

Basic Soil Chemistry

Soil Type - controls the availability of nutrients, air and water for plant growth. There are 3 basic types of soil; sand, loam, and clay. (Figure 1)

Sand is most commonly found in coastal regions. This type of soil has large particles and drains well but doesn't retain water or nutrients well. Our native unamended soil is primarily composed of sand.

Loam has finer particles and contains organic material (humus) which retains moisture and nutrients that support plant growth. This is the best type of soil for growing garden plants.

Clay consists of very fine mineral particles that tend to compact resulting in poor drainage and aeration. Clay is not optimum for vegetable gardening without amendment.

Action Needed: If your soil is primarily sand, amend it by adding organic materials such as mushroom compost and peat moss. Do not use un-composted mulch like we have at the farm. It consumes the nitrogen in the soil as it decomposes. Protect your soil from the sun with plastic or landscape cloth to prevent bleaching.



Figure 1

Crop	Range of soil pH optimum for selected crops					
	pH					
	5	5.5	6	6.5	7	7.5
Asparagus						
Bean						
Cabbage						
Carrots						
Corn						
Cucumber						
Kale						
Lettuce						
Mustards						
Onions						
Parsnips						
Peas						
Pepper						
Potatoes						
Radishes						
Spinach						
Squash						
Tomatoes						

Figure 2

Soil pH - affects the availability of nutrients and minerals in the soil. Plants can't absorb nutrients from soil that is too basic or acidic. Optimum soil pH varies for different garden vegetables (Figure 2) but a good target is slightly acidic soil with a pH between 6 and 6.5. Our native soil is slightly basic at around 7.5.

Action Needed: Add lime or potash to raise the pH of acidic soil and aluminum sulfate or an organic soil acidifier such as Espoma organic soil acidifier (available at Lowes) to lower the pH of basic soil.

NPK - stands for the three main plant macronutrients; nitrogen, phosphorus, and potassium. Deficiencies of these nutrients will stunt the growth of your garden plants. Our native soil is low in nitrogen, excessive in phosphorous, and medium in potassium. (Figure 3) For more info see <https://en.wikipedia.org/wiki/Fertilizer>

Action Needed: Get your soil tested to determine what action to take. A good soil test will let you know which nutrients your soil is deficient in, what to use to correct the deficiency, and how much to add. Our native soil appears to primarily require the addition of nitrogen but the soil in your plot may have been amended in the past so it's best to test it before taking action.



Figure 3

Soil Testing – Determining the chemistry of the soil in your plot will enable you to take the appropriate corrective action needed to grow healthy vegetable plants. (Figure 3)

Action Needed: Either go to the Clemson extension services office in the tax assessors building at 539 William Hilton Parkway for soil testing forms and instructions or purchase your own test kit for about \$12. (Figure 4)

Figure 4

