

Rainwater Harvesting



Rain Barrel



Water Storage Containers



Cistern



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.

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 rain garden!

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.

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.

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 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>


Often those containers are ugly, how can I make them look better? You can hide the container behind shrubs, paint it or cover it with various materials. Better yet, make it stand out to educate others! Okay this may not work in some neighborhoods so many people like the look of wood surrounding the container with a tin roof, cover with faux brick, or spend a little extra for a unique container that resembles a planter box or a wood bin.



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

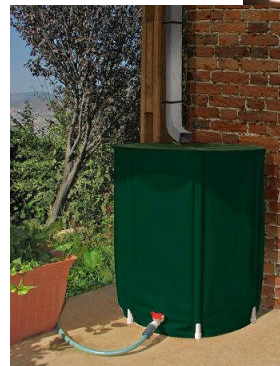
Average Inches of Rainfall per Month (Annual average rainfall = 42" per year)

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).

- Bakeries and tortilla factories
- Farmer/tractor/feed supply stores
- Nurseries, hardware and grocery stores
- Soda and juice bottling companies

- A.B. Seed, 336-393-0214
- Blue Ridge Atlantic (BRAE), 704-485-8031
- Earth Saver LLC, 252-256-0848
- Guilford Co. Cooperative Extension, 336-375-5876
- Logans Nursery, 919-828-5337
- Mariner Container Corp, 828-396-8177
- Master's Touch Builders, 336-479-0462
- Mathis Home Improvements, 336-744-1141
- Rain Barrel USA, 704-843-1581
- Rain Catchers, 336-918-0147
- Rain Pro, Inc, 336-847-8421
- Rain Water Solutions, Inc, 919-835-1699



Tools

- ◆ 1" spade bit
- ◆ Jigsaw or Sabre Saw
- ◆ Measuring tape
- ◆ 2 1/2" or 3" hole saw
- ◆ Scissors and/or wire cutters
- ◆ Level

Parts List for Rain Barrel (hardware store)

- ◆ Plastic food-grade barrel
- ◆ One 3/4" faucet
- ◆ One 3/4" threaded bushing
- ◆ One garden hose
- ◆ One 2 1/2" or 3" male adapter
- ◆ 8 self-threading screws
- ◆ 2-3 Cement blocks
- ◆ Teflon Plumbers tape
- ◆ 2 1/2" or 3" corrugated smooth-wall pipe or PVC
- ◆ Silicone Rubber Sealant (RTV) or Plumber's Putty
- ◆ Hardware cloth (9"x9" rabbit fence and 11"x11" mosquito screen)

Directions:

1. Use a spade bit to drill a 1" hole 6" from bottom of barrel for faucet.
2. Wrap Teflon Plumbers tape a few times around 3/4" faucet and screw 3/4" faucet into hole (should be snug). Attach garden hose.
3. Use Jigsaw or Sabre Saw to cut an 8"x8" opening in top. Use 9"x9" rabbit fence piece and put 11"x11" mosquito fence on top. Attach screening to top of barrel with 8 self-threading screws.

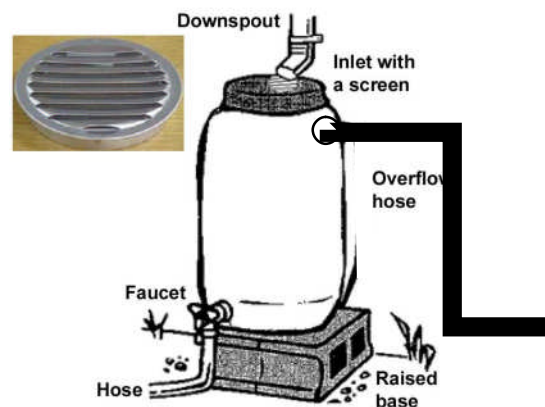
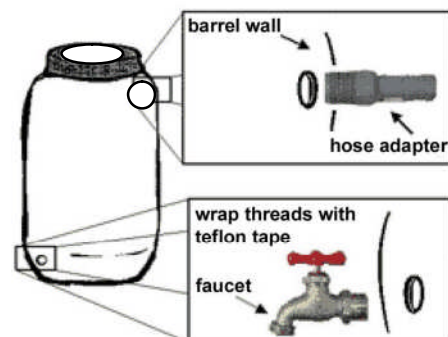
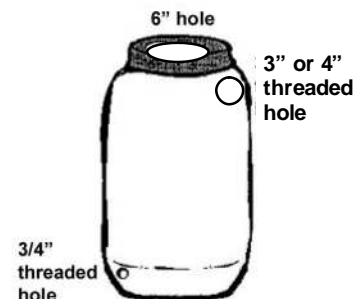
OPTION: Cut out all of top and cover with a fine fiberglass screen.

4. Use hole saw to cut 2 1/2" or 3" hole about 3" down from the top. Use matching 2 1/2" or 3" corrugated smooth-wall pipe or PVC for barrel overflow or to connect an additional barrel.
5. Elevate barrel on 2-3 cement blocks for easier access to spigot. Make sure to level the foundation.

OPTION: For larger overflow back to downspout purchase 2"x3" Y adapter and flexible guttering.

6. After usage may need to plug leaks with Silicone Rubber Sealant (RTV) or Plumber's Putty.

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



More Information

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

Soil and Water Conservation District: A resource for offsetting the costs of best management practices such as cisterns and rain gardens (75% cost share). For more info contact the Forsyth County office at 703-2850.

Wendi Hartup
Natural Resources Extension Agent
wendi_hartup@ncsu.edu
North Carolina Cooperative Extension, Forsyth County
1450 Fairchild Rd, Winston-Salem, NC 27105
Phone: 336-703-2850, Fax: 336-767-3557
<http://forsyth.ces.ncsu.edu>