

# RAIN BARRELS AND RAIN GARDENS: *A GUIDE FOR HARVESTING RAIN WATER*



*Town of  
Fort Myers Beach*

Florida Yards & Neighborhoods



UNIVERSITY OF  
**FLORIDA**  
IFAS EXTENSION

## What is a Rain Barrel?

Rain barrels capture (harvest) and save rain water collected from the rooftop of your home to reduce stormwater runoff. Supplementing natural rainfall and landscape irrigation outdoors, a basic, low-cost rain barrel is easy to assemble and install. The design works for homes with or without a rain gutter system. Reducing stormwater runoff from a property helps to effectively reduce levels of pesticides and fertilizers entering local ponds, lakes, canals, bays and other water bodies. During extended periods of below normal rainfall, having extra water on hand is a good idea.

Water from a rain barrel can be used for most indoor or outdoor plants. Free of most sediment and dissolved salts, rain barrels collect and provide free water for newly planted trees, shrubs, flowers, groundcovers and lawns. Many parts of the world do harvest and store rainwater for potable uses, such as drinking, cooking and bathing. However, this requires filtration, treatment and testing, all of which are beyond the scope of this text.



*Rain water collection vessels, above-ground cisterns and rain barrels have been around for thousands of years and can still offer a great benefit to homeowners.*

## **Components of a Rainwater Collection System**

Your rain barrel should consist of a food grade plastic barrel. These containers transported food such as juices, olives, pickles, bananas, etc. Most have sealed tops to exclude mosquitoes while making it fairly easy to drill holes for the downspout, spigot and overflow outlets. For homes without rain gutters, the barrel can be used by cutting a larger hole in the top. Barrels are also available with open tops. The barrel can easily be fitted with a screen over the opening to allow the rain water to collect while sealing out mosquitoes and debris. Larger recycled containers up to about 350 gallons may also be available.

The rain catchment area can be at any location that collects and conveys water off a roof, either from gutters or roof valleys. When using a rain gutter downspout, it can be fitted with a gutter screen to prevent leaves and debris from entering the rain barrel. Some debris may enter the rain barrel but will settle below the spigot. If the spigot clogs you will know its time to perform rain barrel maintenance.

Getting the water to your plants is the final step. This can be accomplished by filling watering cans, attaching soaker hoses, or other types of hoses. The barrel overflows can also be diverted with hoses to add more benefit.

It is important to keep any plumbing attachments to your rain barrel or cistern independent from your existing house piping or sprinkler system piping. This will prevent a cross-connection to your potable water supply.





## Assembly and Installation Steps

1. After selecting a barrel, wash out any remnants of food or juice. Clean the rain barrel by rinsing all surfaces (inside and out) with vinegar mixed with water or a mixture of 1/8 cup bleach in 5 gallons of water.



2. Identify the location for the barrel. Level the area where the barrel is to be placed.
3. Build a sturdy platform for the barrel making sure it is level and high enough to fill a watering can. Concrete blocks work well. Set a large 24" x 24" concrete, stepping stone on top of the cement blocks. Check the top surface to make sure it is level.
4. Using a downspout template, trace the outline for cutting a water inlet on the top of the barrel.
5. Drill a pilot hole using a large bit just inside the inner drawn circle. Using a saber or jig saw, follow the inner circle line until the shape of your downspout hole is removed. Remove the plastic that has fallen into the barrel.



