

Activity 28: Soil Sampling Techniques and Data Sheet

Maine Geological Survey



Objectives:

To have students collect a representative soil sample from a piece of land (preferably their own) as an introduction to soil testing and other soil activities.

Time:

This activity is designed to last one (1) class period, with outside sampling by students.

Background:

A soil data sheet consists of the results of a series of tests and other significant information that one obtains about a specific soil sample from a known location. The data sheet gives a wide variety of information about the soil and its potential use. The types of information include the following: specific soil name, texture, slope of soil, colorations of the subsoil horizons, organic matter content (this is abbreviated OM in texts and literature), percolation rate, results of macronutrient tests (at the very LEAST nitrogen, potassium, and phosphorus), and the results of a pH test. Other information can be added as needed or desired.

The time needed for a more or less comprehensive teaching unit on soils is about 3-4 weeks, including lab time and testing. In areas with any significant amount of agricultural activity there will be a high degree of student and possibly even parent interest in this aspect of earth science. Students need to supply a "uniform sample" of topsoil from their garden (preferred) or lawn and will need a full (one pound) coffee can

of material. Make certain that the samples are LABELED with the student's name as they are brought in; it is very hard to distinguish your soil sample among 25 others stored in identical Maxwell House coffee cans. All large debris (over 2 inches) should be removed before starting any of the activities subsequently described in this book.

As the section on soils progresses, each student should develop a written profile of the pertinent facts about his/her soil. A sample profile sheet is attached; you may wish to develop your own based on local needs. Once completed, this bank of information makes an excellent basis for student oral reports, essay test question(s), posters, and so on.

Materials:

Trowel or soil auger, coffee can, labels, and tape measure. Soil survey maps and topographic maps should be available in the class room; optional in the field.

Procedure:

Obviously the sampling process will greatly affect the nature of the test results. A single sample, scooped up near the compost pile for example, will have a tremendous difference in OM value and nutrient content from the "average" or more representative sample. If possible students should obtain a representative sample using a pattern similar to the one shown below. You may wish to demonstrate this on a nearby field or garden. If a sampling auger is not available, identical results can be obtained with a good trowel and a little extra effort.

The distances between sampling points are not critical as long as a number of samples go into the mix and the samples come from all parts of the test area. Distances can be increased for larger plots and decreased for smaller ones. Avoid any sample location that will obviously skew the results - for example an area around a dropped bag of lime. Once all the samples have been collected, they should be mixed thoroughly in a CLEAN 5 gallon plastic bucket or similar container and the coffee can sample taken from the bucket.

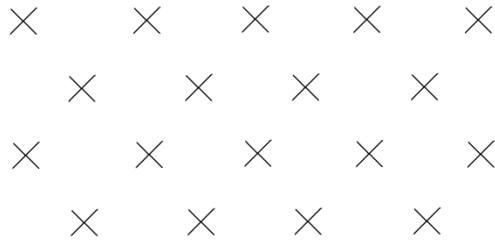


Figure 1. Sample collection diagram for a 40' x 60' garden.

Each X in the above diagram indicates a location for an auger sample; if using a trowel, remove any turf or surface vegetation, and take one good trowel full to a depth of 4-6 inches. The soil auger will take a narrower sample to a depth of about one foot. Be certain, immediately upon collecting the sample, to label it. Include the date, the sample's precise location, and other field information that you deem significant.

Follow-Up:

See other soil activities such as:

Activity #29: [Constructing a Set of Soil Sieves](#)

Activity #30: [Composition of Topsoil](#)

Activity #31: [Determining a Soil's Textural Classification](#)

Activity #33: [Soil Horizons](#)

References:

Activity developed by Duane Leavitt from procedures described in *The Nature and Properties of Soils*, by Harry O. Buckman and Nye C. Brady (The Macmillan Co., New York, eighth printing, 1966).

Name _____



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Maine Geological Survey

Student Sheet

Purpose:

In this activity you will collect a representative soil sample for subsequent testing and analysis.

Materials:

Trowel or soil auger, tape measure, coffee can with lid, label for can, pens, and notebook.

Procedure:

Using the sampling patterns and techniques discussed in class, collect and label a sample of soil from your garden, lawn, or fields. Using the attached Soil Data Sheet, record information about your soil as you develop it, in this and subsequent activities.

10. Textural classification:

% Sand _____ %Silt _____ %Clay _____

11. Percolation rate in gallons/hour: _____

12. pH (acidity content): _____

13. Other notes: