



Rain Gardens: A How-To Guide



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What is a Rain Garden?

Rain gardens are garden beds that slow down and temporarily hold storm water runoff from your roof, driveway, or lawn. They include a variety of plants and are an easy, sustainable way to prevent pollution from entering our waterways.

Rain gardens provide many benefits. For example, they:

- Help reduce flooding and property damage;
- Create beautiful alternatives to traditional lawns and garden beds;
- Remove pollutants from runoff before it enters our river and waterways;
- Support biodiversity;
- Provide food and shelter for important insects and birds;
- Slow down storm water flows;
- Recharge ground water; and
- Help protect water quality in downstream communities.

What is Storm Water?

Storm water is the water that results from rain fall and snow melt. Much of the storm water in Saskatoon flows directly into our river system and waterways, untreated.

Common pollutants found in storm water runoff include motor oil, antifreeze, paint, gasoline, pesticides, fertilizers, and soaps. These substances can harm fish and wildlife, as well as reduce water quality for human use. Rain gardens help filter and break down these pollutants.

Designing your Rain Garden



Figure 1: Elements of a Rain Garden

A. Downspout

B. Rain barrel

C. Overflow

D. Inlet channel

E. Inlet

F. Plants

G. Mulch

H. Berm

I. Outlet

Size

When choosing the size of your rain garden, consider how much space you have in your yard, what your budget is, and how much runoff you would like your rain garden to hold. Although residential rain gardens are typically 5 to 15 feet wide and approx. twice as long as they are wide, you may choose any size that complements your yard.

To catch as much water as possible:

- The area of your rain garden should be a minimum of 5% of your **drainage area** (the portion of your roof, driveway, and/or lawn that drains into your rain garden).
- The depth of your rain garden should be approx. 20 to 26 inches deep from the top of your lawn surface to the base of your rain garden. See Figure 3 for details.
- The length of your rain garden should be perpendicular to the slope of your yard. This often means the long side will be parallel to your city sidewalk or back lane.

Shape

Rain gardens can be any shape. They are often long and narrow, but can be kidney-shaped, circular, or rectangular as well.

Location

When determining where to locate your rain garden, make sure it is a minimum distance of:

- 10 feet away from all building foundations, such as your house and garage;
- 3 feet away from City rights-of-way, such as sidewalks and boulevards; and
- 6 feet away from neighbouring yards and property lines.

Your rain garden should not be located close to or over top of:

- underground utilities, sprinklers, or underground tanks;
- areas where water already ponds (this indicates poor drainage); or
- steep slopes (for stability reasons, rain gardens should only be built in areas with less than a 10% slope).