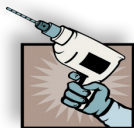


6. To install the outlet or hose spigot, place the barrel on its side. Measure and mark approximately 6" above the base of the barrel. (This will put the spigot approximately 10" above the ground when the barrel is sitting on a solid base or platform.) The spigot hole is generally on the side directly opposite from your inlet hole.
7. For a  $\frac{3}{4}$ " spigot, drill a  $\frac{7}{8}$ " (or  $\frac{15}{16}$ ") hole at your mark.
8. Screw in spigot until it is snug and pointing downward. A threading tap to create threads for screwing in the spigot makes this easier, but is not necessary. Be sure to hold the threading tap vertical, to insure the hole is straight rather than crooked. When properly threaded, no PVC cement is needed.
9. Install two overflow outlets using  $\frac{3}{4}$ " PVC plastic elbows. Drill two  $\frac{7}{8}$ " ( $\frac{15}{16}$ ") holes near the top of the left and right side of the barrel when facing the spigot. Use 90 degree elbows with one end male-threaded and the other a female slip joint.
10. Mark the downspout for cutting. Use a fine-toothed hacksaw blade (24 or 32 teeth/inch).
11. Connect two elbows and insert one into the bottom of the downspout. Insert the second aluminum elbow into the first and insert into the hole cut into the top of the barrel. Note: Be sure to adjust for the height of the barrel sitting on the cement block base before cutting the downspout. Disassemble the downspout if needed to finish the system. Do not seal where the lower elbow enters the barrel as a water tight seal is not desirable.
12. Create a level stone pad using  $\frac{3}{4}$ -inch pea gravel (river rock) or chip stone in the area designated for the rain barrel. The stone base allows any overflow water reaching the pad to quickly drain away leaving the pad dry on top. The stone pad gives you working space around the barrel as well.



## More Ideas

13. Drill a hole for a bottom drain plug for maintenance.
14. Use screens on gutters and downspouts to remove leaves, sediment and shingle particles as the water enters the barrel.
15. Add aesthetic landscaping features leaving working space on three sides of the barrel.
16. Add more barrels for storing additional water during the dry season. Link barrels together with PVC pipes and fittings.



## SUGGESTED TOOLS AND MATERIALS

### TOOLS

Electric Drill — Spade Drill bit 7/8- or 15/16 inch — Saber or Jigsaw  
 Marking pens — Safety glasses — 3/4-inch NPT Threading Tap (optional)  
 Hacksaw or drywall saw

## INSTALLATION MATERIALS

¾ inch gravel drainage stone — Two or Four 16x8-inch concrete block  
 — One 24 inch square stepping stone or four 12 inch stepping stones  
 — One 55-gal barrel — One ¾ inch plastic or brass hose bibb —  
 One flexible plastic elbow or Two aluminum elbows made to fit your  
 downspout — Two ¾ inch 90° elbows, threaded male on one end, female  
 slip joint on other end (Used as overflow fittings on the sides of the barrel )  
 — ¼ inch mesh hardware cloth or plastic window screening

## GENERAL INFORMATION

**Your plastic drum** or barrel should have carried only food products, cosmetics or cleaning products. Rinse well before using. Do NOT use barrels that contained petroleum, pesticide or toxic chemicals. Barrels that contained organic fertilizer products may also be useable. If the barrels previous use is not known, DO NOT use the barrel.

**When buying the aluminum downspout elbows**, make a cardboard template to the size of the end of your downspouts. Take it with you to the hardware store to prevent purchasing the wrong size elbow for your home. Two different size elbows are commonly sold. They include, a 2"x3" elbow (called Elbow A) or a larger 3"x4" (Elbow B).

**For barrels requiring a larger opening where no gutters exist**, wear safety goggles when using a jigsaw to cut a large hole out to the correct size desired. Occasionally, plastic barrels are sold with a separate, tight fitting lid that can easily be removed. To eliminate mosquitoes entering the larger opening to lay eggs, place and secure a piece of window screen over the top of the barrel.

**Painting your barrel.** (1) Wash the exterior of the barrel with detergent and water. (2) Paint the barrel with (KILZ 2 Primer Paint®). This allows use of regular house paint, matching your house, as a color coat. You can also use any color of (Krylon®) spray paint. (3) Decorate the sides of the barrel using acrylic craft or artist paint.



**Mount** your rain barrel as high as practical to use gravity to increase pressure. Use a brass nipple on the end of the spigot to connect a garden hose or irrigation coupler. Corrugated hose or plastic PVC pipes can be made to fit on one or both overflows.

