

RAIN GARDENS

A GUIDE FOR HOMEOWNERS AND LANDSCAPERS

WISCONSIN STANDARDS OVERSIGHT COUNCIL

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

NOVEMBER 2018 | WWW.SOCWISCONSIN.ORG | WWW.DNR.WI.GOV

YOUR PERSONAL CONTRIBUTION TO CLEANER WATER

Rain gardens are capturing more than just water lately; they are capturing the attention of homeowners nationwide. Rain gardens are landscaped areas planted with wildflowers and other native vegetation that soak up rain water, mainly from the roof of a house or other building. The rain garden fills with a few inches of water after a storm and the water slowly filters into the ground rather than running off to a storm drain.

Prior to human development, our natural areas absorbed and filtered rain water. Some water slowly returned to rivers and streams as it filtered through wetlands, while other water slowly infiltrated into groundwater.

As cities and suburbs grow and replace forests and agricultural land, increased stormwater runoff from impervious surfaces becomes a problem. Stormwater runoff from developed areas increases flooding because there are fewer places where rain water is slowed and infiltrated. Stormwater runoff also carries pollutants from streets, parking lots and lawns into local streams and lakes, and leads to costly municipal improvements in stormwater treatment structures.

By reducing stormwater runoff, rain gardens can be a valuable part of changing these trends. While an individual rain garden may seem like a small thing, collectively they produce substantial neighborhood and community environmental benefits.

HOW CAN RAIN GARDENS BENEFIT YOU AND THE ENVIRONMENT?



AESTHETIC PLEASURE

Rain gardens enhance the beauty of yards and neighborhoods.



IMPROVE GROUNDWATER

Rain gardens increase the amount of rain water that filters into the ground, which recharges local and regional aquifers.



HABITAT FRIENDLY

Rain gardens provide valuable habitat for birds, butterflies, and many beneficial insects.



REMOVE POLLUTION

Rain gardens help protect streams and lakes from pollutants carried by urban stormwater, like lawn fertilizers and pesticides, oil and other fluids that leak from cars, and numerous harmful substances that wash off roofs and paved areas.



FLOOD PREVENTION

Rain gardens can protect communities from flooding and drainage problems.



Practical and beautiful, rain gardens help the ground absorb stormwater that would otherwise wash pollution from streets and sidewalks into local streams.

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A GUIDE FOR HOMEOWNERS & LANDSCAPERS

This manual provides homeowners and landscape professionals with the information needed to design and build rain gardens on residential properties. These guidelines can also be used to provide on-site stormwater management in landscaped areas that receive runoff from small rooftops, which are considered low pollutant risks.

However, the manual *should not* be used to design rain gardens for parking lots, busy streets, and other heavily-used paved areas where stormwater would require pretreatment before entering a rain garden. Refer to the Wisconsin Department of Natural Resources' (DNR) Rain Garden Conservation Practice Standard 1009 for clarity about best-use locations and applications.

In some areas, landowners may seek to meet stormwater infiltration performance standards or meet local stormwater ordinances. These landowners should also refer to the Conservation Practice Standard 1009 for complete guidelines and more sizing options, and then use this manual to help with the basic steps of installation.



FAQ

DOES A RAIN GARDEN FORM A POND?

No. The rain water will soak in so the rain garden is dry between rainfalls. Although some rain gardens can be designed to include a permanent pond, that type of rain garden is not addressed in this publication.

ARE THEY A LOT OF MAINTENANCE?

Rain gardens can be maintained with little effort after the plants are established. Some weeding and watering will be needed in the first two years. As with any garden, some regular maintenance like thinning aggressive plants or replanting bare areas will be beneficial.

ARE THEY A BREEDING GROUND FOR MOSQUITOES?

No. Mosquitoes need 7-12 days to lay and hatch eggs, and standing water in the rain garden will last for a few hours after most storms. Mosquitoes are more likely to lay eggs in bird baths, standing water in drainage ditches, and clogged roof gutters. Also rain gardens attract dragonflies, which eat mosquitoes!

IS A RAIN GARDEN EXPENSIVE?

It doesn't have to be. A few family members or friends can provide the labor. If so, the main cost will be purchasing the plants, and even this cost can be minimized by using plants that might already exist in the yard or in a neighbor's yard. In this way, the cost may range from $3-5 per square foot. If a landscaper conducts all work, the cost would increase.





STEP 1

SIZING & SITING
YOUR RAIN GARDEN

This section of the manual covers rain garden basics – where to put the rain garden, how big to make it, how deep to dig it, and what kind of soils and slope are best. Following the instructions in this section is the best way to ensure a successful rain garden project.

If you already know the size you want your rain garden to be, then skip ahead to the section about building the rain garden. However, take time to read the pointers about location, and make sure to find the slope of the lawn. If the location has a slope more than about 12 percent, it's best to pick a different location because of the effort it will take to create a level rain garden.



WHERE SHOULD YOUR RAIN GARDEN GO?

Home rain gardens can be in one of two places – near the house to catch only roof runoff or farther out on the lawn to collect water from the lawn and roof.

It may be tempting to put the rain garden in a part of the yard where water already ponds, but don't! The goal of a rain garden is to improve infiltration, and the wet patches show where infiltration in the yard is slow.

If one of your roof downspouts is draining significantly more roof than the other downspouts, you will better control runoff by placing your rain garden below that downspout (see Figure 1).

keep in mind...

> *The sizing and vegetation recommendations in this manual are designed for Wisconsin landscapes. If you are not a resident of Wisconsin, check to see if more local guidelines are available.*



