

Keep the Rain on Your Side

RAIN GARDENS

by Mary Ann Capehart

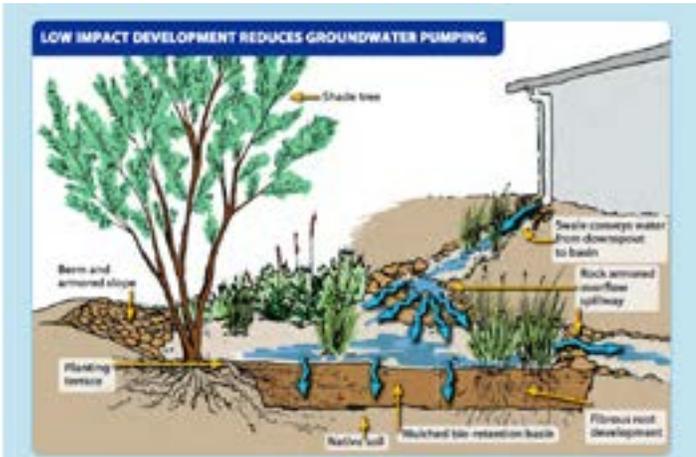


Diagram Courtesy of Watershed Management Group, watershedmg.org

Properties are often designed with sloping front yards that shed nearly all the rain that falls on them to the street. You see this kind of lot frequently in Arizona and you know that the builders were concerned about foundations and flooding. That is understandable. Now, add to that a more recent concern—dropping ground water levels and the need to conserve. We can substitute some of the tap water we normally use for irrigating with another source of water—rain. We don't have to watch all that water run away down the street.

UA Water Wise suggests keeping some of that rain “on your side” by creating a rain garden. A rain garden is a shallow basin dug to capture rain as it flows across the ground from higher to lower elevations, frequently towards the street. This way, you can capture hundreds of gallons of water for landscaping. Here are three reasons why this is a good idea: polluted water, wasted water, and underused water. Water running off yards becomes polluted from oils and dust on driveways and roads and most of it evaporates before it ever reaches a wash or a river. Rain is also free source of water, so why not keep it on your side? And thirdly, a sculpted landscape fed with rain can look more attractive than a uniform, flat surface, potentially adding to your property's value.

Consider guiding the water from your downspout via a gentle channel to a rain garden—a basin around which you can plant.

How to think about it

Let's take a common scenario. A home has a 1,400 square foot roof. The front half of this roof slopes to the front yard. Gutters along the front feed two down-

A rain garden is a “landscaped, shallow depression that allows rain and snowmelt to be collected and seep naturally into the ground.” This depression is braced with rocks, if needed, filled with mulch, and planted.
—Rutgers Cooperative Research and Extension

spouts placed on each side of a doorway. The yard, about 2000 square feet, drops at a three percent slope towards the street.

Any turf here was removed years ago, and in its place is rock over plastic weed barrier. Several trees stand alone and a few shrubs obscure the windows. This yard could use more greenery! So, add a rain garden—also known as a bio-retention basin—to feed new plants. A typical residential rain garden ranges from 70 to 300 square feet.



How to design a rain garden

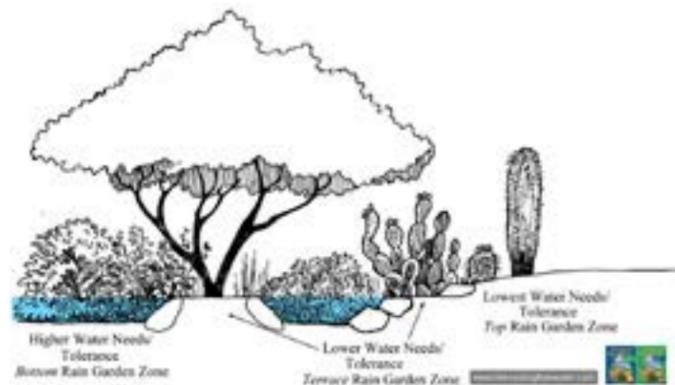
- Choose any shape for your basin that you prefer—crescent, kidney, and teardrop shapes are popular.
- Dig a basin and use the excavated soil to create a berm on the street side of the basin.
- To size the basin, you need to know the volume of water coming off your roof (the part of the roof shedding into the front yard) in a one-inch rain.
- Make sure that you won't have standing water in the basin after 24 hours, breeding mosquitoes. To prevent standing water, you need an idea of your soil's percolation rate.
- Do not place the rain garden directly over a septic system or within ten feet of the house.
- For safety, install an overflow outlet to guide excess water away in the event of a large rain causing the basin to completely fill. An overflow outlet can be a low spot in the berm that leads to a narrow swale. This swale can lead to another basin, to a driveway,

- or directly to the street.
- The bottom of the basin should be level.
- Brace the sides of the basin with rocks especially on the basin-side of a berm particularly on properties with steeper slopes. Brace the overflow outlet with rocks to prevent erosion.
- Plantings can then be considered.

How to plant the rain garden

Plants that don't mind getting their feet wet can go in the bottom of the basin. If you want a more complex basin, build pedestals or shelves within the basin for plants that don't mind their feet wet for a few hours. Finally, place plants that don't like water very much, like cacti, next to the basin. See this Native Plant List for Southern Arizona Rain Gardens: <https://www.harvestingrainwater.com/wp-content/uploads/2009/02/native-plant-list-for-rain-gardens.pdf>

After you plant, fill the bottom of the basin with 2-4 inches of organic mulch to help absorb water and to feed the soil over time.



Plants' water needs and tolerances determine their ideal Rain-Garden Zones. Rain garden fills up to the Terrace Zone in a large storm event. *Rain Harvesting in Drylands and Beyond*, Brad Lancaster.

