

RAIN GARDENS 101

Stormwater specialists in the state of Maryland first conceived of rain gardens in 1990. Since that time, rain gardens have been increasing in popularity as people realize the negative impacts stormwater runoff has on water quality.

I thought it would be appropriate to write about a topic related to rain since we have received so much of it this summer. And with rain comes runoff and increased sedimentation. However, one way that property owners can reduce their impact on the watershed is to create a rain garden.

In a natural ecosystem, rain should soak into the soil, replenish groundwater supplies, be taken up and filtered by plants, and enter surface waters as clean, cool groundwater.

However, in areas where development has occurred, much of the ground is covered with hard, impermeable surfaces such as roofs, streets, parking lots and sidewalks. Water flows quickly across these hard surfaces, picking up sediment and other pollutants, and then into storm drains that dump directly into surface water bodies.

Polluted runoff frequently contains lawn and garden fertilizers, pesticides, yard wastes, sediment, animal wastes, oil and other chemicals. In most cases, this pollution is directly deposited into the same surface waters that many Muskoka residents get their drinking water from.

Building a rain garden on your property can help mitigate the effects of development on water quality. Rain gardens are gardens that soak up rainwater, mainly from your roof, but also from your lawn and driveway. They are landscaped areas planted with wildflowers and other native vegetation that replace areas of lawn.

Rainwater from your downspout is directed into your rain garden where it collects and filters slowly into the ground. Compared to a patch of conventional lawn, a rain garden allows about 30 percent more water to soak into the ground.

Holding back the runoff and allowing it to slowly seep into the ground helps prevent pollutants from washing off your property and into storm sewers or nearby rivers and lakes.

A rain garden is usually located within a shallow depression (natural or man-made) and has gently sloping sides, soil that allows infiltration, and vegetation that traps sediment and runoff.

Rain Gardens . . .

- **Increase the amount of water filtering into the ground, which recharges groundwater supplies and helps reduce the amount of pollutants washing off into lakes and rivers.**
- **Help sustain adequate flows in streams during dry spells.**
- **Provide valuable wildlife habitat.**
- **Enhance the beauty of your yard and neighborhood.**
- **Help protect communities from flooding and drainage problems.**
- **Help protect streams and lakes from damaging flows and reducing erosion of the streambanks and lakeshores.**



Hardy native plant species with deep root systems should be planted in your garden. Trees and shrubs can also be used. Shoreline species work best because they can withstand being periodically flooded. Native species are preferred as they are adapted to local conditions, are more resistant to pests and extreme conditions, and require less maintenance.

Rain gardens are not intended to hold water for long periods. Ideally, runoff will not be detained for more than four days, eliminating the risk of your garden becoming a breeding area for mosquitoes. In fact, a rain garden can actually reduce the amount of mosquitoes in your area by providing habitat for species that prey upon them.

Rain gardens should never be created above your septic bed and should be located at least ten feet away from building foundations to avoid drainage problems.

Rain gardens come in all shapes and sizes, can be designed for any site, are easy to install and maintain, are beautiful landscaping features, and attract birds and butterflies.

Locating your rain garden

Rain gardens are usually in one of two places– near the house to catch only roof runoff or further out on the lawn to collect water from the lawn and roof.

Some pointers to keep in mind when deciding where your garden should go are:

- The lawn should gently slope away from the house to the rain garden to trap water from a downspout.
- The rain garden should be at least 10 feet from the house so water doesn't seep into the foundation.
- Do not place the rain garden directly over a septic system.
- A rain garden should be built in full or partial sun rather than directly under a big tree.
- Putting the rain garden in a fairly level part of the yard will make digging much easier.
- Consider how the rain garden can be integrated with existing and future landscaping.

Sizing your rain garden

The size of your rain garden will depend on how deep the garden will be, what type of soils the garden will be planted in, and how much roof and/or lawn will drain into the garden.

The slope of your lawn will determine the depth of the rain garden. If the slope of your lawn is:

- less than 4%, it is easiest to build a 3"-5" deep rain garden.
- between 5% and 7%, it is easiest to build a 6"-7" deep rain garden.
- Between 8% and 12%, it is easiest to build a rain garden about 8" in depth.

After determining the depth of the rain garden, you need to identify the lawn's soil type as sand, silt, or clay. Sandy soils have the fastest infiltration rate while clay soils have the slowest. Therefore, the more clay in your garden, the larger you want your garden to be.

Alternatively, if you have predominantly clayey or sandy soils, soil replacement or additional preparation may be needed. A good soil mix for rain gardens is 50-60% sand, 20-30% topsoil, and 20-30% compost.

