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**Every Drop You Lose,
Nature Finds.**

TAPPwater.org
850-891-6860



Rain Gardens

A How-to Manual for Homeowners



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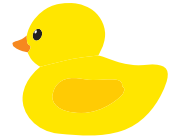
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A rain garden allows approximately 30 percent more water to soak into the ground compared to a conventional lawn.

Introduction

Rain gardens are landscaped areas planted with wildflowers and other vegetation that can capture and soak up excess rainwater, commonly known as stormwater runoff. When homeowners build and plant rain gardens in their yards they capture runoff, typically from the roof or driveway. Captured runoff fills the rain garden, minimizing the amount of runoff that can carry pollutants to our local waterbodies. For several hours after rainfall, the captured stormwater runoff slowly seeps into the ground and is filtered by the soil and plants in the garden.



A rain garden allows approximately 30 percent more water to soak into the ground compared to a conventional lawn. Building a rain garden on your property is a beautiful way to help slow the flow of stormwater runoff and improve the quality of water in nearby lakes and streams.

Rain gardens consisting of plants, mulch, loose soil and sometimes a layer of small gravel, utilize several methods to absorb and disperse water. Plant roots absorb runoff for use in the biological processes of plant metabolism, where it is transpired or “breathed” out through the leaves into the atmosphere. Stormwater runoff not utilized by the

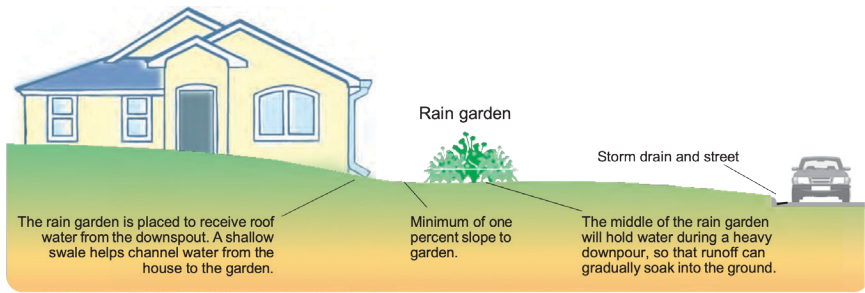
plant roots is absorbed into the loose soil. As runoff moves downward through the mulched layer, chemical and biological processes filter and break down many pollutants. Over time, any excess runoff evaporates into the atmosphere.

Before you get started on your own rain garden, it's a good idea to look through this entire manual. This manual is intended as a guide for local homeowners. This manual covers the siting and sizing, building, planting and maintenance of your rain garden. You'll also find detailed information about plant and soil types near the end of the manual to help you select the right plants for your rain garden.

The original manual circa 2007, was a collaborative effort with contributions from *University of Florida Institute of Food and Agricultural Sciences (IFAS)*, *City of Tallahassee, Department of Environmental Protection (DEP)*, and *Florida State University (FSU)*. This revised version recognizes and builds on those contributions. For questions or more information regarding this guide, please contact City of Tallahassee Stormwater Management at 850-891-6860.

HAPPY GARDENING!





Why Are Rain Gardens Important?

As cities and suburbs continue to grow, increased runoff from impervious surfaces, such as roofs, sidewalks and pavement, has become increasingly problematic. Additional runoff increases the risk of flooding and potential to carry pollutants into local lakes and streams. This “personal pollution” from our homes and yards contributes to the pollution of local waterbodies.

Rain gardens help improve the quality of our local waters and the environmental health of our communities by reducing the amount of runoff leaving our yards. While an individual rain garden may seem like a small thing, collectively rain gardens can produce substantial neighborhood and community environmental benefits including the following:

- Rain gardens increase the amount of water that filters into the ground, helping to recharge the groundwater supplies from which we draw our drinking water.
- Rain gardens help mitigate flood risks and aid in solving local drainage problems.
- Rain gardens help protect our streams, lakes and rivers from pollutants.
- Rain gardens help prevent erosion and in turn protect structures and other vegetation in your yard.
- Rain gardens provide valuable native habitats for birds, butterflies and many beneficial insects.
- Rain gardens enhance the beauty of yards and neighborhoods.

Rain Garden FAQs

Does a rain garden form a pond?

NO. While some rain gardens can be designed to include a permanent pond, homeowners should not do so. Instead, following this guide will help ensure your rain garden is designed in a manner where the stormwater runoff soaks into the ground, or is used by the vegetation.

Will a rain garden provide a breeding ground for mosquitoes?

NO. Mosquitoes need several days to lay and hatch eggs and by following this guide standing water in your rain garden should last for only a few hours. Mosquitoes are much more likely to lay eggs in birdbaths, plant pots and old tires than in a rain garden. Also, rain gardens attract other insects, like dragonflies, which eat mosquitoes and their eggs.

Does a rain garden require a lot of maintenance?

NO. Rain gardens can be maintained with little effort once the plants are established. As with any garden, some weeding and watering will be necessary and perhaps some thinning of plants over time.

Is a rain garden expensive?

It doesn't have to be! The cost to build your rain garden will vary depending on how big you want the rain garden, who does the work and what plants you select. To keep costs down, you can invite family and friends to help build the garden or start with smaller planted areas and gradually expand over time.

Get Ready to Build Your Rain Garden

Now that you know some rain garden basics, let's talk about how to build your own rain garden. Following the three steps below will ensure you build a rain garden that performs well and lasts for years to come.

1. Site and size the rain garden based on your home's drainage pattern.
2. Build the rain garden based on your home's available lawn area.
3. Select plants that work best with your soils and require minimal maintenance over time.

The best way to ensure a successful rain garden project is to follow the process outlined in this manual.

