

Choosing plants

- Choose native plants that are tolerant of wet and dry conditions.
- Embrace biodiversity. Mix small trees, shrubs, perennials, and grasses.
- For possible plant species, see the Extension Office's presentation at <http://bit.ly/1K5NNC2>.



Directing rain

- Create shallow, wide swales to route water from your roof and paved surfaces to your rain garden.
- Line swales with rocks or vegetation.
- In place of swales, you could install an underground drainage pipe.

Maintenance

- Add mulch as needed to maintain a 2 to 4 inch top layer.
- Check the rain garden inlets and outlets for erosion after heavy rains.
- Weed and cultivate your garden to maintain aesthetics and optimize performance.



Considerations

- Hire a professional if you are installing a rain garden on a slope greater than 10%. Extra precaution must be taken to avoid soil erosion.
- Consider renting a backhoe to excavate your rain garden site.

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Stormwater Solutions

Rain Gardens

Rain gardens are beautiful and unique gardens designed to collect and temporarily hold rain water, providing habitat for plants with a wide range of water needs. The garden's plants, soils, and mulch remove pollutants from the water, provide habitat for wildlife, and beautify yards.

Garden function

A rain garden is a small, low-lying area designed to collect runoff and let it slowly soak into the ground. As rainwater pools in the garden, sediment settles. The rainwater is further filtered by plants, which use the nutrients, and by the mulch, which can break down oil and gas products carried by the runoff.

Garden benefits

In addition to reducing runoff and water pollution, rain gardens provide benefits such as:

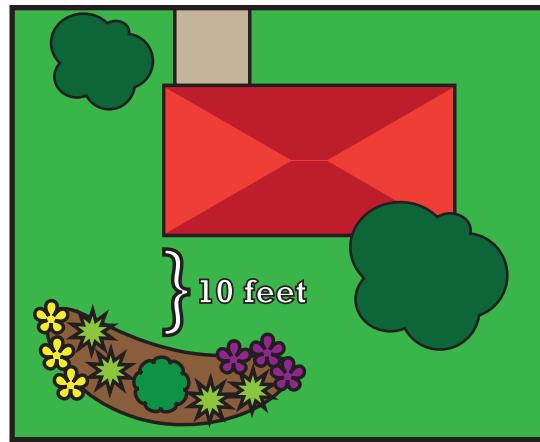
1. Habitat for wildlife, such as birds and insects.
2. A lovely garden that rarely needs watering.
3. Increased curb appeal and property value.



Planning & installing the rain garden

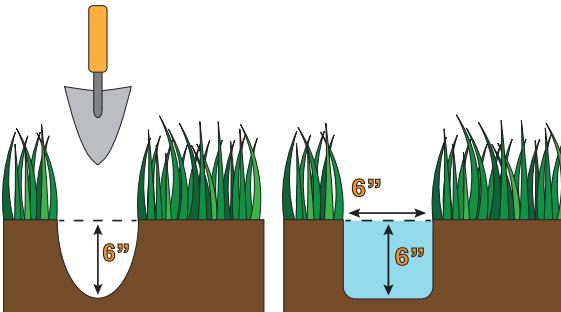
1. Pick a place for the garden

- Stay at least 10 feet away from buildings.
- Stay at least 25 feet away from septic tanks, drain fields, and well heads.
- Avoid utilities and large trees.
- Find a spot in full or partial sun.



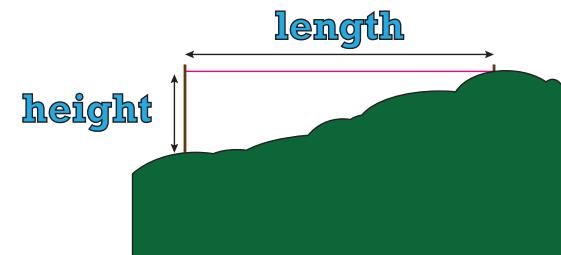
2. Analyze the soil

- **pH/nutrient test.** Collect a soil sample from the proposed garden site and bring it to your county extension agent for a pH and nutrient test.
- **Drainage test.** Dig a hole 6 inches deep and 6 inches wide in the proposed garden site and fill it with water. Record how long it takes for the water to completely drain. Repeat the test in the same hole to make sure the water table is low enough for a rain garden.



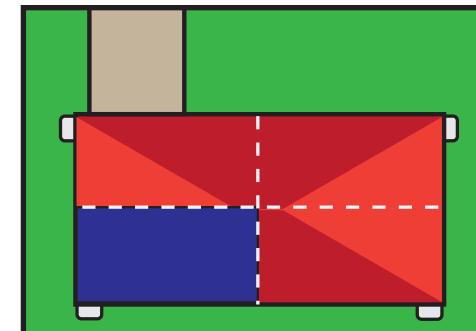
3. Calculate the slope

- Place one stake at the uphill end of your garden site and one stake at the downhill end of your site.
- Tie a string where the uphill stake meets the ground. Run the string to the downhill stake and tie it where the string is horizontal.
- Measure the length and height of the string.
- Divide the height by the length and multiply by 100. This is your slope percentage.
- If the slope exceeds 10%, contact a professional.



4. Calculate the impervious area

- Determine which impervious structures (roofs, patios, driveways, etc.) will drain towards your rain garden.
- Calculate the area of each structure and sum it to determine total impervious area. In this example, one fourth of the roof drains to the downspout that leads to the rain garden.



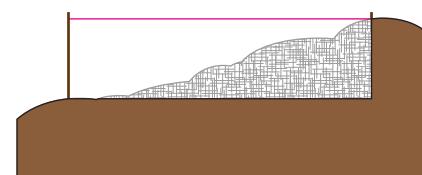
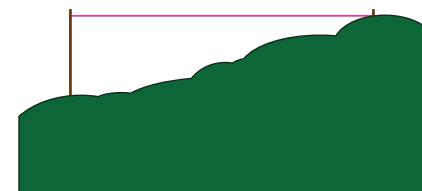
5. Determine the garden's size

- Use the sizing chart to determine the sizing factor. The sizing factor is in the white cells.
- Multiply this sizing factor by the impervious area (calculated in step 4) to determine the rain garden's size.

Rain garden sizing chart	Ground slope near garden		
	0-4%	5-7%	8-10%
Ponding depth	6"	7"	8"
Soil infiltration rate			
High	0.15	0.11	0.08
Medium	0.25	0.20	0.16
Low	0.32	0.26	0.20

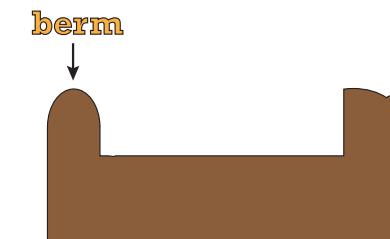
6. Excavation

- Outline the garden with rope or field paint.
- Drive a stake in the uphill side and downhill side of the rain garden
- Tie a string at the base of the uphill stake and tie it at a point on the downhill stake so that it is level.
- Remove and stockpile the topsoil.
- Dig out and stockpile 1 to 3 ft. of subsoil so that the rain garden area is level.



7. Building the berm

- Use the removed subsoil to create a berm on the downhill side of the rain garden. The berm should be the same height as the uphill edge of the garden.
- Design a low point in the berm where water can leave if the rain garden overflows.



8. Filling the garden

- Fill and till the garden with the removed topsoil (depending on your soil filtration test you may need to mix in compost to improve drainage). Save 2 to 4 in. for the mulch layer.
- Add a 2 to 4 in. mulch layer to the top of the garden (make sure to maintain a 6 to 8 in. ponding depth).
- Consider using a porous geotextile liner.

