

# Rainwater Harvesting Tips

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Opinions expressed are those of the author. Rev Apr. 2023

This article offers tips for rainwater harvesting:

- Why should I harvest rainwater?
- How can I collect rain from my downspouts into containers? Is that easy?
- Where do I store rainwater? Are there inexpensive containers?
- What is passive rainwater harvesting?

About 30 percent of our water in Prescott is used for landscaping. We can save this precious water by replacing thirsty vegetation with drought-tolerant plants and by irrigating with rainwater harvested and stored in rain tanks and/or passively capturing water in a shallow basin or rain garden and allowing it to percolate into the ground.

You can harvest rainwater from even a very slight shower. The first ½ mm just wets the roof and is lost but after that, every ½ mm produces about 10 gal. of water (depending on roof area). Thus 5 mm, if captured in 4 tanks at the corners of your house, yields  $4 \times 10 \times (5 - \frac{1}{2}) = 180$  gal. And this is from a very light rain! A 1,000 sq. ft. roof can collect 11,000 gal. a year in Prescott. You can passively harvest even more rainwater from your lot: A small 6,500 sq. ft. lot receives 72,000 gal. of water a year.

In addition to saving water and money, rainwater is free from chlorine or salts, which makes it ideal for watering flowers and vegetable gardens. You can supplement harvested rain by saving water used to wash fruits and vegetables: catch it in a bowl and pour it on your plants.

**Rain barrels** come in various sizes from about 50 to well over 1,000 gallons. Smaller barrels, which can be "daisy chained" to provide more storage, can be purchased from stores or online and low-cost barrels can be made from used plastic food-grade drums.

For a small inexpensive system, I recommend 50-60 gallon used food barrels such as the paintable containers shown in Fig. 1. These sell for about \$40 including a small spigot (that you may want to replace) at the C-A-L Ranch store, 1048 Willow Creek Rd, Prescott. My house has 10 rainbarrels with a total capacity of about 550 gal.

You may find free used barrels from a food processor or soft drink bottler. I do not recommend rain barrels that take water through a screen at the top of the barrel (Fig.2). If the screen is coarse, mosquitos can enter and breed. A fine screen will clog and dump water on the ground. This barrel will overflow when it is full.



**Fig 1 —Three 50-gallon rainbarrels (painted used food drums) supply water for the small garden behind.**



**Fig 2 — Top-feeding rainbarrel (not recommended)**

With small rain barrels, you can use diverters to collect water from your downspouts and send it to containers. Some rain barrels come with a rubber diverter (Fig. 3). But I do not recommend that. (See below.)

**What type of diverter do you need?** If you are not concerned about overflow near your house (you probably should be!) then almost any diverter will do including the rubber type shown in Fig. 3, although it blocks  $\frac{3}{4}$  of the downspout area. Water will back up in the downspout after the barrel is full, causing overflow. In a heavy rain, water can even overflow the gutter. Also, tree leaves can block the small center opening.

**An effective diverter** not prone to overflowing the barrel (but should be sealed to prevent leaking) is the [Oatley Mystic Rainwater Collection System](#) (Fig. 4). The Oatley does not include an inlet fitting for the barrel. The supplied hose kinks where it was folded for shipping. I suggest mounting the Oatley diverter at the same height as the barrel fitting, not 12" higher as the instructions say, unless the barrel is sealed and you provide an air vent hose extending above the diverter.

**Another effective diverter**, though somewhat expensive, is the [Fiskars DiverterPro](#) (Fig. 5) which, does not overflow and works well if you make some simple modifications. The diverter was available for a discount at online retailers but now is available only from Fiskars at full list price.

**Modifications:** Mount your barrel on a base (such as concrete blocks) to provide room to get a bucket under the spigot at the bottom of the barrel (see Fig. 6). Hold the diverter up to the downspout with the outlet at the height you want the barrel inlet, allowing 1-2" headroom in the barrel to prevent overflow. Allow  $\frac{1}{2}$ " for the downspout to fit into the diverter and make your top cut there. Then for a DiverterPro, cut off 10.25" for a 2x3" (or 7.75" for a 3x4") downspout. It's easier to cut and fit the downspout if you remove it from the house first.

After the downspout is cut, you need to shape it to flatten the fluting and square the corners. I used large linesman's pliers for this. Take extra care fitting the bottom piece and caulk it well with silicone seal or caulk to prevent leaking (Fig. 7). Adding a screw at front and back will make it fit better.

To assemble the system, re-attach top and bottom of



Fig 3 – Rubber diverter in downspout that blocks  $\frac{3}{4}$  of its area. Note small opening for passing water.



Fig 4 – Oatley Mystic Diverter.



Fig 5 – Fiskars DiverterPro feeding two rainbarrels (since painted).



