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## The Demonstration Rain Garden

Christopher C. Obropta

*Rutgers Cooperative Extension*, obropta@envsci.rutgers.edu

Madeline Flahive DiNardo

*Rutgers Cooperative Extension*, flahive@aesop.rutgers.edu

Gregory M. Rusciano

*Rutgers Cooperative Extension*, greg.rusciano@rutgers.edu



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## The Demonstration Rain Garden

### Abstract

The process of developing a successful, demonstration-based rain garden education program for a specific county is presented. A series of demonstration rain garden projects were conducted by Extension personnel and Master Gardeners to provide "in-the-ground" tools to help teach local homeowners to become better "stormwater stewards" on their own property. The demonstration sites were constructed based on the idea that Extension programming to the public can be enhanced by conducting programs at the sites. At the same time, the eight demonstration sites are contributing to treating and infiltrating approximately 200,000 gallons of stormwater runoff annually.

### Christopher C. Obropta

Assistant Extension Specialist in Water Resources  
New Brunswick, New Jersey  
[obropta@envsci.rutgers.edu](mailto:obropta@envsci.rutgers.edu)

### Madeline Flahive DiNardo

County Agricultural Agent  
Union County, New Jersey  
Westfield, New Jersey  
[flahive@aesop.rutgers.edu](mailto:flahive@aesop.rutgers.edu)

### Gregory M. Rusciano

Program Associate, Water Resource  
New Brunswick, New Jersey  
[Greg.rusciano@rutgers.edu](mailto:Greg.rusciano@rutgers.edu)

Rutgers Cooperative Extension

## Introduction

Would you buy a car without driving it, or would you purchase land without first seeing it? The answers to these questions are "no," so why should someone expect you to invest in a rain garden without seeing one? A rain garden is a shallow landscaped depression that is designed to capture, treat, and infiltrate stormwater runoff. The plants in a rain garden are native to the region and help retain pollutants.

The Demonstration Rain Garden is a useful tool for educating homeowners, landscapers, developers, and politicians on the ease of taking responsibility for the stormwater runoff generated on personal property. The construction of the garden is an opportunity to provide "hands-on" training for residential property owners. Once the garden is constructed, it provides other educational opportunities such as guided and self-guided tours. These demonstration stormwater management systems can be shown to have measurable impacts, such as the amount of runoff from impervious surfaces treated.

## The Tool

A rain garden is a simple system to design, build, and maintain. It is typically placed a minimum of 10 feet from the foundation of the building and is 6 to 18 inches deep. Although it is usually located to receive stormwater runoff from a rooftop, driveway, or other impervious surface, it can be used to intercept runoff from lawns or agricultural fields. A rain garden is designed to capture runoff from small storms, which, due to their frequency, are responsible for contributing a large

amount of nonpoint source pollution (Leopold, 1968; May, Horner, Karr, Mar, & Welsh, 1997).

Clayton and Schueler (1996) recognized that 90% of the rainfall events in the mid-Atlantic region come in storms of less than one-inch of rainfall. Therefore, NJ regulators have defined the "water quality design storm" as 1.25 inches of rain over 2 hours and recommends that stormwater systems be designed to maximize pollutant removal for this type of storm. This system allows for the maximum treatment of 90% of the rainfall events in the state.

A rain garden is designed to infiltrate stormwater runoff and should not be constructed in a wet area. Soil percolation tests are performed to determine if captured stormwater will drain within 48 hours, a specification that prevents mosquito breeding.

Generally, existing soils need to be amended with sand aggregate to obtain the desired level of infiltration. The best planting media will promote both infiltration and native plant growth. Thus, soil tests should be taken to determine to amendments for nutrient and pH levels. Future fertilization is not recommended. At times, the existing soil needs to be completely replaced with a more desirable soil mix. A rain garden typically has a layer of hardwood mulch around its native plants, shrubs, and small trees. Plant selection is based on light requirements and drainage preferences.

## **Siting a Demonstration Rain Garden**

The demonstration rain garden should be constructed in a highly visible place such as a public library, town hall, or school. It is also desirable to select a location where public education programs can be easily held, allowing for maximum use of the rain garden. Rutgers Cooperative Extension (RCE) has built eight demonstration rain gardens throughout NJ, five of which are in the same watershed. The close proximity allows for half-day tours of all five rain gardens. Locations for the rain gardens include a health department, a local watershed association office, a public elementary school, a public library, and a municipal park. Other demonstration rain gardens in NJ are located at county Extension offices, which allows staff to easily maintain and monitor them.

## **Installation and Maintenance**

The funding of the materials for the demonstration rain gardens was provided by a New Jersey Department of Environmental Protection Section 319(h) Grant. Labor was provided by the Master Gardeners of Union County, RCE personnel, and local stakeholders. Master Gardeners participated in a stormwater management course as training for the project. In return for the training, they installed and maintain the gardens. Municipal public works departments and other cooperating stakeholders provided in kind assistance.

## **Using the Tool**

The new demonstration rain gardens became the tools that facilitated RCE's training of Master Gardeners and other community stakeholders in stormwater management. RCE of Union County received a grant from the United States Department of Agriculture-Cooperative State Research Education and Extension-Regional Water Quality Coordination Program to hire a student intern to assist with creating and delivering educational programs. Over a summer, two education programs, targeted for adults and children, were developed. All programs were at the demonstration rain gardens.

The demonstration rain gardens served as a powerful visual aid. People attending the program walked around the demonstration rain garden and learned about the native plants. They spoke with Master Gardeners who installed and maintain the gardens. Thirty adults participated in two evening programs that included a PowerPoint™ presentation describing rain garden site selection, design, installation, and maintenance. Evaluative pre-post test scores improved by 13%; questions that the participants improved their scores on were: rain garden depth, care of native grasses, and limited use of fertilizers.

A children's program at the school and library rain garden sites featured a demonstration of non-point source pollution using an Enviro-Scape™ Model and a tour of the garden. Pre-Post tests results of the Clean-Up Messy Town lesson revealed that students could list 50% more actions to prevent ground water contamination, including planting rain gardens, than they could at the beginning of the lesson.

## **Conclusion**

A "tool of the trade" is usually thought of as an educational pamphlet, curriculum, or informational CD or DVD. Here a living tool has been presented--the Demonstration Rain Garden. Not only does this in-the-ground tool provide Extension an opportunity to train people during construction, but it also continues to grow and thrive as an educational tool for the local community. An additional benefit is that the Demonstration Rain Garden is completely functional. The eight demonstration rain gardens designed and built by RCE capture treat and recharge approximately 200,000 gallons of stormwater runoff per year. Now that's an impact!

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