BE WATER WISE - Rain Gardening at Home

Watershed Weekend
Dover Township
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• Gary R. Peacock  
  – Watershed Specialist

118 Pleasant Acres Road
York, PA 17402
Tel: 717-840-7430
Fax: 717-755-0301
Web: www.yorkccd.org
E-mail: gpeacock@yorkccd.org
The great aim of education is not knowledge but action.
– Herbert Spencer (1820 - 1903)
Program

• Frequently Asked Questions
• The Plan
• The Design
• Building the Rain Garden
• The Maintenance
• The Enjoyment
• References
Introduction

• This program is designed to help homeowners build their own rain garden.
• Armed with the information in this program, you can enhance the natural function of your home’s landscape.
• The goal of the program is to outline a step-by-step guide to build a rain garden both easily and economically.
Frequently Asked Questions

• Q: Why are rain gardens important?
  – A: Rain gardens help manage stormwater onsite, improve water quality, provide functional landscaping, and enhance wildlife habitat.

• Q: How is a rain garden different from any other garden?
  – A: The goal of gardening is to harvest enjoyment, feed, fiber, food, fuel, or water.

• Q: How do I build a rain garden?
  – A: Building a rain garden involves planning, design, construction, and maintenance.
The Plan

- Goals & Strategies
- Budget
- First Step
- Health & Safety
- Soils
- Considerations
The Plan

- Goal: Capturing 50% of runoff in my rain garden.
  - Objectives:
    - Using native plants
    - Conserving water
    - Reducing the use of fertilizer and pesticides
    - Wildlife habitat
The Plan

- Budget
  - Residential rain gardens average $3 to $5 per square foot
  - Depends on soil conditions, desired species, size and density of plants used
The Plan

• First Step
  – Identify site’s natural characteristics and man-made features
  – Get permission, if needed
  – Survey the grounds to identify possible rain garden sites
  – Pay attention to drainage problem areas
The Plan

- Call Before You Dig!
  - PA One Call
    - 1-800-242-1776
    - www.paonecall.org
  - 3 working days notice is the law!
The Plan

• Check Your Soil
  – York County Soil Survey (2000)
  – NRCS Soils Website http://soils.usda.gov/
  – Penn State Cooperative Extension Soil Test Kits
The Plan

• Considerations
  – *How* it will catch water
  – What will happen during *very large* storms

• Tips
  – Avoid high traffic areas
  – Do not disturb forest soils
The Design

- Location
- Drainage Area
- Depth
- Slope
- Level
- Soil Types
- Infiltration Area
- Selecting Plants
The Design

- **Location**
  - Observe potential areas during rainfall events
  - Identify flow paths, including excess
  - Minimum 10 feet away from foundations
  - Rain garden should be twice as long (perpendicular to slope) as it is wide
The Design

- **Drainage Area**
  - Measure length and width of roof area(s)
  - Determine total square feet
The Design

- Depth
  - Typical depth 3” to 6”
  - Increase depth for larger drainage areas
  - Increase depth for larger volumes of water

Figure 3: The string should be tied to the base of the uphill stake, then tied to the downhill stake at the same level.
The Design

- Slope: <4% = 3”-5” depth  5-7% = 6”-7” depth  8-12% = 8” depth
  >12% not recommended
The Design

- Leveling
  - Making sure bottom surface area level will determine the height of berms, up and down slope
The Design

- Soil Type
  - Permeability
    - 0.1-0.1 in/hr Extremely slow
    - 0.1-0.6 in/hr Very slow
    - 0.6-0.2 in/hr Slow
    - 0.2-0.6 in/hr Moderately slow
    - 0.6-2.0 in/hr Moderate
    - 2.0-6.0 in/hr Moderately rapid
    - 6.0-20 in/hr Rapid
    - >20 in/hr Very rapid
• Infiltration Area of Small Rain Garden
  – Total Drainage Area = \((\leq 100 \text{ ft}^2) \times ________\)
  – Multiplier:
    • 0.03 Sandy Soil
    • 0.06 Silty Soil
    • 0.10 Clayey Soil
The Design

• Infiltration Area of Large Rain Garden
  – Total Drainage Area = (>100 ft²) x ________
  – Multiplier:

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-5 in</td>
</tr>
<tr>
<td>Sandy</td>
<td>0.19</td>
</tr>
<tr>
<td>Silty</td>
<td>0.34</td>
</tr>
<tr>
<td>Clayey</td>
<td>0.43</td>
</tr>
</tbody>
</table>
The Design

Selecting Plants

- Right plant, right place
  - Light
  - Temperature
  - Moisture
  - Growth habit
  - Height
  - Other
- Use native plants for optimum benefits
• Considerations
  – Native plants are more effective and efficient
  – Non-native plants may be invasive
  – Some plants are poisonous/toxic to pets and children
The Building

• Before Construction
• Day of Construction
• Planting
The Building

Before Construction
- Task list
- Tool & materials
- Plants
- Mulch

The following tools will help in building the rain garden. Some of the tools are optional.
- Tape measure
- Shovels
- Rakes
- Trowels
- Carpenter’s level
- Wood stakes, at least 2 ft long
- String
- 2x4 board, at least 6 ft long (optional)
- Small backhoe with caterpillar treads (optional)
**The Building**

- **Day of Construction**
  - Layout perimeter using flags, hose, rope, tape, etc.
  - Remove grass sod
  - Dig soil from center and build berm around perimeter or downslope edge
The Building

- Planting
  - Species
  - Size
  - Density
  - Growth habit
  - Height
  - Other
  - Mulch 2”-3” depth
The Maintenance

• First Month
• First Season
• Subsequent Seasons
The Maintenance

• First Month
  – Observe during rainfall events
  – Water, as needed
  – Weed, as needed
The Maintenance

• First Season
  – Monitor rainfall events
  – Inspect plants periodically
  – Weed, as needed
  – Water, as needed
  – Mulch, as needed
Subsequent Seasons
- Monitor rainfall events
- Maintain/replace plants, if needed
- Weed, as needed
- Mulch, as needed
- Water, as needed
The Enjoyment
Epilogue

• A watershed is an area of land where all the rain and snow drain to common waterbodies.
• Everything we do in our daily lives creates some nonpoint sources of pollution.
• Nonpoint sources of pollution are the greatest threat to water quality today.
• Best Management Practices are measures designed to abate, mitigate and protect soil and water quality.
• One square foot of rain garden, on average soils, can capture, treat and infiltrate up to 12,264 gallons per year!
References

- **Build Your Own Rain Garden**

- **RAIN GARDENS: A Design Guide for Homeowners**
  - [http://www.sustainability.uconn.edu/landscape/05-rain_gardens.html](http://www.sustainability.uconn.edu/landscape/05-rain_gardens.html)

- **MAEscapes Rain Garden Basics**
  - [www.maescapes.org](http://www.maescapes.org) (coming soon)

- **Schoolyard Habitat**

- **Rain Garden Manual for New Jersey**
  - [http://www.npsnj.org/raingarden_home.htm](http://www.npsnj.org/raingarden_home.htm)

- **Rain Garden Design Templates**
  - [http://www.lowimpactdevelopment.org/raingarden_design/download.htm](http://www.lowimpactdevelopment.org/raingarden_design/download.htm)

- **Rain Gardens Technical Guide**
• You must not know too much or be too precise or scientific about birds and trees and flowers and watercraft; a certain free-margin, and even vagueness - ignorance, credulity - helps your enjoyment of these things.
  
  – Walt Whitman (1819 - 1892)

• Thank you for your interest and support!