

# SOIL TESTING Science Page

## WHY TEST SOIL?

Is this soil good for growing vegetables? Do I need to buy lime and fertilizer? Is there lead in the soil that will harm my family's health?

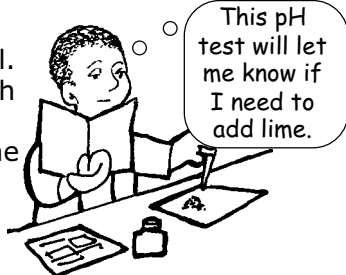


By testing the soil, you can determine how suitable your soil is for growing different types of plants. You can also find out if you need to add fertilizer, lime, or other soil amendments to help plants grow.

Some tests help you find out if your soil is polluted with toxic substances. High levels of lead and other heavy metals are a health risk, especially for small children.

## TYPES OF TESTS AVAILABLE

A **pH test** measures the acidity of the soil. It tells you how much lime or sulfur should be added to make the soil suitable for growing plants.

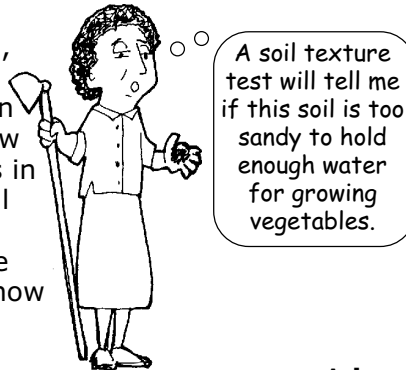


A **soil nutrient test** measures the levels of phosphorus, potassium, and other plant nutrients in soil. It tells you how much fertilizer is needed to make up for the lack of certain nutrients in your soil.



I wonder why my plants are not growing well? I'll get my soil tested to see if it's lacking plant nutrients.

A **soil texture test** measures the amounts of sand, silt, and clay in your soil. You can also measure how fast water drains in soil using the soil percolation or "**perc**" test. The results suggest how to best use or improve the soil.



You can test your soil for **organic matter**. If levels are too low, you will be given suggestions for adding organic matter.

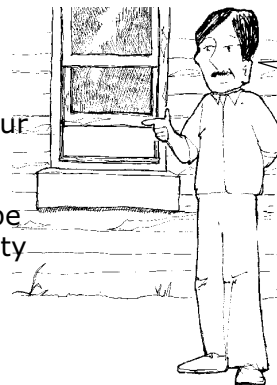


A **salinity test** tells you if your soil is too salty for plants to grow well.

No wonder my seeds won't sprout! The salinity test shows that salt is a problem in this dry climate.



A **heavy metal test** shows how much lead and other heavy metals are in your soil. If toxic amounts are found, you will be given some safety tips.



## HOW TO TEST YOUR SOIL

Garden stores sell kits that you can use to measure the pH and nutrient levels of your soil. These kits will give you fairly accurate results. You can send a soil sample to a lab for more accurate measurements of pH and nutrient levels.



You can also send a soil sample to a lab to test for heavy metals, texture, salinity, and organic matter content. Get a soil sample box and information sheet, and follow the directions carefully. Fill in the soil information sheet, and send it with your soil sample to the lab.

The lab sent me the results of my soil test. Now I know what I have to do to improve my soil.



**TRY THIS**

**COLLECT SOIL SAMPLES FOR TESTING**

Whether you test your own soil, or send it to a lab for testing, the most important first step is to get a good soil sample. A soil sample is only about 1/4 kg in weight, but it should represent all of the soil in the area you are testing. The sample should be made up of 10 soil samples collected from 10 points within 9 square meters of garden. Here is one way to get a good soil sample from your garden.

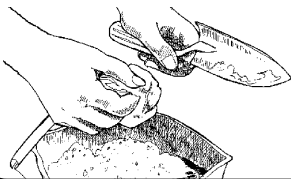
**What you need**



- \* a plastic bucket
- \* spade and trowel (not galvanized)
- \* a clean sheet of plastic

**What to do**

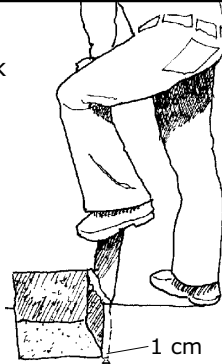
1. Wash the tools and bucket. Any left-over fertilizer on your tools or hands can contaminate your sample.



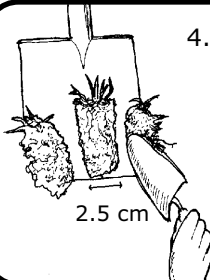
2. Open a hole about 20 cm deep with a spade.



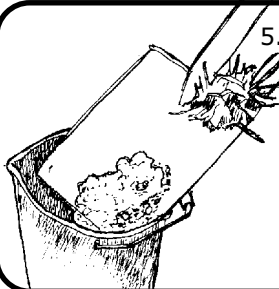
3. Remove a 1-cm thick slice from the open hole.



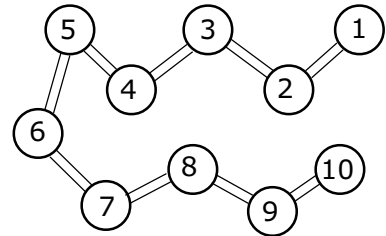
4. Trim both sides of the slice to get a strip 2.5 cm wide.



5. Remove any rocks, grass, dead leaves, or sticks from the surface from the sample.

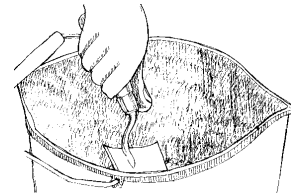


6. Follow a zig-zag pattern around the garden to collect soil samples from 9 more spots.



Follow steps 2-5 to collect each soil sample.

7. Thoroughly mix the ten soil samples in a clean bucket. Break up clumps and remove roots, stalks, and rocks.



8. If the soil is moist, place it on a clean sheet of plastic, and let it dry at room temperature. Once dry, your soil sample is ready for testing.



9. If you are sending your soil sample to a lab, get a soil sample box and information sheet. Carefully follow the directions for sending your soil sample to the lab.



**SPOTLIGHT ON RESEARCH**

**Soil Tests Are Reliable**

Suppose you sent identical soil samples to two different labs. Would the two sets of test results be identical? A team of scientists set out to find the answer to this question. They sent 24 soil samples from across the U.S. to several soil testing labs. They found that the results of tests on the same soil sent to different labs were similar. Why was it important for scientists to know this? Now scientists can compare soils

from across the country, even though the soils have been tested at different labs.

Kleinman, P., Sharpley, A., Gartley, K., Jarrell, W., Kuo, S., Menon, R.G., Myers, R., Reddy, K.R., and Skogely, E. (2000). Interlaboratory comparison of soil phosphorus extracted by various soil test methods. U.S. Regional Pasture Resource Lab. University Park, PA <<http://www.nal.usda.gov/ttic/tektran/data/000011/210000112164.html>>



**QUOTE**

"To be a successful farmer one must first know the nature of the soil." — Xenophon, Greek soldier and historian, 400 B.C.