

THE EDIBLE GARDEN

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Introducing Soil

Part 5
The "ideal" texture of soil

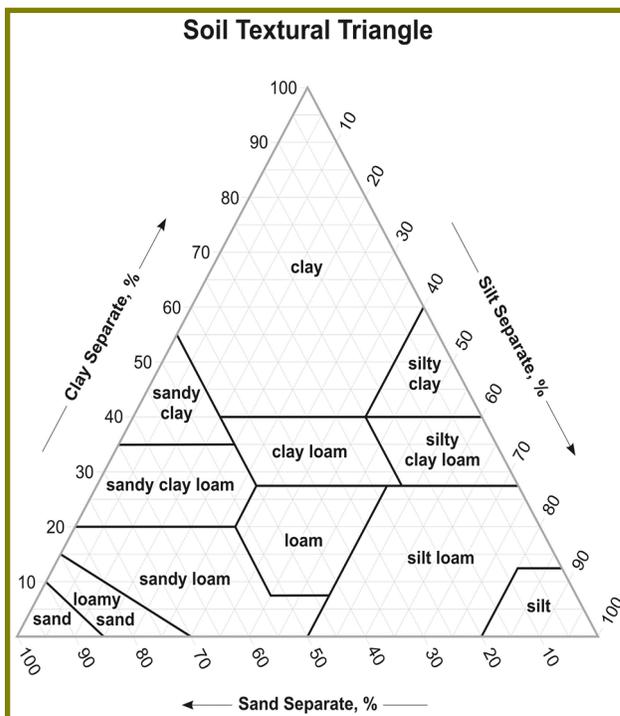
Susan Bicket
Master Gardener of Ottawa Carleton

Most soils are not just sand or silt or clay particles but a mixture of the three. Soils are classified into 12 divisions (by the USDA) according to the proportions of sand, silt, and clay in the mix. The soil triangle illustrates this.

Loam, which is a mixture of all three particles (sand, silt, and clay), is considered by most gardeners to have the ideal properties for growing most vegetables and fruits: good drainage and air circulation from the sand particles, moisture and nutrient retention from the clay portion.

A comparison of the properties of the three soil types can be found on page 3.

To find out where your soil falls take a sample of soil and test it!



From; https://www.nrcs.usda.gov/Internet/FSE_MEDIA/nrcs142p2_050242.jpg

Simple ways to Test your Soil

Dale Odorizzi
Master Gardener of Lanark County

In our Newsletter issues over the summer and fall, we discussed the different types of soil. So, how do you know what your soil is made up of? These simple soil tests are easy and fun to do with your children to get them interested in the garden.

Texture Test--Dig a soil sample in your garden or where you would like a garden. Put about 250 mL of soil in a 1 litre mason jar. While any 1 litre jar will do, mason jars have nice straight sides and work very well. Add 500 mL of water, put the lid on the jar, and shake the jar vigorously. Sit the jar in a stable place where it won't get jostled. After 10 minutes, a sand layer settles out. Measure it without jostling the jar and record that number. After 1 hour, a silt layer will settle; measure it. After 12 more hours, a clay layer will settle out; measure it.

How do the layers of sand, silt and clay compare? This will give you a good idea of your

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Delicata Squash

Lesley Peace
Master Gardener of Ottawa Carleton

I invited one of my cousins from out of town to visit the Mosaiculture in Gatineau and on our way walking back through the Byward Market, my cousin spotted a squash for sale that she had been looking for for years. She immediately bought it, although it was expensive. We cooked it that evening for supper. She said it tasted like the ones she remembers from years past – tender, mild, and somewhat sweet.

Because the squash was hard to find for sale, we found a supplier of seeds and planted several patches the following spring. We had just added well-aged horse manure to the vegetable garden, so we had plenty of squash to share with friends and relatives once they were ripe.



Delicata Squash

Lesley Peace

soil texture.

Another Texture Test—Take a handful of moist, but not wet, soil from your garden and give it a firm squeeze. If it will hold its shape and then crumble when you give it a light poke, you have loam! This is what you want. If, when it is poked, it sits stubbornly in a clump, you have clay. Clay soil can lead to compaction and poor drainage. If it falls apart when it is poked, you have sandy soil.

As well as soil texture, it is important to know how much moisture you have. All soils can go from wet to dry. How fast they drain is very important to plants. We have all read those words—plant loves moist, well drained soil. Sounds like an oxymoron!

Different types of soils hold different amounts of water, depending on their texture and structure. Some sites have good drainage and other sites drain very poorly.

Many factors influence soil moisture:

- Rainfall;
- Land formation;
- Groundwater levels;
- Soil structure.

Percolation Test—To test your drainage use this simple percolation test. Dig a hole about 15 cm wide and 30 cm deep. Fill the hole with water and let it drain completely. Fill it with water again. Keep track of how long it takes to drain completely. If the water takes more than four hours to drain, you have poor drainage.

Worms are a great indicator of the overall health of your soil. If you have earthworms, chances are you have all the beneficial microbes and bacteria that makes for healthy soil and strong plants.

Worm Test—Dig a hole 30 cm by 30 cm in your garden and place the soil on a piece of cardboard or a tarp. Sift through the soil with your hands as you place the soil back in the hole, counting the earthworms as you go. If you find at least ten worms, your soil is in pretty good shape. Less than that indicates that there may not be enough organic matter to support a healthy worm population or your soil is too acidic or alkaline.

pH Test—The pH (acidity level) of your soil has a large part to do with how well your plants grow. Most plants grow best with a fairly neutral pH level of between six and eight. If the pH is lower than five or higher than eight, they do not grow as well as they should. Virtually every garden centre carries pH test kits that are fairly accurate, but you must follow the testing instructions precisely. Once you know if you have a problem, you can work to correct the problem.