*One 55-gallon barrel will provide runoff storage from a rooftop area of approximately 215 square feet with a 0.5-inch rainfall.*

## **ADDITIONAL NOTES**

- \* Barrels with open tops present a safety hazard for children. Be sure to fasten hardware cloth (screening with holes no larger than 3/8" wide) securely to the frame of the barrel.
- \* While rainwater harvesting systems are largely unregulated, local homeowners associations, health, plumbing codes or regulations may apply.
- \* This basic rain water collection system uses materials sold locally for less than \$50. This handout is intended for novices. No specialized construction or plumbing tools are needed. The components added to each barrel are easily found and purchased at retail hardware stores or building material suppliers.
- \* Plumbing and gutter contractors interested in the environment are also starting to specialize in whole home rain water catchment systems.
- \* Rain barrel kits are available on-line and through garden magazines. Rain barrel capacity varies. Check with the manufacturer on the price and shipping cost.
- \* If you are concerned about mosquitoes breeding in your rainbarrel, add approximately 2 teaspoons of vegetable oil to the barrel. This will keep a layer on the surface that will not allow the mosquitoes to lay eggs. Be sure to keep all the nooks and crannies on the outside of the barrel dry to avoid mosquito breeding.
- \* In the event of a hurricane, it is recommended that rain barrels be emptied and stored in a secure area. The approximate weight of a water filled rain barrel is 450 lbs.

## **CREATE A RAIN GARDEN TO SLOW THE FLOW**

Building a rain garden is a beautiful way to help *slow the flow* of stormwater from your property to protect and improve the quality of water entering any receiving waters.

The first few inches of rainwater flowing from a roof, lawn, paved driveway or walkway fills the rain garden, minimizing the amount of water entering a stormdrain, roadway, canal, bay, lake or stream. During a storm event, the water will continue to seep into the ground and is filtered by the soil and plants in the rain garden. A rain garden allows approximately 30 percent more stormwater to soak into the ground compared to a conventional lawn.

Rain gardens can be designed in all shapes and sizes for sun, shade and sandy soil. A rain garden can be formal or informal and include a variety of Florida-friendly native and/or non-invasive plants; Examples include native grasses, helianthus, oxeye daisy, tropical sage, rouge plants, wax myrtle and buttonwood. Rain gardens can also include ornamental features including stone culverts and pathways.

## **SIZING A RAIN GARDEN**

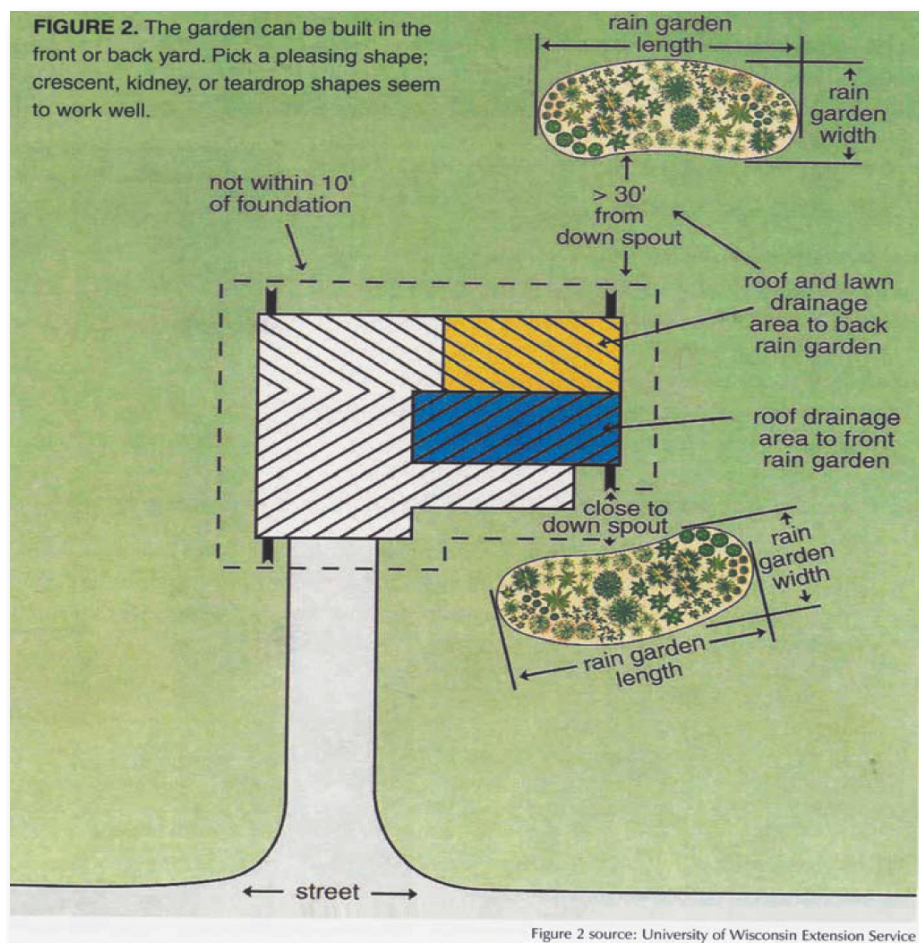
*“Any Rain Garden is a Good Rain Garden.”* Its efficiency will depend on several factors: how large and/or deep the garden can be made, what type of soils the garden site has and the amount of roof and other areas draining into the garden.

