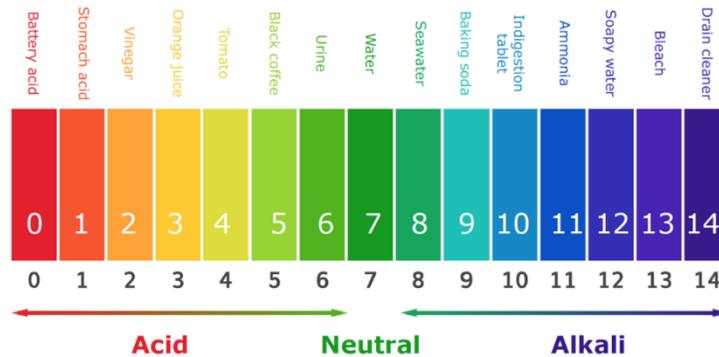


SOIL NUTRIENT TESTS

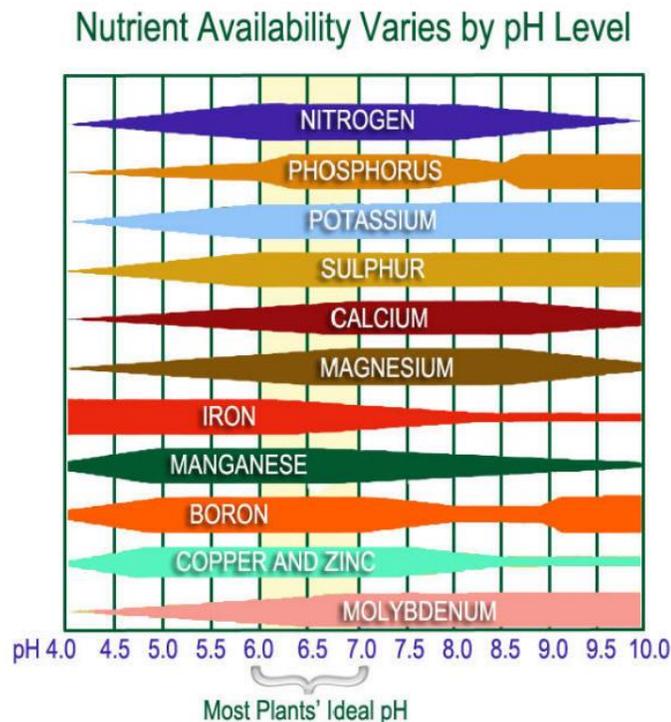
Gardeners and others often need to know the levels of macro-nutrients in their soil. The La Motte kit we use is widely available to anyone seeking this information and it addresses 4 important soil parameters: pH, nitrogen (N) and phosphorus (P) and potassium (K), the latter 3 being termed NPK (on soil supplement fertilizers).

pH is a measure of acidity with 7 being neutral:



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Most plants prefer slightly acidic soil but there are others that like it a little basic or alkaline. The pH does affect the availability of nutrients (mineral) to the plant as seen below:



Calscape.org is a great site for CA natives where you can check out the acceptable pH range for each plant.

The Floc Ex you use early on helps remove suspended particles from the solution of water and soil before running each assay. Each test relies on a colorimetric result which yields a range of values for each nutrient. N and P are required for proteins and nucleic acids in plants. The potassium, K, is usually pretty common; it's needed for a number of cellular functions.

Here are the La Motte instructions to familiarize yourself with the procedures before doing the activity. You'll receive a copy in class.

Shopping List

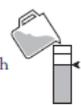
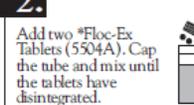
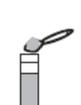
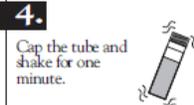
-  Distilled water (400 mL / 1 pint for 10 tests)
-  Timer (clock or watch)
-  Plastic teaspoon

Soil Sampling & Preparation

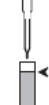
-  Use a clean trowel, spoon, or dull knife to loosen the soil.
-  Collect the soil from the desired depth.
- Collect several small samples from a single place and mix them together to get an "average" sample.
- Collect a total of about 1 cup of soil.
- Spread the soil sample out on a sheet of plastic wrap.
- Allow it to dry overnight if possible.
-  Pick out any large leaves, stones or sticks and crush any lumps. The dried soil may be passed through a sieve or a piece of screen.

