



Factors to Consider in Selecting a Soil Testing Laboratory

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Soil testing is an integral part of efficient nutrient management for both farm fields and home gardens. There are many different types of chemical tests that can be done on soil. When you send a soil sample for analysis, it is important to select the tests that will provide you with the most useful information. This publication provides guidelines for selecting which chemical tests you should request and some options for soil-testing laboratories that use these procedures.

Types of Soil Tests

Soil tests are designed to extract a portion of an essential plant nutrient from the soil. The results of these tests can be correlated with the availability of that nutrient for uptake by plant roots, and, therefore, the need for additional amounts of the nutrients for good crop growth and yield. Most soil tests are indexes of nutrient availability rather than measures of absolute amounts. Indexes tell whether nutrient availability is low, adequate or high. This is more useful than knowing total amounts, because not all of a nutrient in the soil is in a form that plants can use.

The use of relative indexes, rather than total amounts, means that different types of soil tests for the same nutrient can differ numerically — even though they are all “good” soil tests. However, some soil tests are better adapted to the characteristics of soils in different regions of the country. They work better on those soils than alternative procedures. For this reason, it is important to use the specific soil tests that are best suited for your Alaska soil.

After the nutrient level of a soil is determined by laboratory analysis, the next step is to develop a fertilizer recommendation for a specific crop on that site. The need for fertilizer is determined through calibration experiments where different amounts of fertilizer are added to fields with different soil test values. A crop is grown, and the yield of the crop is used to develop recommendations for how much fertilizer to apply at

different soil test levels. This “calibration” research is performed using specific soil test procedures. Thus, to effectively use the recommendations developed from the research, a soil sample must be analyzed using those same procedures.

While it is important to select the right soil test, it is also important to recognize that fertilizer recommendations are most accurate when the calibration research is done in the same geographical area as the soil that is being tested. For example, fertilizer recommendations developed for a specific soil test in Washington may be very different from those developed using the same soil test in Alaska. This is due to factors such as the differences between soils and climatic conditions of Alaska and Washington that have an effect on plant growth. These factors result in differences in yield potential for crops grown in different regions of the country, which lead to differences in the total amount of plant nutrients and fertilizer required for maximum yield.

Alaska Soil Test Requirements

The following methods are the standard soil tests used by the University of Alaska Fairbanks Agricultural and Forestry Experiment Station (AFES) Soil and Plant Analysis Laboratory. They should be requested when using soil test laboratories outside of Alaska to ensure that your results will correlate with our existing UAF fertilizer recommendations.

Nitrogen: nitrate ($\text{NO}_3\text{-N}$) and ammonium ($\text{NH}_4\text{-N}$)
2 Normal KCl extraction method

Phosphorus: Mehlich-3 extraction method

Potassium: Mehlich-3 extraction method

Soil pH: 1:1, soil: water method

Lime Requirement: SMP Buffer method

In addition to selecting the right soil tests, cost is an important factor in selecting a soil-testing laboratory. Laboratories offer standard packages of tests, which are usually the cheapest option if all the tests you need are in one of the packages. However, some packages may include a number of tests that you don't really need, and these may be more expensive than a package from another laboratory that doesn't include as many tests. Most laboratories also offer individual analyses for additional tests that are not part of their standard packages. This may allow you to add to the package to get all the necessary tests, although these separate tests can have a relatively high individual cost. Always call a laboratory for current prices and assistance in finding the least expensive way to meet your soil testing requirements.

Soil Testing Laboratories

The following list of laboratories provides some options for meeting your soil testing needs. The list includes the UAF-AFES Soil and Plant Analysis Laboratory and three laboratories outside of Alaska that are certified by the National Association of Proficiency Testing (NAPT). The list is not exhaustive and is only intended to provide some examples of suitable soil testing laboratories. It is not an endorsement by the UAF Cooperative Extension Service of one group of laboratories over others not appearing on the list. However, soil types and growing conditions in Alaska are unique, so the number of soil-testing laboratories offering the exact set of tests used in Alaska is very limited.

Soil and Plant Analysis Laboratory

Palmer Center for Sustainable Living
Matanuska Experiment Farm
University of Alaska Fairbanks
1509 S. Georgeson Dr.
Palmer, AK 99645
907-746-9450

Standard soil test includes pH, nitrate, ammonium, potassium and phosphorus. Cost: \$40 per sample.

SoilTest Farm Consultants

2925 Driggs Dr.
Moses Lake, WA 98837
1-800-764-1622
www.soiltestlab.com

Request test group S3. In addition to the basic Alaska soil test requirements, you will receive results for organic matter, soluble salts, sulfur, magnesium, boron, zinc, copper and iron. Cost: \$35 per sample.

A&L Eastern Agricultural Laboratories

7621 Whitepine Road
Richmond, VA 23231
804-743-9401
www.al-labs-eastern.com

Request soil test package MES1, along with individual analyses for ammonium-N and nitrate-N. In addition to the basic Alaska soil test requirements, you will receive results for organic matter, magnesium, calcium, cation exchange capacity and percent base saturation. Cost: \$32 per sample (including the additional nitrate and ammonia N analysis).

Brookside Laboratories Inc.

200 White Mountain Dr.
New Bremen, OH 45869
419-977-2766 (phone)
419-977-2767 (fax)
www.blinc.com

Request soil test package S001AN. In addition to the basic Alaska soil test requirements, you will receive results for organic matter, sulfur, magnesium, calcium, manganese, zinc, copper, boron, iron, cation exchange capacity and percent base saturation. Cost: \$16.50 per sample.

A major limiting factor in selecting a suitable soil-testing laboratory is that the majority of laboratories in the western United States do not offer the Mehlich-3 extraction method. The Mehlich-3 method is effective in extracting available phosphorus from the acidic soils found in many parts of Alaska, but it is not suitable for the alkaline soils that dominate many western states. One laboratory in the Pacific Northwest that does offer Mehlich-3 is SoilTest Farm Consultants in Moses Lake, Washington. This laboratory will also automatically forward your soil test results to the UAF Cooperative Extension Service so

Soil laboratory



that your district Extension agent can contact you. Your district agent can then provide UAF fertilizer recommendations based on the soils in your area. The UAF-AFES Soil and Plant Analysis Laboratory continues to provide the service of sending your soil test results to your UAF district Extension agent for interpretation.

If you use one of the other laboratories, you can list your local Extension agent on the submittal form as someone who should receive a copy of the results. You will need to call or visit the website of the laboratories outside of Alaska to obtain a submittal form and current lab prices. Samples for analysis must include prepayment. These laboratories may automatically send you fertilizer recommendations appropriate for their local conditions, but it is best to have your results interpreted by someone who uses Alaska research as a basis for fertilizer recommendations.

Summary

If you decide to use a soil testing laboratory outside of Alaska, take the following steps:

1. Request soil test procedures with proven effectiveness on Alaska soils.
2. Use Alaska fertilizer recommendations to interpret the soil test results rather than rely on fertilizer recommendations developed for another state.
3. Select a laboratory that is certified by the National Association of Proficiency Testing (NAPT).
4. Compare the prices charged by different laboratories for a similar series of tests.

For information on how to collect a representative soil sample to submit to a laboratory for soil testing, see the UAF Cooperative Extension Service publication *Soil Sampling*, FGV-00044.

www.uaf.edu/ces or 1-877-520-5211

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