A rain garden can be as large or small as the area you choose to utilize for the garden. A good guide may be an 8'x10' area to drain one downspout from the average house.



## LOCATING THE RAIN GARDEN

Your rain garden should be located several feet from the house so that rain water does not seep into the foundation. Locating the rain garden further from the building provides more opportunity to collect and infiltrate additional stormwater generated on the property. Use the topography of your yard to enhance the rain garden's location – WATER RUNS DOWNHILL. Try to locate the garden away from any impervious surfaces on your property and away from existing vegetation that cannot withstand flooding. Of course the site location is solely your personal preference where the colors and fragrances can be enjoyed.





## **HOW DEEP SHOULD THE RAIN GARDEN BE?**

*A TYPICAL RAIN GARDEN IS BETWEEN 4 AND 8 INCHES DEEP.* Deeper than 8 inches may cause the water to pond. A rain garden less than 4 inches deep will require a larger surface area to contain the water runoff.

No matter the depth of the garden, the goal is to level the ground surface of the garden with a berm around three sides to help keep the water from overflowing. Digging a very shallow rain garden on a steep lawn will require bringing in extra topsoil to fill the downhill portion of the garden to the same height as the uphill part of the garden. As the yard's slope gets steeper, it is easier to dig the garden a little deeper, to level the ground surface, than to bring in extra soil.



## **DIGGING THE RAIN GARDEN**

While digging the garden to the correct depth, heap the soil around the edge to form a berm around three sides of the garden to help keep the water from overflowing during heavier storms.

Create the shape of the garden by laying a garden hose or string in a desirable shape. Next put stakes along the uphill and downhill sides and run a level string between them. Start digging at the uphill side of the string. Measure down from the string and dig until you reach the depth you want the garden to be.

Hand dig or use a rototiller to create the basin of the rain garden. An ideal soil mix would be 50-60% sand, 30-40% loamy topsoil and 5-10% organic matter from yard waste or compost. After digging the basin and adding soil amendments needed, retest the soil's infiltration of water to make sure that the basin still drains in 24 hours or less.

**Percolation Test** - This simple procedure can determine your soil's porosity or infiltration rate.

Remove both ends of a 48 oz. can. Mark a line 2 inches from the bottom end.

Pound the can 2 inches deep into the soil, so that the line is level with the ground's surface.

Pour one quart of water into the can. Time how long it takes the water to drain into the soil.

***2 minutes or less*** - Excellent percolation

***2 to 8 minutes*** - Somewhat compact or dense soil - Acceptable drainage for a rain garden

***More than 8 minutes*** - overly compact or dense soil - add amendments to soil to improve porosity

## **PLANTING THE RAIN GARDEN**

When choosing plants for the garden, it is important to remember that this is a garden for YOU – pick attractive plants that you like. Deep rooted plants are an essential component of the rain garden, as they penetrate and break up the soil.

Select nursery plants that have a well established root system.