Slope

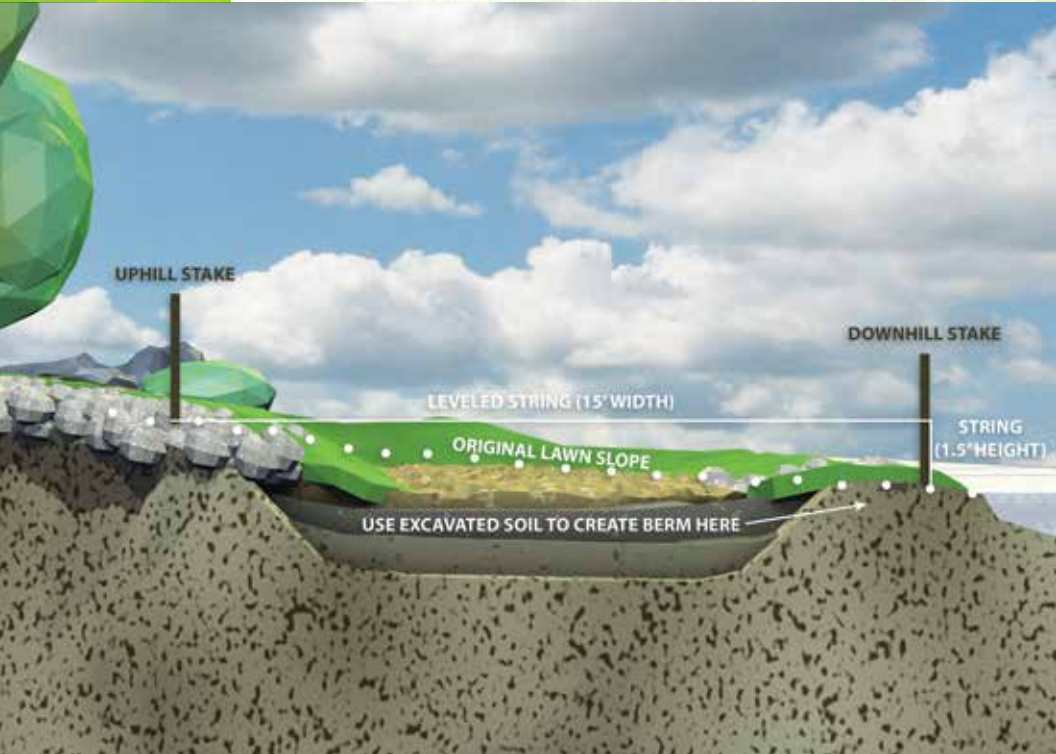


Figure 2: Slope

Most yards in Saskatoon do not have steep slopes and are well-suited for rain gardens. However, if you are concerned that the slope of your yard is too steep for a rain garden (more than 10%), please follow the steps below to determine the slope of your yard.

- Place one stake at the uphill end of your rain garden and place another stake at the downhill end.
- Tie one end of a string to the uphill stake at ground level and the other end of the string to the downhill stake, ensuring the string remains level.
- The slope can then be calculated by dividing the height by the width and multiplying the result by 100. **For example:** (1.5 feet height ÷ 15 feet width) x 100 = 10% slope.

Plant Selection

The plants you select will need to tolerate alternating flood and drought conditions. The inner part of the garden will experience more wet conditions than the outer edge. **Other considerations include:** plant height, sun and shade requirements, water requirements, and tolerance to common substances found in storm water runoff, such as sidewalk salt. With these factors in mind, choose a combination of non-invasive flowers, shrubs, grasses, ferns, perennials, and bulbs.

Moisture loving native plants can be well-suited to rain gardens since they are adapted to our local growing conditions. Purchase from a native plant supplier to ensure you receive quality plants that are native to the prairies. For a list of native plant and seed suppliers in western Canada, visit npss.sk.ca.

Plant suggestions for our climate (*zone 3b*) include prairie grasses, ferns, dogwood, sedges, rushes, meadow rue, marsh marigold, Joe-Pye weed, irises, lilies, hosta, water avens, shooting star, snowdrop anemone, purple coneflower, blanket flower, wild bergamot, black eyed susan, and smooth aster.

Before you Get Started

Tools you will need:

- Gardening gloves
- Close-toed shoes
- Measuring tape
- String and 2 stakes (*if you are measuring the slope of your yard*)
- Hand tools (*shovel, spade, garden fork, rake*)
- Level
- Trowel
- Ground paint or string

Materials you will need:

- Plants
- Mulch
- Amended soil with good drainage and absorption properties
- Washed round rock or pea gravel

Building your Rain Garden



Figure 3: Layers of a Rain Garden

- A.** Downspout
- B.** Rain barrel
- C.** Overflow
- D.** Inlet channel
- E.** Inlet
- F.** Plants
- G.** Mulch (4 inch layer)
- H.** Berm
- I.** Outlet
- J.** Air space - ponding depth (6 to 10 inches in depth)
- K.** Amended soil (10 to 12 inch layer)
- L.** Existing soil – loosened (12 inches in depth)
- M.** Storm drain

Build a Rain Garden in 10 Easy Steps!

1. Using ground paint or string, mark the desired shape of your rain garden. Choose a shape and size that complements your yard.
2. Mark the **inlet channel**. The inlet channel is a shallow trench that directs water from your water source (*e.g. downspout, rain barrel, lawn, and/or driveway*) to your rain garden. It must be sloped towards your inlet.

Mark the **inlet**. The inlet is the point where water from the inlet channel enters your rain garden. It must be higher than the outlet.

Mark the **outlet**. The outlet is the point where excess water exits your rain garden (*e.g. during heavy rainfalls*) and overflows into your local storm water system. It must be the lowest part of your rain garden.

As a general rule of thumb:

- If you are constructing a rain garden in your front yard, direct the outlet towards the front street;
- If you are constructing a rain garden in your back yard, direct the outlet toward the back lane or rear property line; and
- Always ensure the outlet is not directed towards any neighbouring yards.

Rain Barrels are a great addition to any garden!

