



WHAT IS A RAIN GARDEN?

A rain garden is a flower garden that captures runoff from rain that falls on roofs, driveways or yards. A rain garden is a depression or a shallow bowl made in the landscape that is level from side to side and end to end. Runoff that travels to your rain garden is temporarily ponded - but it doesn't stay ponded for long. Capturing runoff in a rain garden allows water to infiltrate into the soil rather than running into streets and storm drains. Dirty runoff that enters storm drains is sent directly into "receiving waters" - our rivers, streams, lakes, ponds, or wetlands.

WHY INSTALL A RAIN GARDEN?

Homeowners would be surprised to learn that hundreds of thousands of gallons of rain falls on an urban lot in a year. In Iowa, rainfall averages anywhere from 28-36 inches per year. That means an acre of land in Iowa will receive anywhere from 760,000 to 977,500 gallons of rain in a typical year. The owner of a half acre urban lot in central Iowa would receive approximately 434,500 gallons of rain each year (a little less in western Iowa; a little more in eastern Iowa).

It is hard to visualize how much water 434,500 gallons actually is. Imagine capturing all that rainfall in 50 gallon barrels. You'd need a row of barrels more than 4 miles long to hold all the rain a typical lot receives.

HOW TO BUILD A RAIN GARDEN

Location

1. **Location is Critical** Proper location is one of the most important components of successful rain garden installation. The first step in planning a rain garden is walking a property during a rainfall event. Get out in the rain, and watch how runoff moves on the site. You have to locate a rain garden so that runoff moves to it.

If you have a low spot where water ponds, it might be a good site for a rain garden - but maybe not. If you have a spot that ponds water for an extended period of time (i.e. long enough to kill grass) it does not percolate well enough for a rain garden to work properly. A rain garden should impound water for about 12 hours (maybe up to 24 hours). You **do not want** water standing in a rain garden for an extended period of time.

2. **One Call** Another key item in locating a rain garden is the presence or absence of utilities. So you should make sure there are no phone lines, gas lines, or other infrastructure in the area you will be digging. Call "Iowa One Call" at 800-292-8989 to request assistance locating utilities. Call at least 48 hours before you want to start installing a rain garden.

3. **Other Considerations**

- a. Rain gardens should never be located upslope from a house or closer than 10 feet from a foundation. 30 to 40 feet away from a foundation is recommended if the site allows. Roof water can be directed to a rain garden by extending tile from downspouts to the rain garden, or by creating a swale that will convey runoff to the rain garden.
- b. Avoid locating rain gardens under trees. There will always be some excavation involved with rain garden installation, and excavation under the drip line of a tree canopy will cause damage to a tree's roots.
- c. Rain gardens should not be installed in areas with high water tables (some sites in central Iowa), or areas with shallow soils over bedrock (some sites in northeast Iowa). There should be at least 4 feet of soil profile between the bottom of a rain garden and the normal high water table or bedrock. Soil survey information from the Soil and Water Conservation District will indicate whether the potential high water tables exist or whether shallow bedrock might exist.
- d. Rain gardens should not be located on steep slopes that can become unstable when saturated. If excessive slope exists, installing a rain garden will be more of a challenge. Retaining walls are usually needed to create a level depressional area for a rain garden on steep slopes.

Site Preparation

1. Any sod or other existing vegetation that is not going to be dug up needs to be killed before installation of the rain garden.
2. Install an edging material along the edge of the rain garden to a depth of at least 4 inches.

Installation

1. Lay out the shape of the rain garden with a rope or flags. Rain gardens should be laid out on the contour – that is across the slope. Long and narrow rain gardens are recommended, so make the long sides lay across the slope and have the narrow ends running up and down the slope.
2. Place stakes at the upper edge of the rain garden and stakes at perpendicular angles on the lower edge of the rain garden. Tie a rope at the base of the upper stake. Then tie the rope to the lower stake at an elevation that is level with the ground at the upper stake. Use a carpenter's level to make sure the rope is level.
3. Now measure the distance from the ground at the lower stake to the rope. This tells you how much the slope has dropped from the upper stake to the lower stake. To get a level surface in the rain garden, you'll have to excavate to that depth at the upper stake.
4. It is important that the rain garden be level from side to side and end to end so that water infiltrates uniformly across the bottom of the rain garden.
5. Excavate subsoil and use it as fill material to create a berm on the lower edge of the rain garden.
6. Stomp the fill down in 2 inch lifts to make sure it's compacted (you want the berm compacted, but this is the only place in the yard you'll want compaction).
7. Make sure the berm is constructed level across the top. Use a carpenter's level and a long 2 x 4 board to make sure the top of the berm is level.
8. If you want to impound 6 inches of water, you'll have to build a berm 8 inches high on the lower edge of the rain garden. Leave one end or both ends of the rain garden 2 inches below the berm to serve as an overflow outlet.
9. The cut slope on the upper edge of the rain garden should be sloped back to a stable slope.
10. Rain gardens must be level side to side, end to end, and the berm must be level. Note the low spot in the berm.

Plants

1. Native plant species are recommended for rain gardens
2. A mixture of plants in a rain garden provides habitat diversity.
3. A monoculture border (all one species) will give the rain garden a defining edge and a well kept appearance. Typically the border will be a low growing grass, such as blue or hairy grama or sideoats grama if using natives (or turfgrass if a blend of natives and non-natives are used).
4. On the floor of the rain garden plant a variety of species that bloom throughout the growing season.
5. Plant clumps of each species, with spacing of 1 to 1.5 feet apart. Select lower growing native plants that don't grow more than 3- 4 feet high.
6. Typically, you'll want to install live plants that establish readily during the first year. Select plants that meet your aesthetic values, but consider the amount of input needed to keep any nonnatives alive (water during drought, fertilizer), and the effects of those inputs on nearby native species.

Mulch

Mulching the rain garden surface is usually recommended to provide a weed barrier and to conserve moisture for young plants during the first year.

1. You should use a 2 – 3 inch layer of shredded hardwood mulch.
2. When planting small plugs, it is usually easier to place the mulch before planting. Then spread the mulch before installing the plug and pull it back around the little plant after it is in place.

How Much Will it Cost?

Cost of a rain garden will depend on its size and complexity. Obviously, if you're on a steep slope and are using a retaining wall system your costs will be higher than if you're installing a simple cut/fill rain garden on gentle slopes.

Tools List (for installation of rain garden by a homeowner)

- Clam shell post hole digger
- Shovel
- Rakes
- Rope
- Wooden stakes
- Flags
- String
- A carpenter's level
- Tape measure
- Materials for killing existing vegetation (Round-up, plastic, cardboard, etc.)
- Work gloves
- Wheel barrow
- Rototiller (not required unless amending soil)