Fig 6 – Three rainbarrels fill from one downspout. Barrel on left was painted.

downspout to your gutter and drain pipe and then ease the diverter into place. Secure with screws. You should have a gutter screen above your downspout to keep leaves, etc. out of your system. Tie barrels down to keep them from blowing away.

The DiverterPro comes with one inlet fitting for the barrel and a flexible hose. Use a 1" hole saw or drill to mount the fitting. You can connect two barrels to a single diverter with another inlet fitting (Fig. 5). But these are hard to find locally. You can also use a connection kit to "daisy chain" two or more barrels together Fig. 6. (Note painted left barrel was painted with latex house paint).

Larger homemade systems can be made from intermediate bulk containers, which come in 175 and 275-gallon sizes or larger. These have a metal frame that reinforces a plastic container (Fig. 8). They should be painted or covered with a light-blocking fabric to prevent algae growth.

Polyethylene rainbarrels can be painted to match your house as shown in Figs. 1 and 6. The paint sticks better if the barrel is pre-treated by "flaming" (lightly passing the flame from a propane torch over the surface).

**Larger rain tanks** (see Fig. 9), shows two 650-gallon tanks with pumps and an overflow line. It costs about 40% more for two tanks instead of one of double size. But with two or more tanks, you can collect water from a larger part of your roof. With larger systems, you can add a pump to provide pressure and connect to an irrigation system. For containers larger than about 200 gal., the downspout should connect directly to the container with a separate overflow.

You can see examples of larger systems at the Adult Center of Prescott, 1280 E Rosser St. Larger systems can be purchased from and installed by Prescott area companies such as [Skywater](#) and [Southwest Water Tanks](#).

**Water quality:** [A Univ. of Texas study](#) found that rainwater collected from asphalt fiberglass shingle roofs contains high levels of dissolved organic carbon. This is mainly a concern for potable (drinking) use. Water from a new asphalt roof may temporarily have a dark (tea) color and odor.

**Passive rainwater harvesting** refers to the use of shallow basins in the ground designed to "slow it down, spread it out and soak it in." Passive collection does not require gutters on the house and water can be collected from a driveway and hillside in addition to the roof. The soil can store more water more cheaply than cisterns or barrels. You can see attractive basins or swales at the Adult Center of Prescott on Rosser St. (Fig. 10) and at Prescott College on Grove Ave.



Fig 7 – Adapter connected to lower part of downspout. Note silicon seal .



Fig 8 – Intermediate bulk container



Fig 9 – Twin 650-gallon rainwater tanks beside Prescott home.

Passive systems can also be created using small check dams in a wash or ditch. Fig. 11 shows check dams at Highlands Center. A check dam can be simply a row of stones. Dirt accumulating behind the dams grows plants. Native Americans have used check dams to grow corn.

Equally important as rainwater harvesting is landscaping with drought-tolerant plants (Fig. 12). These plants can be quite beautiful and they belong here.

**For more information:** Additional information can be found at [https://cwagaz.org/index.php?option=com\\_content&view=article&id=190:bcaction&catid=35&Itemid=287](https://cwagaz.org/index.php?option=com_content&view=article&id=190:bcaction&catid=35&Itemid=287) including the booklet “Harvesting Rainwater for Landscape Use” and a “Water Budget” spreadsheet. The city of Prescott has some excellent ideas on its Water Resources web pages at <https://www.prescott-az.gov/water-sewer/water-conservation/publications-and-resources/>. Prescott water customers [can get a utility bill credit](#) (\$0.50 to \$1/gallon up to \$500) for installing “Rain Water Catchment” systems. There are also credits for passive rainwater harvesting.

For ideas about larger systems, see a video of the April 2016 CWAG program, “Everything You Need to Know About Rainwater Harvesting” available at [https://cwagaz.org/index.php?option=com\\_content&view=article&id=216:2016-04-09-rwh&catid=42&Itemid=66](https://cwagaz.org/index.php?option=com_content&view=article&id=216:2016-04-09-rwh&catid=42&Itemid=66).

More information on passive harvesting can be found in: *Rainwater Harvesting for Drylands and Beyond*, vols. 1 & 2 by Brad Lancaster. (Available at [Yavapai County Public Library](#).)

With a little care, we can all save significant water in our homes, protect the aquifer and save money on our water bills.

This article is updated frequently. You can find the latest version with other information at [cwag.org](http://cwag.org). Look for link to [Rainwater Harvesting and Water Budget](#) under “CURRENT ISSUES.”



Fig 10 – Passive rainwater harvesting



Fig 11 – Check dams in wash



Fig 12 – Yellow Bird of Paradise, drought-tolerant plant, [amwua.org/](http://amwua.org/)