Title of Program: Residential Rain Garden Program **Facilitator's Guide**
Number of Sessions: One **Date of Publication: 12/2014**
Length of Lesson: 45 minutes + **Author(s): A. Osborne**
Audience: KEHA members, Master Gardeners, Homeowners **Optimum Group Size: 25**

Planning Phase:

Purpose: To increase participants' knowledge of rain gardens (i.e., what a rain garden is, why a rain garden is important, and if a rain garden is right for them).

Supporting Research: According to the Kentucky Division of Water, nonpoint source pollution is responsible for roughly two-thirds of the water quality impairments in Kentucky's streams and lakes, and is the main contributor to water pollution in the Commonwealth. Nonpoint source pollution occurs as precipitation moves over and through the ground, picking up and carrying pollutants with it to local waterbodies. A rain garden is one of several practices that homeowners can use to reduce their property's negative impact on water quality and flooding. A rain garden is a manmade landscape feature that includes a shallow depression designed to capture and reduce polluted runoff.

In 2014, the Kentucky Environmental Education Council conducted a survey of Kentucky citizens addressing environmental knowledge, attitudes, and behaviors. When respondents were asked to name the most important environmental problem in Kentucky, 22% reported water pollution, quality, and protection as the primary environmental concern.

FCS Initiative(s): Promoting Healthy Homes and Communities

Initiative Goal(s): Through Family and Consumer Sciences Extension, individuals decrease their environmental footprint.

Sample Success Story: (use with evaluation)
_____(Name of County)_____ County presented the Residential Rain Garden program to _(#) _ participants. As a result of this program, (# or % of participants) (note: look for change in knowledge in evaluation question #1 and/or #2) showed an increase in knowledge on rain gardens. In addition, (# or % of participants) (question #4)stated that they will install a rain garden at their home within the next <insert #> months, and (# or % of participants) (question #5) reported that they will learn more about and adopt other landscaping best management practices that protect and/or conserve water resources.

(Optional Follow-up Evaluation)
Of the (# or % of participants) (question #1) that stated they already had a rain garden at their home prior to the rain garden lesson, (# or % of participants) (question #2a) reported that they made changes to their rain garden as a result of the lesson and (# or % of participants) (question

#2b) reported that they made changes to how they maintained their rain garden as a result of the lesson. Of the (# or % of participants) that stated they did not have a rain garden at their home prior to the rain garden lesson (question #1), (# or % of participants) (question #3) reported that they installed a rain garden at their home as a result of attending the program.

Suggested Resources:

- *Residential Rain Gardens* Factsheet
- *HENV-205 Residential Rain Gardens: Design, Construction, and Maintenance* (Available online: http://www2.ca.uky.edu/agc/pubs/HENV/HENV205/HENV205.pdf)
- PowerPoint presentation with talking points
- Rain Garden Metaphors Activity
- Videos
- Evaluation
- Follow-Up Evaluation

Potential Collaborators:

Extension Personnel:

Ashley Osborne, Extension Associate for Environmental and Natural Resource Issues, P: 859-257-2505, E: ashley.osborne@uky.edu

Community Collaborators:

- Municipal Separate Storm Sewer System (MS4) Coordinator
- Conservation District (contact information available online at http://tinyurl.com/pjtrm5r)
- Local nurseries and/or greenhouses

Objectives:

1. Participants will increase their knowledge of rain gardens (i.e., what a rain garden is, why a rain garden is important, and if a rain garden is right for them).

   Supporting Activities (optional):

   - Two short YouTube videos are available to use in addition to the PowerPoint presentation when discussing watersheds and stormwater.
     - *What is a Watershed?* (MO and MS Resource Conservation Development Inc.) http://tinyurl.com/mw2kkce
     - *Revenge of the Fish 2- The Swimming Pool* (Kentucky Transportation Cabinet) http://tinyurl.com/msbmotz
   - *Rain Garden Metaphors* is an activity that can be used when discussing what a rain garden is.
   - Tour an existing rain garden.

Materials List:
Presentation Materials:
- Computer
- Projector

Props:
- Plants suitable for a rain garden (see rain garden plant list in HENV-205 Residential Rain Gardens)

Handouts/Publications:
- *Residential Rain Gardens* Factsheet
- *HENV-205 Residential Rain Gardens: Design, Construction, and Maintenance* Publication (optional)
- Evaluation

Project Supplies:
- Supplies needed for rain garden activity (see activity for materials list)

Facilities Required: Power outlets, computer and internet access, and if doing rain garden activity a large open space for participants to move around

Prior to Lesson: (Outline all preparations needed prior to presenting this program, i.e. gather props, copy publications, etc.)

1. Review and familiarize yourself with the PowerPoint presentation (with talking points) and the following publication and factsheet: *HENV-205 Residential Rain Gardens: Design, Construction, and Maintenance* Publication, *Residential Rain Gardens* Factsheet.

