



Build Beautiful Rain Gardens to Purify Water

“Rain, rain, go away.
Come again, some other day.”

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While rain storms are natural, storm water runoff is not. Flowing from rooftops and surging out downspouts, across the yard, into the street and down the storm sewer untreated, rainfall is routed to the nearest stream or lake. Runoff is often polluted. In its rough and tumble downhill journey, rain picks up heavy metals, oils, fertilizers, soils, sediment, and pesticides.

BEAUTIFUL SOLUTIONS

Reverse this process and beautify yards with a rain garden—a shallow, saucer-shaped ground depression planted with low-maintenance plants. Deep roots and soil act as a sponge, soaking up runoff as water-loving perennials and native plants help purify pollutants.

Attractive in any landscape, rain gardens gild a low lying area with carpets of wildflowers to help improve water quality, sustain stream flows during dry periods and reduce flash flooding and stream bank erosion. They add beautiful habitat for butterflies and birds too.

CREATING RAIN GARDENS

CHOOSING A LOCATION

Take advantage of existing drainage patterns by looking for low areas where water naturally flows. Choose sunny spots at least 10 feet away and downhill from your house. Choose a flat area to minimize excavation.

Stay away from areas under large trees where tree roots could be affected. Areas where water pools may drain poorly and should be avoided as should areas around septic tanks. To avoid buried utilities, check with Iowa One Call at (800) 292-8989 several working days ahead of digging.

AMENDING SOILS

A rain garden must be able to soak up runoff and allow it to slowly infiltrate soils. A simple test for your soil's ability to absorb is to dig a bucket-sized hole and fill it with water. Watch as the water recedes. If it goes down at least one inch per hour, the soils are okay. If it doesn't, you will need to find another location or replace the soil with a sand and compost mix, a labor-intensive and expensive process.

GARDEN SIZE AND SHAPE

The greatest water quality benefits occur when rain gardens hold the most runoff from your house and driveway. Calculate the area (length multiplied by width) of roofs, driveways and other non-porous surfaces draining to your planned area. Remember: only part of your roof drains to your garden area.

Most gardens require 7 to 10 percent of the area being drained. Sandy soils need less area, but clay soils take



LEFT: A bee sips from swamp milkweed (*Asclepias incarnata*.) Suited to home use, rain gardens can also hold and clean commercial parking lot runoff. A permeable surface allows rainwater to enter the ground and rocks guide excess to flow toward a rain garden. **ABOVE:** Roof and driveway runoff collect in this vibrant front yard rain garden. With proper design, water percolates into soil within 24 hours. Since mosquitoes require at least 10 days to mature from egg to adult, rain gardens are not viable habitat.

extra space and may need amended soils and a below-ground drain.

Choose a shape based on your yard and the area being drained. Any shape will work: square, rectangle, kidney, oval or circle. Outline the garden shape with a hose or rope.

EXAMPLE SIZING: To estimate the area of a standard 1500-square foot ranch house (30 feet X 50 feet) with a gently sloped roof and a three-foot overhang on all sides:

- Add the length plus overhangs: $50 + 3 + 3 = 56$ ft.
- Add the width plus overhangs and allowance for slope: $30 + 3 + 3 + 4 = 40$ ft.
- Multiply length times width: $56 \times 40 = 2240$ sq. ft.
- Multiply by portion of roof that drains to rain garden: $\frac{1}{2} \times 2240 = 1120$ sq. ft.
- Add length times width of driveway, sidewalk, etc. to get total area drained: $1120 + 600 = 1720$ sq. ft.
- For well-drained soils, multiply 7 percent by total area: $0.07 \times 1720 \text{ ft}^2 = 120$ sq. ft.

A 120 sq. ft. rectangular garden is 10 by 12 feet.

MY BACKYARD

GARDEN CONSTRUCTION

Prepare soil by digging at least two feet deep. To keep soil loose, remove it as you dig and be careful not to compact it as you replace it. Add compost to increase permeability. Replace poorly drained soils with a mix of 50 to 60 percent sand, 20 to 30 percent compost and 20 to 30 percent topsoil. Ensure no clay is in the topsoil.

The bottom of the excavation should be flat, not bowl-shaped, with gradually sloping sides. The top layer of the garden should also be flat and lie about six inches below the surrounding lawn. If on a slope, build an embankment on the downhill side to keep the garden surface level.

PLANT CHOICE

Choose plants with a pleasing mix of height, bloom time and color. Select from water-tolerant native plants and perennials with low maintenance requirements. Avoid plants that frequently need dividing, and invasive species such as purple loosestrife. Many garden shops have lists of suitable plants.

