

# Getting the Dirt on Soil

Soil is the most fundamental element in the garden. It is the foundation for all plants. As gardeners we need to know what our soil has to offer and what we need to do to either work with or correct any problems.

**Types of Soil** - Soil falls into 3 types based on structure and texture. Knowing your soil type gives you an idea of how well it holds fertility and how well it drains.

1. Sandy soil is gritty and crumbles easily; it is hard to form into a ball.
  - It can absorb > 2 inches of water in an hour BUT retains very little. Thus it dries out quickly. This is an advantage in early spring – it is warm and dry enough to work earlier than any other soil type. It is a disadvantage during a summer drought – requiring much more frequent watering.
  - Nutrients also move quickly through the soil with the water.
  - However, its structure creates larger pores which increase the amount of oxygen available to soil organisms and plants.
2. Clay soil is smooth and sticky;
  - it is slow to warm up and to dry out enough to work in early spring. When it dries out completely it becomes like concrete.
  - Nutrients are held in the soil very effectively.
  - Clay particles are very small and compact; limits the amount of oxygen in the soil.
3. Loam has the best qualities of sand and clay combined in it.
  - It is loose, and porous but holds water well.
  - The clay particles give it strength and water/nutrient holding capacity.
  - The sand gives larger pore space for air and better drainage.

## Know your Soil – Type (Sand/Silt/Clay), pH, Nutrients (N,P,K)

### Sand/Silt/Clay – know what you have so you know what will grow well!

Test Option 1 – Rope or Squeeze Test (gives a very rough idea of your soil type)

Take moist but not muddy soil. Form it into a ball.

- Sandy soil will not hold the space well and will tend to crumble. It will feel gritty.
- Loam will form a ball but will crumble apart easily and will feel partly gritty and partly sticky.
- Clay will form a ball and will not crumble; if you press or roll it between your fingers a ribbon will form.

Test Option 2 – Jar Test (more detailed profile of your soil type with only a little more effort).

You will need:

- 1 litre or quart jar with a lid.
- Clean water
- Soil sample (handful or approx. 1/2 cup of soil taken from a garden bed a few inches below the soil surface)

Steps:

- Fill the jar about 2/3 full with water.
- Add soil, leaving a few centimeters of air space.
- Put the lid on tightly.
- Shake vigorously for 1-2 minutes. All particles must break down and be suspended in the water.

Assess:

- After it sits for 1-2 minutes, observe the first layer to settle – This is Sand. Mark or measure.
- Recheck in an hour. The next layer will be Silt. Mark or measure.
- Recheck in 24 hours. The last layer is Clay. Mark or measure.

You now have a good picture of your soil's composition in terms of % sand/silt/clay. Compare to the soil texture triangle <http://www.pedosphere.com/resources/bulkdensity/triangle.cfm>

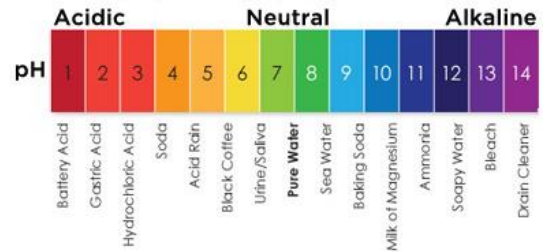


## pH – some plants prefer more acidic or more alkaline soils.

pH refers to how acidic or alkaline your soil is. This is important because it affects the availability of the soil nutrients to the plants. This is especially true of phosphorus and potassium.

Testing the pH of your soil

- Purchase a test kit for pH and nutrients
- Use the green tube. Remove capsule. Fill with soil up to the 1<sup>st</sup> line. Open capsule and pour powder over the soil. Add water to the 4<sup>th</sup> line.
- Cap and shake thoroughly.
- Allow soil to settle and color to develop for ~ 1 min.
- Compare color to pH color chart provided with the kit



A low pH is acidic.

7.0 is neutral.

A high pH is alkaline.

Most plants grow well between 6.0 and 7.5. This range keeps the nutrients available to most plants and provides a suitable environment for bacteria and fungus in the soil.

- To make a soil more acidic add sphagnum peat moss or soluble compounds containing sulfur.
- To make a soil more alkaline add lime.

The amount needed is determined by your soil texture. The change will be gradual and difficult to sustain.

**Basic Nutrients** 3 main nutrients that all plants require: nitrogen (N), phosphorus (P), and potassium (K).

The test kit will give an indication of the level of these basic nutrients in your soil. Each test takes approximately 20 minutes to complete.

**Nitrogen** gives plants a dark green color and promotes the leafy portion of plant growth. Too much nitrogen on tomatoes gives lots of leaves and few tomatoes. It also feeds soil bacteria and fungi. They need it for growth; so they can do the work of decomposition. Nitrogen moves in/out of soil quickly – it is the least reliable of the tests for this reason.

**Phosphorus** stimulates early root development. It is most important to have it readily available at the time of transplanting seedlings to the garden. It moves slowly out of the soil. You will see it sold as superphosphate.

**Potassium** promotes plant vigour and disease resistance. It increases the heat – cold – drought hardiness of plants by strengthening their stems and leaves.

Plants need other nutrients in small quantities. These are readily available in organic matter, such as compost. Compost helps both clay and sandy soils by improving drainage and water holding capacity. It builds soil structure and adds many micronutrients.

**Best method to amend your soil type and nutrients** - Add 1-4 inches of compost to top-dress your soil annually. Work it in lightly, just into the top layer, especially if planting immediately.

**Final word of Advice** - Treat your soil with care. Avoid walking on and compacting it when wet and don't disturb the complex balanced ecosystem by over-tilling.



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