Rain Gardens

Lorain Soil and Water Conservation District

Political subdivision of the State funded through appropriations from the County Commissioners, State of Ohio, local municipalities, and special project grants

With assistance from USDA-NRCS

The Lorain Soil and Water Conservation District provides leadership in a partnership effort to help people conserve, maintain and improve the natural resources and environment in Lorain County.

TECHNICAL

Model Ordinances

Trainings

Plan Reviews

Construction Site Inspections

Drainage Problems

Conservation Easements

EDUCATIONAL

Rain Garden Program

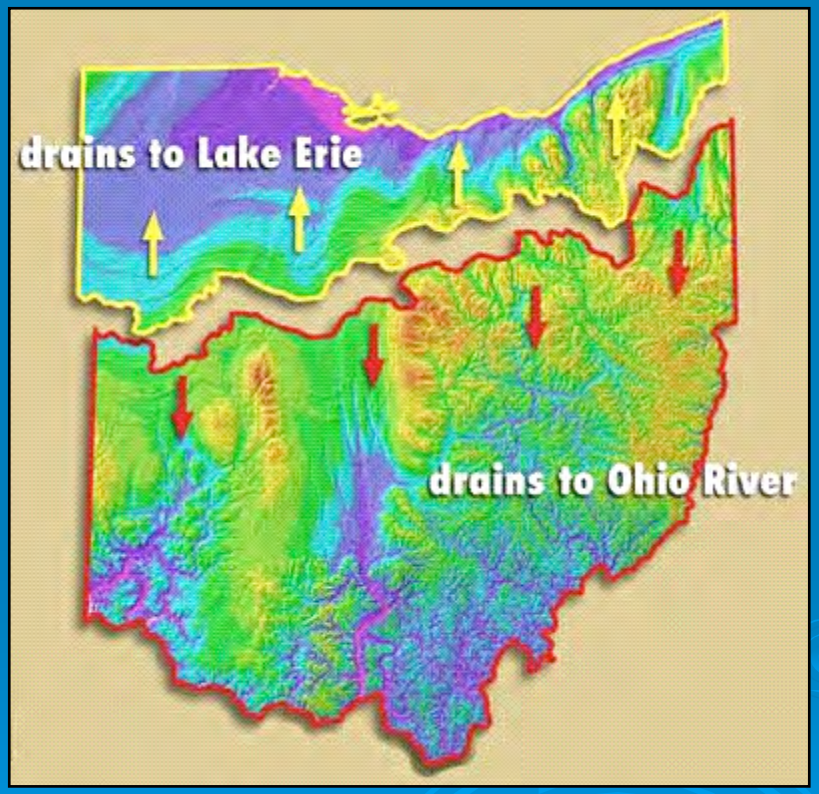
Pond Clinic

Public Events & Programs

Educational Tools

What is a Watershed?

- Simply the land that water flows across or under on its way to a stream, river, or lake.
- Our landscape is made up of many interconnected basins or watersheds.
- Within each watershed, all water runs to the lowest point—a stream, river, or lake.
- On its way, water travels over the surface and across farm fields, forest land, suburban lawns, and city streets, or it seeps into the soil and travels as ground water.



Lorain County's 9-Watersheds

- Vermilion River & Beaver Creek Watershed
- Vermilion River Watershed
- Beaver Creek Watershed
- Black River Watershed - West Branch
- Lower Black River Watershed
- Black River Watershed – East Branch
- Black River & Porter Creek Watershed
- French Creek Watershed
- Rocky River Watershed

What are Rain Gardens?

- Rain gardens are beautiful natural landscape features requiring less maintenance and fewer chemicals than traditional lawns
- Rain gardens capture runoff from impervious areas such as roofs and driveways (and lawns) and allow it to seep slowly into the ground
- Building rain gardens is something we can all do in our yards to help our watershed.

Why are Rain Gardens Important?