Drain water from your downspout(s) into a rain barrel so you can capture rain water for later use. Ensure your rain barrel's overflow mechanism drains a minimum of 6 feet away from the nearest building foundation and is directed into your inlet channel so that excess water flows into your rain garden. **To learn more, read our Rain Barrel: How-To Guide.**

3. Using the ground markings as a guide, dig your rain garden down to a depth of 20 to 26 inches. **See Figure 3 for details.** Keep the base of your rain garden as level as possible so water can infiltrate easily and equally. Use a level if necessary.

Then dig your inlet channel down to a depth of 2 to 4 inches. Keep the inlet channel sloped towards your rain garden so water can easily drain away from your building foundation(s).

And remember, only dig when the soil is dry. If you dig when wet, you will compact your soil to the point where water can no longer infiltrate.

STAY SAFE! For your own and others' safety, contact Sask 1st Call before starting any project requiring digging, excavation or ground disturbance.

4. Shape the sides of your rain garden so they are sloped at a 25% to 33% angle (*4:1 or 3:1 ratio of horizontal distance to vertical distance*).
5. Build a berm around the edge of your rain garden. A berm is a shallow hill of soil that helps contain water in your rain garden. Use the berm to direct water towards your outlet. In place of a berm, you may also use rocks or bricks to border your rain garden.
6. Dig spaces out of your berm where you marked the locations of your inlet and outlet. Lay down washed round rock or pea gravel at the inlet and outlet to prevent soil erosion and to slow down water flow. Afterwards, fill the inlet channel with washed round rock or pea gravel as well.
7. Loosen the soil on the bottom of your rain garden to a depth of 12 inches to reduce soil compaction and encourage infiltration. It is recommended that you use hand tools, such as spades and garden forks, because rototillers can disrupt soil structure and biology.
8. Carefully add 10 to 12 inches of amended soil to your rain garden. Some of this amended soil should be mixed into the soil you loosened during the previous step to ensure that water naturally drains into your existing soil. Once your amended soil is added, gently compact the layer by walking on it.

What Is Amended Soil?

Amended soil includes materials that enhance the soil's properties, support plant growth, and/or help absorb and retain water. For example, amendments could include topsoil, compost, well-rotted manure, and leaf mold. To pick an amended soil that is right for your yard, contact a local landscape supplier or use your own compost. **To learn more, read our Compost How-To Guide.**

9. Using a hand trowel, plant your garden. Make sure to follow the planting and spacing recommendations for each plant. To avoid soil compaction, work from one side of the garden to the other. If you think that you have packed down the soil too much, use a rake or garden fork to loosen it.
10. Use a rake to gently spread 4 inches of mulch evenly across the garden, without burying the crowns of new plants. **To learn more, read our Mulch & More: How-To Guide.**

Maintaining your Rain Garden

To maintain a successful rain garden:

- Water regularly for the first two years, reducing water frequency in the second year. After plants are established, supplemental watering should only be necessary during dry spells.
- Weed and prune as necessary. The rain garden soil mix will be loose, so weeds should be relatively easy to remove.
- Check the inlet, outlet, and under the mulch layer for debris (such as leaves, garbage, and fine sediment) that may be preventing water flow and infiltration. Remove as necessary.
- Replace mulch if erosion occurs. Add more mulch every few years as it slowly decomposes.
- Replace plants as necessary.
- Add compost annually. **Learn more in our Compost: How-To Guide.**
- Fertilizing is not required. The rain garden soil mix will provide adequate nutrients for your plants.
- Do not use pesticides. **Learn more in our Pesticide Free Gardening: How-To Guide.**
- You may cut back your plants in fall or leave them in place over winter to provide food and shelter for birds and wildlife. Once new growth appears in the spring, simply remove dead plant material from the previous gardening season.
- Monitor performance by checking for flooding or ponding.
- Through absorption and infiltration, rain gardens can prevent water from flowing onto sidewalks, driveways and pathways. However, during freeze-thaw cycles (particularly in the spring and fall), keep an eye on any icy patches that may form close to your outlet.





Photo courtesy City of Edmonton

Other Considerations

Do rain gardens harbour mosquitoes?