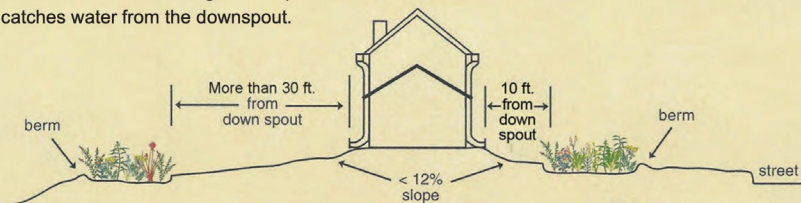
Step One: Siting and Sizing the Rain Garden

After this step you will know the best placement, size, depth, length, width, soils and slopes for your rain garden.

Where should the garden be located?

Home rain gardens typically should be located ten or more feet away from the house but near enough to ensure you catch roof runoff. Some homeowners may wish to place the rain garden further out in the lawn to collect more stormwater runoff from the lawn and driveway. (See **Figure 1 below**)

FIGURE 1. Rain gardens should be at least 10 feet from the house, on a gentle slope that catches water from the downspout.

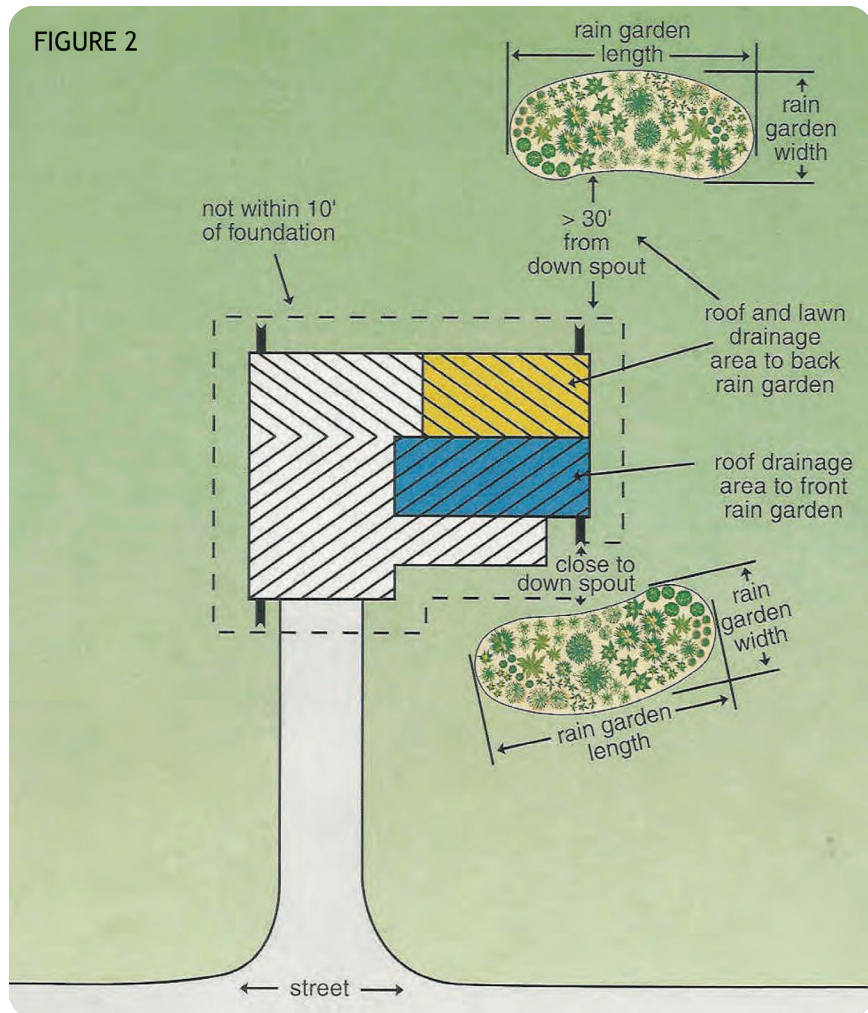


When considering placement of your rain garden, think about how the garden can be integrated into existing landscaping. Make sure you pay attention to views from inside as well as outside your home. For example, you may want to locate the rain garden near a porch or patio where you can enjoy the colors and fragrances.

To help you decide where to place your rain garden, consider the points below and see Figure 2 on the next page.

- The garden should be at least 10 feet from the house so that infiltrating water doesn't seep into the foundation.
- Do not place the garden directly over a septic system or drainfield.
- The goal of a rain garden is to encourage additional infiltration of runoff. Low areas in your yard may already be retaining water for prolonged periods, making it harder for grass to grow. You may want to add rain garden plants to these areas that are already low.
- Rain gardens can thrive in full or partial sun if you select the right plants. For a list of plants appropriate for shade and sun, see the reference tables at the end of this guide.
- Rain gardens will not thrive in full shade so be careful not to put your rain garden directly under a large tree or awning.
- You will need to do less digging if you choose a more level or gently sloped part of the yard.

FIGURE 2



What size and shape should the garden be?

The size of your rain garden will depend on your soil type, the drainage area and depth.

What type of soil makes up your rain garden site?

It is very important to identify your soil type: sandy, silty or clay. Sandy soils provide the fastest infiltration, clay soils have the slowest and silty

soils are in the middle. The longer your soil takes to absorb water, the larger the rain garden needs to be. Most homeowners have a little bit of each soil type. Homeowners in northern Leon County typically have more silty or clay-based soils while homeowners in southern portions of the County have more sandy soils. Soil conditions will vary, so it is a good idea to check your yard specifically around where you want to place the rain garden.

You can get a general idea of your soil type by touch. Dig a small hole about six inches into your yard near where you want to build your rain garden. Rub the soil around in your hands. If the soil feels gritty and coarse, you probably have mostly sandy soil. If your soil is smooth, but not sticky, you have mostly silty soil. If it is very sticky and clumpy, you probably have mostly clay soil.