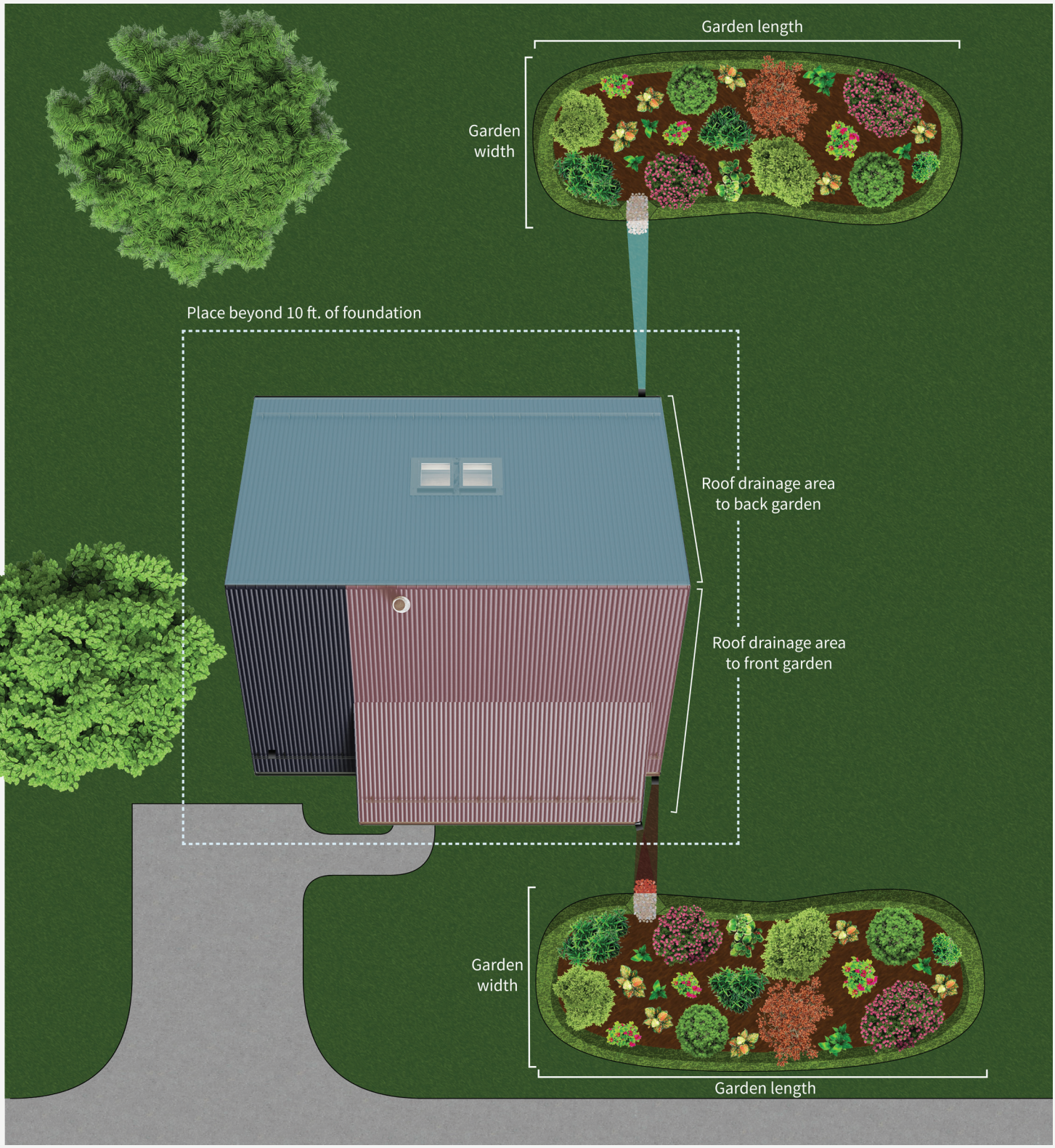
THE IDEAL PLACE FOR YOUR RAIN GARDEN IS:

- At least ten feet from the house so infiltrating water is less likely to seep into the foundation;
- At least eight feet from a well;
- At least five feet from a septic system;
- At least one foot above bedrock or high groundwater level;
- In a gently, but not steeply, sloped area, so less digging is required;
- Not directly over a sewer lateral or buried utilities. Remember to call the Diggers Hotline at 811 before you dig;
- Not where water already ponds;
- Not where tree roots may make it difficult to dig or where digging could damage a desirable tree;
- Not in areas that receive heavy foot-traffic, which may compact soils and compromise infiltration capacity.

CONSIDERING YOUR ENTIRE LANDSCAPE

When considering placement of your rain garden, design while keeping the end in mind. Always locate utilities before digging. Consider how the rain garden can be integrated into existing and future landscaping. Pay attention to viewing perspectives throughout the interior and exterior of your home. Determine how close you want your rain garden to outdoor gathering spaces or other recreational areas. A great spot is near a patio where you can enjoy the colors and fragrances for hours on end!

Figure 1. Displayed below is an example of two rain gardens placed in front and back of a property, highlighting the rain runoff areas on the roof. Pick a pleasing shape for the rain garden, like crescent, kidney, or teardrop shapes.



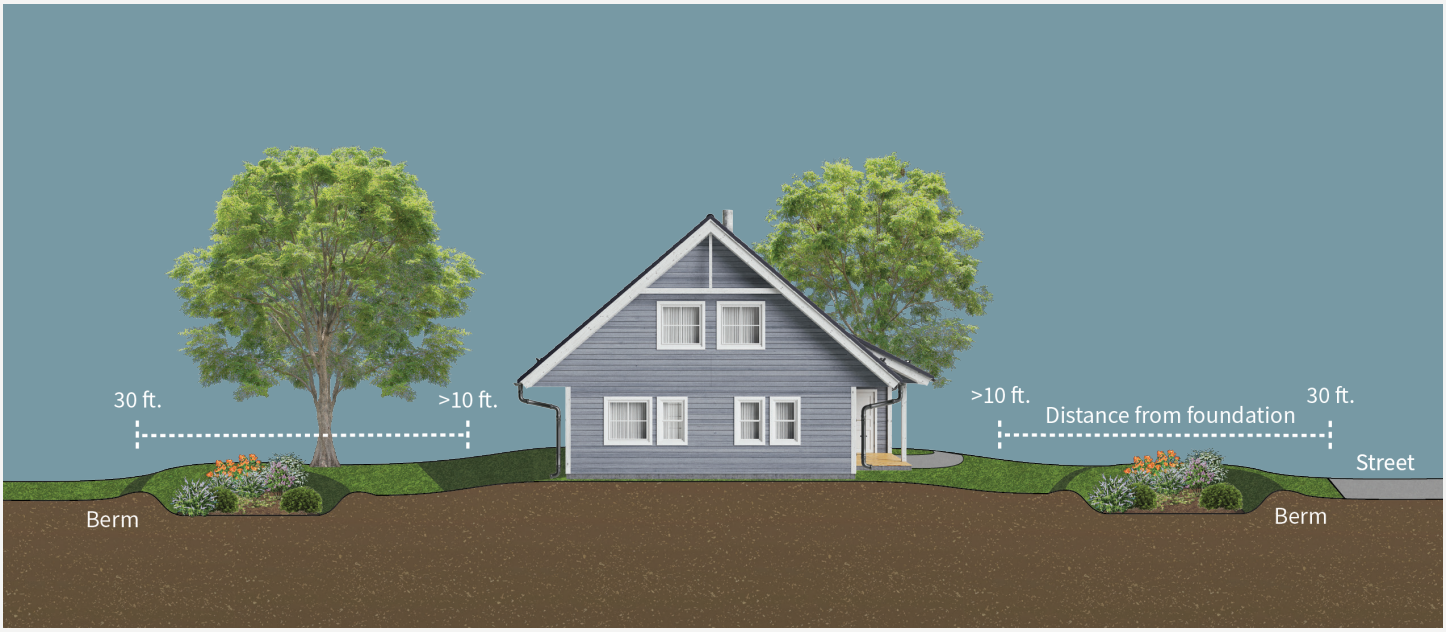


Figure 2. Rain gardens should be placed at least ten feet from the house and within thirty feet from the mouth of the downspout. Ideally, they should also be situated on a gentle slope that catches downspout water.