- Increased impervious areas with urbanization/ suburbanization

- Resulting problems:
  - Flooding
  - Compacted soils
  - Polluted waterways
  - Low flows of urban streams
  - High cost of fixing problems

Why are Rain Gardens Important?

- Increase the amount of water that filters into the ground
  - Recharges aquifers, replenishes water in streams, lakes
- Helps protect communities from flooding and drainage problems
  - Slows water down and absorbs it rather that it rushing off to a ditch or storm drain


Rain Gardens of Western Michigan

Why are Rain Gardens Important?

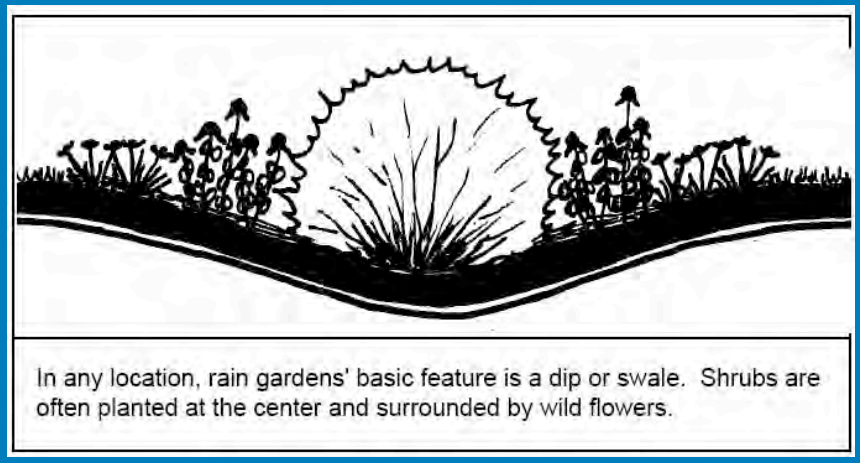
- Helps protect streams and lakes from pollutants that are carried by urban and suburban storm water
  - Lawn fertilizers and pesticides
  - Oil and other automotive fluids
  - Other substances that wash off roofs and paved areas
- Enhance community awareness of storm water issues
  - Spread the word!

Why are Rain Gardens Important?

- Enhance the beauty of yards and neighborhoods
- Provide valuable natural habitat for birds, butterflies, and many beneficial insects

How Do Rain Gardens Work?

- Receives runoff water from roofs or other impervious (hard) surfaces such as driveways
- Designed with a shallow depression so that the water can be taken in by plants and soak into the ground instead of running off.
- Plants, mulch and soil in rain gardens combine natural physical, biological and chemical processes to remove pollutants from runoff



In any location, rain gardens' basic feature is a dip or swale. Shrubs are often planted at the center and surrounded by wild flowers.

Considerations for Rain Gardens

- Determine location
- Sizing (less than 5% slope)
  - Soil, Slope, Area etc.
- Plant selection
  - Avoid invasive species

Where to Locate Rain Gardens

- Below downspouts

Where to Locate Rain Gardens

- Down slope of any lawn areas

Where to Locate Rain Gardens

- Collect rain water from roads and parking lots

Site Considerations

- At least 10 feet from foundation
- Avoid septic systems
- Full sun or part shade
- Avoid slopes of 12% or more

- Close enough to downspouts can be used to direct rainwater into your garden
- Investigate natural drainage of yard so overflow (during a heavy rain) flows away from the house and into the rest of your yard
- Identify the location of underground utilities

  1-800-362-2764

Sizing Rain Gardens

- Costs
  - If you do the work yourself but purchase plants, cost is about $3 to $5 per square foot.
  - Cost of landscape consultants is about $10 to $15 per square foot. Includes design, construction, plants, and planting.
  - A 300 square foot rain garden costs approximately $1,000 to $4,500.
- Depends on the depth of the garden
- Soil type
  - Sand, silt, clay
- How much roof and/or lawn area drains to garden
  - Calculate runoff area