Have an idea of where each plant will be placed. Lay out the plants, keeping appropriate distances between plants, they will grow and spread. It is important to consider the height of each plant, bloom time and color.



## **EXAMPLES OF FLOWERS, TREES AND SHRUBS APPROPRIATE FOR RAIN GARDENS IN SOUTHWEST FLORIDA AND COASTAL COMMUNITIES**

*Canna flaccida*, Golden Canna

*Tripsacum dactyloides*, Fakahatchee Grass

*Acrostichum danaeifolium*, Leather Fern

*Blechnum serrulatum*, Swamp Fern

*Muhlenbergia capillaris*, Gulf Muhly Grass

*Borrhchia frutescens*, Sea Oxeye Daisy

*Helianthus debilis*, Dune Sunflower

*Salvia coccinea*, Tropical Sage

*Stachytarpheta jamaicensis*, Native Porterweed

*Psychotria nervosa*, Wild Coffee

*Rivina humilis*, Rouge Plant

*Myrica cerifera*, Wax Myrtle

*Myrsine floridana*, Myrsine

*Conocarpus erectus*, Green Buttonwood

*Chrysobalanus icaco*, Cocoplum

*Cephalanthus occidentalis*, Buttonbush

*Ilex glabra*, Galberry

*Acer rubrum var. trilobum*, Red Maple

*Annona glabra*, Pond Apple

*Ilex cassine*, Dahoon Holly

*Magnolia virginiana*, Sweetbay

*Sabal palmetto*, Cabbage Palm

*Salix caroliniana*, Coastal Plain Willow

*Sambucus canadensis*, American Elderberry

*Serenoa repens*, Saw Palmetto

*Taxodium ascendens*, Pond Cypress



## **MAINTAINING YOUR RAIN GARDEN**

Designed properly, a rain garden requires no special maintenance than the rest of the yard. For plant establishment, additional water is likely for the first sixty days or so. During the first two years, weeding of the garden is likely. Remove the weeds by hand and try to remove the roots and all. As the rain garden plants begin to mature and spread, maintenance and weeding will decrease. Remember to mulch the garden. Mulch keeps the soil moist, suppresses weed growth, stabilizes soil temperatures and reduces erosion and soil compaction. It is also a great way to reuse your yard debris.



*By following these simple guidelines, your rain garden may never need fertilizer.*

Follow these nine easy principles of Florida-Friendly Landscaping for a low maintenance, friendly yard:

1. Right Plant, Right Place
2. Water Efficiently
3. Fertilize Appropriately
4. Mulch
5. Attract Wildlife
6. Manage Yard Pests Responsibly
7. Recycle
8. Reduce Stormwater Runoff
9. Protect the Waterfront

- \* The information contained in this guide uses standard construction and installation methods. The materials, sizes and location of a rain barrel or rain garden on your property are limited only by your imagination.
- \* Many thanks to the volunteers with the Florida Friendly Yard program who help to make this program work in SW Florida and the property owners who graciously let me tromp through their yards to film and photograph their rain barrels and rain gardens, many of which are shown in this guidebook.
- \* A special thanks to Joan and Warren Bush, Lee County Master Gardeners, Rain Barrel Consultants and Cape Coral Historical Museum Volunteers, who continually assist with and teach conservation techniques within South West Florida.
- \* In remembrance of Audree Inglis, a Lee County Master Gardener, member of the Fort Myers Beach Garden Club, member of the Fort Myers Beach Marine Resources Task Force, Rain Barrel volunteer and Fort Myers Beach resident.

*For additional information on Florida Friendly Yards, please email [tbecker@leegov.com](mailto:tbecker@leegov.com) or call 239-533-7515.*

# *Town of Fort Myers Beach*



## **PERSONAL RESPONSIBILITY FOR ISLAND STORMWATER MANAGEMENT**

*This how-to guide was a grant-funded project by South Florida Water Management District for the Town of Ft Myers Beach. For more information on other locally available classes and workshops, contact Lee County Florida Yard and Neighborhood program at 239-533-7515 or the Town of Fort Myers Beach at 239-765-0202.*



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