A NOTE ON SIZING GUIDELINES

The sizing guidelines described in this manual are based on a goal of controlling 100 percent of the runoff from the drainage area for the average annual rainfall event. If you cannot fit the recommended size in your yard, check with the DNR's Rain Garden Conservation Practice Standard 1009 for sizing options that control lesser amounts of runoff. On the other hand, it is also fine to make the rain garden bigger than the guidelines indicate.

HOW BIG SHOULD THE RAIN GARDEN BE?

Any reasonable sized rain garden will provide some stormwater runoff control. A typical residential rain garden ranges from 100-300 square feet. Rain gardens can be smaller than 100 square feet, but very small gardens have little plant variety. If a rain garden is larger than 300 square feet, it takes a lot more time to dig, is more difficult to make level, and could be hard on your budget.

Three main factors will determine the size of your rain garden:

1. how deep the garden will be;
2. what type of soils the garden will be planted in; and
3. how much roof and/or lawn will drain to the garden.

This information, along with the sizing factor from Examples 3-4 and Table 1 on page 14, will assist you in determining the surface area of your rain garden.

HOW DEEP SHOULD YOUR RAIN GARDEN BE?

A typical rain garden is between three and eight inches deep. A rain garden more than eight inches deep might pond water too long, look like a hole in the ground, and present a tripping hazard. A rain garden much less than three inches deep will need a significantly larger amount of surface area to provide enough water storage to infiltrate larger storms.

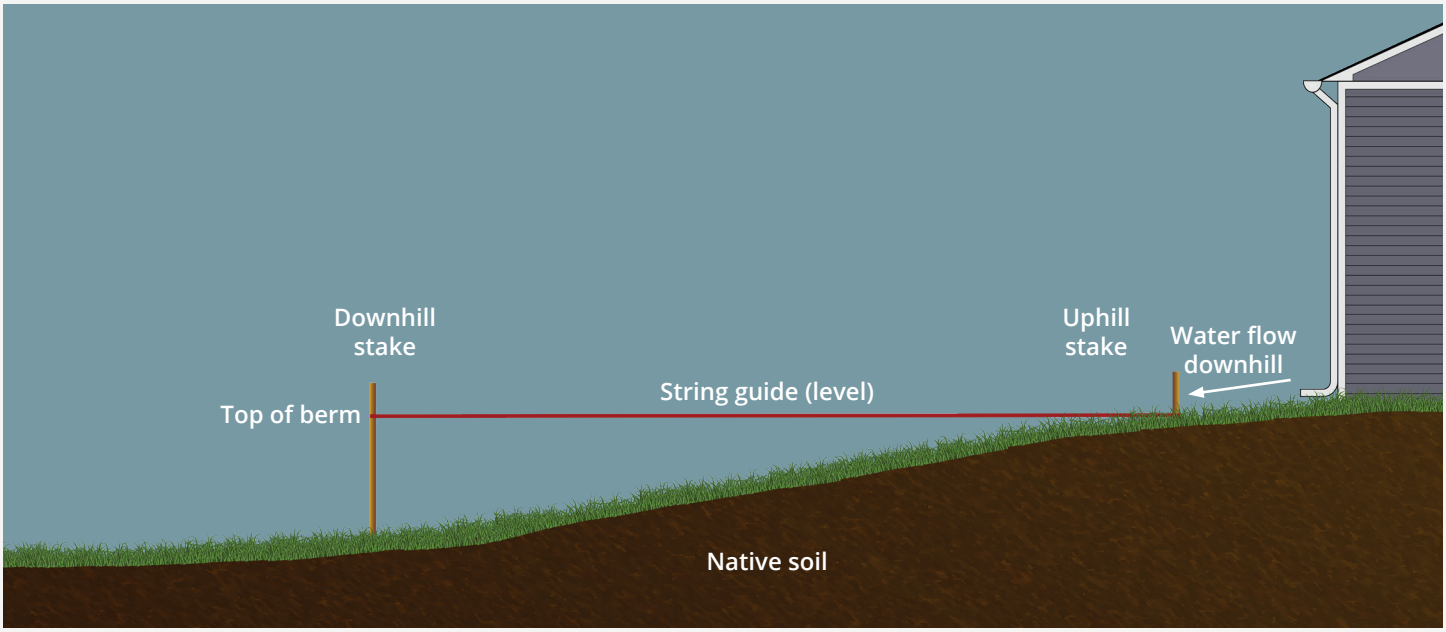
The slope of the lawn should determine the depth of the rain garden. Find the slope of your lawn by following these steps (Refer to Figure 3 as an example of how the stakes and string should look):

1. Pound one stake in at the uphill end of your rain garden site and pound the other stake in at the downhill end. The stakes should be about 15 feet apart.
2. Tie a string to the bottom of the uphill stake and run the string to the downhill stake. Make the string as tight and level as possible.

TERRACING YOUR GARDEN

When on slopes greater than 8 percent, consider terracing the garden. For example, a 400 square foot garden would become two 200 square foot gardens, resting at different heights. A gravel "weeping" wall or similar dividing structure allows water to move slowly between the terraces, while reducing the potential for erosion.

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



3. Using a string level or a carpenter's level, make the string perfectly horizontal and tie the string to the downhill stake at that height.
4. Measure the width between the two stakes.
5. Now measure the height on the downhill stake between the ground and string.
6. Divide the height by the width and multiply the result by 100 to find the lawn's percent slope. If the slope is more than 12 percent, it's best to find another location or talk to a landscape professional.

Using the slope of the lawn, select the depth of the rain garden from the following options:

- If the slope is less than 4 percent, it is easiest to build the rain garden 3-5 inches deep.
- If the slope is between 5-7 percent, it is easiest to build 6-7 inches deep.
- If the slope is between 8-12 percent, it is easiest to build about eight inches deep.
- If the slope is greater than 12 percent, contact a landscape professional.

EXAMPLE 1.