Sizing Rain Gardens

- Depth
  - Gentle slope
    - Example is 4-6 inches deep; Use excavated soil to form berm
  - Steeper slope
    - May need to import soil to use for berm

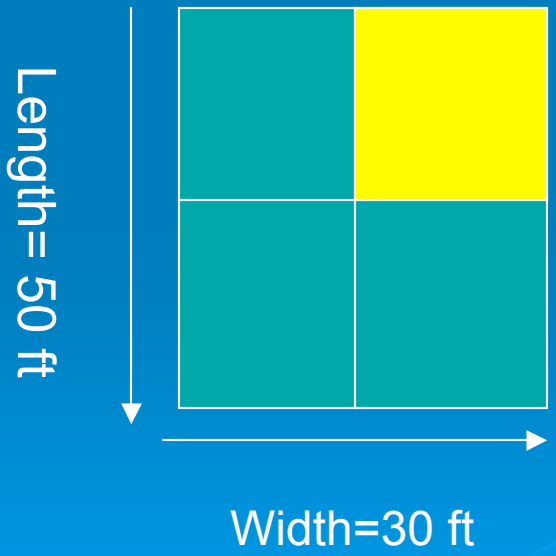
Sizing Rain Gardens

- Soil type
  - Sandy soils infiltrate 2.5 in/hr
  - Silty soils infiltrate 0.5 in/hr
  - Clayey soils infiltrate 0.3 in/hr
- Some hints:
  - Soil feels gritty and coarse = sandy
  - Soil feels smooth not sticky = silty
  - Soil feels sticky and clumpy = clayey
- Test your soil drainage:
  - Dig a hole 8”x8”x8”
  - Fill with water
  - Should drain at 1” / hr
  - If not, amend with a course sand and top soil mixture (% dependent on conditions)

Sizing Rain Gardens

- Calculate area draining to rain garden

Area of roof going to down spout



Area of rooftop= Length x Width

Area= 50 x 30 = 1500 square feet

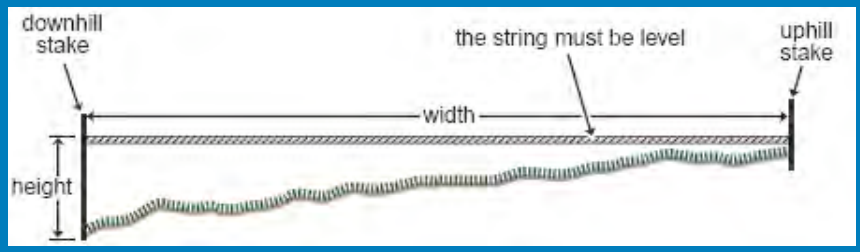
Only a quarter of rooftop is draining to downspout, so 1500/4 = 375 sq ft

Sizing Rain Gardens

- Calculate slope and depth
  - Measure length of string between the stakes. Divide height by length of the string and multiply the result by 100 to find the site's percent slope
  - Example: String is 120 in long; height is 5 in

5 ÷ 120 = .04 .04 X 100 = 4% slope

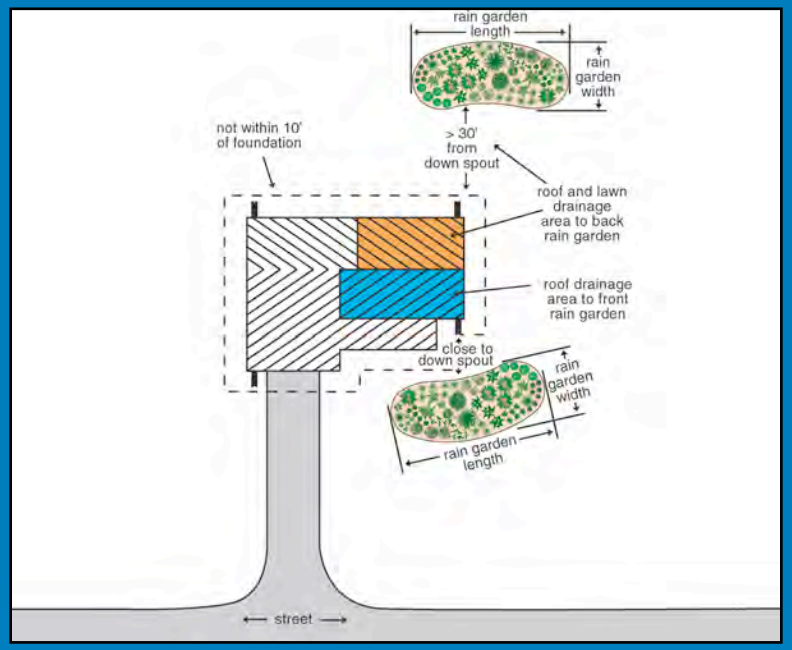
  - Using the slope of the lawn, select the depth of the rain garden from the following chart:



Slope	Depth
≤4%	3 to 5 inches
5% to 7%	6 to 7 inches
8% to 12%	8 inches (maximum)

Sizing Rain Gardens

- Location will impact size
  - Less than 30 ft from downspout

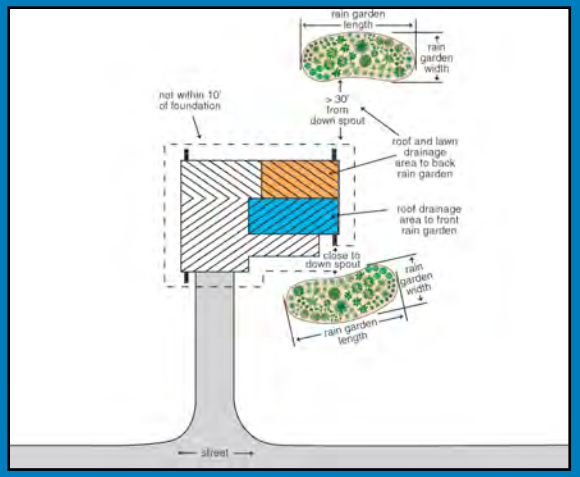


Garden depth is determined by slope

Type of Soil	3 to 5 Inches Deep	6 to 7 Inches Deep	8 Inches Deep
Sandy	0.19	0.15	0.08
Silty	0.34	0.25	0.16
Clayey	0.43	0.32	0.20

Example 1: 375 sq ft x .25 = approx 100 sq ft

Sizing Rain Gardens



- Location will impact size
  - More than 30 ft from downspout

Garden depth is determined by slope

Soil Type	All Depths Between 3 and 8 in
Sandy	0.03
Silty	0.06
Clayey	0.10

Example 2: 375 sq ft x .10 = approx 37.5 sq ft

Building a Rain Garden

- Many hands make light work!
- Avoid compaction of the soil with heavy equipment
- You may need to amend your soil if it is too clayey and doesn't absorb water at the rate you want it

