



Soil Sampling

FGV-00044

Why test your soil?

Unless a specific problem is suspected, the most common reason to sample soil is to determine levels of essential nutrients. Soil samples submitted to a laboratory will be analyzed for macronutrient (nitrogen, phosphorus and potassium) content as well as pH levels. Knowledge of current soil nutrient levels, combined with a relative understanding of crop nutrient needs, aids in developing useful fertilizer recommendations to reach or maintain desired nutrient levels.

Some independent laboratories include nutrient recommendations with soil sample results; however, these recommendations are not necessarily appropriate for soil conditions in Alaska. Various laboratories use different soil test methodologies that are often only suited or calibrated for soils and crops in their area. Location-appropriate recommendations are available from your district Cooperative Extension Service personnel or from the National Resource Conservation Service.

Why sample correctly?

Only a few tablespoons of the soil sample are used in the lab for the actual analysis, so it is important that the small amount truly represents the area of soil being tested. Soil improvement recommendations are based on the test results, and the accuracy of test results depends on the quality of the sample. If recommendations are made based on an unrepresentative sample, the crop could suffer in yield and/or appearance and money could be wasted. In addition, improper fertilization could also have adverse environmental impacts. Proper sampling greatly reduces these risks.

Soil sampling guidelines:

The soil sample that goes to the lab should represent the entire area sampled. The sample should not be collected from the best part of the lawn or garden, nor should it come from the worst part. It should represent the "average" part of the area being tested. For example, if there is a small sandy corner of the garden, don't sample there, but if half of the garden is sandy, include soil from both halves.

Areas that are managed separately should be sampled separately. Lawns, gardens and flowerbeds tend to have different management practices; therefore, each area should be sampled separately. Many gardeners in Alaska use raised beds, and often each bed has a separate crop or separate soil properties. When using raised beds with one type of crop in each, it is important to sample each bed separately, because the soil will have different nutrient characteristics with different crop history. If all raised beds are treated exactly the same and generally contain the same crops or else a mixture of crops, it is sufficient to sample each bed and combine the soil into one sample for the lab. The general rule for sampling is that each area should be analyzed separately if it is going to be treated differently. The reason is that each type of crop will have different nutritional needs and will leave the soil with different characteristics.

How do you take a soil sample?

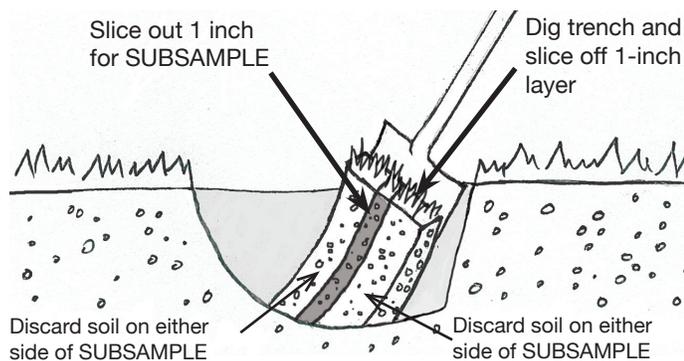
There are commercially available soil probes that allow many soil samples to be collected in a short time, but these probes are expensive and generally not worth the cost for the home gardener's occasional use. A clean shovel (or spade), along with a clean pail and a trowel or old kitchen knife, is quite adequate for collecting soil samples.

If using a shovel or spade...

1 Insert the shovel straight into the ground, about 6 inches deep for flower and vegetable gardens, and 4 inches deep for new and established lawns. Lift out the shovel full of soil, leaving a D-shaped hole in the ground.

2 Take about a 1-inch slice of soil from the straight, vertical side of the hole, making sure to keep the slice as even as possible. The important consideration is to make sure all layers of soil are included in the sample.

3 With a knife, a trowel, or even by hand (if the soil is soft), remove both sides of the slice on the shovel, leaving approximately 1 inch in the center. The resulting sample will be 1 inch thick, 1 inch wide and 6 inches long. This is called a subsample. See the diagram next page.