Todd measures the length of the string between the stakes; it is 180 inches long. The level string is tied to the downhill stake nine inches above the ground. He divides the height by the width, then multiplies by 100 to find his lawn's percent slope.

$$\frac{height}{width} \times 100 = \% \text{ slope}$$

$$\frac{9 \text{ inches}}{180 \text{ inches}} \times 100 = 5\% \text{ slope}$$

Todd has a 5% slope, which means his rain garden should be **6 inches deep**.



DETERMINING YOUR GARDEN'S SOIL

After choosing a rain garden depth, identify the lawn's soil type as sandy, silty, or clayey. Sandy soils have the fastest infiltration; clayey soils have the slowest. Since clayey soils take longer to absorb water, rain gardens in clayey soil must be bigger than rain gardens in sandy or silty soil. **Use the Simple Soil Test to determine your soil type.**

SIMPLE SOIL TEST

Conduct one of these tests to determine your soil type or its infiltration rate. This will help you select the appropriate sizing factor for your rain garden. The infiltration test will give you the most accurate estimate.

INFILTRATION TEST

Dig a hole 6-12 inches deep and at least four inches wide where the rain garden will be. Fill the hole with water and let it stand for one hour to pre-soak the soil for your test. Then fill the hole back up with water and measure the depth of the water with a ruler. After one hour, measure the depth of the water again and subtract this value from the starting measurement. This will tell you how many inches per hour the site infiltrates. Use this value to determine your sizing factor on Table 1.

SOIL TEXTURE TEST

Collect two teaspoons of soil from 4-6 inches beneath the surface and place it in the palm of your hand. Add drops of water until the soil is moldable, like moist putty. Knead the soil to work in the drops of water.

- If the soil does not remain in a ball when squeezed, **your soil type is sandy.**
- If the soil forms a ball, place the ball between your thumb and forefinger. Gently pushing the soil against your forefinger with your thumb, squeeze the soil upward into a ribbon. Allow the ribbon to emerge and extend over your forefinger until breaks from its own weight.
    - If the soil forms a ribbon less than one inch in length before it breaks, **the soil is silty.**
    - If the soil makes a ribbon 1-2 inches in length before it breaks, **the soil is clayey.**
    - If the soil makes a ribbon greater than two inches before it breaks, ***it is not suitable for a rain garden.***

DETERMINING THE AMOUNT OF WATER

Next, find the area that will drain to the rain garden, refered to as the "drainage area." As the drainage area size increases, so should the size of the rain garden. There is some guesswork in determining the size of a drainage area, especially if a large part of the lawn is up-slope from the proposed garden site. Use the suggestions below to estimate the drainage area for your rain garden.

To measure the drainage area, multiply the footprint of the house by the estimated percent of the roof's rain runoff coming from the downspout. If there is a nearby impervious area like a patio or driveway that drains to the rain garden, add this area to the calculation of the drainage area. Impervious areas can be connected to your rain garden by constructing a shallow ditch across the lawn.

Before you begin your calculations, it's important to determine if you plan to build your garden within or beyond thirty feet of the roof's downspout. Any garden beyond thirty feet requires additional consideration of the water runoff from the lawn. Refer to the steps and examples below.

RAIN GARDENS *WITHIN* 30 FEET FROM DOWNSPOUT

1. In this case, where the rain garden is close to the house, almost all water will come from the roof downspout. Walk around the house and estimate what percent of the roof feeds to that downspout. Many houses have four downspouts, each taking about 25 percent of the roof's runoff.
2. Find your house's footprint, which is the area of the first floor. If you don't already know it, use a tape measure to find your house's length and width. Multiply the length and width together to find the approximate area of your roof.
3. Multiply the roof area by the percent of the roof that feeds to the rain garden downspout. This is the roof drainage area.

EXAMPLE 2.1

Todd's house is 60 feet by 40 feet, so the roof area is 2,400 square feet. He estimates that the downspout collects water from 25 percent of the roof, so he multiplies 2,400 by 0.25 to get a downspout drainage area of 600 square feet.

Roof area: 60' x 40' = 2400 sq. ft.

Drainage area: 2400 sq. ft. x 0.25 = **600 square feet**

RAIN GARDENS *BEYOND* 30 FEET FROM DOWNSPOUT

1. In this case, where there is significant area of lawn uphill that will drain into the rain garden, the lawn runoff area must be added to the roof drainage area. Find the roof drainage area using the steps for a rain garden less than thirty feet from the downspout.
2. Find the area of the lawn that will drain to the rain garden. Stand where your rain garden will be and look towards the house. Identify the parts of the lawn sloping into the rain garden.
3. Measure the length and the width of the uphill lawn and multiply them to find the lawn's area.
4. Add the lawn area to the roof drainage area to find the total drainage area.

EXAMPLE 2.2

Kate's rain garden is 40 feet from the downspout. She first calculates the roof drainage area from her house, as described in Example 2.1, at 600 square feet. Kate then determines the width of the lawn area draining to the rain garden is about 20 feet. She multiplies 20 feet by 40 feet to get the lawn drainage area of 800 square feet. Kate then adds this to her roof area of 600 square feet to find her garden's total drainage area is 1,400 square feet.

Lawn drainage area: 40' x 20' = 800 sq. ft.

Total drainage area: 800 sq. ft. + 600 sq. ft. = **1,400 square feet**

USING THE RAIN GARDEN SIZE FACTORS

Use Table 1 to determine the rain garden's ponding area. If your rain garden is more than thirty feet from the end of the downspout, you can use the smaller sizing factor listed at the bottom of the table. This is because water will infiltrate into the soil as is travels from the downspout to your garden.

1. Find the size factor for the soil type and rain garden depth.
2. Multiply the size factor by the drainage area. This number is the recommended rain garden area.
3. If the recommended rain garden area is much more than 300 square feet, divide it into smaller rain gardens.