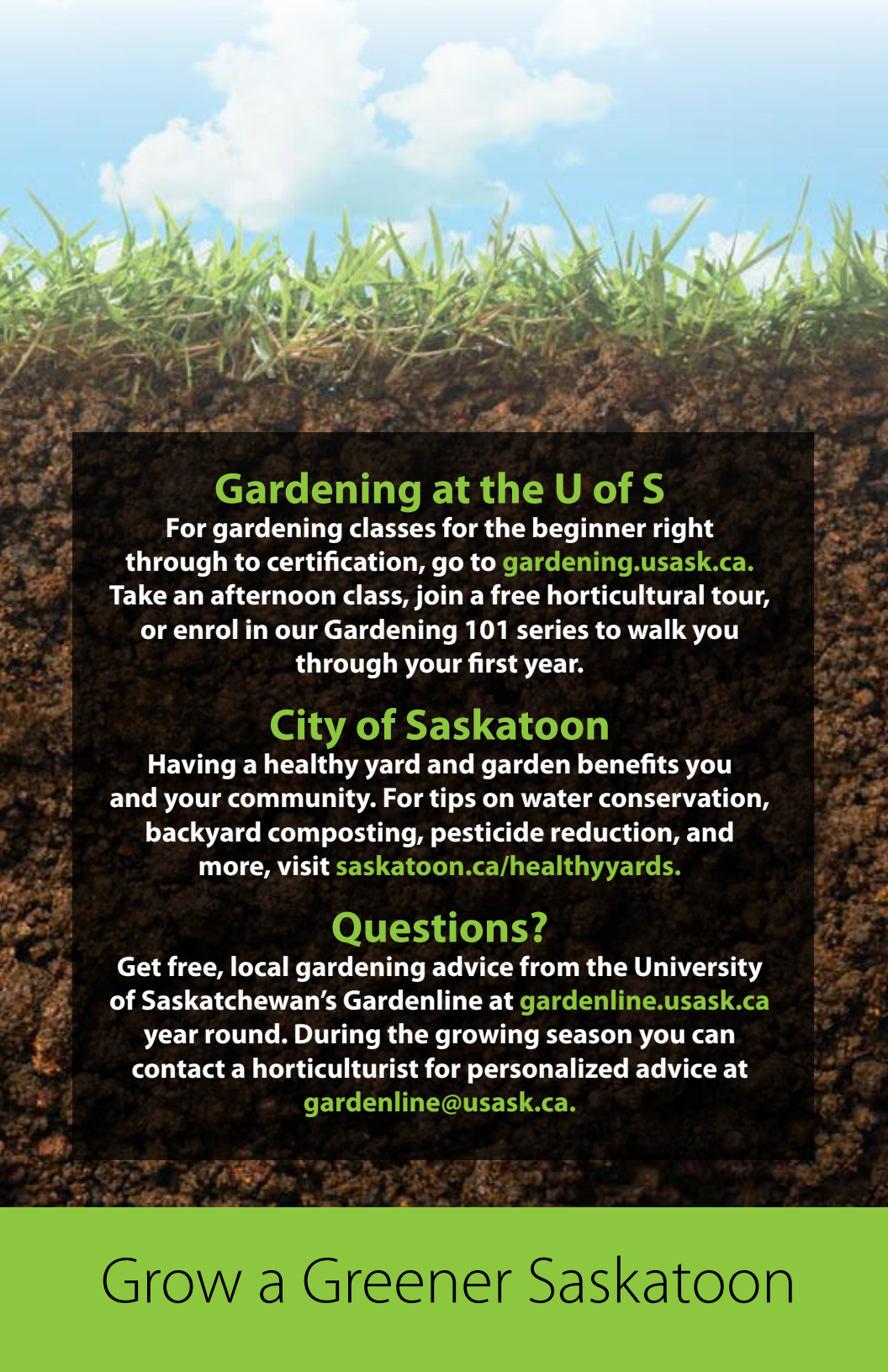
A properly constructed rain garden will drain water, not hold it. Water will only be present for 1 to 3 days and mosquitoes need standing water for 7 to 12 days.

What is the cost for a rain garden?

The cost will depend on how much work you decide to do yourself. If you do all the work yourself, it will be much less than if you hire a landscaper.

Where is a DIY rain garden appropriate?

Residential projects that don't pose any complex challenges or site constraints (e.g. steep slopes) are appropriate to do yourself.



Gardening at the U of S

For gardening classes for the beginner right through to certification, go to gardening.usask.ca. Take an afternoon class, join a free horticultural tour, or enrol in our Gardening 101 series to walk you through your first year.

City of Saskatoon

Having a healthy yard and garden benefits you and your community. For tips on water conservation, backyard composting, pesticide reduction, and more, visit saskatoon.ca/healthyyards.

Questions?

Get free, local gardening advice from the University of Saskatchewan's Gardenline at gardenline.usask.ca year round. During the growing season you can contact a horticulturist for personalized advice at gardenline@usask.ca.

Grow a Greener Saskatoon