Rain Barrels Part II: Installation and Use

Fact Sheet FS1118

Cooperative Extension

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Why Install and Use a Rain Barrel?

A rain barrel is placed under a gutter's downspout next to a house, small shed or other outdoor structure to collect rain water from the roof. The water can then be used in various ways including to water a garden. A rain barrel provides two important environmental functions: 1) harvesting rain water provides an alternative to utilizing the drinking water supply for gardening and other uses, and 2) the overflow from a rain barrel can be directed to a pervious area (an area where rain water can infiltrate into the ground) such as a lawn or garden and help replenish ground water supplies. By collecting rain water, homeowners help to reduce flooding and pollution in local streams, rivers, and lakes. When rain water runs off of hard surfaces (also called stormwater) like rooftops, roadways, parking lots, and compacted lawns, it carries with it pollution to the storm drain system and is then discharged directly to our rivers and lakes. Often in older cities, the storm drain system is combined with the sanitary system. During large rain events the storm water and raw sewage is discharged directly to local waterways. Harvesting rain water in a rain barrel reduces the potential for stormwater to deliver pollution to our local waterways.

Figure 1. Fifty-five gallon rain barrel made from a recycled olive barrel. A plastic downspout extension is used to direct water into the barrel.

How Much Rain Will Come Off My Roof?

A large roof is not needed to collect a significant amount of rain water. Approximately 90% of the rain events in New Jersey are 1.25 inches or less. A home with an 800 square foot roof area, in a 1.25 inch rain storm, will drain approximately 600 gallons of water from the roof. The average rain barrel holds 50 gallons of water. To maximize the amount of water collected, multiple rain barrels can be connected together to transfer rain water from a full barrel into empty barrels.

Finding Barrels

Rain barrels can be purchased from local home and garden stores and on the internet. The retail cost of a rain barrel is normally over $100 dollars. An alternative is to build your own rain barrel; they are very easy and inexpensive to construct. See ***E329 Rain Barrels Part I: How to Build a Rain Barrel.*** Most rain barrels are constructed using a 55 gallon high density polyethylene (HDPE) food grade barrel. It is important for a barrel to be food grade so the barrel material will not leach into the water. Barrel and drum manufacturers can be found on the internet or in the phonebook. Steel drums can also be used, but the barrel should be lined with a plastic food grade barrel liner to prevent rusting. Rain barrels can also be created from heavy duty garbage cans.

The most inexpensive method for building a rain barrel is to acquire a used or refurbished barrel. There are many creative ways to find used barrels. Used barrels are sold on internet classified websites or through barrel recycling companies. Different industries such as pickling companies, car washes, and beverage companies use food grade barrels and may be willing to donate used barrels. Often these barrels will need to be cleaned. Barrels should be scrubbed with soap and water, or power washed, and triple rinsed to remove any residual liquid or materials. Barrels that contained toxic industrial chemicals should not be used.

Constructing a Rain Barrel

All other materials used to build a rain barrel can be bought at a local hardware store. See ***E329 Rain Barrels Part I: How to Build a Rain Barrel*** for specific instructions, materials, and tools needed for building a rain barrel. Most rain barrels are fitted with a faucet at the bottom, and a drain (hose adaptor) towards the top of the barrel to drain overflow when the rain barrel fills up. A hose is hooked up to the overflow drain to direct the excess rain water away from the house or building (see Figure 1).

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Preventing Mosquitoes

Any standing water left uncovered will attract mosquitoes and become a potential breeding area. Make sure a screen is kept on all openings to your barrel at all times. When constructing your own rain barrel, fiberglass or aluminum window screen can be used to prevent mosquitoes and other insects from entering the barrel. Mosquitoes can also enter the barrel through the overflow opening. To prevent this, a hose should be attached to the overflow at all times. Products like Mosquito Dunks® are effective in preventing mosquito larvae development. It can also be helpful to add one (1) tablespoon of vegetable oil to the water in the rain barrel to break the surface tension and prevent mosquitoes from landing.

Installation

Installing a rain barrel under a downspout is simple but does require some planning. Determine beforehand where the over- flow from your barrel will be directed. Consider how the downspout runoff conditions will change when you install your barrel. For example, many downspouts are directed below ground through a stand-pipe, and the roof runoff is discharged to some distant runoff area such as the street. If installing a rain barrel in this situation, determine beforehand whether the overflow will go back into the standpipe or whether you can safely divert the water to a landscaped area and allow some to soak into the ground. Ideally the overflow should be directed to a pervious area where the water can infiltrate into the ground, such as a garden, mulched planting bed, or lawn. This is not always possible especially in more urban, highly developed areas. When it is possible to direct the overflow to a pervious area, overflow should be directed at least six (6) feet from the house or building foundation if there is a basement and at least two (2) feet if there is a crawl space.

