

ACTIVITY 4: Soil Nutrients (N,P,K and pH)

OBJECTIVES:

- Determine the nutrient levels for the primary macronutrients (N,P,K), as well as the pH, of selected soil types.
- Analyze results and make recommendations for soil nutrient improvement.

MATERIALS NEEDED PER GROUP:

- 1 Soil test kit
- Small sample of Soils A, B, and C
- Distilled water (not supplied)

PROCEDURE: (For each soil complete the following)

Part I - pH and Nitrogen

1. Fill mixing vial to line with distilled water.
2. Pack scoop with the soil to be tested (A,B, or C) and level off.
3. Add this soil to the water in the mixing vial, then cap and shake for 30 seconds.
4. Dip a pH/Nitrogen test strip into the sample mixture for 3 seconds and remove. *Note: Be sure both test strip pads are submerged in the water. Do not push the pads into the soil that has settled.*
5. Hold the test strip level, pad side up, for 1 minute.
6. Read your pH and nitrogen results by turning the strip over (pad side down) and comparing the resulting pad colors to the color chart on the bottle label. Be sure you are reading the results through the clear plastic of the test strip.
7. Record the number (for pH) and the letter (for Nitrogen) that matches your result, in **Data Table 4.0**.
8. Retain the soil/water mixture in the mixing vial for use in Part II of the test.

Part II - Phosphorus and Potassium

1. Using the same scoop as a measure, add one scoop full of Activator solution from Bottle A to the sample soil mixture already in the vial.
2. Replace the vial cap and shake vigorously for 60 seconds.
3. Dip a Phosphorus/Potassium test strip into the sample mixture for 10 seconds and remove. *Note: Be sure both test strip pads are submerged in the water. Do not push the pads into the soil that has settled.*

4. Hold the test strip level, pad side up, for 1 minute.
5. Read your Phosphorus and Potassium results by turning the strip over (pad side down) and comparing the resulting pad colors to the color chart on the bottle label. Be sure you are reading the results through the clear plastic of the test strip.
6. Record the letters under the color block that match your results for Phosphorus and Potassium and record in **Data Table 4.0**.
7. Rinse the scoop and mixing vial with water to remove any soil residue.
8. Answer the Assessment questions that follow.

Data Table 4.0 – Soil Nutrient Results

Soil Sample	pH Range	Nitrogen	Phosphorus	Potassium
A				
B				
C				

ASSESSMENT:

Analyzing Your Results

A general nutrient requirement for most plants is described in the chart below.

pH Range	Nitrogen	Phosphorus	Potassium
6-7	C	C	C

If your soil is found to be deficient in any nutrient, in most cases below letter C on the AccuGrow color chart, you would select a fertilizer high in that nutrient. Usually one application of fertilizer, as described on the bag, will be sufficient to raise the nutrient level by one letter on the AccuGrow color chart.

If your soil has too much of a particular nutrient for the plants you want to grow, you would choose a fertilizer that is very low in that particular nutrient. If you found your soil to be in excess of phosphorus and potassium, you would select a fertilizer with only nitrogen for example. Refer to <http://www.backyardgardener.com/veg/nurt1.html>, for a listing of specific nutrient requirements for common vegetables.

In Activity 5 of this lab, you will plant radish seeds and predict which soil will grow the plants best. Radishes require a nutrient regime similar to the chart above. Therefore, you can compare your soil nutrient analysis to the chart to determine deficiency or excess of a particular nutrient.

Questions

1. What do the numbers, 10-5-5, refer to on a bag of fertilizer?
2. The analysis of a garden soil showed a nutrient level of "C" for potassium and phosphorus but a level of "D" for nitrogen. What fertilizer would you choose and why?
3. Describe the areas of plant growth that are affected by each nutrient.



