

Soil Sampling using Home Test Kits

Soil test kits that are readily available at garden and home centers can be a quick, easy and economical way to know the quality of your soil. Before you invest time and money planting fruit, vegetables and ornamentals take some time to test your soil.

Home soil tests tell you:

- pH – a scale from 0 to 14 where values below 7 indicate acidic soil and values above 7 indicate basic or alkaline soil
- N - Nitrogen which is needed for leaf growth and green leaves
- P - Phosphorous which is needed for seed development and fruit development
- K - Potassium which is needed for root growth, early stem strength & fruit flavor

Most home soil test kits have clear, detailed instructions and information on how to amend the soil if your results are not what you want.

A Rapidtest® kit containing 40 tests (10 each of the 4 different tests) was purchased in late March 2009 for \$17 and used to sample some of the Demonstration Garden beds and a couple of home garden beds for comparison.

1 ½ cups of soil taken from the center of the bed 4" below the surface was used for all tests. The pH test only needs a minute to develop but soil & water mixtures for N,P & K tests must be allowed to settle for several hours - so plan ahead. **(Be sure to follow the exact instructions that come with your brand of soil test kit.)**

The table below lists the results of some sampling done in early April 2009

Bed #	pH	N	P	K	Action Plan
2	6.5 – 7.0	depleted	adequate to sufficient	depleted	
10	6.5 – 7.0	depleted	depleted	depleted	
12	7.3 – 7.5	depleted	adequate to sufficient	depleted	
15	7.5	depleted	depleted	depleted	
The beds referenced above are located in the Calaveras Master Gardener Demonstration Garden					
Tuolumne Community Garden	7.0 – 7.2	depleted	adequate to sufficient	sufficient to surplus	
GS Home	6.0	depleted	depleted	depleted	
Top soil	7.5+	adequate	<adequate	depleted	

Lessons learned:

- Soil color and texture are not an accurate indicator of pH, N, P & K
- pH can be good and nutrients may still be depleted
- Colored testing powders (especially Phosphorus) may sink to the bottom of the tube soon after shaking-this means there isn't enough Phosphorus to bind to-NOT that you've done the test incorrectly

After testing **consider what you want to plant before amending the soil** and remember:
Nitrogen (N) moves through the soil easily and can be easily added and depleted.
Phosphate (P) & Potassium (K) stay in the soil much longer and don't move.
Proper pH levels allow plants to uptake nutrients well.

Consider carefully before deciding to use organic or inorganic fertilizers.

All fertilizers influence plant growth directly by improving the supply of nutrients.
Inorganic fertilizers are fast-acting and low in cost but they may acidify the soil and add salts that can damage some crops.

Organic fertilizer concentrates such as fish emulsion, feather meal, blood & bone meal can change nutrient levels quickly OR slowly, can improve water infiltration & nutrient-holding capacity, may add small amounts of micro-nutrients, but may be expensive.

Animal Manures can be a good organic choice but they must be completely composted or applied weeks before starting seeds/transplanting tender plants.

Green Manures sometimes called **Cover Crops** can reduce soil compaction, add nutrients to the following crop and help maintain populations of mycorrhizal fungi spores. Cover crops should be tilled in a couple of weeks before the next planting.

Amendments improve the soils tilth and water holding capacity as well as adding some nutrients (based on the amendment used)

Note: Overall soil quality is influenced by:

Soil structure and tilth
Compaction
Workability
Earthworm abundance
Plant residue

Plant vigor
Root growth
Water infiltration
Water Availability

Resources for Soil Testing and Soil Management:

Soil Fertility Management for Organic Crops, University of California free publication #7249
<http://ucanr.org/freepubs/docs/7249.pdf>

Soil Building-related articles written & compiled by Ken R. Churches, Farm Advisor

Soil pH is Important to your Plants
Clay Garden Soils Require Special Care
Does Your Garden soil have Enough Organic Matter?
Choosing Between Chemical and Organic Fertilizers

Ken's articles are available at - <http://cecalaveras.ucdavis.edu/>

Compiled April 20, 2009 by Gretchen Sullivan using information from the following sources: California Master Gardener Handbook UC pub #3382, Building Soils for Better Crops by Fred Magdoff and Harold van Es, Rapidtest® Soil Test Kit instruction sheet, and the Ken R Churches articles listed above.