Cuyahoga County Rain Garden
Euclid Creek
South Euclid –Lyndhurst Library



Euclid Creek Rain Garden
South Euclid-Lyndhurst Library

Euclid Creek Rain Garden

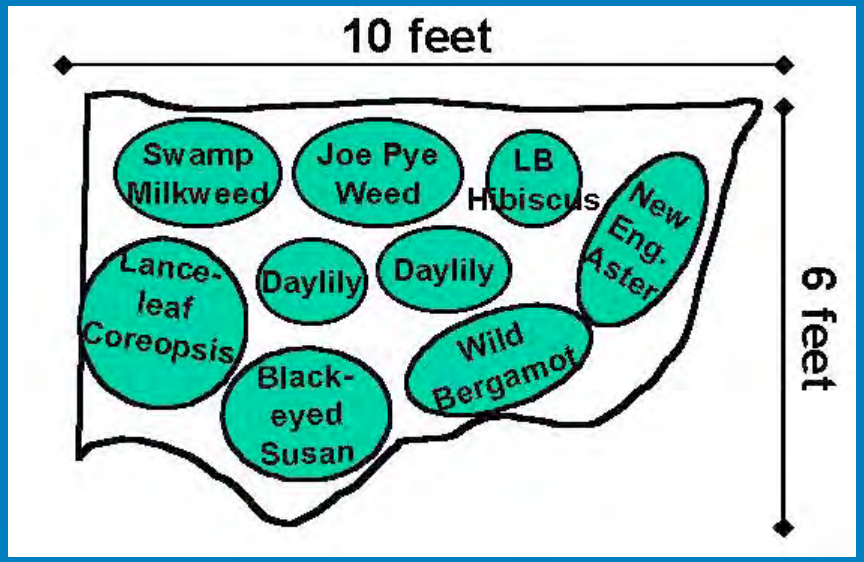
Richmond Heights Kiwanis Lodge

Other Rain Gardens

- Cleveland Metroparks Euclid Creek Reservation, Welsh Woods
- Brainard Park, Lyndhurst (October, 2006)
- Independence Community Center
- Bay Village, Brecksville, Walton Hills (planned)

Designing Rain Gardens

- Keep the design simple
- Choose a few types of plants and group them together for maximum effect
- As a general rule, you will need one plant every one to two feet
- Incorporate mix of sedges, rushes and grasses with flowering species
  - Differing root matrix maximizes infiltration



Choosing Plants for Rain Gardens

- For maximum benefits, plant native Ohio plants
  - Better adapted for Ohio's environment
    - Wet dry cycles
  - More beneficial for local wildlife
    - Food sources, shelter
  - Lower short & long term maintenance costs
  - Reduced chance of introducing non native invasive species into the landscape
  - Preservation of Ohio's unique botanical heritage and biodiversity

Choosing Plants for Rain Gardens

- Do not collect plants from the wild!
- Make sure you choose plants that can survive wet-dry cycles

Choosing Plants for Rain Gardens

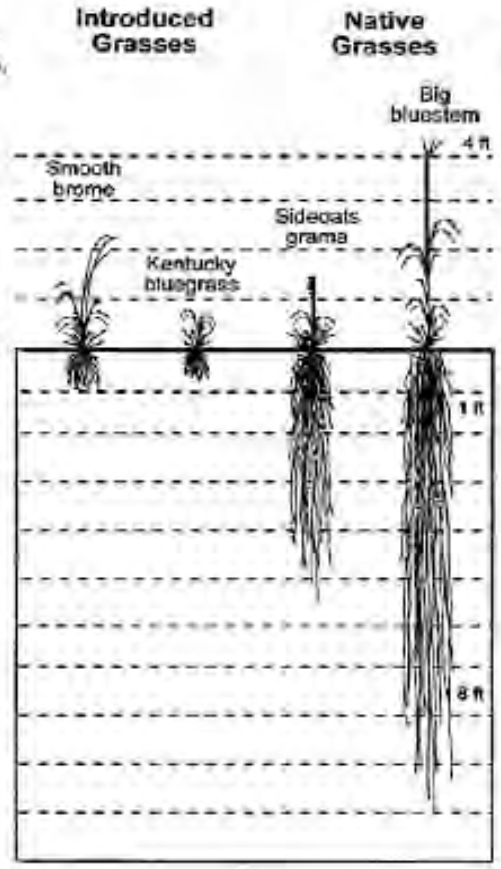
Smooth brome
- Root system reaches 10-15 inches in depth.
- Plant height is 2-3 ft.

Kentucky bluegrass
- Root system reaches 6-8 inches in depth.
- Plant height is about 1 ft.

Grasses introduced from Europe and Asia have been traditionally used to establish vegetative cover on roadsides in the midwestern United States. However, many experts are now specifying native grasses for critical area seedlings.

While they establish quickly, introduced grasses frequently deteriorate when planted on poor soils. Often their sod opens up and weeds invade.

Introduced grasses may provide good erosion control under favorable soil and moisture conditions.



