



Rainwater Harvesting

What is rainwater harvesting?

Rainwater harvesting is merely a tool used to conserve water. This type of concept is not new. The larger version of a rain barrel, known as a cistern, holds several thousand gallons and has been used for centuries. Typical rain barrels come in 55-gallon food grade drums. As our human population grows, water quality and quantity will continue to be important issues. Rain barrels are a simple way we can help the environment by:

-  reducing erosion from storm surges in our streams
-  reducing the amount of treated city water used for watering lawns and gardens
-  reducing non-point source water pollution



How can I use rain barrel water? Use to water any type of plants. Rainwater is good for plants because it is highly oxygenated, free of salts and other minerals. As rainwater percolates into the soil, it washes salts away from root zones, allowing better root grow and making plants more drought tolerant. Infiltration of rainwater recharges groundwater resources as well. Remember rainwater does not contain chlorine and fluorine like municipal water so soil micro-organisms and worms appreciate this! Rainwater is slightly acidic with a pH around 5.7. Other uses include: connect to a soaker hose (with the pressure-reducing washer removed); keep your compost bin moist; rinse off gardening tools, wash your car or wash your dog.

Are there any safety concerns with rain barrel water? The best quality organic fertilizers will have some metals, probably more than that in water from any roof. Even microbial agents would not be an issue for watering garden plants as long as the water is put on the ground and not directly on the plant.

The type of roof is not a major issue in collecting water in rain barrels. A metal roof could have some

metal oxides as corrosion products. However, most roofs are painted or sealed today and wash off from roofing materials is only a small issue for irrigation water. For drinking water petroleum products from asphalt shingles, etc. would be of little more concern but not for watering plants of any kind, especially if you did not put the water directly on the plants.

According to NCSU's Dr. Deanna Osmond, "Lead and copper have only slightly higher concentrations coming off roofs than air. This will probably be solids, not dissolved and shouldn't pose a problem in the soil. Zinc (Zn) is a problem when it builds up in soils because it can cause phytotoxicity. When irrigating edible plants and home gardens, you may want to refer to the soil testing publication

www.cals.ncsu.edu/agcomm/publications/Ag-614.pdf

That would ensure that Zn doesn't build up too much and that pH is maintained appropriately."

What may collect and wash off the roof is a bigger concern. In the absence of organic debris like pollen, dusts that may contain chemicals etc., the type of storage container could usually cause more contamination than the roof which has such a short duration contact time with water draining off.

How can biological contamination be prevented? Some contamination is inevitable. Bird droppings will be washed off the roof into the barrel. Bacteria and moss grow on cedar and asphalt roofs. Plant debris that accumulates in the bottom of your rain barrel can support microbial growth. Clean out debris that settles to the bottom of your rain barrel at least once a year. This is a problem for humans and small animals but not for your ornamental plants.

How do I prevent mosquitoes? Cover with screening and seal all openings to your rain barrel. Open access to standing water for more than one week allows mosquitoes to complete their lifecycle. Use "Mosquito Dunks" if needed.

What about algae? Algae need sunlight to grow. A dark-colored rain barrel will exclude the sunlight; paint clear barrels or cover to prevent growth.

How heavy is a full rain barrel? Water weighs 8.3 pounds per gallon. A full 55-gallon rain barrel can weigh over 450 pounds. Make sure the rain barrel foundation is level so that the barrel cannot fall or roll over and hurt someone.

What about water overflow from my rain barrel? Protect your house foundation by diverting water overflow away from your house. Even better, pipe this water to another rain barrel or to a nearby thirsty flower bed!

What about using this water for emergency preparedness? This water can be used for washing clothes and bathing. Treat or boil rainwater, if needed, in emergencies for drinking or cooking. As mentioned above there are no safety standards for rainwater and there is some level of chemical and microbial contamination.

<http://www.ces.ncsu.edu/disaster/handbook.pdf>

Calculating Water Runoff from a Roof:

A 1,000 square foot roof sheds 625 gallons in a 1" rainfall. So if your roof is 50 square feet, here's how to estimate the volume to expect from a 1" rainfall:

$$50 \times 0.625 = 31.25 \text{ gallons of rainwater from a 1" rainfall}$$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Winston Salem	3.3	3.3	3.7	2.8	4.0	3.8	4.5	3.9	3.5	3.5	3.0	3.4

Average Inches of Rainfall per Month (Annual average rainfall = 42" per year)

Parts List for Rain Barrel (hardware store)

- Plastic food-grade barrel
- One 1/2" brass hose bibb
- One garden hose cap
- Sealant - for PVC joints
- Mosquito Screening
- Bungee cord to attach screening to top of barrel
- Cement blocks to lift the barrel to the height you need for getting containers under the faucet. Make sure to level the foundation.

Optional - for larger overflow back to downspout also purchase 2"x3" adapter and flexible guttering.



A small cistern



Water Storage Containers



Rain Barrels

Tools

Use a 15/16" spade bit to cut holes:

- ♻️ One hole 6-7" from bottom of barrel for faucet.
- ♻️ One hole 3-4" down from the top for barrel overflow or to connect an additional barrel.
- ♻️ One hole near the bottom for the brass hose adapter that can be used as clean out port.

Measuring tape

Level

Jigsaw to cut opening in top

Sand paper to sand opening cut by jigsaw

Scissors to cut mesh screening

Pipe wrench to tighten PVC bushings

Additional: Purchase a gutter elbow, a Save the Rain Diverter, or other diverter. You will need a hacksaw for the installation to downspout.

Places to purchase rain barrels, cisterns or water collection tanks:

Check local industrial surplus dealers in your area or look in the yellow pages for drum and barrel or barrel and drum (make sure food-grade drum).

Farmer/tractor supply stores

Hardware stores

Some nurseries and grocery stores

Guilford Co. Cooperative Extension, 336-375-5876

Mathis Home Improvements, 336-744-1141

Sandy Ridge Farmers Market

Master's Touch Builders, Davidson County, 336-479-0462

Rain Pro, Inc, High Point, 336-847-8421

Rain Catchers, Kernersville, 336-918-0147

Blue Ridge Atlantic or BRAE, Oakboro, 704-485-8031

Earth Saver LLC, Kitty Hawk, 252-256-0848

Logans Nursery, Raleigh, 919-828-5337

Rain Water Solutions, Inc., Raleigh, 919-835-1699

More Information

<http://www.bae.ncsu.edu/stormwater/>