At Home Soil Tests

It is very important to know the drainage potential of your rain garden's soil. Mostly sand soils provide the fastest infiltration while mostly clay soils are the slowest. The longer your soil takes to absorb water, the larger the rain garden needs to be. If your soil drainage potential is very poor, you may consider a different location or consult with a landscape professional. Below are some quick ways to test the drainage potential of your rain garden.

Clay Test

Take a handful of soil and dampen it with a few drops of water. After kneading the soil in your fingers, squeeze the soil into a ball. If your soil does not ball up, it is sandy and has very good drainage potential.

If your soil remains in a ball, then work the soil between your forefinger and thumb, squeezing it upward into a ribbon of uniform thickness. Allow the ribbon to emerge and extend over your forefinger until it breaks from its own weight. If the soil forms a ribbon more than an inch long before it breaks, the soil likely has too much clay for a rain garden. If it breaks sooner than 1 inch, your soil has moderate drainage potential, and you may consider building your rain garden slightly larger than traditionally recommended.

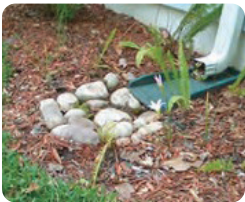
Infiltration Test

- Remove both ends from a large aluminum can (like a large juice can). Mark a line two inches from the bottom end.
- Pound the can two inches deep into the soil so that the line is level with the ground's surface.
- Pour one quart of water into the can. Time how long it takes the water to drain into the soil.
- Check the table below to estimate your soil's porosity and drainage conditions.

Drainage Time	Soil Porosity	Drainage Conditions
Less than 2 minutes	Excellent percolation and air circulation	This soil offers the BEST drainage conditions for planting a rain garden.
2 to 8 minutes	Somewhat compact or dense soil	ACCEPTABLE drainage for a rain garden, but slower than in less compact soil.
More than 8 minutes	Overly compact or dense soil	Very slow, POOR drainage. This soil offers the most challenging conditions for a rain garden.

How large is the area draining to your rain garden?

To best choose your rain garden site, first determine the size of the area draining into the garden. The larger the drainage area, the larger the rain garden will need to be to use all the stormwater runoff. Sometimes, there can be a little guesswork in determining the size of a drainage area, especially if your roof has multiple downspouts. Use the suggestions below to estimate the drainage area. A simple example of area calculation is also provided on the next page (See **Example 1**).



EXAMPLE 1

How to Calculate the Roof Area Draining to Your Rain Garden

Your house is 60 feet long x 40 feet wide.
To calculate the roof area, multiply $60 \times 40 = 2,400$.

Your roof area is 2,400 square feet.

You estimate that a certain downspout collects water from 25 percent of the 2,400 square foot roof. To calculate the drainage area, multiply $2,400 \times 0.25 = 600$ square feet.

A 600 square foot portion of the roof drains into the rain garden.

NOTE: If your lawn is sloped, also note **Example 2**.

For rain gardens more than 30 feet from the downspout:

1. If there is a significant area of lawn uphill that also will drain to the rain garden, you should add this lawn area to the roof drainage area. To do so, first determine the roof drainage area using Steps 1-3 for a rain garden 10-30 feet from the downspout.
2. Next, find the area of the lawn that will also drain to the rain garden. Stand where your garden will be and look up toward the house. Identify the part of the lawn sloping into the rain garden.
3. Estimate the area using online tools or using a tape measure to find the length and width of the uphill lawn. Multiply the length and width and the result is the lawn area in square feet.
4. Add the lawn area to the roof drainage area to find the total drainage area that will be directed to your rain garden. If your patio or driveway also drains to the rain garden, be sure to measure them as well and add that square footage to your total area.



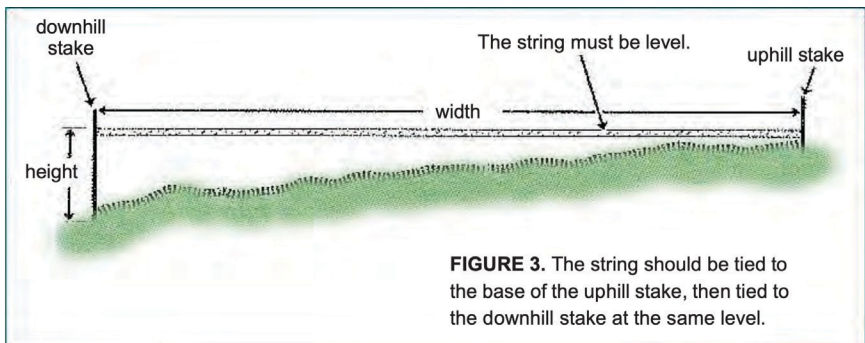
What is the slope of my yard?

Follow these six steps to find the slope of your lawn. (See **Figure 3**)

1. Put a stake into the ground at the uphill end of your rain garden site and put a second stake at the downhill end, typically about 15 feet apart.
2. Tie a string to the bottom of the uphill stake and run the string horizontally across the rain garden site to the downhill stake.
3. Make the string level and tie the string to the downhill stake at that height.
4. Measure along the string between the two stakes for the horizontal width.
5. Now measure the vertical height on the downhill stake between the ground and the string.
6. Divide the vertical height by the horizontal width and multiply the result by 100 to find the lawn's slope as a percent. See example slope calculations below. Slopes less than 10 percent work best. For very steep sloped lawns, it's best to talk to a professional landscaper.

MATERIALS LIST

- String and ruler
- Carpenter's level or string level
- Two wooden stakes
- Calculator (optional)



EXAMPLE 2
How to Calculate Slope and Depth

The horizontal distance of the string between the stakes is 180 inches. The string’s vertical height on the downhill stake is 9 inches. Divide the height by the (horizontal) distance between stakes and multiply by 100 to find your lawn’s percentage slope.

$$\frac{9 \text{ inch height}}{180 \text{ inch width}} = \frac{1}{20} = 0.05$$

0.05 X 100 = 5 percent slope

PERCENT of your slope	Recommended DEPTH
Less than 5 percent	5 inches deep
5 to 7 percent	6 to 7 inches deep
7 to 12 percent	about 8 inches deep

Using the slope of your lawn, select the depth of the rain garden, e.g., based on a 5 percent slope, build the rain garden 6 to 7 inches deep.