Sideoats grama
- Root system reaches to 5 ft in depth.
- Plant height is 12-18 inches.

Big bluestem
- Root system reaches down to 9 ft in depth.
- Plant height is 4-8 inches.

Because they develop very deep root systems, native grasses provide very good long-term erosion control. And, they will often grow on poor soils because they can gain access to nutrients and water that shallower rooted grasses cannot reach. Native grasses are therefore desirable for stabilizing soils.

Their drawback is that they establish somewhat slowly. Cover crops may be seeded with them to provide short-term erosion control while the native grasses establish. Mulching newly planted sites is also a good idea.

Choosing Plants for Rain Gardens

Forbs (Wildflowers)

Actinomeris alterniflolia/ Wingstem
Asclepias incarnata/Swamp Milkweed
Asclepias syriaca/Common Milkweed
Asclepias tuberosa/Butterfly Weed
Aster azureus/Blue Sky Aster
Aster laevis/Smooth Aster
Aster novae-angliae/New England Aster
Aster umbellatus/Flat Topped White Aster
Baptisia australis/Blue False Indigo
Baptisia leucantha/White Wild Indigo
Chamaecrista fasciculata/Partridge Pea
Coreopsis tripteris/Tall Coreopsis
Echinacea purpurea/Purple Coneflower
Eryngium yuccifolium/Rattlesnake Master
Eupatorium altissimum/Tall Boneset
Eupatorium maculatum/Spotted Joe Pye
Eupatorium perfoliatum/Common Boneset
Eupatorium rugosum/Snake Root
Helianthus grosseserratus/Saw-tooth Sunflower
Helianthus laetiflorus/Showy Sunflower
Helianthus mollis/Hairy Sunflower
Heliopsis helianthoides/Ox-eye Sunflower
Lespedeza capitata/Bushclover
Liatris aspera/Rough Blazing Star
Liatris pycnostachya/Prairie Blazing Star
Liatris spicata/Dense Blazing Star
Lobelia cardinalis/Cardinal Flower
Lobelia siphilitica/Great Lobelia
Mimulus ringens/Monkey Flower
Monarda fistulosa/Bergamot
Oenothera biennis/Evening Primrose
Penstemon digitalis/Foxglove Beardtongue
Physostegia virginiana/Purple Obedient Plant
Pycnanthemum tenuifolium/Narrow Leaved Mountain Mint
Pycnanthemum virginianum/ Virginia Mountain Mint
Ratibida pinnata/Grey-headed Coneflower

Choosing Plants for Rain Gardens

Forbs (Wildflowers) con't.

Rudbeckia hirta/Black-eyed Susan
Rudbeckia laciniata/Green Headed Coneflower
Rudbeckia triloba/Thin-leaved Coneflower
Solidago ohiensis/Ohio Goldenrod
Solidago petula/Swamp Goldenrod
Solidago riddellii/Riddell's Goldenrod
Solidago rigida/Stiff Goldenrod
Tradescantia ohiensis/Spiderwort
Verbena hastata/Blue Vervain
Verbena stricta/Hoary Vervain
Veronicastrum virginicum/Culvers Root
Zizia aurea/Golden Alexanders

