

Building Rain Barrels to Harvest Rainwater

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Introduction

Arkansas can be prone to temporary drought during summer months. As demand for potable (drinkable) water increases, so do controls of water use by municipalities during peak demand in times of drought. To address this challenge, there is new interest in the age-old practice of harvesting and storing rainwater for nonpotable uses. The most common harvesting method is capturing stormwater from rooftops into rain barrels and cisterns.

A one-inch storm on a 1,000 ft² roof generates over 600 gallons of free, soft, nonchlorinated rainwater.

Capturing even a fraction of this volume in rain barrels can serve as a cost-effective alternative to using tap water for watering landscapes and gardens. Harvesting stormwater with rain barrels can offer many benefits including:

- Saving money on municipal water bills.
- Reducing use of treated water for home irrigation.
- Lowering peak demands on public water systems.
- Reducing stormwater runoff volume.
- Reducing stormwater runoff velocity.



Rain barrel with soaker hose attachment leading to a flower bed

A typical residential rainwater harvesting system directs gutter downspouts to a 55-gallon rain barrel. A hose can be attached to a spigot at the bottom of the barrel for water to be released through gravity pressure. Using this water for irrigation is an easy and economical way to help you maintain healthy gardens. Even though the rainwater is safe to use on food-producing plants, **collected rainwater should never be used for drinking or cooking!**

Rain barrels are available commercially and vary in design and price. However, rain barrels are relatively easy and inexpensive to construct and maintain and are applicable to residential, commercial and industrial sites. This fact sheet provides guidelines for constructing your own collection system using rain barrels.

How to Build a Rain Barrel

Tools Required

- Jig saw or reciprocating saw
- Drill
- 1" drill bit (spade bit will work but a regular bit bores a smoother hole)
- 1½" hole bit for bulkhead tank fitting and spigot
- Adjustable crescent wrench
- Staple gun
- Scissors or utility knife

Parts List (Single Barrel)

- Food-grade plastic, 55-gallon barrel
- ¾" hose bibb (MIP threaded inlet) (plastic or brass spigot)
- ¾" bulkhead tank fitting with 1½" mounting hole



Bulkhead tank fitting

- ¾" x ¾" pipe-to-garden hose connector
- Teflon® tape (plumber's tape)
- Fiberglass window screen
- Bricks or cement blocks

Barrels

- If you are reusing a 55-gallon barrel, make sure it is food grade and wash it out thoroughly.
- Barrels can be purchased new or used from several locations. The cheapest place to buy barrels is directly from food or juice processing plants. Other companies, such as container supply businesses, may be a good, consistent source of used food-grade barrels. Industrial strength 44-gallon trash containers may be used if barrels are hard to track down.

Step 1: Preparation. Mark all cuts and holes to be drilled on your clean 55-gallon barrel. The overflow hole can be located on either side of the barrel and should be at least 2 inches from the top edge of the barrel. The spigot hole should also be 2 to 3 inches from the bottom edge of the barrel.

Step 2: Cutting and drilling. Drill a 1" pilot hole in the top of the barrel to start your saw blade and cut the top out of the barrel using a jig saw or reciprocating saw. Make sure to leave at least a 1" rim to secure the fiberglass screen later. Next, drill the overflow hole at the top of your barrel with a 1" drill bit. Then drill the spigot hole



Barrel with top cut out

using a 1½" hole bit. Use a utility knife to smooth out the plastic burrs around all holes and cuts. Finally, clean the inside of the barrel to remove plastic shavings.



Drilling overflow hole

Step 3: Inserting fixtures and fittings. Insert the bolt-shaped end of the bulkhead tank fitting into the barrel from the inside, keeping the rubber gasket between the "bolt" and the inside of the barrel. The plastic washer fits between the outside of the barrel and the nut of the tank fitting. These fittings have left-handed threads, so tightening seems backwards. Wrap the spigot in Teflon® tape and insert it into the bulkhead tank fitting. For the overflow, the hose-to-hose connector will screw directly into the plastic barrel in the 1" overflow hole. If desired, you can use a 1" internal diameter metal washer between the barrel and the overflow adaptor to give more support to the fitting.



Spigot attached to a bulkhead tank fitting

Step 4: Screening the top of your barrel. Cut your fiberglass screen large enough to cover the entire top of your barrel to prevent mosquito breeding. Staple one edge of the screen to the rim of the barrel (12 o'clock), stretch the screen smoothly across and staple the screen on the opposite side (6 o'clock). Staple the screen at 3 and 9 o'clock, then fill in with additional staples around the rim of the barrel, keeping the screen tight as you staple. Trim off the excess screening material with a utility knife or scissors to give it a clean appearance. If stapling the screen is not an option, the screen can be wrapped over the edges of the barrel and fastened down with bungee cords or straps. Ensure a tight fit to prohibit insects from entering the barrel.



Screen stapled to top



Screen fastened to top

Step 5: Installing your rain barrel. Your rain barrel needs to be raised above the ground to allow access to the spigot and provide enough head pressure to water your plants through gravity flow. Cinder blocks or landscape blocks work well as a stable means of raising rain barrels off the ground.



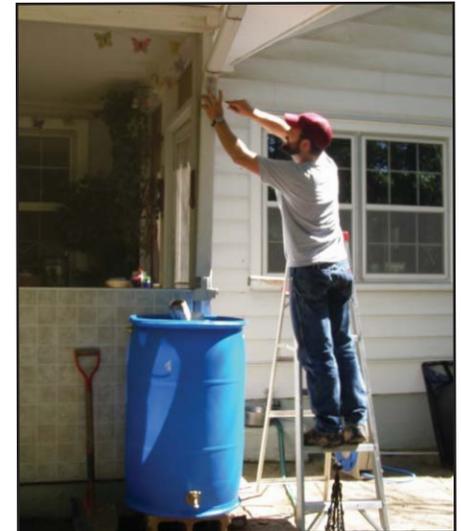
Painted rain barrel on stand with flexspout attachment



Rain barrel placed without a stand will have reduced water pressure



Making the gutter cut for new elbow placement



Outfitting rain barrel to house

Once you know the height of the barrel, it is time to cut the downspout. Disconnect the elbow at the bottom of your downspout. Hold the disconnected elbow up to the downspout to mark where to cut the downspout to provide at least 2 inches between the elbow and the rain barrel so the barrel can be easily removed for future maintenance. Cut the downspout at the line and reconnect the elbow to the downspout.

Maintaining Your Rain Barrel

To keep your rain barrel functioning well, you will need to clean it periodically to remove algae and grit. Take off or pull back a portion of the window screen to wash out the interior with a scrub brush. During winter, either empty and store your barrel or maintain a low water level so repeated freezing and thawing of water in your rain barrel does not split the screen or cause cracks in the plastic. Over time, the window screen may also need to be replaced.



Summary

Rain barrels can be an inexpensive way of collecting rain-water for use in home landscaping and gardens, but they also provide environmental and societal benefits by reducing stormwater runoff and by reducing peak demands on potable water. For more information on using or constructing rain barrels, contact your local Cooperative Extension Service office.

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