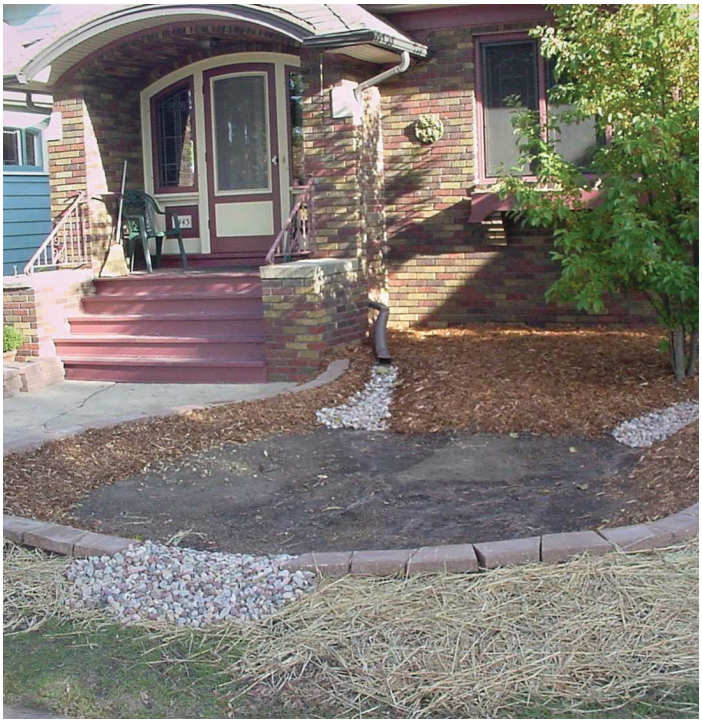


TABLE 1. SIZING FACTORS FOR RAIN GARDENS

Garden Depth	Soil Types (Infiltration Rate)		
	Sandy (>1.0 inches/hour)	**Silty** (0.41-1.0 inches/hour)	**Clayey** (0.15-0.40 inches/hour)
3-5 inches	0.17	0.35	0.44
6-7 inches	0.13	0.30	0.35
8 inches	0.11	0.23	0.25
>30 feet from down-spout (any depth)	0.03	0.08	0.10

EXAMPLE 3.1

Todd's rain garden is less than 30 feet from the downspout, and the depth is 6 inches. His lawn is silty, so Table 1 recommends a sizing factor of 0.30. He multiplies the drainage area, 600 square feet, by 0.30 to find the recommended rain garden area, which is 180 square feet.

600 sq. ft. x 0.30 = **180 square feet**

EXAMPLE 3.2

Since Kate's rain garden is more than 30 feet from the downspout, she uses the >30 ft. row in Table 1 to find her sizing factor. Her soil is silty, so she uses the sizing factor of 0.08 and multiplies her total drainage area, 1,400 square feet, to determine the recommended size of her rain garden, which is 112 square feet.

1,400 sq. ft. x 0.08 = **112 square feet**



NOW YOU KNOW THE AREA, HOW LONG AND WIDE SHOULD THE RAIN GARDEN BE?

Think about how the rain garden will catch water: runoff will flow out of a downspout and should spread evenly across the entire length of the rain garden. The rain garden must be as level as possible so water doesn't pool at one end and spill over before it has a chance to infiltrate.

The longer side of the rain garden should face upslope; that is, the length of the rain garden should be perpendicular to the slope and the downspout. This way the garden catches as much water as possible. However, the rain garden should still be wide enough for the water to spread evenly over the whole bottom and to provide the space to plant a variety of plants. A good rule of thumb is that the rain garden should be about twice as long (perpendicular to the slope) as it is wide.

To determine the length of the rain garden:

- Pick the best rain garden width for your lawn and landscaping, considering a pleasing shape like crescent, kidney or teardrop shapes; then
- Divide the size of your rain garden by the width to find your rain garden's length.

Note: wide rain gardens and rain gardens on steep slopes will need to be dug very deep at one end in order to be level. Making a rain garden about 10-15 feet wide is a good compromise between the effect of slope and how deep the rain garden should be.

EXAMPLE 4.

Todd wants a ten foot wide rain garden, so he divides 180 sq. ft. by 10 ft. to find the rain garden length. Todd's rain garden should be **18 feet long**.

$$\frac{\textit{rain garden area}}{\textit{width}} = \text{length}$$

$$\frac{\textit{180 sq. feet}}{\textit{10 feet}} = 18 \text{ feet}$$

selecting a size that fits your yard...

> *Remember that these are only guidelines. The size of the rain garden also depends on how much money you want to spend, how much room you have in your yard, and how much runoff you want to control.*
>
> *You can reduce the size of your rain garden by as much as 30 percent and still control almost 90 percent of the runoff. If the sizing table suggests that the rain garden be 200 square feet, but there is only enough room for a 140 square foot rain garden, that's fine. A smaller rain garden will usually work to control most stormwater runoff, although some bigger storms might spill over the berm.*





STEP 2

CONSTRUCTING
YOUR RAIN GARDEN

Now that the size and place for the rain garden are set, it's time to get a shovel and start digging. If friends help, it will go much faster, possibly only a few hours to construct. Before you start digging, locate public utility lines by calling the Digger's Hotline at 811 or 1-800-242-8511 or file a request online at www.diggershotline.com. You will have to locate and avoid private lines on your own.

TOOLS CHECKLIST

- ☐ Tape measure
- ☐ Shovels
- ☐ Rakes
- ☐ Trowels
- ☐ Carpenter's level
- ☐ Wood stakes (at least 2 ft. long)

**optional*

- ☐ String
- ☐ 2x4 board (at least 6 ft. long)*
- ☐ Sod cutter*
- ☐ Wheelbarrow*
- ☐ Small backhoe with caterpillar treads*
- ☐ Hand tamper for berm*







PREPARING THE SITE

If you are building the rain garden into an existing lawn, you'll first need to remove the sod layer. Killing the grass will make sod removal easier, and will ensure that long tap-roots of weeds don't sprout within your rain garden. An herbicide can be used, but a more environmentally friendly approach is to place black plastic over the lawn until the grass dies. Sod-cutters, available for rent from hardware stores, make it easier to cut and remove sod, which can be composted or used in the berm.

DIGGING THE RAIN GARDEN

Recall that the goal is to create a level bottom across the whole ponding area at your desired depth.

Start by laying string around the perimeter of your rain garden. The berm will be constructed outside the string. Next, put a row of stakes along the uphill and downhill sides at approximately five foot intervals. Line them up so that each uphill stake has a stake directly downhill.

Beginning at one end of the rain garden, tie a string to each uphill stake at ground level and connect it to the stake directly downhill so that the string is level.

Start digging at the uphill side of the string. Measure down from the string and dig until you reach the depth you want the rain garden to be. If the rain garden will be four inches deep, then dig four inches down from the string (see Figure 4).

While digging, heap the soil around the edge where the berm will be. On a steeper lawn, the lower part of the rain garden can be filled in with soil from the uphill half, and extra soil might need to be brought in for the berm. If the lawn is almost flat, you will be digging at the same depth throughout the rain garden and using the soil for the berm.

Continue digging and filling one section at a time across the length of your rain garden until it is as level as possible.