4 Place this strip of soil in the clean pail and move on to the next sample location. For gardens less than 500 square feet, take at least three subsamples to give an adequate representation of the soil. For gardens and lawns 500 to 10,000 square feet, take at least five subsamples. Each subsample from an area should be added to the pail. Do not mix subsamples from different areas. For example, the subsamples from the lawn will be mixed in the same bucket, but will be kept separate from the subsamples from the garden.

5 Once all subsamples for an area are placed in the bucket, break up soil clumps and thoroughly mix all of the soil together. Once it is mixed, pour about a pint of soil into a clearly labeled plastic sample bag and discard the rest of the soil in the pail. Clean out the bucket and utensils if another area will be sampled.

6 Repeat steps 1 to 5 for each area to be sampled, making sure to clean the utensils and bucket before sampling the next area.

Processing the samples

It is preferable to dry the soil samples before sending them to the lab. The samples should be air-dried within 24 hours, without raising the temperature above 120°F.

Soil won't dry in closed plastic bags, so lay out the samples where they can dry rapidly. Dried samples can be sent to the lab in plastic bags (clearly labeled).

Although it is not preferred, samples can be sent to the lab without drying them; however, some labs may assess an additional fee for drying them. Moist soil samples must be sent to the lab in plastic bags. Resealable freezer bags work well because they are made stronger than sandwich bags, and tend to have a good labeling area on them.

Fill out the Soil Sample Information Sheet and the laboratory's test request forms and send the soil to the lab of your choice (see CES publication FGV-00045, *Factors to Consider in Selecting a Soil Testing Laboratory*).

When (and how often) do I sample?

Collecting soil samples in the fall allows the entire winter for time to receive the test results and recommendations and to find the best prices for the fertilizer materials. The soil can also be sampled in the spring; however, spring sampling leaves much less time to organize and initiate the recommended fertilizer program.

Do not collect soil samples when the soil is very muddy or after lime or nutrients have been added since these would give errors in the recommendations.

Once a lawn or garden has been established, sampling the soil every three to five years should be adequate. If nutrient deficiencies or plant growth problems are observed, it may be a good idea to sample the soil. Also, if the soil is particularly sandy or has high gravel content, it may be necessary to sample every two to three years since the sandy soils don't retain nutrients as securely as do loamy soils.

For more information, contact your local Cooperative Extension Service office or Jeff Smeenk at 907-746-9470 or jeff.smeenk@alaska.edu. This publication is a major revision by Jeff Smeenk of Soil Sampling, written by Wayne Vandre in April 1987. Reviewed by Jodie Anderson, Instructor, High Latitude Agriculture, School of Natural Resources and Agricultural Sciences, University of Alaska Fairbanks; Stephen Brown, Extension Faculty, Agriculture and Horticulture; and Gary Michaelson, Research Associate, Agricultural and Forestry Experiment Station, University of Alaska Fairbanks.

Visit the Cooperative Extension Service website at
www.uaf.edu/ces or call 1-877-520-5211

Soil Sample Information Sheet

(Instructions on back)

Name: _____

Sample identification: _____

Address: _____

Telephone: _____

Location if different from mailing address: _____

| | | |
|--|--------------|--|
| <p style="text-align: center;">Homeowner Samples Please check only one</p> <p><input type="checkbox"/> Vegetable garden</p> <p><input type="checkbox"/> Flower garden</p> <p><input type="checkbox"/> Lawn</p> <p><input type="checkbox"/> Greenhouse bed</p> <p><input type="checkbox"/> Greenhouse bench</p> <p><input type="checkbox"/> Greenhouse container</p> <p><input type="checkbox"/> Other _____</p> | <p>.....</p> | <p style="text-align: center;">Farm Samples</p> <p>List crop to be grown: _____</p> <p>Is sample for USDA cost share? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Farm name or CSFA # _____</p> <p><input type="checkbox"/> Irrigated or <input type="checkbox"/> Nonirrigated crop</p> |
|--|--------------|--|

Is this newly cleared land? Yes No

Is this newly purchased topsoil? Yes No

If site was previously planted, please provide the following information where applicable:

| | Two Years Ago | Last Year | Planned This Year |
|------------------------------|---------------|-----------|-------------------|
| Plants or crop grown | | | |
| Yield or results | | | |
| Conventional fertilizer used | | | |
| Organic fertilizer used | | | |

Example 1 – Garden: Spring broadcast 3 lbs/100 sq ft of 0-20-20 fertilizer.