2. If you doing the rain garden activity with participants, familiarize yourself with the activity and gather the necessary materials needed.

3. Find several examples of plants suitable for a rain garden for participants to look at during the lesson (if possible). Ask Master Gardeners or local nurseries or greenhouses if you can borrow plants for the program if you do not have plants available.

4. Copy *Residential Rain Gardens* Factsheet (one per participant). A longer publication titled *HENV-205 Residential Rain Gardens: Design, Construction, and Maintenance* is also available and provides additional information about sizing, installing, and maintaining residential rain gardens. Depending on your audience and your printing capabilities you may only want to print out and provide the shorter factsheet to participants, then provide the longer factsheet/booklet for those that request more information.

5. Copy the evaluation (one per participant)

Adaptations for other Audiences:
If adapting this lesson for youth consider the following:

- Additional hands-on activities developed for youth audiences are available that focus on rain gardens. Contact Ashley Osborne, E: ashley.osborne@uky.edu, P: 859-257-2505.
- Conduct this lesson in succession with lessons related to water quality (e.g., nonpoint source and point source pollution), stormwater, watersheds, and/or gardening. Numerous hands-on activities related to these topics are available through various curriculum guides, including Project Water Education for Teachers (WET), Project Learning Tree (PLT), and 4-H_2O Ambassadors. For information on these or other water education curriculum contact Ashley Osborne, E: ashley.osborne@uky.edu, P: 859-257-2505.

Presenting the Program:

Note that the PowerPoint presentation slides corresponding with each section are listed in parenthesis.

Lesson Introduction (1 minute): The objectives of this lesson are that each participant will increase their knowledge of (1) what a rain garden is, (2) why a rain garden is important, and (3) if a rain garden is right for them.

Talking Points and Procedures:

Step1 (5-20 minutes, depending on if you do the supporting activity): This section addresses the question of "*What is a rain garden?*"

What is a rain garden? (PowerPoint slide #2-3)

- A rain garden is a manmade landscape feature that includes a shallow (6–9 inches deep) depression designed to capture and reduce stormwater runoff.
- Rain gardens act as a sponge absorbing polluted stormwater runoff. The plants, mulch, and soil in a rain garden act as a filter and filter out pollutants in the runoff. The water returns to the environment cleaner than when it originally entered the rain garden.
    - *Rain Garden Metaphors* supporting activity– this activity can be carried out as instructed in the activity write-up, or the objects specified in the activity (e.g., sponge, filter, soap, strainer) can be brought in and used during the presentation. If using the latter idea, have items out of sight of participants. Take one item out at a time, and discuss with participants how the item represents a rain garden (e.g., a rain garden is a sponge, because a rain garden absorbs stormwater like a sponge absorbs water).

Step2 (10 minutes): This section addresses the question of "*Why is a rain garden important?*"

Rain gardens capture and reduce stormwater runoff. (PowerPoint slide #4-7)

- Rain gardens capture and reduce stormwater runoff, but what is stormwater?

- To understand stormwater, it's important to understand what a watershed is.
- A watershed is an area of land that sheds (drains) water to a single waterbody, such as a stream, river, or lake. No matter where you are, you are always in a watershed.
- Impervious surfaces such as rooftops, parking lots, and roads in a watershed prevent rainwater from soaking into the soil. As the water runs off it becomes stormwater.
- As stormwater flows across impervious surfaces anything that is on the ground (e.g., cigarette butts, pop cans, automotive fluids, paint, etc.) eventually ends up in our streams, rivers, or lakes untreated by way of storm drains.
- Rain gardens can be used to capture and reduce stormwater runoff.
- Presenter – (optional) Show two short YouTube videos listed below when discussing watersheds and stormwater. Internet access is needed.
    - *What is a Watershed?* (MO and MS Resource Conservation Development Inc.) http://tinyurl.com/mw2kkce
    - *Revenge of the Fish 2- The Swimming Pool* (Kentucky Transportation Cabinet) http://tinyurl.com/msbmotz

Rain gardens improve water quality. (PowerPoint slide #8)

- North Carolina State University conducted a study where water samples were collected as stormwater water entered a rain garden and as the water exited the rain garden. Samples were analyzed for different forms of nitrogen and total phosphorus. Results showed that generally nutrient levels decreased as the stormwater filtered through the rain garden and exited the garden. (A graph of the data from this study is available in the PowerPoint presentation.)
- The plants and soil in a rain garden absorb stormwater runoff and filter out pollutants (such as nutrients, heavy metals, sediment, and fecal coliform) in the runoff, returning cleaner water to ground- and surface waterbodies.