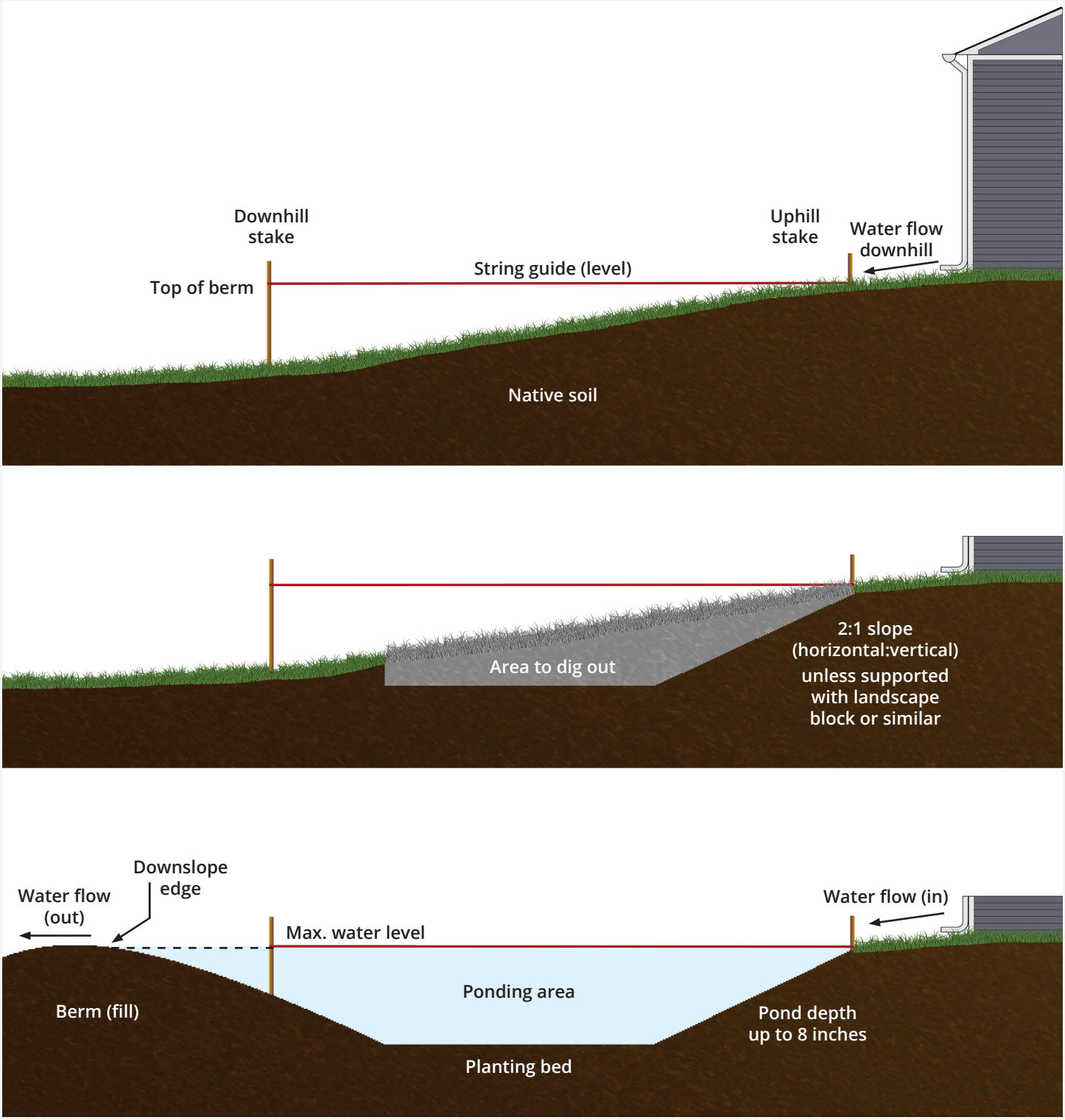


Figure 4. The position of the string will not only help visualizing the area to dig out, but also display the height of the berm and the maximum water level of your garden.

HELPFUL TIP WHEN LEVELING THE RAIN GARDEN

When the whole area has been dug out to about the right depth, lay the 2x4 board in the rain garden with the carpenter's level sitting on it. Find the spots that aren't flat. Fill in the low places and dig out the high places.

Move the board to different places and different directions, filling and digging as necessary to make the surface level. When the rain garden is as level as you can get it, rake the soil smooth, but don't compress it.

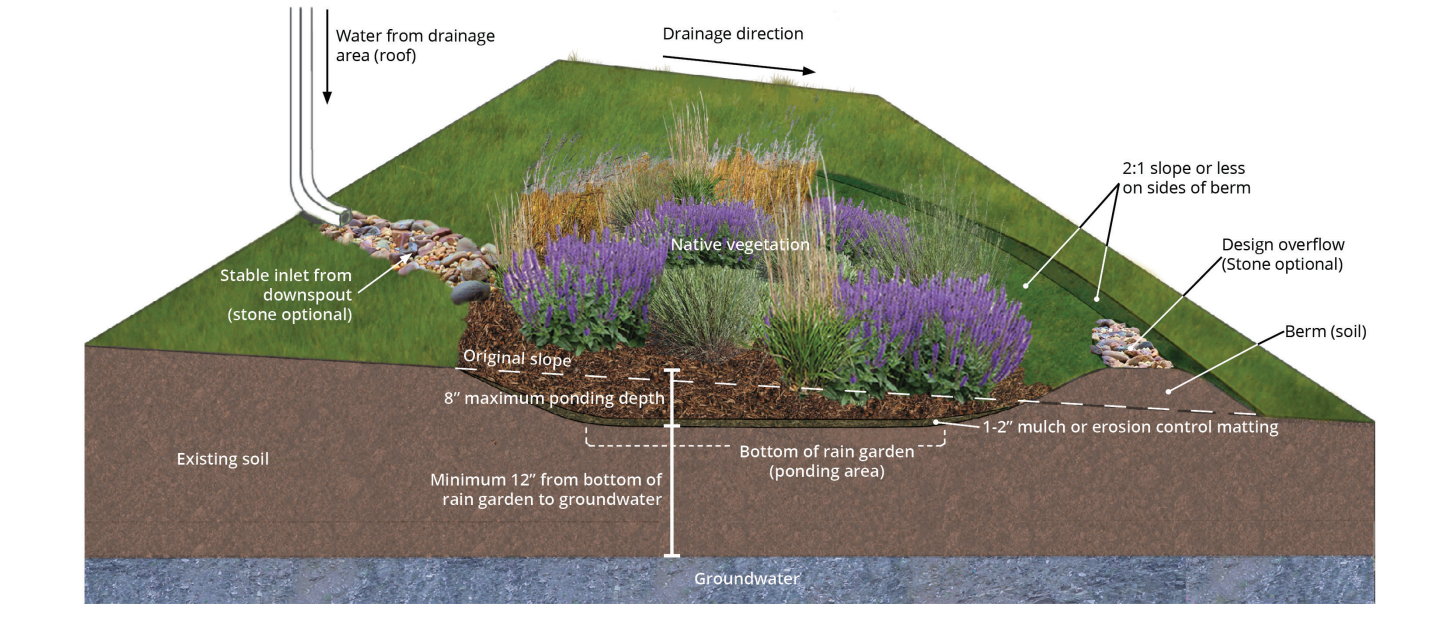


Figure 5. The top of the downhill part of the berm should come up to the same elevation as the entry to the rain garden at the uphill end.