Sizing a basin

A 700 square foot roof area x 0.623 (a constant that equals gallons per square foot to a depth of one inch) x 80% an efficiency factor (representing some loss as water moves to the basin), to yield about 350 gallons in a one-inch rain.

$$700 \text{ ft}^2 \times 1\text{-inch rain} \times 0.623 \times 0.80 = 350 \text{ gallons}$$

With two downspouts, you can direct the rain to two separate basins. For each basin you need a 175-gallon capacity to harvest the anticipated one-inch rain.

To handle a 2-inch peak storm, you want a 350-gallon capacity for each basin. The seven-foot by ten-foot basin pictured above can hold 46 cubic feet/244 gallons. You can rely on the overflow to take excess water to an appropriate location. This size basin can capture much

of a two-inch rain, but can the basin's bottom infiltrate all the water within twenty-four hours? This depends on your soil. We do not want standing water because of mosquitoes, the danger to young children and so forth.

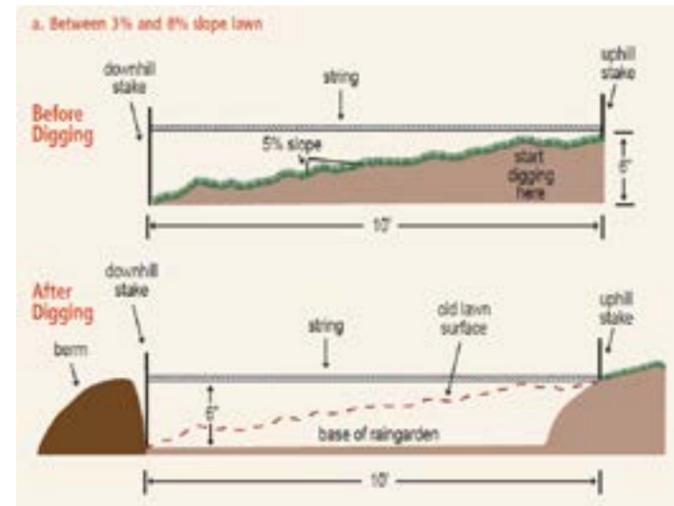


Diagram reprinted with permission from the Wisconsin Department of Natural Resources

Percolation Test

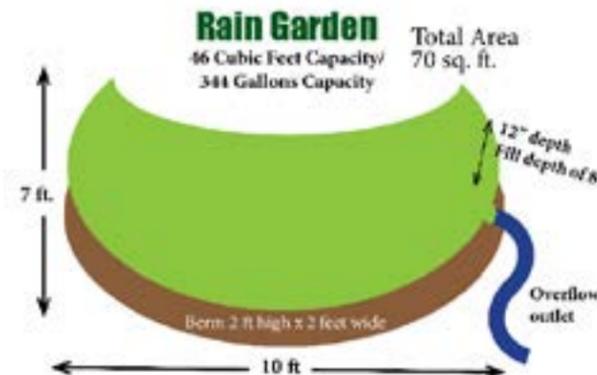
Find out how quickly your soil absorbs water by doing a soil percolation test. Visit <https://greywateraction.org/how-do-percolation-test/> for instructions.

Infiltration rate

Assume that this basin has sandy loam soil. A 'perc' test determines that this soil type can absorb 2.5 gallons per square foot in a day.

This basin is seventy square feet, so it can absorb 175 gallons in a day. That is not enough absorption for a peak storm, so your options are: to dig a bigger basin; to add an additional connected basin, or to size for a more typical 1-inch rainfall over a twenty-four-hour period.

The rain garden in our example will absorb 175 gallons for a one-inch rain. As with any water system, be sure you have a good overflow plan.

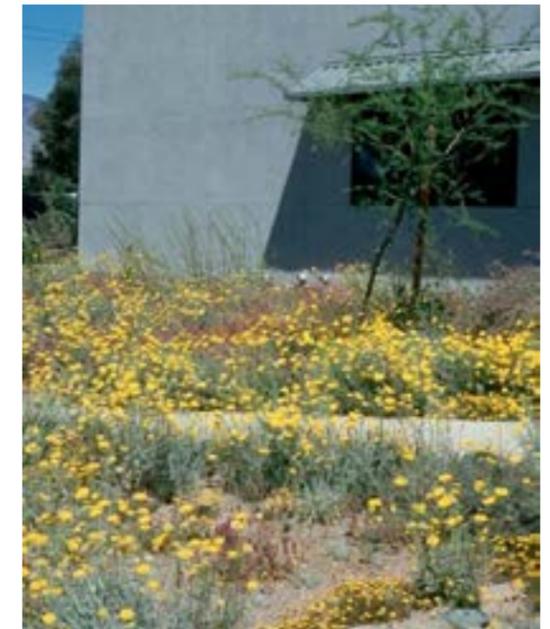


So, get started digging! Size the basin at 7 by 10 feet with a depth of 12 inches (fill depth of 8 inches), add mulch, and plant!

Save the rain. Keep it on your side!



Swales capture storm water that would otherwise end up in the street. University of Arizona.



ADDITIONAL RESOURCES

Watershed Management Group
Field Guide for Rain Garden Care, A Guide for Backyard, Neighborhood, and Commercial Rain Gardens
https://watershedmg.org/sites/default/files/documents/resource-guide-rain-garden_0.pdf

Chicago Botanic Garden
Rain Garden Guide a How To Manual for Homeowners
https://www.chicagobotanic.org/downloads/wed/WI_DNR_homeowners.pdf

Water Wise

If you would like more information on rain gardens, harvesting rain into cisterns, watering schedules, etc., or to schedule a free on-site landscape consultation, contact Water Wise at 520-458-8278 x 2139 or visit www.water-wise.edu.



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