WATER IN THE LANDSCAPE: DON’T GET BOGGED DOWN!

KIM COUNTS MORGANELLO
WATER RESOURCES AGENT
CLEMSON COOPERATIVE EXTENSION
EROSION
Polluted runoff is the #1 threat to clean water in the US.
RESIDENTIAL-SCALE TREATMENT TRAIN
Forest Water Budget – Typical Scenario

Evaporated Water → Water Uptake → Transpired Water

Infiltration

Surface Runoff?

Groundwater

Dr. Dan Hitchcock
Baruch Institute of Coastal Ecology and Forest Science
Urban Water Budget – Pavement and Rooftop Scenario

- ROOFTOP RUNOFF!!
- SURFACE RUNOFF!!
- EVAPORATED WATER
- INFILTRATION??
- GROUNDWATER??

Slide by Dr. Dan Hitchcock
Rainwater Harvesting – Barrels and Gardens

Slide by Dr. Dan Hitchcock
GREEN INFRASTRUCTURE IN THE HOME LANDSCAPE

- Healthy Soils/Mulch
- Rain Gardens
- Native Plants/Vegetative Buffers
- Rainwater Harvesting
- Reduce Impervious Surfaces
Rain Garden Myths
A rain garden is a planted depression that allows rainwater runoff from impervious urban areas, like roofs, driveways, walkways, parking lots and compacted lawn areas, the opportunity to be absorbed.
WHY RAIN GARDENS?

- Allows for **Collection and infiltration** of stormwater runoff (reducing quantity)

- **Manage erosion & moisture control issues** around home

- **Beautify** the landscape

- Plants and microbes do the work of **pollutant removal** (protecting downstream water quality)

- **Attract desirable wildlife** (birds and butterflies)

- **Water-wise**: A smart way to irrigate
Before

After
Bioretention Cell Vs Rain Garden

clemson.edu/carolinaclera
RAIN GARDEN SITING

• > 10 ft. from building foundation

• > 25 ft. from septic system drainfield

• Avoid shallow water tables < 18 in. deep

• Away from utility lines

• Call #811! Ensure no buried cables or pipes in the excavation area

• In full to partial sun, if possible
Go outside when it rains and watch how water flows across your landscape!!!

Note the “source” and “destination.”
• The ability of rain water to *drain* is important for your rain garden location

• A simple “perc” (*percolation*) *test* can help you to decide:

1. Dig a hole about 6 inches deep and wide

2. Fill the hole to the top with water

3. Check the hole 24 hours later — if the water is gone, you have an ideal rain garden location, otherwise, consider a backyard wetland!! **Ideal is 1-6 inches an hour.**
1. Determine the area of impervious runoff source (rooftops + sidewalks + driveway areas). Note: Your rain garden likely only capturing a portion of your roof area.

2. Rule of thumb: estimate the size of your rain garden based on perc test:

Sandy soil (well-drained)
= 20% of impervious area

Loamy soil (poorly-drained)
= 30-50% of impervious area

Refer to Rain Garden Worksheet on p.11 of “A Guide to Rain Gardens in South Carolina”
Excavate down 12 inches.  
*Find friends to help!*

Build a berm around perimeter of shape

*Berm varies, typically no more than 5 inches high and 12 inches wide*
• Consider existing soil when amending rain garden. For example if a quick draining perc test, will not need to add as much sand.

• Typical rain garden soil mix:
  - Sand: 50-60%
  - Compost: 20-30%
  - Existing soil: 20-30%

• In a standard rain garden, will amend 2 bags sand to 1 bag compost. Mix well in the excavated area, like baking a cake!
RAIN GARDEN PLANT SELECTION

Perennials

Grasses

Shrubs
Dwarf Palmetto
*Sabal minor*

*Hearty species with a range of drought and wet condition tolerance*
Oakleaf Hydrangea
_Hydrangea quercifolia_
Black-eyed Susan
Rudbeckia fulgida
Stokes Aster
*Stokesia laevis*
- Sweetgrass
  *Muhlenbergia filipes*
MULCH

• Non-floating mulch

• Cedar generally most recommended

* After soil is amended & mulch added, the depth of the rain garden should be at least 6 inches from top of the berm to the bottom of the rain garden
clemson.edu/raingarden
WHAT IS RAINWATER HARVESTING? ANCIENT PRACTICE OF CAPTURING RAIN AND STORING IN A RESERVOIR FOR REDISTRIBUTION/REUSE

COLLECTION + STORAGE + USE

The Cistern, Randolph Hall, College of Charleston, SC
BEFORE AND AFTER
Rainwater Harvesting Comes in All Shapes & Sizes

“Rain Barrel” vs. “Cistern”
During a one inch rainfall, a 1000 square foot roof can yield over 600 gallons of water!

Multiple square footage of roof area by 0.623
CONVEYANCE

- Gutters
- Downspout
- Rain chain
- Corners/eaves where water collects
- Flexible downspout
- PVC
CONVEYANCE

- Gravity fed
- Elevate using cinder blocks, pavers, wooden stand..
- Site close to end use
- Distribute water using: watering can, drip tubing, hose
NECESSARY FEATURES

- Outlets that can be turned on and off
- Emergency overflows that allow water to escape when barrel is full (direct away from house)
- Dark colored that prevents sunlight penetration and algae growth
- Recycled barrels, should be food grade never been used to transport chemicals
- Point of water entry secure to exclude small animals/children
- Screening to prevent mosquitoes
NON-POTABLE USES

- Landscape Needs
- Wildlife
- Washing Equipment
- Toilets (check codes)
USE THE WATER!
TREATMENT TRAIN
Kim Counts Morganello
Water Resources Agent
Clemson Extension
ccounts@clemson.edu
843-730-5212

clemson.edu/raingarden
See links under the AMGA website's "Helpful Links" tab to stormwater and rain garden resources. Also, if you enter rain garden in the HGIC main search window - the search results provide Factsheets on a variety of plants suitable for use in rain gardens.