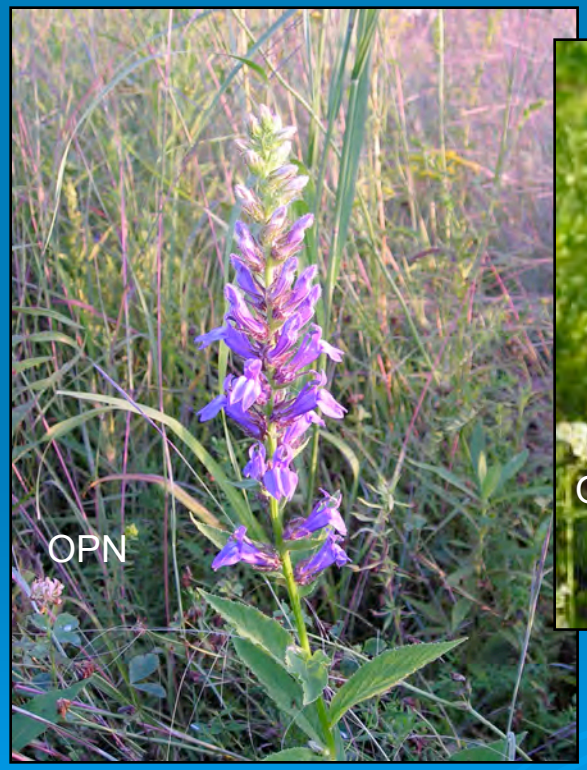
Graminoids (Grasses)

Andropogon gerardii/Big Bluestem
Bouteloua curtipendula/Side-oats Grama
Elymus canadensis/Nodding Wild Rye
Elymus virginicus/Virginia Wild Rye
Hystrix patula/Bottle Brush Grass
Panicum virgatum/Switch Grass
Schizachyrium scoparium/Little Bluestem
Scirpus atrovirens/Dark Green Bullrush
Scirpus cyperinus/Wool Grass
Sorghastrum nutans/Indian Grass
Spartina pectinata/Prairie Cord Grass

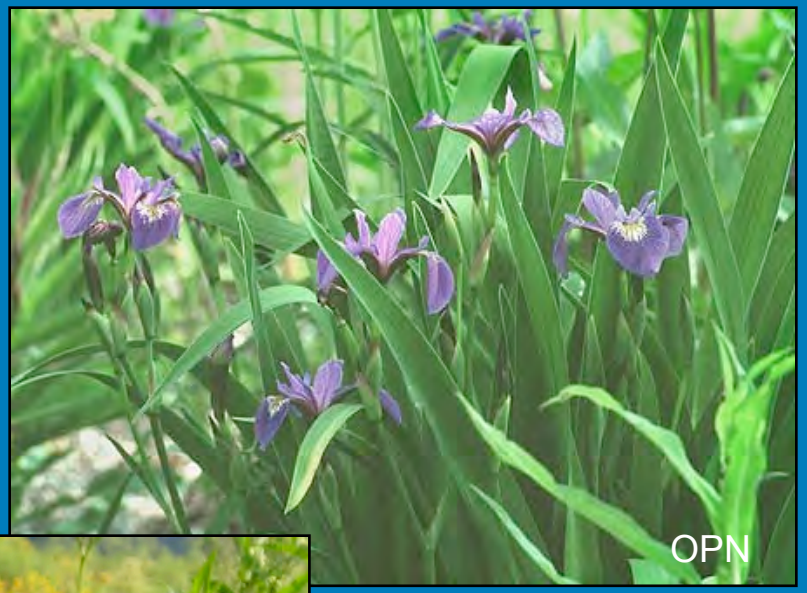
Shrubs?