MAKING THE BERM

Water flowing into the rain garden will naturally try to run off the downhill edge. A berm is needed to keep the water in the garden. The berm is a "dam" across the bottom and up the sides of the rain garden. The berm will need to be highest at the downhill side. The berm will become lower and gradually taper off by the time it reaches the top of the rain garden (see Figures 4 and 5).

adding compost...

> *Compost may be incorporated into the soil using a roto-tiller. Additional compost can provide nutrients, improve the structure of more clayey soils, and improve moisture retention of more sandy soils. Usually 2 inches of compost is sufficient when incorporated to a depth of 4-6 inches. Some loss of depth will occur, but some loss will be restored with settling.*

On a flat slope, there should be plenty of soil from digging out the rain garden to use for a berm. On a steeper slope, most of the soil from the uphill part of the rain garden was probably used to fill in the downhill half, and soil will have to be brought in from somewhere else. After shaping the berm into a smooth ridge about a foot across, compact by foot. It is very important to have a well-compacted berm.

The berm should have very gently sloping sides; this helps smoothly integrate the rain garden with the surrounding lawn and also makes the berm less susceptible to erosion. On steep slopes, hardscape such as landscaping stones can provide additional security against erosion.

If the downspout is a few feet from the entry to the rain garden, dig a shallow grass swale or attach an extension to the spout to ensure the water runs directly into the garden.

To prevent erosion while new grass takes root, cover the berm with erosion-control mat or straw. If seeding, spread the seed atop the matting and cover it with mulch or shredded newspaper. Plugs can be planted within the matting.

SUGGESTIONS TO DESIGNING AN ATTRACTIVE RAIN GARDEN:

- Select plants that bloom at different times throughout the year.
- Select a variety of plant heights, shapes, and textures.
- Cluster individual species in groups of three-to-seven to make a bolder color statement.
- Include sedges and grasses with your flowers so plants follow their normal growth patterns and don't outcompete each other.
- If you're concerned about animals browsing, temporarily fence the garden off with chicken wire.
- Add stone, ornamental fences, paths, benches, and other wildflower plantings nearby.









STEP 3

PLANTING & MAINTAINING

YOUR RAIN GARDEN

The beauty of rain gardens is in its fuctional design - the confluence of the natural garden aesthetic with the purpose of stormwater filtration. The following section will help you tie in your style into the functionality of your garden, helping you make smart choices about what should be planted and where, keeping in mind soil types, sun levels, and plant growth rates. Your choices in plants and the proper maintenance of your garden will give you a beautiful and practical garden for seasons to come.





PLANTING THE RAIN GARDEN

Choosing the right plant species and mindfully choosing where they go in your rain garden will make maintenance much easier in the coming seasons. Below are general tips for the novice gardener to help in the buying and planting process. Only use plants from nurseries or divisions of existing plants; do not collect plants from the wild.

- Make a plan in which plants are spaced at least one foot apart. Be mindful of how large and aggressive plants grow to determine the best spacing for your garden.
- Select plants that have a well-established root system. Look for roots that just extend to the bottom of the containers.
- Keeping the plants in their containers, lay out where each plant will go in the garden before planting to provide a visual idea of how the garden will look and ensure proper spacing.
- Dig each hole twice as wide as the plant plug and deep enough to bury the plant as it was in the container.
- Insert the plant, fill the hole, and firmly tamp around the roots to avoid air pockets.
- Water the plants immediately after planting, then water once a week if needed, through the first summer.
- Label your plants so you don't accidentally weed them out during future maintenance.
- If using erosion-control matting instead of mulch, install the matting per the manufacturer's directions. *Refer to Table 2 to see the benefits of using an erosion-control mat.*
- If you did not use erosion-control matting, apply about three inches of double-shredded mulch evenly over the bed without burying the crown of the plants.
- Reapply mulch each year until the plant have filled out (typically 3-4 years) to retain moisture, strengthen the soil, and protect the root structures.

TABLE 2. BENEFITS TO USING AN EROSION MAT

Mulch	Erosion mat	Benefits
X	X	Minimizes loss of moisture
X	X	Provides barrier against seeds of prolific self-seeding species
	X	Stays in place
	X	Some varieties come with seed and young plants embedded in them



"Remember to label your plants so you don't accidentally weed them out."

MAINTAINING THE RAIN GARDEN

Although rain gardens are resilent and fairly self-sufficent, it's important to consistently clean and groom the garden to keep the plants healthy and the stormwater infiltrating properly. Like any garden, your rain garden will need extra attention in the beginning, as the plants grow in. As the plants grow to full size and the grassed berm settles, maintenance will taper off to the need of a regular garden.

WEEDING

Check the garden a few times each year to determine weeding needs. Remove the roots of the weeds whenever possible, paying close attention to areas near the base of rain garden plants. Remember to label your plants so that you don't accidentally weed them out.

DEAD ORGANIC WASTE

As flower blooms conclude in autumn, leave stems and seedheads in the garden for wildlife cover and bird food during the winter. Dead leaves can provide additional insulation for plant roots, in addition to mulch. In the spring when new growth has reached at least 4 inches, cut tattered plants 6-8 inches tall using hand clippers, string trimmer, or a mower. Optionally, clean out and compost dead plant material when applying fresh mulch.

INFILTRATION

Over time, plant roots will improve the soil structure, which will infiltration rate. If standing water occurs soon after planting, dig a small opening in the berm and stabilize it with gravel. This will provide an exit for excess water during significant rain events. After a year, bring the opening back to the original berm height to regain the full functionality of the garden.