Figure 2. Brick platform used to elevate a rain barrel. The ground below the platform should be leveled out before installing a rain barrel.

Figure 3. Marking the line where the downspout pipe will be cut and reconnected to the downspout elbow.

When full, a 55 gallon rain barrel will weigh about 460 pounds. Therefore, once the location for the barrel is determined, it is important for the ground to be level so the barrel does not tip over when full. Add crushed stone or gravel to the ground under the barrel to help level out the base, if necessary.

The barrel should be elevated above ground using a platform so that the weight of the water and height above ground moves the water out of the barrel. Use cinder blocks, bricks, or wood to create a platform. Place a level on the platform to make sure the platform is level from side to side and front to back so the barrel will sit even and securely (see Figure 2).

The simplest method for redirecting the downspout into the barrel is to cut the downspout pipe at an appropriate height, above the barrel, then reattach the elbow to the new end. Before cutting the downspout pipe, place the barrel on the platform to accurately determine where to cut. Hold the elbow next to the downspout pipe at the level where water can enter directly into the barrel. Use a pencil to mark a line on the down- spout pipe about two (2) inches below the top of the elbow (see Figure 3). Use a hacksaw or saber saw to cut the down- spout pipe on the marked line. When cutting, place a piece of cardboard or metal flashing between the house and downspout to avoid damage to the siding. Reattach the elbow to the downspout pipe. Pliers can be used to bend the edges of the downspout pipe to fit snugly inside the elbow. It is important to fit the elbow over the downspout pipe to avoid leaks. Downspout screws can be drilled into either side of the elbow to keep it in place. Keep the cut portion of the downspout pipe for reinstallation in the winter.

An alternative method for installing a rain barrel is to use a flexible plastic downspout instead of the aluminum elbow to direct water into the barrel. Flexible downspouts are inexpensive and range in sizes up to 4.5 feet long. In this way the rain barrel does not have to sit up against the house or directly underneath the downspout. Downspout screws should be used to prevent the plastic downspout from dislodging during heavy winds.

Winter Storage

Rain barrels should be drained and disconnected from the downspout and garden hose during the winter. The rain barrel can be stored indoors or stored outside standing upside down. A cover can also be placed over the barrel to prevent water from getting inside. Water should not be left in the barrel to freeze. The cut downspout pipe that was removed can be reconnected using screws and a downspout strap. Alternatively, a flexible downspout can be attached to the hanging downspout pipe. A splash pad should be placed at the bottom of the downspout to prevent erosion.

Decorating Rain Barrels

Rain barrels can be made into unique features in a backyard as an artistic or landscaping component. To paint a barrel, the plastic should be cleaned and sanded with fine sandpaper to remove the outer waxy coating. When painting, use a primer and spray paint that adheres to plastic. These are available at retail home centers or hardware stores. Barrels can be decorated using acrylic paint. Painted barrels can be finished using a clear coat of polyurethane to ensure the paint will not chip or fade when exposed to the elements.

Additional Safety Precautions

Common sense should be used when deciding how to use the harvested water from your rain barrel. A roof can collect dust, leaves, pollen, animal feces, pesticides, and other airborne residues (Texas Rainwater Development Board, 2002). Harvested water in a rain barrel should not be used as a drinking water source. Rain water should not be collected in a rain barrel if a moss killer was recently used on the roof (up to three months prior). If water quality is a concern, a first flush diverter can be installed to route the first flow of water off the roof away from the rain barrel. First flush diverters are available for purchase online from rain water harvesting supply companies.

Additionally, before using the harvested rain water to water a vegetable garden, a sample should be taken and sent to a certified water testing laboratory. Water samples should be taken periodically throughout the growing season to confirm results. Check the New Jersey Department of Environmental Protection Data Miner website to search for certified laboratories in your area, www.nj.gov/dep/oqa/certlabs.htm. Recommended tests include metals (zinc, lead, chromium, arsenic), polycyclic aromatic hydrocarbons (PAHs), and pathogens (fecal coliform, and E. coli). Studies have shown that most of metals detected in rooftop runoff are also detected in rainwater that has yet to contact the rooftop. Therefore, these contaminants are unlikely to result in intolerable residues in edible plants, fruits, and vegetables, especially when they bind with soil particles and organic matter on the ground (DeBusk, et al., 2009). Regardless, if the water is confirmed to be safe, it is still best to use drip line irrigation to water the roots of the plants. Be sure to thoroughly clean any edible plants harvested with potable water before consumption.

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