How deep should the rain garden be?

A typical rain garden is four to eight inches deep. A rain garden deeper than eight inches may pond with water too long, resembling a hole in the ground, and possibly create a safety hazard for anyone who accidentally steps into it, while a rain garden less than four inches deep will require a large surface area to contain water runoff generated from heavier rainstorms.

No matter the depth of the rain garden, the goal is to level the bottom of the garden to allow for the maximum absorption area and so water doesn’t pool at one end or spill out before it has a chance to infiltrate. Digging a very shallow rain garden on a steep lawn will require

bringing in extra topsoil to raise the downhill edge of the garden to the same height as the uphill part of the garden. Accordingly, if you have steep slopes it is likely easier to dig the garden a little deeper than to bring in extra soil. If you don't know where to begin, start with a depth of four inches and dig deeper as needed.



How large should the rain garden be?

Now that you have estimated the drainage area, soil type and depth for your rain garden, use **Table 1 or 2** to determine the surface area needed for 100 percent capture. Use **Table 1** if the garden is 10 to 30 feet from the downspout but use **Table 2** if it is more than 30 feet from the downspout. Then, follow the steps below to size the garden.

1. To find the size factor for the soil type and rain garden depth, refer to **Table 1 or 2** below.
2. Multiply the size factor by the drainage area you calculated above. The result is the recommended rain garden area to capture 100 percent of average annual runoff.
3. If the recommended garden surface area is much more than 300 square feet, consider distributing the area requirement into two or more smaller rain gardens.

A typical home rain garden is between 100 and 300 square feet. Gardens smaller than 100 square feet will limit the number of plants you can have while larger the rain gardens can have a variety of plants. However, a rain garden of more than 300 square feet will take longer to dig and will be more difficult to level.

The sizing guidelines provided here assume you want to capture and absorb 100 percent of the runoff from the drainage area for

an average rainfall event. However, if you follow these guidelines and decide the calculated surface area is just too large, it is perfectly okay to make the garden smaller or create a series of rain gardens. On the other hand, it is also fine to make the garden bigger than the guidelines indicate, just be aware you may need to water some of the plants from time to time. Rain gardens of any size will reduce the amount of stormwater runoff and, therefore, potential pollutants that drain from your property.

TABLE 1
Size factor for rain gardens LESS than 30 feet from the downspout

Soil Type	5 Inches Deep	6-7 Inches Deep	8 Inches Deep
SANDY SOIL	0.19	0.15	0.08
SILTY SOIL	0.34	0.25	0.16
CLAY SOIL	0.43	0.32	0.20

TABLE 2
Size factor for rain gardens MORE than 30 feet from the downspout

Soil Type	Size Factor for All Depths
SANDY SOIL	0.3
SILTY SOIL	0.03
CLAY SOIL	0.10

EXAMPLE 3

How to Determine the Surface Area of the Garden

Use both slope and area drainage calculations where appropriate.

Your lawn has a 5 percent slope, so you will have a 6-inch deep rain garden. Your lawn is silty and your rain garden is 10 to 30 feet from the downspout. By referring to Table 1, you see that a size factor of 0.25 is recommended. You multiply the downspout drainage area*, 600 square feet (from Example 2), by 0.25 to find the recommended rain garden area: 150 square feet.

600 square feet x 0.25 (Table 1) = 150 square feet

*If your drainage area includes an area of lawn or driveway, etc., as well as roof downspout, remember to use the total drainage area in your calculations.

How long and wide should the rain garden be?

Before building the rain garden, think about how it will capture stormwater runoff, which will usually flow out of a downspout and spread evenly across the entire uphill border (top edge) of the rain garden. Therefore, the top edge of the rain garden should be perpendicular to the slope and the downspout so the garden catches as much water as possible. The top edge is the length of the rain garden.



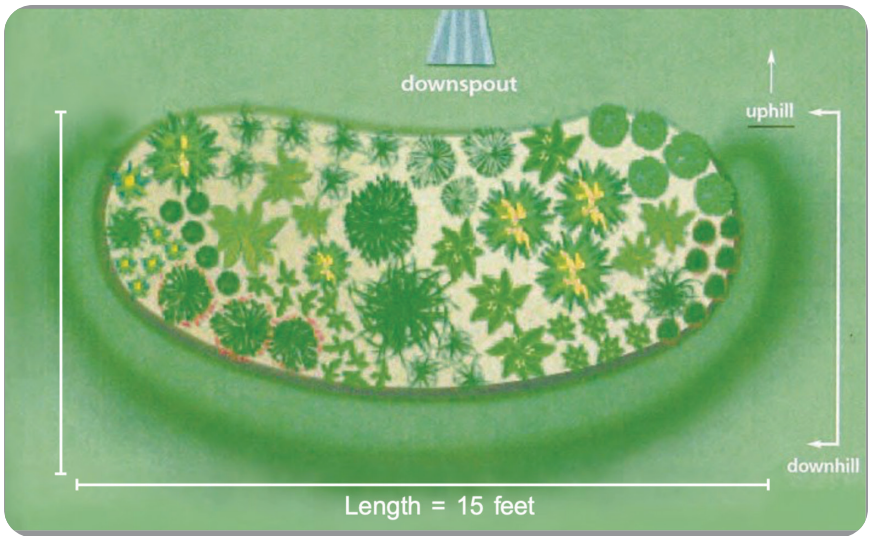


FIGURE 4. The top of the downhill part of the berm should come up to the same elevation as the entry to the rain garden at the uphill end.