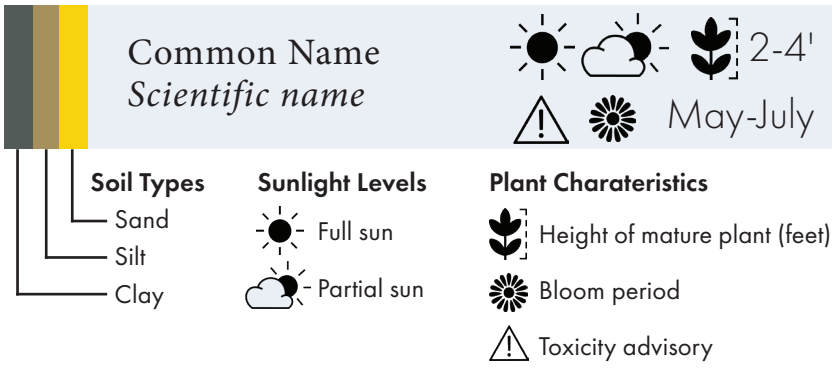
CONTROLLED BURNING

In some circumstances, controlled burning can be an option to knock back weeds and stimulate native plant growth. Controlled burning is banned or highly regulated in most municipalities. Contact your local fire department to obtain appropriate approvals, follow all rules and guidance, and alert your neighbors before you burn.

RAIN GARDEN PLANT RECOMMENDATIONS

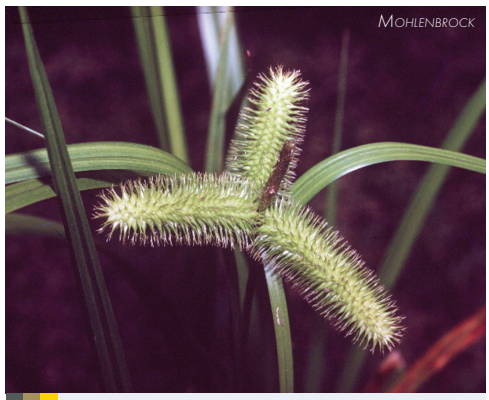
From bursts of color to tall fluid brush, choosing the right plants in your rain garden can transfigure your outdoor space. Select plants that are hardy for Wisconsin growing conditions. Ensure they are capable of withstanding the site's soil, sunlight, and shade conditions, as well as water inundation and drought cycles associated with rain gardens. Native species, non-native perennials, or cool season turf grasses may be used. The deep roots of many native species will enhance soil infiltration and can better withstand the challenging growing environment inherent to rain gardens.

The following plants are recommended for Wisconsin gardens by Prairie Nursery, Aspen Gardens, and the Good Oak Ecological Service. Before planting, it's always best to research different types of plants and consult with a local nursery or landscape professionals to determine what's best for you.





Blue Flag Iris
Iris versicolor
2-3'
June-July



Bottlebrush Sedge
Carex comosa
2-4'
May-June



Butterfly weed
Asclepias tuberosa
2-3'
June-Aug



Calico Aster
Aster lateriflorus
2-3'
Sept-Oct



Cream False Indigo
Baptisia bracteata
1-2'
May-June



Crooked Stem Aster
Aster prenanthoides
1-3'
Aug-Oct



Culver's Root
Veronicastrum virginicum
3-6'
July-Aug



Fireweed
Epilobium angustifolium
2-6'
July-Sept



Fox Sedge
Carex vulpinoidea
1-3'
May-June



Great Blue Lobelia
Lobelia siphilitica
1-4'
July-Sept



Foxglove Beardtongue
Penstemon digitalis
2-3'
June-July



Golden Alexander
Zizia aurea
1-3'
May-July



Hoary Vervain
Verbena stricta
2-4'
July-Sept



Ironweed
Vernonia fasciculata
4-6'
July-Sept



Jack in the Pulpit
Arisaema triphyllum
1-2'
April-May



Jacob's Ladder
Polemonium reptans
1-2'
May-June



Joe Pye Weed
Eupatorium maculatum
4-6'
Aug-Sept



New England Aster
Aster novae-angliae
3-6'
Aug-Oct



Little Bluestem
Schizachyrium scoparium
2-3'
Aug-Sept



Mountain Mint
Pycnanthemum virginianum
1-3'
July-Sept



Obedient Plant
Physostegia virginiana
2-4'
Aug-Sept



Nodding Onion
Allium cernuum
1-2'
July-Aug



Northern Sea Oats
Chasmanthium latifolium
2-4'
Aug-Oct



Ohio Goldenrod
Solidago ohioensis
2-3'
Aug-Sept



Ohio Spiderwort
Tradescantia ohiensis
2-4'
June-July



Pale Purple Coneflower
Echinacea pallida
3-5'
June-July



Prairie Blazing Star
Liatris pycnostachya
3-5'
July-Aug



Prairie Dropseed
Sporobolus heterolepis
2-4'
Aug-Sept



Purple Coneflower
Echinacea purpurea
3-4'
July-Sept



Rattlesnake Master
Eryngium yuccifolium
3-5'
June-Aug



Red Baneberry
Actaea rubra
1-2'
June



Rough Blazing Star
Liatris aspera
2-5'
Aug-Sept



Showy Goldenrod
Solidago speciosa
1-3'
Aug-Sept



Smooth Blue Aster
Aster laevis
2-4'
Aug-Oct



Smooth Phlox
Phlox glaberrima
2-4'
June-July



Solomon's Seal
Polygonatum biflorum
1-3'
May-June



Swamp Milkweed
Asclepias incarnata
3-5'
June-July



Sweet Black Eyed Susan
Rudbeckia subtomentosa
4-6'
Aug-Oct



Sweet Joe Pye Weed
Eupatorium purpureum
4-6'
Aug-Sept



Virginia Wild Rye
Elymus virginicus
4-5'
July-Aug



White False Indigo
Baptisia alba
3-5'
June-July



Wild Bergamot
Monarda fistulosa
2-5'
July-Sept



Wild Geranium
Geranium maculatum
1-2'
May-June



Wild Petunia
Ruellia humilis
1-2'
June-Aug



Wild Quinine
Parthenium integrifolium
3-5'
June-Sept



Zig Zag Goldenrod
Solidago flexicaulis
2-4'
Aug-Sept



Wild Senna
Cassia hebecarpa
4-6'
July-Aug



Yellow Coneflower
Ratibida pinnata
3-6'
July-Sept

ACKNOWLEDGEMENTS

Rain Gardens: A Guide for Homeowners and Landscapers was made possible by the contribution, input, and guidance from the following authors, photographers, and organizations.

This guide accompanies the revision of the Wisconsin Department of Natural Resources (DNR) Rain Garden Conservation Practice Standard 1009 published in September 2018. Revisions to the standard were made by a team under the Wisconsin Standards Oversight Council (SOC) process between 2017-2018.

Instructions in this guide are in accordance with the September 2018 DNR Conservation Practice Standard 1009, but does not substitute the full standard. Refer to the full technical standard for any project beyond private, single-lot residential homes.

This publication is adapted from the 2003 Wisconsin DNR and University of Wisconsin-Extension publication *Rain Gardens - A how-to manual for homeowners.*

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DNR Publication PUB-WT-776 2018

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