Example 2 – Field: (pH was 5.1) Applied no lime but spring broadcast 400 lbs/acre of 20-20-15

Please describe problems you have experienced previously and indicate past fertilizer and lime practices used. Give as much detail as you have on fertilizer analysis and timing of application.

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Instructions for completing the Soil Sample Information Sheet:

Homeowners often question why they are asked so many questions when they submit a soil sample to the lab. The questions on the CES Soil Sample Information Sheet are not so much for the lab analysis but rather to aid the agricultural professional who is making action recommendations for the soil based on the test results.

| | |
|---|---|
| Name and contact info: | Identifies the source of the sample and how to reach you. |
| Sample ID: | This is your way of identifying each sample when you submit multiple samples. Words are fine (e.g., front lawn, flowers, vegetable garden). |
| Location (if different from address): | Where is the physical location of the garden or field? |
| Homeowner samples: | What will be grown in the soil that got sampled? Is the sample for a lawn, flower garden, vegetable garden or berry patch? These soils often respond differently than greenhouse soils and potted plants. If the sample came from a greenhouse, was the soil from a bed, a bench or an individual container? If other, please be more specific on the supplied line. |
| Farm samples: | What is the planned crop? Different crops have different nutrient requirements. If USDA/CFSA cost share is involved, what is your farm's name or CSFA number? |
| Irrigated? | The higher yield expectations associated with irrigated crops have correspondingly higher fertility requirements. |
| Newly cleared land or purchased topsoil? | Many Alaska soils are initially low in nutrients until they have been amended with supplemental nutrients. |
| Planned planting info: | The site's cropping history and the yields from previous seasons factor in when making nutrient recommendations. Reporting the fertilizers used and their rates is also important for getting good recommendations. Indicating the organic and conventional fertilizers previously used (and desired for the current season) also influences recommendations. |
| Previous problems: | Give as much detail as possible. Useful information includes: What types (and rates) of fertilizer or lime have you put on? When did you apply the material? What kind of plant response did you see? Please include information on any organic amendments that you have applied. Your responses to this question do not change any of the test procedures, but they do assist the professional that is making recommendations for you. |

Price List (as of July 2011)

**If you are using the University of Alaska Fairbanks Soil Testing Lab,
please fill out and return this form with soil sample**

Step 1 Choose the analytic tests that you want done on the soil sample(s.)

Standard soil analysis..... **\$40.00**
(pH, nitrate, ammonium, phosphorus and potassium)

Additional nutrients of possible interest

Calcium\$ 4.85
Magnesium.....\$ 4.85
Sulfur.....\$ 4.85
Boron.....\$ 4.85

Other analytic tests

Electrical Conductivity (salt level)..... \$ 5.21
Cation Exchange Capacity (CEC) \$14.44
Soil Texture (requires additional soil)..... \$ 8.98
Loss on Ignition (organic matter)..... \$ 4.31

| Sample ID | Tests Requested | Cost |
|-----------|-----------------|------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Total _____

Step 2 Fill out the Soil Sample Information Sheet to assist the Extension person making the recommendations based on the laboratory results. Make sure the sample ID on the sample bag matches the sample ID on the form.

Step 3 To whom do you want the results to be sent? (circle appropriate one)

Mat-Su District CES Anchorage District CES Other Alaska CES office:

Step 4 Make a check payable to University of Alaska Fairbanks or UAF for the appropriate amount.

Step 5 Place air-dried soil sample in a small plastic bag (e.g., quart-size freezer bag) and write your name and the sample identification on the bag. The tests need about 1–2 cups of dried soil. Mail the soil sample, payment, this sheet and the Soil Sample Information Sheet to

**University of Alaska Fairbanks
Soil Testing Laboratory
1509 S. Trunk Rd
Palmer, AK 99645**

Contact Information

Name: _____

Phone: _____

E-mail: _____

Mailing Address: _____
