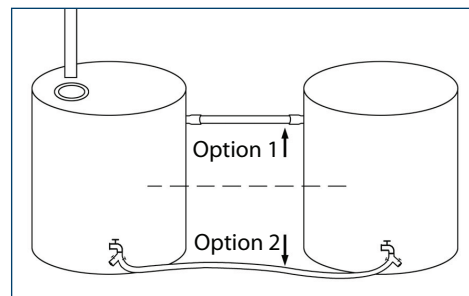


Figure 21. Two options for connecting multiple barrels.



Figure 22. Pet watering tray connected to a rain barrel.



Figure 23. Bird bath made from a plow disc with a drip emitter in an old log.



This publication was funded, in part, by the Rio Grande Basin Initiative administered by the Texas Water Resources Institute of Texas AgriLife Extension Service, with funds provided through a grant from the National Institute of Food and Agriculture, U.S. Department of Agriculture, under Agreement No. 2009-45049-05492.

Texas A&M AgriLife Extension Service

AgriLifeExtension.tamu.edu

More Extension publications can be found at *AgriLifeBookstore.org*

Educational programs of the Texas A&M AgriLife Extension Service are open to all people without regard to race, color, sex, religion, national origin, age, disability, genetic information, or veteran status.

The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Courts of Texas Cooperating.