When deciding the width of the garden (side edge), remember the slope of the lawn. Wide rain gardens and those on steep slopes will need to be dug deeper at the top end to be level. If the garden is too wide, you may need to bring in additional soil to fill in the downhill portion of the rain garden to make it level.

A good rule of thumb is that the rain garden should be longer than it is wide so the top and bottom edges will be longer than the side edges. Most homeowners will find a rain garden about 10 feet wide is a good start. Rain gardens typically should not be more than about 15 feet wide, especially for lawns with steeper slopes. (See **Example 4**)

EXAMPLE 4

How to Determine the Length of the Garden

1. Choose a rain garden width suitable for your lawn and landscaping— for example, 10 feet.
2. Divide the square footage of your garden by its width to find your garden's length.

You want a rain garden that is 10 feet wide, so divide 150 square feet (page 13 Example) by the 10-foot width to calculate your rain garden's length.

The length in this example is 15 feet.

Step Two: Building the Rain Garden

Now that you have decided on the size and place for the rain garden, it's time to get a shovel and start digging. Working alone, it will probably take a full day to dig an average-sized garden. If you make it a family project, it will go much faster.

MATERIALS LIST

- Tape Measure
- Shovels, rakes and trowels
- Carpenter's level
- Wooden stakes (at least 2 feet long)
- Garden hose
- One 6 ft 2X4 board
- Plants and mulch

Call before you dig!

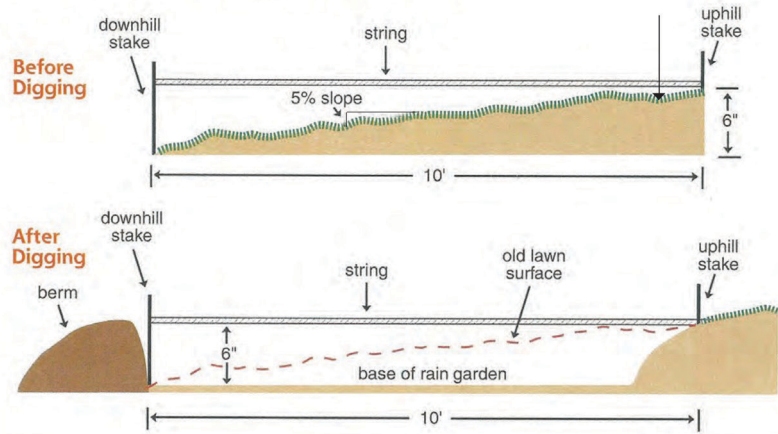
Florida law requires that you call before you dig in order to prevent hitting underground facilities and to ensure proper work coordination. It could be very dangerous and costly to cut through an underground wire or cable and it will really slow your project. Be sure to call 811 or 1-800-432-4770 at least two but no more than five business days before you start your project. You can also visit the Sunshine 811 website at **Sunshine811.com**.

Dig it!

You can reduce your digging time by removing any sod first. Sod is easy to remove with a square shovel and may be useful elsewhere in your yard. Also, the best time to build the garden is in the fall. It's easier to dig, and the plants are more likely to thrive. When you start to dig, follow these steps:

1. Create the shape of your rain garden by laying a string or garden hose in the pattern that you wish to use. Remember that the berm will go outside the shape. Next, put stakes along the uphill and downhill sides, lining them up so that each uphill stake has a stake directly downhill. Place a stake every five feet or so along the length of the garden.
2. Begin at one end of the garden and tie a string to the uphill stake at ground level. Tie it to the stake directly downhill so that the string is level. Work with only one string at a time or else the strings will become obstacles.
3. Start digging at the uphill side of the string. Measure down from the string and dig until you reach the depth you want the garden to be. If the garden will be four inches deep, then dig four inches down from the string. (See **Figure 5**)
4. Heap the soil around the edge to start forming a berm. A berm is a low dirt "wall" around three edges of the garden that keeps the water in during a storm. The top edge should not have a berm so rainfall runoff can enter the garden.
5. If the lawn is almost flat, you will be digging at the same depth throughout the garden and using the soil for the berm. If the lawn is steeper, the high end of the garden will need to be dug out noticeably more than the low end. For steep lawns, when the low end is below your desired rain garden depth, you will need to fill the lower part of the garden with some soil from the uphill half to make a level bottom. Doing so will leave less soil for the berm and may require you to bring in extra soil from elsewhere to finish the job.
6. In any garden, compost will help the plants become established, and now is the time to mix in compost. If you do add compost, dig the garden one or two inches deeper than planned. Then add one to two inches of compost. A rototiller can make mixing much easier, but it is not necessary.

A. Between 5 percent and 7 percent sloped lawn



B. Greater than 8 percent sloped lawn

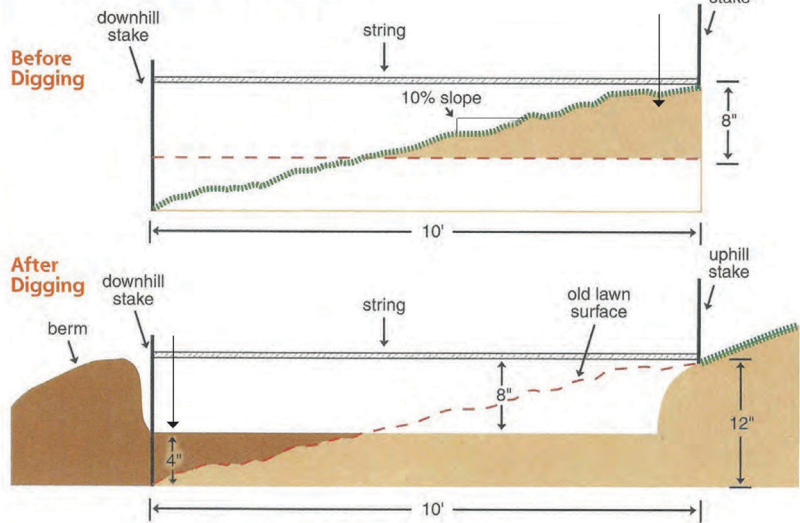


FIGURE 5. Where to dig and where to put the soil you've dug

Level it!

