You will need to know what soil type you have so that you know what plants will thrive and so you can ensure your rain garden is an efficient as possible. Sandy soils, for example, will drain more quickly while heavy clay enriched soils will retain moisture longer. Runoff should infiltrate within 4-6 hours. If you have standing water for longer than this, you may want to consider adding more organic matter or increasing the size of your garden.

Water Needs to Soak Into the Soil of Your Rain Garden

- Sandy and loamy soils drain well
- Clay soils may become waterlogged
- Loosen your soil and improve it with compost
- If your soil if clay, remove it and replace it with a mix that is 50-60% sand, 20-30% topsoil and 20-30% compost

Test Your Drainage!

- Dig a hole 8 inches wide and 8 inches deep
- Pour in a bucket of water
- The water should drain at a rate of about an inch every hour
- If it takes longer than that, improve or replace your soil
- Driving on your soil will pack it down, so try not to drive on it

Design the Pond Area

- The purpose of your rain garden is to soak up rainwater and prevent runoff into the drainage system. For your garden to function properly, you must replace the soil with the recommended rain garden mix
- 50-60% sand; 20-30% topsoil (no clay); and 20-30% compost
- Create a flat area or a depression where rainwater will collect as it sinks into your soil. The standard depth for your rain garden's "ponding" area is six inches.
- Keep the bottom of your rain garden's depression saucer-shaped rather than bowl shaped. That way, the rainwater will always spread out as much as possible.
- Adjust the depth of the depression to the infiltration (drainage) rate. For soils with slow drainage, make your pond shallower to reduce the amount of water. If your soil sucks up water, make the depression deeper to increase its storage capacity.
- Rain gardens have very wet, wet to dry, and dry zones. Different types of plants will thrive in different zones.

Drain Systems

If You Have Heavy Soil or Need to Manage a Large Amount of Water

- An under-drain system of gravel and perforated pipe (French drain) enables your rain garden to absorb more rain.
- Sometimes a rain garden's only purpose is to filter water; the under-drain system pipes the filtered water to another location.
- Under-drain systems require cleanout access.

Compacted Soils

Soils on developed land have been compacted by heavy construction equipment as part of the construction site plan to avoid the formation of sinkholes and to stabilize building foundations. Even sandy soils' capacity to absorb rain is greatly reduced after trucks and bulldozers have run over them.

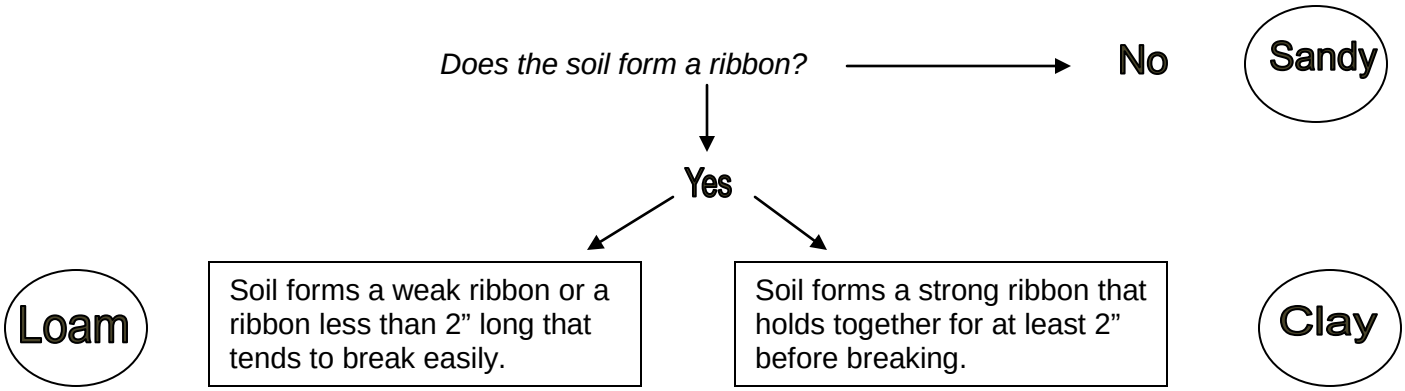
- To make a properly functioning rain garden, you will need to dig up and loosen compacted soils.
- If you have extra soil left over, use it elsewhere, create a berm with it or have it hauled away.

Check Soil pH and Other Qualities

Sandy soil, which drains well, feels gritty and coarse. Clay soil is sticky, clumpy, and will require different preparation. Loam soil contains a lot of silt. Use the 'ribbon test' below to see which type of soil you may have if you have any questions.

If you are uncertain about kind (or pH) of soil you have, contact your county Extension office for a soil testing kit.

Place a small ball of soil in the palm of your hand. Add water dropwise and knead the soil to break down all aggregates or soil crumbles., Soil is at the proper consistency when it is moldable, like putty. Place the ball of soil between your thumb and forefinger, gently pushing the soil with the thumb, squeezing it upward into a ribbon. Try to form a ribbon of uniform thickness and width. Allow the ribbon to emerge and extend over the forefinger, breaking from its own weight.



The texture of the soil influences the moisture holding capacity of soil, the drainage rate and the soil's ability to hold nutrients. Generally, a soil high in clay with tend to impede water movement. A soil high in sand will tend to drain very rapidly. If the site you've selected seems to have clay soil, test the drainage with a percolation test by digging a hole 8 inches wide and 8 inches deep. Pour a bucket of water into the hole and allow it all to infiltrate. Pour in another bucket of water and monitor how long it takes to sink in. If infiltration is slower than 1 inch per hour you'll have to do extra work to improve the soil's absorption ability.

Testing the soil in each area you plan to have a rain garden is important. You might have loamy soil near one area with a high pH and heavy clay soil in another area with low pH.

If you have slow-draining clay soil, you'll have to excavate the clay. Remove the top 10 to 12 inches of soil and replace with a composition of roughly 40% sand, 20% topsoil, 20% compost, and 20% clay. This soil mix will support plant growth and improve infiltration. Leaving a small percentage of clay in the mix will prevent a "layering effect." In other words, if no clay is mixed into the replacement mix, plant roots may behave as if they were in a clay bottomed pot and stay in the top layer of soil, and water will not move through the soil as is your intention.

No matter what type of soil you may have, organic matter is always good to add to the soil. Organic matter is the biological components of the soil. Organic matter is either decomposed material or material in the process of decomposition; or fresh organic material; or living organisms. Organic material plays a vital role in the soil. It acts like a sponge, being able to absorb six times its weight in water. It holds on to nutrients that would otherwise wash away. Organic matter loosens heavy clay soil by creating spaces for air and water movement. Also, it adds nutrients such a nitrogen, phosphorus, potassium and carbon.