The next step in choosing the size of your rain garden is to find the area that will drain into it. As the size of the drainage area increases, so should the size of the rain garden.

Now find the size factor for the soil type and rain garden depth in Table 1, taking into account the location of your garden. Multiply the size factor from Table 1 by the drainage area for your property. This number is the recommended area for your rain garden.

Table 1					
Rain gardens less than 30 feet from downspout				Rain gardens more than 30 feet from downspout	
	3-5" deep	6-7" deep	8" deep		For all depths
Sandy Soil	0.19	0.15	0.08	Sandy Soil	0.03
Silty Soil	0.34	0.25	0.16	Silty Soil	0.06
Clayey Soil	0.43	0.32	0.20	Clayey Soil	0.10

Rain gardens for single-family homes will typically range from 150 to 400 square feet in size.

The size of your garden will also depend 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% and still control almost 90% of the runoff.

Shape of your rain garden

Once you know the size your rain garden should be, you can design the shape and layout of it. Some pointers to keep in mind are:

- Crescent, kidney and teardrop-shaped rain gardens seem to work best.
- The rain garden should be about twice as long as it is wide, with the face of the longer side perpendicular to the slope.
- Rope can be used to outline the shape of your rain garden before construction begins.
- Rain gardens usually have three zones– very wet, wet-to-dry, and dry areas at the edges. Your planting design should include species that tolerate extremes.
- Most riparian plant species will do well in a rain garden.

If you need to direct water from a downspout to your garden, you can make a swale to guide the water, lay piping on the ground, or dig a trench into which you place plastic piping.

Once you have a location and design set out for your rain garden, the next step is to construct it.

Building your rain garden

Before you begin digging, locate any buried cables and pipes by calling your local utility companies.

The best time of year to build your rain garden is in the spring when the ground is soft and there is plenty of rain to help your plants thrive. Building in the summer is also possible, but you may need to water your rain garden until the plants are established.

Begin the construction of your rain garden by laying out the shape and size of the bed with a rope or garden hose.

If you are building your rain garden into an existing lawn, you can either kill the grass ahead of time by placing black plastic over the area until the grass dies, or you can remove the existing lawn with a sod cutter, garden spade, or edging tool.

Dig the bed to the required depth. When digging on a slope, the high end of the rain garden will need to be dug out more than the low end. If needed, some of the soil excavated from the high end can be used in the low end to make the rain garden level.

It is important that the bed of the rain garden is as level as possible so water doesn't pool at one end and spill over before it has a chance to be absorbed. Once the bed is level, rake it lightly to smooth it out.

When building your rain garden on a slope, you will need to build a low berm along the lower side of the slope edge to retain the water. You can use soil excavated from your bed to build this.

Shape the berm into a smooth ridge one foot wide and compact it by stomping on it, giving it gently sloping sides. To prevent erosion, cover the berm with mulch, plant grass, or plant some dry-tolerant species of plants. If you plant the berm with grass, cover the berm with straw or an erosion control mat until the grass takes root.

If your downspout empties a few feet from the rain garden, make sure the water runs into the garden by either digging a shallow grass swale or attaching an extension to the downspout. To prevent erosion in the garden, place a small bed of pea gravel under the extension.

The next step is to transplant plants into your garden. Randomly clump individual species in groups of three to seven plants and repeat these groupings throughout your rain garden to improve the overall look.

Use many different plant types to create a thick underground root mat that will act to keep the plant community in balance and crowd out unwanted species.

Once the plants are in the ground, apply a two-inch thick layer of hardwood mulch evenly over the bed. Avoid burying the crowns of the new plants.

Water your rain garden immediately after planting and continue to give your garden one-inch of water per week, if the rain doesn't provide it for you, until the plants are established. If you selected plants that are suited to the soil and moisture conditions, plants in your rain garden shouldn't need to be watered once they are established.

Weeding will be needed the first couple of years. Manually remove only those plants you know are weeds, being careful to remove all of the roots. This is easiest if you pull the weeds

out before they mature. Once your garden is mature, you will only need to weed isolated patches, as required.

Once fall arrives, the stems and seed heads can be left for wildlife cover and food during the winter. Each spring, mow down the dead plant material to a height of 6 inches, rake it up and place it in the compost pile.

For more information about rain gardens, see *Rain Gardens: A how-to manual for homeowners* at <http://clean-water.uwex.edu/pubs/raingarden> or *Rain Gardens: Improve stormwater management in your yard* from the Canadian Housing and Mortgage Corporation at http://www.cmhc.ca/en/burema/gesein/abhose/abhose_075.cfm.

Rain gardens are an attractive and enjoyable way to help keep your watershed clean and healthy.