One way to check the level of the garden is to just “eyeball” it. For more accuracy, follow these steps:

1. When the whole area has been excavated to about the right depth, lay a flat board in the garden with a carpenter’s level sitting on top. Find the spots that aren’t flat. Fill in the low places and dig out the high places.
2. Move the board to different places and different directions, filling and digging as necessary to make the surface level
3. Once the garden is as level as you can make it, rake the soil smooth.

Berm it!

Stormwater runoff flowing into the garden will naturally try to escape over the downhill edge. A berm is critical to help hold the runoff inside the garden. The berm will need to be the highest at the downhill edge and should be as high as, or slightly higher than, the uphill edge. Moving along the sides up toward the front (top) edge of the garden, the berm will gradually become lower and finally taper off by the time it reaches the top of the garden.

On a more gradual slope there should be plenty of soil from excavating the garden to use for a berm. On a steeper slope, soil from the uphill part of the garden will be used to fill the downhill half and additional soil may have to be brought in for the berm. After shaping the berm into a smooth ridge about a foot across, tamp it down to compact the soil. It is important to have a strong, well-compacted berm, so tamp hard. The berm should have very gently sloping sides to smoothly integrate the garden with the surrounding lawn and make the berm much less susceptible to erosion.

To best prevent erosion, cover the berm with mulch, lay sod, or plant a ground cover. You can also use straw or erosion control matting to protect the berm while the grass becomes established. If you don’t want to lay sod or mulch over the berm, you can also plant drought tolerant vegetation or winterize the berm with rye grass.



FIGURE 6. A berm is critical to help hold the water inside the rain garden.

Step Three: Planting and Maintenance

Planting the rain garden is the fun part! Lists of suggested plants are included at the end of this guide. Use these for ideas, but don't be afraid to get creative. There is no single best way to plant a garden, just be aware of your soil and light conditions. Any casual gardener will have no problem planting a rain garden. For those who are new to gardening, what follows are a few basic reminders.

Planting your rain garden

1. Select one or more types of plants that have a well-established root system. Nursery-propagated plants are best, and three or four types of plants should be enough.
2. Try to have at least a rough plan for where each plant will be placed. Lay out the plants as planned, keeping appropriate distances between plants.
3. Dig each hole twice as wide as the plant and deep enough to keep the crown of the plant level with the existing grade, just as it was in the container. Make sure the crown is level and then fill the hole and firmly tap around the roots to eliminate air pockets.
4. Apply mulch evenly over the bed, about two inches thick.

5. Be sure to water the garden immediately after planting and continue to water several times a week (unless it rains) until the plants become established. As a general rule, plants need one inch of water per week. Use a simple rain gauge to measure the amount of water the plants are receiving. Once the plants begin to thrive on their own, you only need to water during dry periods.

Maintaining your rain garden

Weeding will probably be necessary for the first year or two, as with any new garden. Remove by hand only those plants you are certain are weeds. Try to take the weeds out roots and all. Weeds may not be a problem in the second season, depending on the variety and tenacity of the type of weeds present. By year three and beyond, your rain garden plants will begin to mature and will out-compete the weeds, although weeding isolated patches might still be needed.

After each growing season, the stems and seed heads can be left on for winter interest, wildlife cover, bird food and reseeding. Once spring arrives and new growth is 4 to 6 inches tall, cut back all tattered plants.

Tips for Your Rain Garden

- Rain gardens should be an attractive part of your yard and neighborhood. Think of the rain garden in the context of your home's overall landscape design. When choosing plants for the garden, it's important to consider the height of each plant, bloom time and color and the garden's overall texture. Use plants that bloom at different times to create a long flowering season. Mix heights, shapes and textures to give the garden depth and dimension and keep the garden looking good even when few flowers are in bloom.

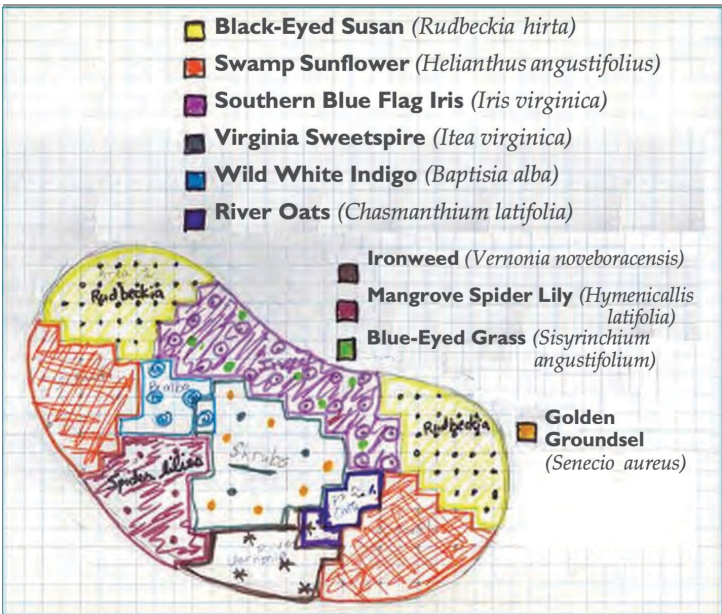
Native plants make good choices because they are accustomed to the regional climate and rainfall patterns and will easily acclimate to the rain garden.

- When laying out plants, randomly clump individual species in groups of three to seven plants to provide a bolder statement of color. Use odd numbers when determining how many to plant in

a mass. Make sure to repeat these individual groupings to create repetition and cohesion in a planting.

