



Rain Gardens for Sustainable Landscapes

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Sustainable landscapes combine various aspects of horticulture, water quality, and integrated pest, soil, wildlife, and watershed management practices to address the landscape needs of a homeowner. These landscaping techniques are done without compromising



the ability of future generations to meet their own needs. One way a homeowner, business, or community can be more sustainable is to install and maintain rain gardens where there are large impermeable surfaces such as roofs, sidewalks, driveways, or parking lots. A rain garden allows the homeowner to give water back to the earth by increasing infiltration and improving the quality of the water before it moves on to creeks or streams. Rain gardens impact backyard water quality and even watershed management. A rain garden is not much more than a shallow depression in a landscape that captures water and holds it for a short time to reduce downstream flooding.



Figure 1. A rain garden on commercial property.

How to Build a Rain Garden

Choose an ideal location. Look for an area that holds water or where water runs from downspouts or driveways and sidewalks. Try to avoid soggy areas that have standing water most of the year. Wet areas that hold water can be converted into wetlands rather than rain gardens. Once you have selected a reasonable site, determine if there are power lines, field lines from a septic system or tank, water or gas lines, or television cables near the place you would like to plant your rain garden. You will have to move to a new location if any of these lines are found. It's also best to mark or flag these lines for easy identification and safety purposes.

The next step is to test the water holding capacity of the soil. Dig a hole, in the middle of your site about one-foot deep and one-foot wide. Fill the hole with water. If it takes less than 12 hours to drain, you can plant a regular rain garden. When the drain time exceeds 36 hours your site is considered a wetland. But if it drains in less than 36 hours but more than 12 hours, you will have to zone your rain garden.

Sizing the rain garden. For water quality, the rain garden will need to capture a depth of 6 inches. Water should get in easily and, in the case of larger storms that drop more than 1 inch, the water needs to overflow into the lawn area without causing damage or erosion. If you will be collecting water from the downspouts, calculate the square feet of the area of the roof served by those downspouts. You may be adding your driveway, as well. Measure or pace off the driveway and sidewalks that will drain into the rain garden. Add the square feet from the roof area and the driveway and sidewalks and divide by 20. That will give you the garden's area requirements for a garden water depth of six inches. Divide the area figure by ten instead of 20 for a three-inch deep rain garden.

If, for example, the first floor area of your home is 1800 sq ft and you plan to collect water from gutters serving $\frac{1}{4}$ of the roof area, your calculation would be:

$1800 \text{ sq ft} \times \frac{1}{4} = 450 \text{ sq ft} / 20 = 22.5 \text{ sq ft}$ or a 4.5 ft by 5 ft garden that will hold 6 in. of water would be sufficient.

Construct the rain garden. A rain garden should be constructed to receive water, hold it while it infiltrates and/or slows the rate of downstream flow. Therefore, water should enter at the flush end and move toward a berm or elevated section of the garden. The garden should be dug four to six-inches deep with a slight depression in the center. The soil that you dig out of the garden will be used to build the berm along one side of the rain garden. Cover the berm with mulch or grass to prevent possible erosion.



Figure 2. Water should flow into the low side of the rain garden and meet resistance to outflow by the raised berm. (Photo courtesy of Mitch Woodward, North Carolina Cooperative Extension)

Planting the garden. Plants in a rain garden have to tolerate fluctuating levels of soil wetness. To help plants survive extended wet periods, consider placing plants "high" on the edge of the rain garden or on mounds within the rain garden to elevate the roots above the ponded-water level. A plant list modified for Alabama is available for guidance in plant selection in the publication [Rain Garden Design for Home Owners](#). If you prefer, you can find your plant hardiness zone by visiting the Arbor Day Foundation site at www.arborday.org/treeinfo/zonelookup.cfm. You can then visit

any number of sites describing rain garden plants to determine what is hardy in your area and their tolerance to wet and dry conditions. Be sure to dig plant holes twice the depth and diameter of the pot they came in and refill with good soils. Tamp soil around the plants to avoid air pockets. The top of the root ball should be even with the ground. Be sure to water your plants regularly until they are established or you have sufficient rainfall. Fill the rain garden with two inches of mulch. Do not mound the mulch around the plants instead spread it evenly throughout the garden. When you are finished, your rain garden will function as shown to the right.

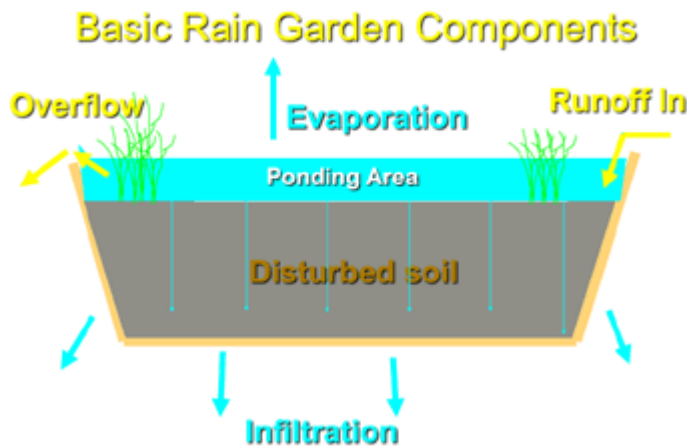


Figure 3. Rain water runoff enters the rain garden, ponds and infiltrates into the soil, evaporates and/or may overflow in heavier rains. (Photo courtesy of North Carolina State University Bio and Ag Engineering)

Advantages of rain gardens. Rain gardens improve water quality by handling storm water runoff at its source. The rainwater is kept on the soil surface longer, allowing more time for infiltration. Rain gardens decrease the velocity of water flowing across the landscape and improve the quality of water before it enters the stream or ditch. Any size garden will contribute to the reduction of nutrients, heavy metals, sediments, and fecal coliforms in streams and lakes.

Cost of a rain garden. On average, a rain garden costs \$2.00-\$5.00 per square foot depending on selected plants, labor required, and the soil type. If you are worried about appearance, don't be! Rain

gardens can be functional, look great, and produce a "critter" habitat in the landscape! Rain gardens can also be a small addition or a large part of your landscaping projects.

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