MAINTENANCE

Water regularly until plants are established. Later, native plants only require watering during drought. Fertilizers are not necessary. Weed regularly, especially the first year. Shredded hardwood mulches minimize weeding and watering, and keep the soil surface from sealing. 🐜



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1) Rose mallow (*Hibiscus laevis*) adds distinctive flower shape to gardens. A lover of wet ground, it may reach 6 feet heights, so allow plenty of space. 2) Roof runoff flows across porous pavement that allows water to enter the soil with excess flowing toward an adjacent rain garden. 3) Droplets splash onto a permeable parking area to absorb into the ground, reducing flow to city storm drains. 4) Late season color. 5) Black-eyed susan. 6) Fluted, colorful red cardinal flower will attract hummingbirds. FACING PAGE: Oil-laden runoff flows between parking lot curbs towards bed of sneezeweed.








WHAT NATIVE SPECIES TO PLANT

A FEW PLANTS SUITED FOR IOWA RAIN GARDENS:

T, M, S refers to Tall, Medium and Small plant heights.

Sp, Su, F refers to Spring, Summer and Fall blooms.

 attracts butterflies  attracts hummingbirds

- Big bluestem (*Andropogon gerardii*) **T - Su, F**
- Swamp milkweed (*Asclepias incarnata*) **T - Su** 
- New England aster (*Aster novae-angliae*) **T - Su, F** 
- Prairie Indian Plantain (*Cacalia plantaginea*) **T - Su**
- Cup Plant (*Silphium perfoliatum*) **T - Su, F**
- Prairie cordgrass (*Spartina pectinata*) **T - Su, F**
- Meadow rue (*Thalictrum dasycarpum*) **T - Su**
- Blue vervain (*Verbena hastata*) **T - Su**
- Culver's Root (*Veronicastrum virginicum*) **T - Su** 
- Michigan lily (*Lilium michiganense*) **T - Su**
- Prairie blazing star (*Liatris pycnostachya*) **T - Su** 
- Boneset (*Eupatorium perfoliatum*) **T - Su**
- White turtlehead (*Chelone glabra*) **T - Su**
- Blue joint grass (*Calamagrostis canadensis*) **M - Su**
- Bottlebrush sedge (*Carex comosa*) **M - Sp**
- Brown fox sedge (*Carex vulpinoidea*) **M - Sp**
- Virginia wild rye (*Elymus virginicus*) **M - Su**
- Bottle gentian (*Gentiana andrewsii*) **M - Su, F**
- Sneezeweed (*Helenium autumnale*) **M - Su, F**
- Spotted touch-me-not (*Impatiens capensis*) **M - Su, F** 
- Blue flag iris (*Iris shrevei*) **M - Sp**
- Cardinal flower (*Lobelia cardinalis*) **M - Su, F** 
- Great Blue lobelia (*Lobelia siphilitica*) **M - Su, F**
- Fringed loosestrife (*Lysimachia ciliata*) **M - Su**
- Prairie loosestrife (*Lysimachia quadriflora*) **M - Su**
- Purple monkey flower (*Mimulus ringens*) **M - Su, F**
- Marsh phlox (*Phlox maculata*) **M - Su**
- Glaucous white lettuce (*Prenanthes racemosa*) **M - Su, F**
- Mountain mint (*Pycnanthemum virginianum*) **M - Su** 
- Swamp saxifrage (*Saxifraga pensylvanica*) **M - Sp**
- Canada anemone (*Anemone canadensis*) **S - Su**
- Prairie phlox (*Phlox pilosa*) **S - Sp, Su**
- Marsh vetchling (*Lathyrus palustris*) **S - Sp**
- Wild strawberry (*Fragaria virginiana*) **S - Sp**
- Holy grass (*Hierochloa odorata*) **S - Sp**
- Marsh marigold (*Caltha palustris*) **S - Sp**

ADDITIONAL RESOURCES

- Find plants at your local landscape supply vendor or order native plants from www.ionxchange.com in Harper's Ferry, 1878 Old Mission Drive. 1-800-291-2143.
- www.raingardens.org
- www.urbanwaterquality.org/RainGardens/rgindex1.htm
- Urban Resources & Borderland Alliance Network, Ankeny www.ci.des-moines.ia.us/departments/PR/rain_gardens.htm



WORTH A VISIT

Rain garden under construction at Elinor Bedell State Park overlooking Lake Okoboji. Underground water filtration system near parking lot at Harbor Inn located on west side of Clear Lake—an alternative way, like porous paving, to treat storm water runoff.