Try incorporating a diverse mixture of sedges, rushes and grasses with your flowering species. A diverse mixture of plants creates root competition that is necessary for plants to follow their normal growth patterns and not outgrow or out-compete other species. In natural areas, a diversity of plant types not only adds beauty, but also creates a thick underground root matrix that keeps the entire plant community in balance. Once the rain garden has matured and your plants have established a deep, thick root system, there will be little change in species from year to year and weeds will naturally decline.

- Don't forget to mulch. Composted yard debris and leaves are best. Mulch helps keep your soil moist, suppresses weed growth, stabilizes soil temperatures and reduces erosion and soil compaction.
- Finally, consider enhancing the garden by using local stone, ornamental fencing, garden benches or additional flower plantings. This will help give the new garden an intentional and cohesive look and provide a finished appearance that neighbors will appreciate.



Suggested Rain Garden Ground Covers and Perennials

NOTE: All plants below were researched at: Nelson, G. (2003), Florida's best native landscape plants; University of Florida Press. Gainesville, FL; Rushing, F. (2005), Tough plants for Florida gardens, Cool Springs Press, Nashville, TN; Tobe, J. D., et al. (1998), Florida wetland plants: an identification manual, Florida Department of Environmental Protection, Tallahassee, FL; Haehle, R. G. and J. Brookwell (2004), Native Florida plants, Taylor Trade Publishing, New York; Godfrey, R.K. (1988), Trees, shrubs, and woody vines of Northern Florida and adjacent Georgia and Alabama,The University of Georgia Press, Athens, GA; www.floridata. com. In addition, the following contributed expertise: Dr. Pamela Hall, Plant Ecologist; Dr. Paul Elliott, Professor Emeritus from Florida State University and Master Gardener; John Cox, Tallahassee Stormwater Management Division; Pam Sawyer, Master Gardener; Dr. Ed Schroeder, Master Gardener; and Stan Rosenthal, Leon County Forester.

NAME	TYPE	LIGHT REQ.	BLOOM SEASON	BLOOM COLOR	HEIGHT	MOISTURE REQ.	COMMENTS and reference source
Blanket Flower <i>Gaillardia pulchella</i>	annual	full sun	summer	yellow to red	1-2 feet	needs good drainage, drought tolerant	Excellent for hot, dry sites. A re-seeding short-lived perennial.
Sand Cordgrass <i>Spartina bakeri</i>	perennial	full sun	N/A	N/A	4-6 feet	moist soil, drought tolerant	Large bunch forming grass, green in summer and browner in winter, grows best in moist sandy soils.
Swamp Sunflower <i>Helianthus</i>	perennial	full sun	fall	very showy, yellow fall flower	2-6 feet	moist soil, watering during drought	Its native habitat is flatwoods, bogs, marshes, disturbed areas and secondary woods. Moist site; spreads vegetatively.
Wild White Indigo <i>Baptisia alba</i>	perennial	full to part sun	spring and summer	white	Up to 4 feet	drought tolerant, regular watering	Grows into a bushy shape like a shrub, takes several years to get established.

NAME	TYPE	LIGHT REQ.	BLOOM SEASON	BLOOM COLOR	HEIGHT	MOISTURE REQ.	COMMENTS and reference source
Joe Pye Weed <i>Eupatorium fistulosum</i>	perennial	part sun	fall	white, pink or purple	3–10 feet	needs water to be in full bloom, drought tolerant	Drought tolerant, it grows faster in more shady environment. <i>Eupatorium purpureum</i> is more common in northern environments.
Blazing Star <i>Liattis spp.</i>	perennial	part sun	fall	mauve, pink, white	2–5 feet	drought resistance, minimal watering	Flowers form heads on dense spikes. Occurs naturally in moist habitats, including wet flatwoods, pine savannas, and roadsides.
Rain-Lily <i>Zephyranthes spp.</i>	perennial	part sun	spring to late summer	varies	one-half to 1 foot	high drought tolerance	Fragrant white flowers with grasslike leaves.
Violets <i>Viola spp.</i>	perennial	part sun	early spring	white, blue, purple	4–8 inches	water when dry	The common violet grows well in moist conditions.
Black-Eyed Susan <i>Rudbeckia hirta</i>	annual, biennial, or perennial	sun to part shade	summer	yellow to yellow-orange	up to 3 feet	drought tolerant, regular watering	Helpful in erosion control, this flower is easy to grow and thrives in all but soggy soils.
Blue-Eyed Grass <i>Sisyrinchium angustifolium</i>	perennial	sun to part shade	spring	white, blue, violet	1.5 ft. to	prefers moist soil	To maintain vigorous and healthy plant, it should be divided every 2–3 years.
Frogfruit <i>Phyla nodiflora</i>	perennial	sun to part shade	varies	White and purple	2–3 inches	Moist to moderately dry soil	Nectar source and larval food for bees and butterflies. Low-growing and creeping with small white and purple flowers.
Cardinal Flower <i>Loebelia cardinalis</i>	perennial	sun to part shade	spring to fall	bright red	1–3 feet	requires moist soil	Flood tolerant, not drought tolerant.