If none of these tests indicate a problem and your plants are not thriving, it may be time to get an official soil test from an accredited soil Testing Laboratory. Visit:

www.omafr.gov.on.ca/english/crops/resource/soillabs.htm

The “ideal” texture of soil continued

Few gardeners are lucky enough to have an “ideal” soil. Most of us in the Ottawa area have either very sandy soil or clayey soil. The most obvious solution would seem to be to amend the soil by adding clay to sandy soil and sand to clayey soil, but this can be expensive both in terms of material and labour to mix in. If not done correctly this can lead to more problems.

Fortunately there is a solution, which is the same for all soils—**COMPOST!** Or the addition of organic matter as a mulch. Compost is cheap, you can make it yourself from kitchen scraps and garden debris. It doesn’t need to be mixed in, it can be spread on the surface of the soil and the soil organisms will do the work for you.

Delicata squash, *Cucurbita pepo* var. *pepo*, also known as peanut squash, Bohemian squash, or sweet potato squash, is an old variety. The squash is native to North and Central America and was apparently introduced to early settlers by Indigenous peoples. According to Wikipedia, the squash almost disappeared in the 1930s because of its susceptibility to mildew diseases. Luckily for us, staff at Cornell University's Department of Plant Breeding bred an open-pollinated variety (Bush Delicata) that was resistant to most known squash diseases and is now the main cultivar available.

The seeds need warm soil, at a temperature of least 18-21°C, to germinate. Plant after the last chance of frost. The plants like full sun and well-draining soil that contains organic matter such as compost. Delicata squash plants need only enough water to keep the plant from drought conditions. Deep watering about once a week is recommended. Plants become mature after approximately 80 to 100 days. When leaves and stems begin to dry out in the fall, plants are ready for harvest. You can begin to pick the squash in late summer until early November. You can store extra squash in a cool, dark, and dry area at about 10-15°C for up to several months.

Delicata squash is rich in vitamin A, vitamin C, fiber, and potassium, and the skin is so thin it is edible. One of my favourite recipes comes from the American Test Kitchen and is included below:

Roasted Delicata Squash -

based on an American Test Kitchen Recipe

- Clean the squash.
- Cut off ends.
- Cut squash in half and remove seeds.
- Cut crosswise in 2 cm slices.
- Toss slices in a bowl with 2 tbsp of oil and ½ tsp of salt.
- Transfer to a baking dish and cover with foil.
- Bake at 425°C for 8-10 minutes on lowest level of oven.
- Remove foil, flip slices, cover again with foil, and bake for a further 10 minutes.
- Remove foil and bake a further 10 minutes. Add butter if needed.
- Transfer to a serving platter and sprinkle with 1 tbsp of parsley.
- Enjoy!

Organic matter will not change the soil texture, but will change the structure or the way soil sticks together. Thus for sand, it fills the large gaps between particles, improving water and nutrient retention. For clay, it clumps the clay particles, essentially creating larger particles with larger gaps in between, improving drainage and aeration.

It will take time and repeated applications of organic matter to improve and maintain soil structure, as the organic matter is literally being eaten by the soil organisms. The rate of improvement and need for reapplication will vary with the amount of organic matter added and the starting soil texture, but most gardeners will see noticeable improvements of soil structure, fertility, and health within a couple of years.



Roasted Delicata Squash

Lesley Peace

Comparison of some of the properties of sand, silt and clay

*Susan Bicket
Master Gardener of Ottawa Carleton*

Properties	Sand	Silt	Clay
Ability to hold nutrients (Cation exchange capacity – CEC)	Poor	Medium to high	Very good
Aeration	Good	Medium	Poor
Compacts easily	No	Some compaction	Yes
Drainage rate	Fast	Medium to slow	Very slow
Feel	Gritty, loose	Smooth, floury, breaks up easily, can form ball shapes	Smooth, sticky, dries very hard, retains shape when moulded
Fertility	Poor	Limited	Good
Organic matter decomposition rates	Rapid	Medium	Slow
Organic matter levels	Low	Medium	High
Particle size	Large, 0.05 to 2 mm	Medium, 0.002 to 0.05 mm	Very small <0.002 mm
Particle surface area for a given volume of soil	Low	Medium	High
Spaces between particles	Large	Medium	Very small and narrow
Spring warm-up	Quick	Moderate	Slow
Suitability to work after rain	Good	Medium	Poor
Water retention	Poor	Medium to high	Very good
When dry	No change	A little contraction	Contracts, very hard, forms crust and cracks.
When wet	No change	A little expansion, washes away easily	Expands, very sticky

Watch for *Trowel Talk* the Master Gardeners of Ottawa Carleton electronic monthly gardening newsletter available on the 15th at <http://mgottawa.ca/>

Visit the Almonte online community newspaper 'The Millstone' - <http://millstonenews.com/> - for a column by David Hinks of the Lanark County Master Gardeners; under the Gardening tab.

Master Gardeners of Ottawa-Carleton and Master Gardeners of Lanark County are member groups of Master Gardeners of Ontario Inc., a registered charity with the mission of providing gardening advice to homeowners. The Edible Garden logo was created by Jon Last (jonlast13@rogers.com).