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 *WARNING: Reagents marked with an * are considered to be potential health hazards. To view or print a Material Safety Data Sheet (MSDS) for these reagents go to www.lamotte.com. To obtain a printed copy, contact LaMotte by e-mail, phone or fax.

Extraction

- 1.** Fill the round extraction tube to the 30mL line with DISTILLED WATER. 
- 2.** Add two *Floc-Ex Tablets (5504A). Cap the tube and mix until the tablets have disintegrated. 
- 3.** Remove the cap. Add one heaping teaspoon of soil. 
- 4.** Cap the tube and shake for one minute. 
- 5.** Let the tube stand until the soil settles out. The clear solution above the soil will be used for the Nitrate, Phosphorus, and Potassium tests. 

Nitrogen

- 1.** Use the pipet to transfer the clear solution above the soil to a square test tube until it is filled to the shoulder. 
- 2.** Add one *Nitrate WR CTA Tablet (3703A). Immediately slide the tube into the Protective Sleeve (0106-PP). 
- 3.** Cap and mix by inverting for two minutes to disintegrate the tablet. Bits of material may remain in the sample. 
- 4.** Wait 5 minutes for the color to develop. Remove tube from Protective Sleeve. Compare the pink color of the solution to the Nitrogen Color Chart. 
 L = 40 lb A/6" soil
 M = 160 lb A/6" soil
 H = 320 lb A/6" soil

NOTE: Nitrate Wide Range CTA Test Tabs (3703A) are sensitive to UV light. The Protective Sleeve (0106-PP) will protect the reaction from UV light. If testing indoors, there is no need to use the Protective Sleeve in this procedure.

Phosphorus

- 1.** Use the pipet to transfer 25 drops of the clear solution above the soil to a square test tube. 
- 2.** Fill the tube to the shoulder with DISTILLED WATER. 
- 3.** Add one Phosphorus Tablet (5422A). Cap and mix until the tablet disintegrates. Wait 5 minutes for the color to develop. 
- 4.** Compare the blue color of the solution to the Phosphorus Color Chart. 
 L = 8 lb A/6" soil
 M = 20 lb A/6" soil
 H = 64 lb A/6" soil

Potassium

- 1.** Use the pipet to transfer the clear solution above the soil to a square test tube until it is filled to the shoulder. 
- 2.** Add one Potassium Tablet (5424A). Cap and mix until the tablet disintegrates. 
- 3.** Compare the cloudiness of the solution in the test tube to the Potassium Color Chart. Hold the tube over the black boxes in the left column and compare it to the shaded boxes in the right column. 
 L = 40 lb A/6" soil
 M = 80 lb A/6" soil
 H = 160 lb A/6" soil



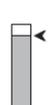
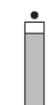
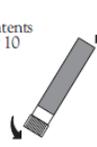
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*WARNING - this are concentration scale that may be harmful, if misused. Read instructions provided to all consumers carefully. Not to be used by children except under adult supervision.

Soil Sampling & Preparation

-  Use a clean trowel, spoon, or dull knife to loosen the soil.
-  Collect the soil from a depth of 2 to 6 inches.
- Collect several small samples from a single place and mix them together to get an "average" sample.
- Collect a total of about 1 cup of soil.
- Spread the soil sample out on a sheet of plastic wrap.
- Allow it to dry overnight if possible.
-  Pick out any large leaves, stones or sticks and crush any lumps with the back of a plastic spoon. The dried soil may be passed through a sieve or a piece of screen.

pH

- 1.** Fill a test tube (0106) to the 10 mL line with distilled or deionized water. 
- 2.** Add 1 Soil pH Test Tab (5503A). 
- 3.** Fill test tube cap with soil. 
- 4.** Pour the soil into the test tube. 
- 5.** Cap the tube. 
- 6.** Mix the contents by inverting 10 times. 
- 7.** Stand test tube up right on a flat surface and let the soil settle out for 1 minute. 
- 8.** Hold the test tube against the white part of the soil pH color chart. Match the color of the liquid above the soil to a color on the chart. Record results as pH. 