SOIL HEALTH

Healthy Soils = Healthy Food

Soils are alive!

- In a teaspoon of healthy soil, there are often more than *1 billion organisms*.
- Soil organisms help fight plant disease, release nutrients into the soil, break down harmful substances, create pore spaces for water and air movement, aid plants in taking up water and nutrients, produce nitrogen, and much more!

Soils are home to bacteria, fungi, actinobacteria, algae, nematodes, protozoa, worms, springtails, millipedes, mites, woodlice, and the tardigrades and yet

Give 'em food, shelter, and water!

- **Food – Soil organisms eat organic matter**
  - Compost your yard and food waste and add it to your garden soil
  - Add composted manures to meet your plants' nutrient requirements
  - Grow a cover crop in your garden when not producing food
- **Shelter – Soil organisms need a good environment to live in**
  - Test your soil to ensure the pH and nutrient levels are optimal
  - Till your soil only when needed – tilling destroys pore spaces where organisms (and plant roots) live and access water and air
  - Keep plants growing all year round – many soil organisms prefer to live near plant roots, where they find food, water, and shelter all in one location
- **Water – soil organisms need water to survive…but not too much!**
  - Water the soil, not the plants, in the morning. Morning waterings allow plant leaves to dry quickly to help prevent fungal diseases, such as powdery mildew.
  - Water only when the soil is dry to a depth of approximately ½ to ¾ inch. Frequent waterings can saturate the soil, harming beneficial soil organisms.
  - Water thoroughly and less frequently - water until the soil profile is moistened, not just the surface, so microbes at all levels get access to water

SOIL TESTING

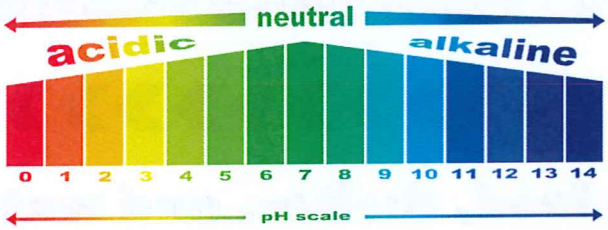
Why soil test?

- Learn your soil's pH and phosphorus and potassium supply
- Learn if and how much lime and fertilizer will make your garden more productive

Soil pH

- pH is a measurement of a soil's acidity or alkalinity
- A pH of *6.5 to 7* is ideal for *most garden plants* – Blueberries prefer a pH of 4.5 to 5.5

If the soil pH is *below 6.5*, lime can be added to increase the pH. Lime is made by grinding up limestone bedrock.



If the soil pH is *above 7.0*, organic matter or elemental sulfur can be added to bring the pH down over time.

Phosphorus

- Phosphorus is used by plants for to produce seed
- Plant phosphorus deficiencies appear as purple leaves
- Manure, bone meal, and superphosphate provide phosphorus

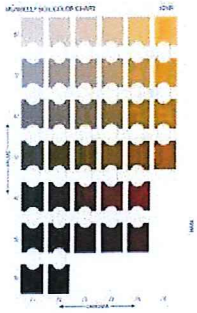
Potassium

- Potassium is used by plants for water regulation
- Potassium deficiencies appear as yellowing or die back on the outside edge of leaves
- Manure, wood ashes, and potash provide potassium

SOIL ORGANIC MATTER

Soil organic matter is key to soil health

- Soil organic matter is the lifeblood of a healthy soil.
- Soil organic matter provides –
  - Water holding capacity
  - Nutrients for plants and microorganisms
  - Cation exchange capacity (storage of nutrients)
  - Food and shelter for soil microorganisms
  - Glues to hold soils together and create pore spaces
  - Carbon storage to reduce greenhouse gasses

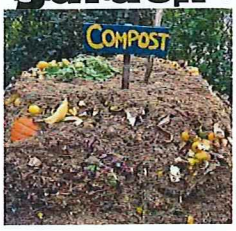


Dark soil = More organic matter

- A soil test tells you how much organic matter is in your soil. Healthy garden soils often contain between 3 and 7 percent organic matter in our area.
- In general, the more soil organic matter, the better.
- There are many amendments and garden practices that will increase your soil organic matter content over time.

Increase soil organic matter in your garden

Compost



Reduce Tillage

Grow a Cover Crop

Use Plant Mulch

For more information contact the Department of Agriculture and Food Systems - (715) 994-1375