Rain gardens provide food and shelter for wildlife. (PowerPoint slide #9)

Rain gardens are easily maintained. (PowerPoint slide #10)

- Maintenance for a rain garden is similar to maintenance for other gardens in your landscape.
- You may need to water your rain garden after your garden is first installed (allowing time for your plants to become more established), and also during times of extreme hot weather.
- Additional garden care (e.g., weeding, pruning, replacing mulch) is similar to other gardens in the landscape.

Rain gardens are a beautiful addition to your landscape. (PowerPoint slide #11)

- Presenter – (optional) Have a few examples of plants suitable for a rain garden for participants to see (see rain garden plant list in HENV-205 *Residential Rain Gardens*). Contact local nurseries or greenhouses to ask if they have plants you can borrow for the program.

Step3 (8 minutes): This section addresses the question of "*Is a rain garden right for me?"*

Can a rain garden be integrated into the overall landscape design? (PowerPoint slide #13)

- Rain gardens are temporary catchments so they may be periodically wet or dry. You will want to keep this in mind as you consider a location.
- Rain gardens need to be positioned so that water will flow easily into the rain garden and, in the case of larger storms (rainfall >1 inches), overflow into the lawn or other area without causing damage or erosion. (The image on the PowerPoint slide shows how you can sketch your house and property when considering where to install a rain garden.)

Will rain garden plants fit into the landscaping scheme? (PowerPoint slide #14-15)

- Locations with full sun will be best, but with proper plant selection partial sun locations can work as well.
- Rain garden plants need to be able to tolerate alternating wet and dry conditions.
- A variety of plants are suitable for rain gardens, and you should consider how these plants will coordinate with the existing landscape.

How much will it cost? (PowerPoint slide #16)

- The cost will be a function of the size, complexity of the draining and overflow system, type of plantings, and mulch but in general a small residential rain garden will cost from $2 to $5 per square foot if you build it yourself.

How much space do I need? (PowerPoint slide #17)

- For the average residential lot, impervious surfaces (e.g., rooftops, sidewalks, driveways) total around 2,400 square feet.
- A typical residential rain garden that captures about 25 percent of the stormwater runoff from a typical lot will be no larger than 60 square feet (e.g. 6 ft x 10 ft).
- To promote water quality, the goal is to capture the first half to one inch of a precipitation event within the rain garden.
- A table shown on the PowerPoint slide shows possible rain garden demonstrations based on the amount of impermeable surface contributing stormwater runoff to the rain garden. More information on how to calculate the size of your rain garden is available in Extension Publication HENV-205 *Residential Rain Gardens*.

How long does it take to build a rain garden? (PowerPoint slide #18)

- Once you have selected the appropriate site, evaluated the soils, and designed your rain garden, a small garden (50 to 60 ft^2) can typically be constructed in a day or two.

Do rain gardens attract mosquitoes? (PowerPoint slide #19)

- If the rain garden is working properly, mosquitoes will not be an issue.
- The rain garden discussed in this manual and in the *Residential Rain Garden* Extension publication is designed to drain water in at least three days. A mosquito's life cycle includes

four distinct life stages and ranges from four days to one month. The first three stages of the mosquito's life cycle require standing water.

Lesson Review (2 minutes): (PowerPoint slides #20-24)

- By installing a rain garden homeowners can intercept stormwater and keep it on their property, allowing it to soak into the soil rather than moving to a nearby ditch or stream.
- Rain gardens are one of several stormwater management practices that homeowners can use to reduce their property's negative impact on water quality and flooding.
- If you are interested in installing a rain garden at your home, ask your county Extension agent for Extension Publication HENV-205 *Residential Rain Gardens*. This Extension publication provides information on how to select a site, size, construct, and maintain your rain garden.
- PowerPoint slides #21-24 show pictures of rain gardens before and after installation.
- Presenter – have at least one copy of HENV-205 *Residential Rain Garden* Extension publication available to pass around for participants to see.
- Presenter – if possible take participants on a tour to see an existing rain garden(s).

Evaluations:

1. Give each participant an evaluation form to complete and turn in.
2. Give each participant an envelope. Have participants write their name and mailing address on the envelope. In 6 months, send a follow-up evaluation (and self-addressed envelope) to participants using the addressed envelope. Ask participants to complete the follow-up evaluation and mail back to you.
3. Please send all evaluations to Ashley Osborne at ashley.osborne@uky.edu. Ashley will compile data and send back to you electronically.

***Invite participants to sign-up for other CES programming. Distribute newsletters, program invites, informational materials, etc. promoting CES programming.

***Remind participants to complete and return prior to leaving the program.

After the Program:

Reflection: Document strengths and weaknesses of program for future improvements. Note additional needs, props, etc. Incorporate participant ideas to refine program for future presentations.

Suggestions for additional program supports:

This lesson can be taught in succession with the following lessons:

- Rain Barrels