Suggested Trees and Shrubs

NAME	TYPE	LIGHT REQ.	BLOOM SEASON	BLOOM COLOR	HEIGHT	MOISTURE REQ.	COMMENTS and reference source
Red Buckeye <i>Aesculus pavia</i>	shrub to small tree, deciduous	sun to part shade	spring	red	6–35 feet	moist to dry organic soils	Flowers attract hummingbirds.
River Birch <i>Betula nigra</i>	large tree, deciduous	sun to part shade	late winter to early spring	greenish, tiny	40–80 feet	moist	Heat-tolerant; fast-growing
Beautyberry <i>Callicarpa americana</i>	small shrub, deciduous	sun to part shade	spring to summer	pale purple	4–8 feet	moist to dry	Colorful fruit; attracts bird
Buttonbush <i>Cephalanthus occidentalis</i>	large shrub, deciduous	sun to part shade	summer	white	6–20 feet	wet to moist	Very hardy
Eastern Redbud <i>Cercis canadensis</i>	small tree, deciduous	sun to part shade	early spring	pink	15–30 feet	moist to dry	Beautiful when flowering
Fringe Tree <i>Chionanthus virginicus</i>	small tree, deciduous	sun to part shade	spring	showy white clusters	15–30 feet	moist to dry	Beautiful when flowering; drought-tolerant

NAME	TYPE	LIGHT REQ.	BLOOM SEASON	BLOOM COLOR	HEIGHT	MOISTURE REQ.	COMMENTS and reference source
Sweet Pepperbush <i>Clethra alnifolia</i>	shrub, deciduous	sun to part shade	summer	white to pink	3–10 feet	moist to dry	Fragrant flowers attract butterflies; likes acid soils
Loblolly Bay <i>Gordonia lasianthus</i>	small tree, evergreen	sun to part shade	spring to summer	white	30–60 feet	wet to moist	Fragrant showy flowers; somewhat sensitive
Scarlet Hibiscus <i>Hibiscus coccineus</i>	herbaceous perennial	sun to part shade	summer	showy red	4–6 feet	wet to moist	Dies back in a cold winter
Rose Mallow <i>Hibiscus moscheutos</i>	herbaceous perennial	sun to part shade	summer	showy white with reddish center	3–6 feet	moist to wet	Dies back in a cold winter
Dahoon Holly <i>Ilex cassine</i>	small tree, evergreen	sun to part shade	spring	white	20–40 feet	wet to moist	Attractive fruit; erect shape suitable for small spaces; attracts birds
Virginia Sweetspire <i>Itea virginica</i>	small shrub, deciduous	sun to part shade	late spring to early summer	white	3–8 feet	moist to dry	Winter color Fragrant flowers
Spicebush <i>Lindera benzoin</i>	large shrub, deciduous	sun to part shade	late winter to early spring	yellow	15 feet	wet to moist	Fruit attracts birds

NAME	TYPE	LIGHT REQ.	BLOOM SEASON	BLOOM COLOR	HEIGHT	MOISTURE REQ.	COMMENTS and reference source
Sweetbay Magnolia <i>Magnolia virginiana</i>	small tree, evergreen	sun to part shade	spring to summer	showy white	25–60 feet	wet to moist	Attractive flowers and colorful fruit; acid soils
Southern Crab Apple <i>Malus augustifolia</i>	small tree, deciduous	sun to part shade	early spring	pink	15–25 feet	moist to dry	Fragrant flowers
Wax Myrtle <i>Myrica cerifera</i>	shrub to small tree, evergreen	sun to part shade	spring	tiny white	4–20 feet	wet to well-drained	Fast growing; good screen
Florida Azalea <i>Rhododendron austrinum</i>	shrub, deciduous	sun to part shade	spring	showy yellow	3–10 feet	wet to moist	Fragrant; acid soils
Pinxter Azalea <i>Rhododendron canescens</i>	shrub, deciduous	sun to part shade	spring	white to pink	10–15 feet	moist to dry	Fragrant; acid soils
Cabbage Palm <i>Sabal palmetto</i>	palm	sun to part shade	summer	white	20–60 feet	moist to dry	Fragrant flowers; very hardy
Bald Cypress <i>Taxodium distichum</i>	large tree, deciduous	sun to part shade	spring	greenish	50–80 feet	wet to dry	Stable and strong; good fall color

NAME	TYPE	LIGHT REQ.	BLOOM SEASON	BLOOM COLOR	HEIGHT	MOISTURE REQ.	COMMENTS and reference source
Winged Elm <i>Ulmus alata</i>	small tree, deciduous	sun to part shade	late winter	tiny reddish- green	40–70 feet	moist to dry	Delicate foliage; drought-tolerant
Saw Palmetto <i>Serenoa repens</i>	Shrub-like palm	sun to part shade	spring	small white	5-10 feet	Moist to dry	Slow-growing, long lived, spreading plant.
Walter's Viburnum <i>Viburnum obovatum</i>	small tree, deciduous	sun to part shade	spring	tiny white	6–30 feet	wet to moist	Good screen; attracts birds
Bluebeech, Hornbeam <i>Carpinus caroliniana</i>	small tree, deciduous	shade to part shade	early spring	greenish, tiny	30 feet	moist	Deeply rippled sinewy trunk; smooth, blue-gray bark
Oakleaf Hydrangea <i>Hydrangea quercifolia</i>	small shrub, deciduous	shade to part shade	late spring to early summer	showy white to pink	4–8 feet	moist to dry	Rich acid soils, large flowers, nice fall color
Yaupon Holly <i>Ilex vomitoria</i>	large shrub to small tree, deciduous	shade to part shade	spring	tiny white	8–25 feet	wet to dry	Colorful fruit; attracts birds
Florida Anise <i>Illicium floridanum</i>	shrub, evergreen	shade to part shade	spring	maroon	6–20 feet	moist to wet	Licorice scent; good screen
Needle Palm <i>Rhapidophyllum hystrix</i>	shrub-like palm	shade to part shade	spring	tiny yellow or purple	3–8 feet	moist to dry	Very hardy
Snowbell <i>Styrax americanus</i>	shrub	shade to part shade	spring	white	6–10 feet	wet to moist	Acid soil
Swamp Azalea <i>Rhododendron serrulatum</i>	shrub, deciduous	part shade	summer	white to pink	9–16 feet	wet to moist	Fragrant; acid soils

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal blue lines across its entire width, providing a guide for handwriting or typing. The paper itself is a clean, off-white color.