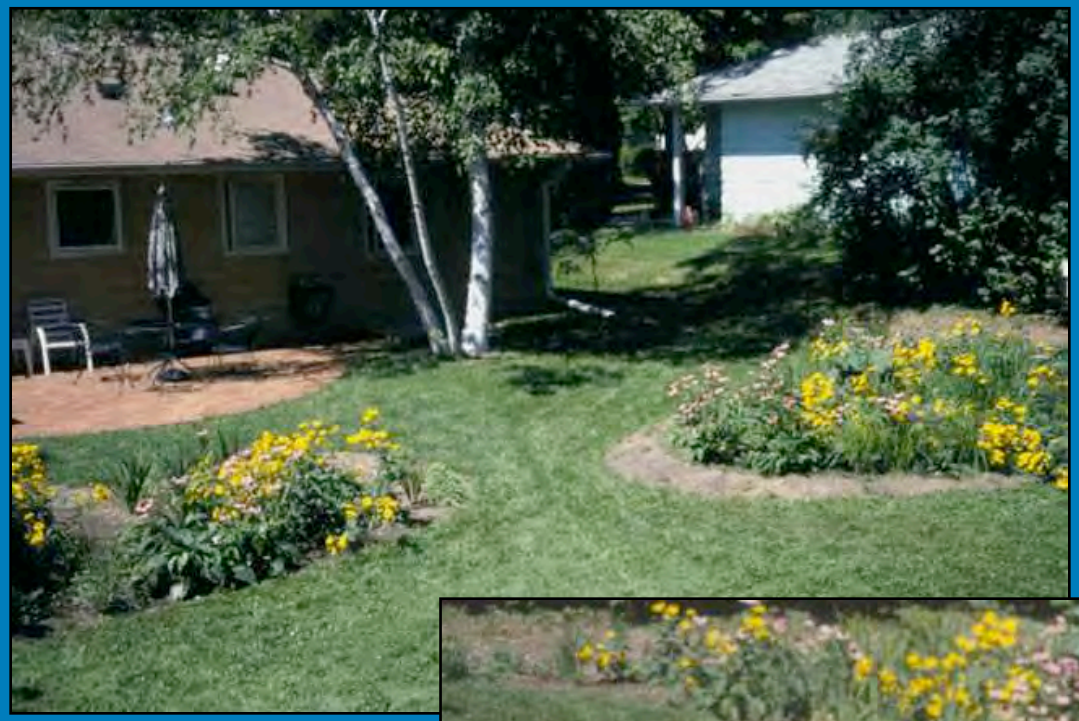
Trees?

Plants in Rain Gardens



Plants in Rain Gardens





Grasses in Rain Gardens

Big / Little Bluestem

Prairie Dropseed

Indian Grass

Soft Rush

Maintenance

- 3” mulch to keep soil in place
- Lighter mulches (pine bark, wood chips and straw) will float in water and may be washed to the edges of the rain garden
- Better mulch choice is shredded wood
- May want to use a weed barrier in addition to mulch


WI Dept. of Natural Resources

Maintenance

- Remove weeds on a regular basis as the plants grow
- Replenish mulch and organic matter as needed
- There will be less need for mulch and weeding as the plants mature
- Rain gardens should be relatively low maintenance if the correct plants are chosen.
- Water plants for at least two years to get them established.

FAQs of Rain Gardens

- Does the rain garden form a pond?
  - No. Rain gardens are saucer shaped, not bowl shaped. If designed properly, rainwater will soak into the ground so that the rain garden is dry between rainfalls.
- Will they attract mosquitoes?
  - No. Mosquitoes need 7-12 days to lay and hatch eggs and standing water in the rain garden should drain in a few hours after rain events. Mosquitoes are more likely to breed in bird baths, old tires, catch basins.
- How much maintenance is entailed?
  - After rain gardens are established, they can be maintained with minimal effort after plants are established. Weeding and watering are the basic maintenance chores.

FAQs of Rain Gardens

- Is a rain garden expensive?
  - It doesn't have to be. Seek out help (labor) from friends and family. Costs may also be minimized by obtaining divided plants from friends, family, colleagues and neighbors. Material cost for approximately 300 sq. ft. - $600. Common tools can be used.
- Can I build a rain garden in my community?
  - Check local ordinances may prohibit or regulate disconnecting downspouts, setbacks from right of ways and property lines, and weed ordinances.

Lorain Soil and Water Conservation District

42110 Russia Road

Elyria Ohio 44035

440-326-5800

www.lorainswcd.com

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Rain Garden References

Ohio Prairie Nursery
www.ohioprairienursery.com

Rain Gardens of West Michigan
www.raingardens.org

University of Wisconsin-Extension Water Resources Programs clean-water.uwex.edu/pubs/raingarden/

Virginia Department of Forestry
www.dof.virginia.gov/rfb/rain-gardens.shtml

Wild Ones
www.for-wild.org


Thank You!